

## REPUBLIC OF IRAQ

Emergency Operation for Development Project (P155732)  
Emergency Operation for Development Project - Additional Financing (P161515)

# Draft for consultation



*Updated Environmental and Social Management Framework (ESMF)*

*September 2017*

---

---

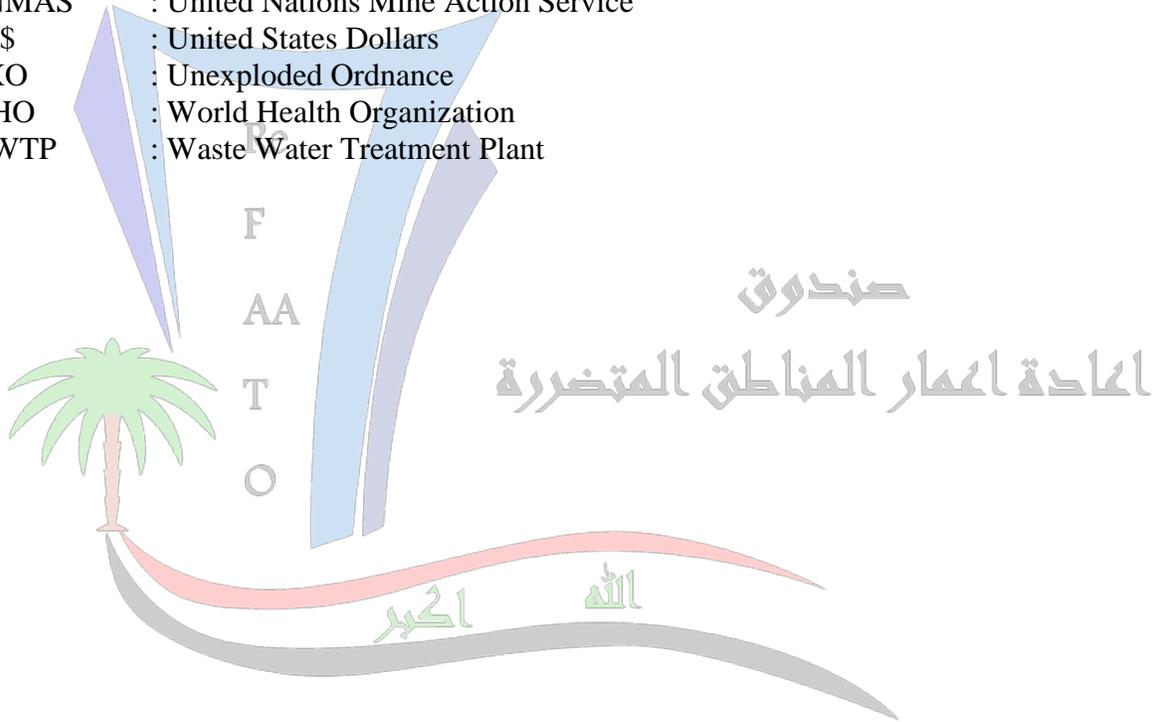
## CURRENCY EQUIVALENTS

1 USD =1,163.86 IQD

## ABBREVIATIONS AND ACRONYMS

°C	: Degree Celsius
°F	: Degree Fahrenheit
%	: Percent
AF	: Additional Finance
BCM	: Billion Cubic Meter
DRB	: Directorate of Roads Bridges
EA	: Environmental Assessment
EERP	: Emergency Electricity Reconstruction Project
EHSG	: Environmental, Health and Safety Guidelines
EMP	: Environmental Management Plan
EOD	: Explosive Ordnance Disposal
EODP	: Emergency Operation for Development
EODP-AF	: Emergency Operation for Development – Additional Finance
EOI	: Expression of Interest
E&S	: Environmental and Social
ESAP	: Environment and Social Action Plan
ESIA	: Environment and Social Impact Assessment
ESMF	: Environmental and Social Management Framework
ESMP	: Environment and Social Management Plan
EWR	: Explosive War Remnants
FY	: Financial Year
GDP	: Gross Domestic Product
GOI	: Government of Iraq
GRS	: Grievance Redress Service
GSCOM	: General Secretariat of the Council of Ministers
IBRD	: International Bank for Reconstruction and Development
IDA	: International Development Association
IDPs	: Internally Displaced Persons
IEDs	: Improvised explosive devices
IFC	: International Finance Corporation
IQD	: Iraqi Dinar
IUCN	: The International Union for Conservation of Nature
Km	: Kilometer
Km <sup>2</sup>	: Square Kilometer
Mg/l	: milligram per liter
m <sup>3</sup>	: Cubic meter
M&E	: Monitoring and Evaluation
MENA	: Middle East and North Africa
MoCH	: Ministry of Construction and Housing
MoE	: Ministry of Electricity
MoH	: Ministry of Health
MoMPW	: Ministry of Municipalities and Public Works
NSWMP	: National Solid Waste Management Plan
OP/BP	: Operation Policy/Best Practice

PAD	: Project Appraisal Document
PCR	: Physical Cultural Resources
PCU	: Project Coordination Unit
PDO	: Project Development Objective
PMT	: Project Management Team
PMU	: Project Management Unit
Qty	: Quantity
RAP	: Resettlement Action Plan
RF	: Reconstruction Fund
RPF	: Resettlement Policy Framework
SBA&H	: State Board of Antiquities & Heritage
TA	: Technical Assistance
TOR	: Terms of Reference
UN	: United Nations
UNOCHA	: United Nations Office for the Coordination of Humanitarian Affairs
UNMAS	: United Nations Mine Action Service
US\$	: United States Dollars
UXO	: Unexploded Ordnance
WHO	: World Health Organization
WWTP	: Waste Water Treatment Plant



---

## EXECUTIVE SUMMARY

---

### 1. Introduction

---

#### 1.1 Background

The conflict in northern Iraq has unfolded at a time of severe fiscal crisis. In the last two decades, Iraq has witnessed a dramatic fall in almost all human development indicators including poverty, health standards, life expectancy, and literacy. Extreme poverty is widespread, particularly in rural areas and a number of governorates. The government's recovery strategy is to jump-start the delivery of basic infrastructure and services and rehabilitate critical infrastructure in the liberated areas from the insurgency. In response to the request of the Government of Iraq, the World Bank's support, through the proposed Emergency Operation for Development – Additional Finance (EODP-AF), is aimed at supporting the Republic of Iraq in the reconstruction of damaged infrastructure and restoration of public services delivery in Targeted Municipal Areas.

The parent EODP is being implemented in urban agglomerations of Tikrit, Al-Dour, Al-Alam and Al Dhuluiya located in the Salah Al-Din Governorate as well as urban agglomerations of Jallawla, As-Sadiya and Al-Azeem located in Diyala Governorate. In addition, suburban areas, villages and infrastructure across open range land may also be included for project-financed activities. The EODP is already expanding its support to additional municipalities such as Ramadi and few others that were liberated over the past year, where immediate support to reinstate services was much needed. The EODP-AF would expand the support further to other liberated areas and extend to other priority sectors. This proposed EODP-AF would expand scope from electricity, water, sanitation and solid waste management, transport (roads and bridges) and health sectors to include agriculture, water resources and irrigation, municipal services and education. These newly introduced sectors would address important segments of the society who are living in lagging regions, poor, with high unemployment and where women's employment in the agriculture is a viable one. Similarly, the improvement of municipals services and the return of the younger generations to a modern schools and curriculum would rehabilitate them from the nearly two years of fierce conflict and extremist ideologies.

Geographically, the expansion would go beyond today's Salah Ad-Din and Diyala governorates to more cities that have been recently liberated in two additional governorates such as Mosul in Nineveh, Ramadi in Anbar and few others. These cities have experienced enormous damage to all aspects of from public and private assets whether in terms of infrastructure, services, housing or businesses.

Beyond these areas that were directly affected by the conflict, the EODP-AF will also support communities who are hosting IDPs for the past three years to continue and improve their ability to deliver services to IDPs. These communities are in many cities in Iraq including in Kurdistan region.

The common feature for all project interventions is the strict adherence to pre-existing footprints of buildings, structures and linear infrastructure, which was damaged, destroyed, sabotaged or stolen during combat activities and occupation by the terrorist groups.

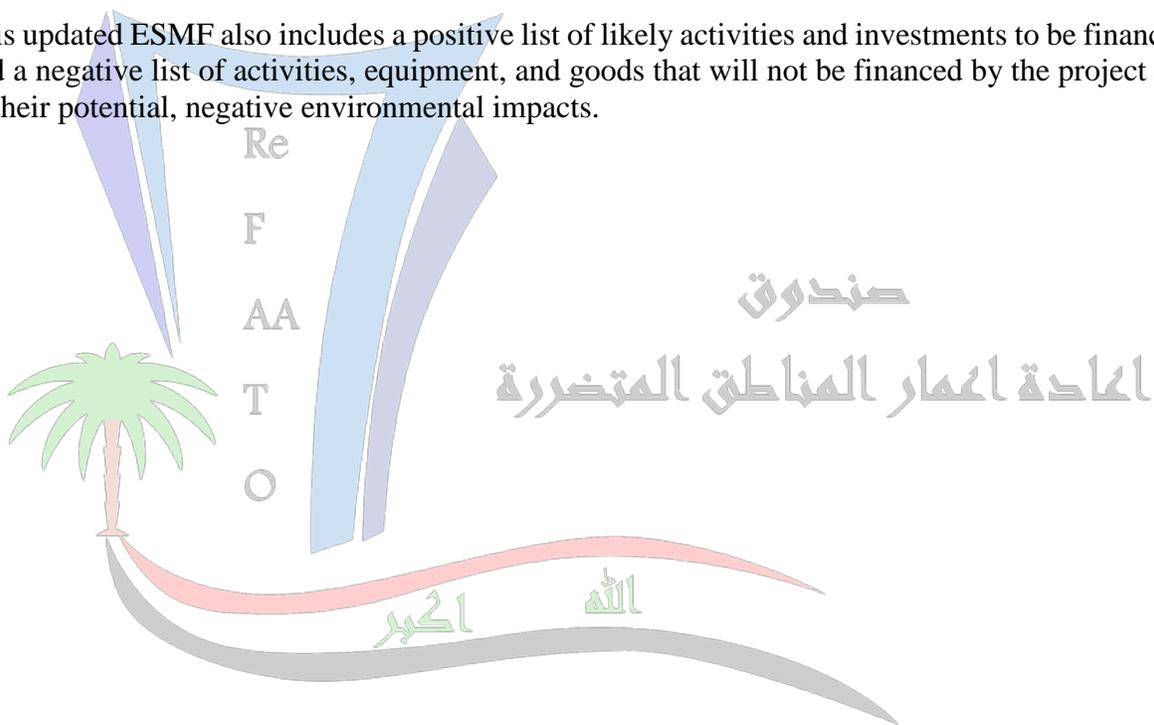
## 1.2 Project Development Objective and Rationale for Additional Finance

The Project development objective is to support the Republic of Iraq in the reconstruction of damaged infrastructure and the restoration of public services delivery in Targeted Municipal Areas. The PDO for the EODP-AF is consistent with the PDO for the parent EODP but with an expansion in geographical and sectoral coverage: to support the GoI in the reconstruction of the damaged infrastructure and the restoration of public service delivery in Targeted Areas.

## 1.3 Rationale for the updated ESMF

According to the World Bank requirements for financing this project, the Project Owner prepared an Environmental and Social Management Framework (ESMF) that covers the entire scope of potential investment sub-projects. The ESMF for the parent EODP was prepared, consulted and disclosed before any EODP physical activities started. Given that a new scope has been added to the original EODP, the ESMF needs to be updated to incorporate the new geographical and sectoral expansion.

This updated ESMF also includes a positive list of likely activities and investments to be financed, and a negative list of activities, equipment, and goods that will not be financed by the project due to their potential, negative environmental impacts.



## 2. Project Description

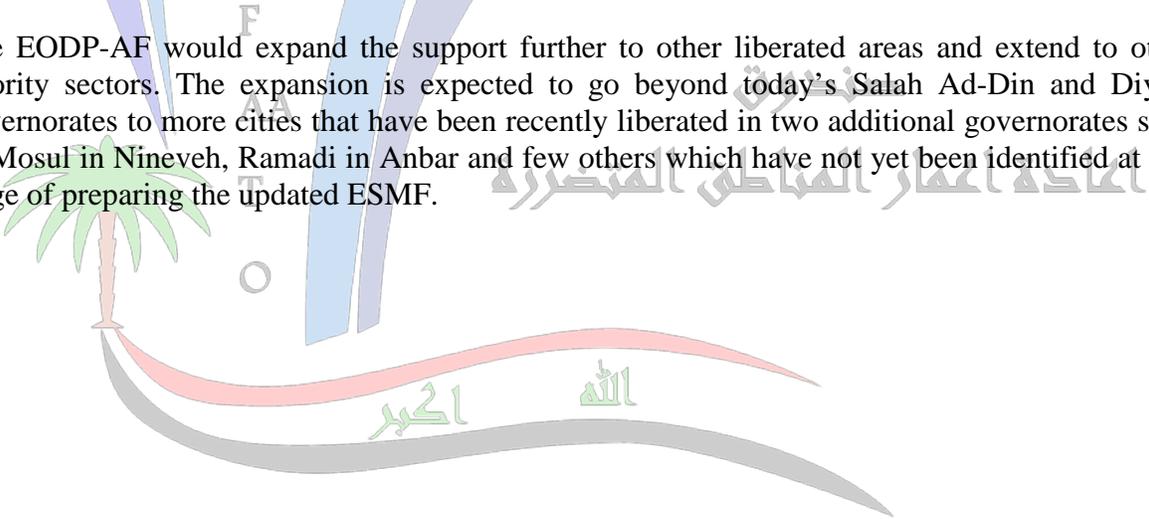
### 2.1 Overview

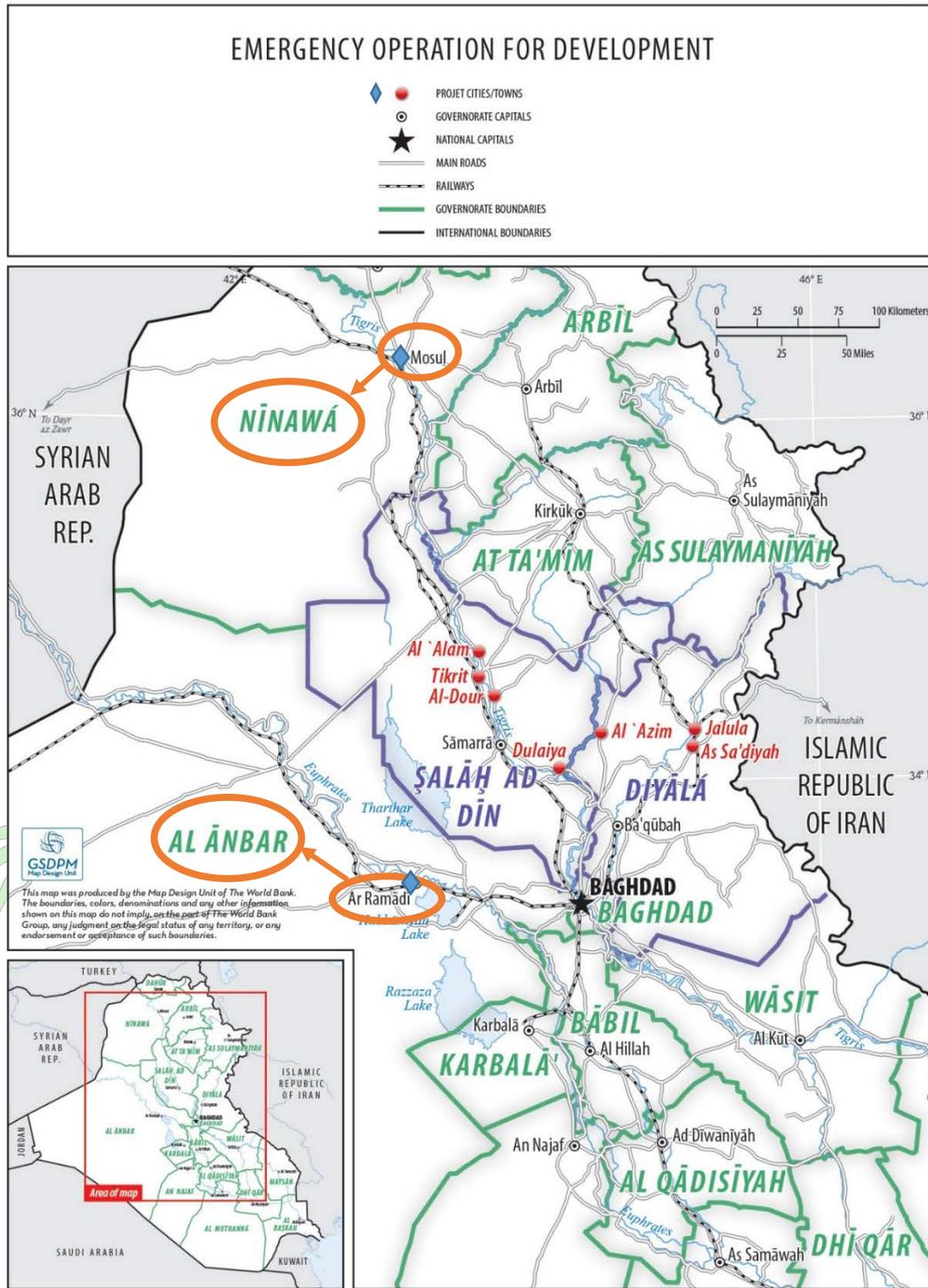
The project adopts an integrated and pragmatic approach to the reconstruction and rehabilitation of damaged infrastructure and housing in conflict-affected cities in Iraq. For the water, energy, transport, social services, agriculture, water resources and irrigation, municipal services and health sectors, this will be conducted through the repair and reconstruction of damaged infrastructure in the selected geographical areas which are described below. The project will also support technical assistance towards planning and designing urban development and future infrastructure schemes and will also support project management, sensitization and monitoring and evaluation component. The design of the project components provides flexibility to include newly liberated and secure municipal areas.

### 2.2 Project Locations and Physical Features

The parent EODP is currently focusing on the originally seven targeted municipalities/cities in two governorates that were identified during project preparation in May 2015 including the cities of Tikrit, Dour, Al Dhulo'eyya and Al-Alam in the Salah ad-Din governorate and Jalula, As-Sadiya and Al-Azeem in the Diyala governorate. The EODP is already expanding its support to additional municipalities such as Ramadi and few others that were liberated over the past year, where immediate support to reinstate services was much needed.

The EODP-AF would expand the support further to other liberated areas and extend to other priority sectors. The expansion is expected to go beyond today's Salah Ad-Din and Diyala governorates to more cities that have been recently liberated in two additional governorates such as Mosul in Nineveh, Ramadi in Anbar and few others which have not yet been identified at this stage of preparing the updated ESMF.





**Figure 1:** Republic of Iraq: Emergency Operation for Development Project Locations (◆ Symbol highlights the new project locations in Al-Anbar and Nineveh Governorates)

## 2.3 Project Components

### Component 1: Restoring Electricity Infrastructure and Connectivity

This component aims to support restoration of electricity services to the liberated areas, with particular emphasis on (i) public sector led interventions covering the reconstruction of damaged transmission and distribution assets (as per the original EODP) and (ii) where feasible, private sector- led efforts to expand access to electricity based on service contracts for installing new infrastructure for electricity generation and distribution (fee per KWh) and SPV systems for institutions and households.

### Component 2: Restoring Municipal Waste, Water and Sanitation Services

This component is largely similar to that described for the EODP and aims to restore water, wastewater and solid waste services through the repair, reconstruction, and rehabilitation of damaged infrastructure in selected municipalities. Reconstruction of public works will generate local employment opportunities, and successful completion of public works in this sector will reduce the incidence of public health risks through water-borne diseases.

However, the AF will incorporate the following modifications to the original component: i) it will now focus on four governorates (Anbar, Diyala, Ninaweh and Salahadin, including the districts and sub-districts surrounding Mosul and Anbar) and ii) prioritize reconstruction and rehabilitation of sewage treatment plants, storm water pumping stations and solid waste management equipment (garbage trucks, etc.)

### Component 3: Restoring Transport Infrastructure

Transport infrastructure (bridges, roads, airports, and railway) is key to the economic development of Iraq. Most of the transport infrastructure in the war-impacted regions suffered destruction and damages resulting from the recent military operations, sabotage and vandalism during the crisis. Critical bridges, road sections, airports and railways have been significantly damaged. This has led to severe disruption of service delivery, closure of several bridges, road sections as well as other modes of transport such as airports and railway systems. In addition, lack of maintenance funding and institutional weaknesses have further deteriorated the quality of the transport infrastructure and service delivery of the sector.

The objective of this component under the AF is to expand coverage to liberated areas in Al Anbar, Salahadeen and Ramadi governorates to restore service delivery, connectivity and access to economic and social services that have been disrupted due to the destruction of roads and bridges in military operations against ISIS. Activities under this component will include the reconstruction of key bridges that have been fully damaged, and rehabilitation of partially damaged bridges in affected areas, particularly in Mosul that has endured wide-ranging destruction to physical assets and infrastructure.

Activities for this component AF will include: preparation of detailed plans, designs and bidding documents for the reconstruction of roads and bridges, and technical assistance and consultancy services for supervision and implementation of transport subprojects. In addition, the proposed reconstruction and rehabilitation works would support the Gol's plans for economic recovery, social reconciliation and employment creation for working-age youth. These works will be implemented by the Iraq Reconstruction Fund in coordination with sector authorities as well as local government agencies to the extent possible.

The AF will finance the restoration of Mosul airport by rehabilitating terminal buildings, runways and taxiways, and communication, navigation and air safety systems. It will also provide funding to restore functioning of local terminals in Al Anbar and Mosul. In parallel, it will support the preparation of a feasibility study for the operation and maintenance of Mosul airport financed by a public-private partnership scheme. This work will draw upon the World Bank's experience in Jordan and other best practice examples. To avoid duplication and random rehabilitation of the Iraq Republic Railway IRR, the AF will finance the railway rehabilitation masterplan.

Year 1 of the Project will focus on maintenance and quick repairs of critical bridges and roads; recruitment of consultants; and preparation of plans and detailed designs for the reconstruction of complex and highly technical transport facilities. Years 2–5 of the Project will focus on the actual implementation of rehabilitation and reconstruction of damaged roads and bridges and restoring functions of airports.

### **Component 5: Technical Assistance**

**Sectoral Development:** This component will develop and espouse a strategic and coherent approach towards recovery and reconstruction efforts across a range of potential sector investment projects. This approach is intended to support the preparation of a range of potential sector investment projects underpinned by strategic and medium to long-term needs assessments that will be undertaken by the Bank and the GoI over the AF implementation period. will continue to constitute a platform for providing Technical Assistance for all of the Project components.

**Technical Assistance:** This component will continue to implement a detailed and nuanced approach to various facets of *state/citizen trust-building and promoting reconciliation in the broader Project context* including: (i) inclusive participation by local communities, (ii) transparency of resource allocations, (iii) measures to promote tolerance amongst various social groups through community-led sub projects, (iv) dissemination of information regarding the Project to build trust and confidence by using targeted media, social media and communications campaigns, (v) youth initiatives to build social capital and foster reconciliation and (vi) effective grievance redressal and increased accountability on service delivery issues at the local level . In addition, technical assistance in this area will be geared towards working on *a broad strategy for the sustainable management of physical cultural resources (PCRs)*. This activity will entail a systematic and detailed damage assessment of physical cultural resources that have been damaged; the preparation of a prioritized list of required interventions; the development of a reconstruction and restoration strategy for PCRs (including related standards, guidelines, knowledge and technical resources, and design codes); and design and preparation to establish a fund to support the restoration and maintenance of PCR on a more sustainable basis.

### **Component 6: Project Management, Sensitization and Communications and Monitoring and Evaluation**

This component will continue to cover costs associated with the management and coordination of the Project, including social and environmental safeguards, procurement and financial management, communication and community sensitization, and monitoring and evaluation (M&E). The remit of this component will be extended to supervise effective execution of citizen’s engagement initiatives.

Strategic communication and citizen engagement activities will be administered throughout the project preparation, implementation and monitoring to promote an inclusive approach in the reconstruction process. Efforts to promote citizen participation in the Project will be underpinned by a strategic communications campaign that is part of an overall holistic citizens engagement strategy. The aim will be to raise awareness of the Project’s objectives, scope and activities; potential benefits (and costs) for beneficiaries; its relevance to the GoI’s broader vision for recovery and reconstruction; and various avenues that are available for beneficiaries and citizens to remain apprised of Project developments and to engage in the design and implementation of sub projects across a range of sectors. Communication messages and modalities will be tailored to the information seeking habits of specific vulnerable groups (IDP’s, women, youth, unemployed, business, etc.) and proactive dissemination of timely and comprehensive information through appropriate media will establish a precedent for transparency and signal the GoI’s willingness for the local populace to be informed and engaged. This approach will also be useful to manage expectations and promote buy-in and ownership.

A baseline beneficiary survey will determine modes of engagement and appropriate communication channels around which the existing the above components of the CE strategy will be modified, from their

current format. The key elements of the citizen engagement strategy for this Project will include the following: (i) early disclosure of important project related information by the GoI on its website and at the appropriate local levels and disclosure procedures agreed with the Bank, (ii) framework for consultation with the key stakeholders ensuring all targeted beneficiaries are informed, through relevant stakeholders and their representatives to obtaining broad community support as a part of preparation of specific sub-projects relevant to that area; (iii) ensure the continuity in existing and establishment and implementation of GRM within new PMTs and at the PCU, to meet specific grievance redress requirements of this operation; and (iv) promote community based initiatives with the participation of and networking with relevant stakeholders including women, school children, youth, IDPs, host communities, civil society organizations, and local bodies.

#### **Component 4: Restoring Health Services (Dropped)**

This component has been removed from the project.

The State of Kuwait, through the Kuwait Fund for Arab Economic Development has made available a grant of USD100 million to support the health sector in conflict affected areas.

#### **Component 7: Restoring Agriculture Productivity and Irrigation Infrastructure**

Widespread unavailability of traditional agricultural inputs and service supplies in newly liberated zones, combined with soaring farm gate prices for agricultural inputs<sup>1</sup> represent significant constraints to productivity growth, and employment and enterprise development in Iraq's rural sector. In addition, emergency assistance is essential for returning farm households, IDPs, producer groups and farmer associations to gain some measure of food security and to establish the foundation of a more measured approach to agriculture sector recovery.

The key focus of this component is to revive agricultural and related activities in the conflict-affected regions across the country. Project activities will utilize a combination of emergency and short-term measures to improve the capacity of the Ministry of Agriculture to support farmers with critical agricultural services, technologies and investments.

The four sub-components are emergency implementation of local area development plans, restoration of critical agriculture support services, emergency agriculture credit facilitation and project management.

The reconstruction of the irrigation system is crucial to the success of the agricultural sector in most parts of the country. Irrigated agriculture, which accounts for bulk of the total production of cereals and other crops was affected by ISIS. Strategic barrages, link canals, major irrigation headworks and pumping stations were severely damaged. In addition, necessary maintenance was not carried out on the irrigation and drainage water distribution network, leaving the irrigation and drainage systems in a state of disrepair. The total area under irrigation decreased by 50 percent and crop productivity has fallen below 30 percent of pre-war levels.

There are three components to the rehabilitation of the irrigation infrastructure. The first component cover the emergency repair of water control hydraulic infrastructure and irrigation headworks and canals. This would support emergency repair of the Falluja barrage and Alerwaia Thathar link canal. Small irrigation schemes listed in the inventories of the MoWR and department of Agrarian Services in the governorates of Anbar, Salahdin, Mosul and Dyala are either dysfunctional or partially operational (albeit heavily dilapidated), also fall under this component. The second component deals with the provision of technical assistance and training in water resources and irrigation management, participatory irrigation management, information technology and implementation consultants. This would include consulting services for engineering, construction supervision, quality control environmental and social safeguard.

---

<sup>1</sup> (relative to international levels)

Training will also be provided in the fields of water resources and irrigation management, participatory irrigation management, information technology, construction supervision. The third component is technical and targets the strengthening capacity for project management, monitoring and evaluation, including financing of Operating Costs: This would include: auditing, monitoring and evaluation, PMU costs and expenses related to supervision of project's activities.

### **Component 8: Restoring Education Services**

This component aims to support the restoration of education services in liberated and affected areas of Iraq, while laying the foundation for further development in the education sector. It will place emphasis on vocational education for youth and the economic empowerment of women. The three sub-components are: rehabilitation, reconstruction, upgrading and equipping of education infrastructure, development and implementation of teacher and school leader training and support programs, and support for out-of-school youth and development of the education sector.

### **Component 9. Restoring Basic Urban Infrastructure and Services in Selected Municipalities (\$60 million)**

This component will support the restoration of basic urban infrastructure and services in the selected municipalities in Anbar, Salaj-Ad-Din, and Diyala governorates, paving the way for the return of displaced residents and laying the ground work for extensive housing repair and reconstruction in the future.

The implementation of this sub component will be based on a framework for sub project preparation and implementation that will be composed of core elements including i) a set of selection and evaluation criteria, ii) a cap for individual sub-projects cost and iii) clear requirements for environmental and social safeguards.

Sub-projects will be identified based on a clear rationale, prioritization criteria and an integrated area-based approach. Revitalization of economic activities will be a key priority in sub project identification, and, as such, sub projects will therefore focus on neighborhoods where 1) there is promise of rejuvenating commerce and trade and ii) the majority of housing has withstood partial damage. Eligible sub-projects will also have to be economically viable, avoid the possibility of major or irreversible environmental and social impacts, and have financing, procurement, and implementation plans in plans that are satisfactory as per Bank standards. Eligible sub projects may include, inter alia, facilities for youth and sports activities, community centers, parks, cultural heritage sites, public markets, internal roads (streets) and urban water and waste water networks.

This component will be implemented by the beneficiary governorates technical support from consulting firms. As a result of the ongoing devolution process, the governorates are expected to have increased responsibilities and autonomy in the provision of urban services. This will contribute towards strengthening the administrative and technical capacities of the governorates, and potentially pave the way for future actions and programs.

### 3. LEGAL AND INSTITUTIONAL FRAMEWORK

---

#### 3.1 National Legislations and Regulations

The project is subject to the following Iraqi laws and regulations:

- Law no. 37 for the year 2008: The Ministry of Environment
- Law no. 27 for the year 2009: Protection and Improvement of Environment
- Regulations no. 2 for the year 2001: Preservation of Water Resources
- Law on 17 for the year 2010: Protection of Wild Animals and Birds
- Law no. 55 for the year 2002: The Law of Antiquities and Heritage

#### 3.2 World Bank Safeguard Requirements

In addition to the Iraqi laws and regulation the ESMF and subsequent ESMPs should comply with the safeguards policies and procedures of the World Bank. Originally OP/BP 4.01 on Environmental Assessment, Physical Cultural Resources (OP4.11), Involuntary Resettlement (OP/BP 4.12), and International Waterways (OP7.50) were triggered for the parent project. Therefore, these policies will continue to be triggered for EODP-AF, in addition to OP/BP 4.09 on Pest Management which has been triggered after introducing the agriculture sector in the additional finance.

Under the Bank's safeguard requirements, the EODP has been assigned an EA Category "B" given that the nature of the proposed activities which will not have highly significant adverse environmental and social impacts, and this category will also continue for the EODP-AF.

In addition, due to the nature of the EODP activities, the General and Industry guidelines on Environmental, Health and Safety Guidelines (EHSGs) in particular the General Guidelines and Sector Guidelines for Construction and Decommissioning should be used as appropriate<sup>2</sup>.

---

<sup>2</sup> See ifc.org/ehsguidelines

## 4. Baseline Conditions

---

### 4.1 Overview

The common feature for all project interventions is the strict adherence to pre-existing footprints of buildings, structures and linear infrastructure, which was damaged or destroyed during combat activities.

The majority of interventions is expected in urbanized areas, which are generally characterized by the nonexistence of environmentally sensitive areas or natural habitats of importance - being in urbanized areas - which require special attention or protection.

### 4.2 Climate<sup>3</sup>

#### 4.2.1 General

The climate of Iraq is mainly a hot desert climate or a hot semi-arid climate to the northernmost part. Averages high temperatures are generally above 40 °C (104 °F) at low elevations during summer months (June, July and August) while averages low temperatures can drop to below 0 °C (32 °F) during the coldest month of the year during winter. Most of the rainfall occurs from December through April and averages between 100 and 180 millimeters annually.

The wind regime is characterized by the winds prevailing from the western and north-western direction throughout the year. In spring the south of Iraq often occur south-west winds accompanied by dust storm. Mean annual wind velocity reading 2.1-3.9 meter per second, maximum register at Mosul 26 meter per second, 31 meter per second at Kirkuk and 40 meter per second near Basrah, Evaporation varies from 1300 mm in the northern region to 2450 mm. in the central region of which 400-500mm. occurs in both July and August only.

The climate of the Iraqi plains is sub-tropical, continental. Summer is long, hot and dry. Winter is short with mean monthly temperatures above zero and some year's daily temperature falls two to three degree below zero. Intensive cyclonic activity in the atmosphere provoking rainfall, most precipitations occurs between October and May.

#### 4.2.2 Salah Al-Din Climate

Salah Al-din has three different climates and is dominated by BWh.

---

<sup>3</sup> Source: <https://en.climate-data.org>

**Table 1: Salah Al-Din Climate Classifications**

Classification	Count	Köppen-Geiger	Examples
Hot desert climates	2121	BWh	<u>Qaryat al Haranah</u> , <u>Qaryat Abu Talhah</u> , <u>Qaryat Abu Talhah</u> , <u>Albu Talhah</u> , <u>Qaryat al Kazakazah</u>
Hot semi-arid climates	358	BSh	<u>Amirli</u> , <u>Garmak</u> , <u>Zindana i Pichuk</u> , <u>Takhta Mina</u> , <u>Chala Duana</u>
Hot-summer Mediterranean climate	1	Csa	<u>Aziz Bag</u>

#### 4.2.3 Diyala Climate

Diyala has three different climates and is dominated by BWh.

Re **Table 2: Diyala climate Classifications**

Classification	Count	Köppen-Geiger	Examples
Hot desert climates	1489	BWh	<u>Husaywat</u> , <u>Mahmud al Khalaf</u> , <u>Badwi al Ali</u> , <u>Abu Bakr</u> , <u>Quraish</u>
Hot semi-arid climates	841	BSh	<u>Chahar Shakh</u> , <u>Chwarshakh</u> , <u>Kani Shirin</u> , <u>Ali Khalah</u> , <a href="http://en.climate-data.org/location/947000/">http://en.climate-data.org/location/947000/</a>
Hot-summer Mediterranean climate	93	Csa	<u>Nawde</u> , <u>Nawday</u> , <u>Saraw</u> , <u>Chuardaran</u> , <u>Darband</u>

#### 4.2.4 Al-Anbar Climate

Al Anbar has two different climates and is dominated by BWh.

##### Classifications

Classification	Count	Köppen-Geiger	Examples
<u>Hot desert climates</u>	<u>831</u>	<u>BWh</u>	<u>Al Khalidiyah</u> , <u>Qaryat Nahhalah</u> , <u>Arak Jasim</u> , <u>Abd Manfi</u> , <u>Abd Allah Ulaywi</u>
<u>Cold desert climates</u>	<u>5</u>	<u>BWk</u>	<u>Qaryat Barim</u> , <u>Tanif</u> , <u>Al Walid</u> , <u>Kharjah</u> , <u>Mahfur al Jandali</u>

#### 4.2.5 Nineveh Governorate

Nineveh has three different climates and the most prevalent ones are BSh, Csa.

#### Classifications

Classification	Count	Köppen-Geiger	Examples
Hot semi-arid climates	816	BSh	Qaryat Lazagah, Qaryat al Karamah, Mansuriyat as Salamiyah, Qaryat as Salamiyah, Namrud
Hot-summer Mediterranean climate	741	Csa	Mosul, Hanis, Barrasha, Maghara, Khirbat Kajuri
Hot desert climates	17	BWh	Qaryat al Ghazlaniyat, Tall Abu Arbid, Tall Rabak, Ayn at Tarfawi, As Sakhriyat

#### 4.3 Geographical features

Iraq can be divided into the following five physiographic zones (FAO/UNESCO/WMO, 1962).

- a) Zagros Mountain Region
- b) Foothills Region
- c) Desert Region
- d) Jazeera Region
- e) Mesopotamian Plain Region

*Concerning EODP, the expected interventions and activities will take place between **Jazeera Region** and the lower fold of the **Mesopotamian Plain Region** which is mainly composed of flat plateau.*

- **Jazeera Region:** includes the remnant of an old inland sea in which mainly gypsum was deposited. It is a steppe and desert plateau. The area is relatively flat broken by some hills and low mountain ridges which are an extension of the mountain ridges to the east. The mountain ridges go in an east west direction; in between there are level to undulating and at places rolling terrain.
- **Mesopotamian Plain Region:** is a geological depression filled with river sediments which covers the central and southern parts of Iraq. It is a plain of the Tigris and Euphrates rivers.

#### 4.4 Water Resources

##### 4.4.1 Surface Water Resources

Iraq is traversed by two major rivers, the Tigris and the Euphrates, both of which rise in the eastern mountains of Turkey and enter Iraq along its northwestern borders. Before their confluence just

north of Basra, the Euphrates flows for about 1,000 km and the Tigris for some 1,300 km within Iraqi territory. Downstream from this point, the combined rivers form the tidal Shatt al-Arab waterway, which flows 190 km into the Gulf.

The Euphrates basin (579,314 km<sup>2</sup>) embraces parts of Iraq (roughly 49% of the basin). The Euphrates River does not receive water from permanent tributaries within Iraqi territory and is fed only by seasonal runoff from wadis.

Within Iraq, the Tigris River receives water from four main tributaries, the Khabour, Great Zab, Little Zab and Diyala, which rise in the mountains of eastern Turkey and northwestern Iran and flow in a southwesterly direction until they meet the Tigris.

The great alluvial plains of the Tigris and Euphrates Rivers comprise more than a quarter of Iraq's surface area. Topographically, the region is extremely flat, with a fall of only 4 cm/km over the lower 300 km of the Euphrates and 8 cm/km along the Tigris. Under natural conditions, the region was rich in wetlands and subject to annual flooding of up to 3m.

The major river flow annual cycle can be divided into three periods:

- a- spring flood period, February to June
- b- summer low flow period, July to October
- c- autumn - winter rainfall period, November to February

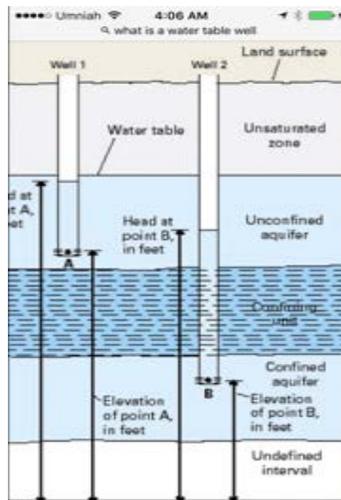
During spring flood period, Tigris River conveys about 75 % of the annual flow, during low flood period 10 % and 15 % during autumn period. The volume and duration of floods on the Tigris depends greatly on flood flow of the tributaries. The spring flood of Diyala tributary occur before that on the Lesser Zab, while this event precedes the spring flood on Greater Zab, The Euphrates carries 70% of annual flow during spring period, 10% in the summer period, and 20% during autumn period.

The Euphrates peak flows usually occur in the beginning of May, whereas that of the Tigris occurs in March or April.

Water quality in the Euphrates is affected by return flows from irrigation projects in Turkey and Syria, and is expected worsen as irrigated land is added. Within Iraq, much of the return flow is now drained into the Persian Gulf through the Main Outfall Drain, but considerable saline return flow enters the river system. On the Tigris River, the quality is further degraded with flood flows diverted into off-stream storage in the highly saline Tharthar Lake, and later returned to the river system carrying salts washed from the lake.

#### 4.4.2 Groundwater

According to the hydrological map as shown in the figure below, there are no specific aquifer in the area, and according to the water table contour lines in the map the nearest water table is more than 100m away from the surface. Therefore, the interaction between the project activities and the water aquifer is not expected.



**Figure 2: Hydrogeological Map in the Regions where EOPD will operate**

## 4.5 Biodiversity

### 4.5.1 Ecosystem in Iraq

The combination of rain shortage and extreme heat makes much of Iraq a desert. Because of very high rates of evaporation, soil and plants rapidly lose the little moisture obtained from the rain, and vegetation could not survive without extensive irrigation. Some areas, however, although arid, do have natural vegetation in contrast to the desert. The majority of sites important for biodiversity conservation have no protected area status, although many have been recommended for designation.

### 4.5.2 Mesopotamian Marshlands

The Mesopotamian marshlands are unique ecological features at the confluence of the Tigris and Euphrates. They fall into three distinct areas: Hawizeh Marsh in the north, fed by the Tigris and Karkheh rivers, the Central (Qurnah) Marsh, which lies between the Tigris and the Euphrates, and the Hammar Marsh to the south, traditionally fed by the Euphrates. These three marshes were once contiguous and covered 20,000 km<sup>2</sup>. The marshes are important economically and ecologically to all peoples of this area and are of global environmental significance.

### 4.5.3 Biodiversity in EODP and EODP-AF Intervention Areas

The ecosystem conditions in the areas where EODP and EODP-Af activities will take place are considered near the “Plateau Area” and is far from the marshlands (which is located in the east-southern part of Iraq) and far from the desert areas (located in the far west of the country). In the EODP and EODP-AF intervention areas (plateau), the fauna and flora species are not classified as rare or endangered. These species are common and abandoned in many locations. No significant terrestrial habitats or ecosystems are present in the EODP or EODP-AF intervention areas. The only important habitat is mainly the aquatic environment of the rivers which cross through the intervention areas.

## **4.6 Economic Activities and Land-use**

### **4.6.1 Oil industry**

Iraq's economy is dominated by the oil sector, which has typically provided 95% of foreign exchange earnings. Production is concentrated in two main areas, namely northern Iraq in and around Kirkuk, and, in the south, around Basra.

### **4.6.2 Natural gas**

Iraq has 3.114 trillion m<sup>3</sup> of proven natural gas reserves, and approximately 4.25 trillion m<sup>3</sup> in probable reserves. About 70% of Iraq's natural gas reserves are 'associated' (meaning that the gas occurs with oil reserves). In 2001, Iraq produced 2.75 billion m<sup>3</sup> of natural gas, down drastically from peak output levels of 19.82 billion m<sup>3</sup> in 1979. Iraq has had a long-term strategy of increasing its domestic consumption of natural gas to free as much oil as possible for export.

### **4.6.3 Agriculture**

The agricultural sector contributes to 35% of Iraq's non-oil GDP and up to about 30% of employment for the rural poor. The development of hydraulic infrastructure, consisting of large dams, reservoirs and distribution networks for water supply and irrigation was central to economic planning. Iraq developed more than 3 million hectares of irrigated-agricultural lands. Traditionally the main crops were wheat, barley, maize, beseem and vegetables. Crop yields for most crops are usually low when compared with other countries and rural poverty is high. Unsustainable water management practices, including construction of large dams and irrigation schemes, have resulted in deterioration of the quality of soil and land productivity.

The desert plateau provides the country's main rangeland grazing, as well as limited dryland cultivation. The uplands and mountains yield acorns, almonds, walnuts and pine nuts, with additional grazing and dryland cultivation. Irrigated agriculture occurs mainly in the alluvial plain. The principal crops include dates, wheat, barley, maize, rice and cotton, as well as a wide variety of fruit and vegetables.

#### **4.7.3.1 Irrigation**

Water use in agriculture is currently estimated at about 44 BCM per year constituting 90 percent of total abstractions. With the exception of about 1 BCM groundwater, the irrigation water is abstracted by diversion from rivers and distributed through an extensive system of barrages, irrigation canals, and on-farm channels and approximately half of the diverted water is lost in conveyance. In addition, on-farm water use efficiency is also low. Irrigation of date palms with highly saline water has been practiced since 1977, while the use of brackish groundwater for tomato irrigation has also been reported in the south of the country.

## 5. Assessment of environmental and social impacts and Impact mitigation framework

Guidance for identification of potential environmental and social impacts of the project components will be presented in addition to proposing general mitigation measures. At later stages and during the preparation of site specific ESMPs/ESIAs, environmental and social impacts should be carefully examined and detailed. Appropriate mitigation measures should also be discussed in relation to each subproject, baseline conditions and capacity of the implementing agency. However, it is important at the beginning to note that some subprojects will have to be excluded from financing under EODP and EODP-AF due to their highly anticipated significant negative environmental and/or social impacts.

### 5.1 Ineligible Subprojects

Some of the activities or subprojects which have significant environmental and/or social impacts have been excluded from implementation under EODP and/or EODP-AF. In all ESMPs or ESIAs which will be prepared prior to construction, the following exclusion list of criteria should be referred to in order to ensure that the proposed subproject is eligible for support under EODP and/or EODP-AF.

**Table 3: Criteria for Ineligible Subprojects**

<ul style="list-style-type: none"> <li>• <b>General Characteristics</b></li> </ul>
a) Concerning significant conversion or degradation of critical natural habitats.
b) Damages cultural property, including but not limited to, any activities that affect the following sites: <ul style="list-style-type: none"> <li>• Archaeological and historical sites; and</li> <li>• Religious monuments, structures and cemeteries.</li> </ul>
c) Requiring pesticides that fall in WHO classes IA, IB, or II.
<ul style="list-style-type: none"> <li>• <b>Sanitation</b></li> <li>• New wastewater treatment plants to serve 10,000 or more households.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Solid Waste</b></li> <li>• New disposal site or significant expansion of an existing disposal site.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Irrigation</b></li> <li>• New irrigation and drainage schemes.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Dams</b></li> <li>• Construction of dams more than 5 meters high. Rehabilitation of dams more than 15 meters high.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Power</b></li> <li>• New power generating capacity of more than 10 MW.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Income Generating Activities</b></li> <li>• Activities involving the use of fuelwood, including trees and bush.</li> <li>• Activities involving the use of hazardous substances.</li> </ul>

#### Note on Unexploded Ordnance (UXO):

An important precondition to infrastructure repair and reconstruction will be the removal of debris and rubble, as well as structures which have been damaged beyond economic repair in order to clear space for subsequent reconstruction works. Due to the risks of explosive war remnants (EWR) concealed in and under the rubble (both unexploded ordnance - UXO, and deliberately planted explosives) an extensive explosive ordnance disposal (EOD) would have to be an integral

part of rubble removal. The GoI with assistance from the European Union, and the rest of the international community including specialized agencies such as the United Nations Mine Action Service (UNMAS) will ensure that improvised explosive devices (IEDs) and UXOs are properly detected and removed prior to works activities begin especially where rubble is accumulated. Any rubble removal, repairs or reconstruction financed by the Bank will only apply to those areas that have been declared safe of EWRs. Confirmation that sub-Project locations have been cleared of EWR, IEDs and UXOs will be sought from the relevant authorities (the Ministries of Interior and Defense). No sub-project activities will be undertaken without this assurance. In a similar manner as the completion of the required safeguards documents, the declaration of absence of ERW will be a criterion to allow any Bank-financed works to proceed.

## 5.2 Preliminary Assessment of Environmental Impacts of EODP and EODP-AF

In general, following is the list of broad positive and negative impacts that are very likely to arise from the sub-projects funded under the EOPD and EODP-AF.

### 5.2.1 Overall positive impacts of the project

The proposed project and its subcomponents are expected to have major positive environmental and social benefits which will contribute to the improvement of the living conditions of the Iraqi people in addition to improvement in the overall environmental status in the liberated lands. The following is a list of key economic, environmental and social benefits which will result from EODP and EODP-AF activities:

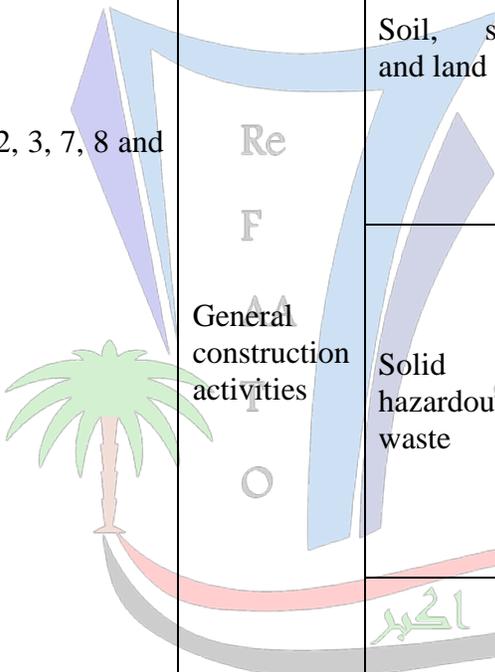
- Economic and social development of the liberated lands;
- Improved environmental conditions due to management of solid and liquid wastes;
- Reduced air pollution and traffic congestions
- Improved accessibility of people, goods and services;
- Improved public health due to provision of clean drinking water, reliable sanitation systems and municipal waste management;
- Improved safety conditions due to provision of reliable electricity service;
- Improved productivity of agriculture land and livestock
- Improved management of water resources
- Restoration of some PCR sites under the municipal services sector
- Job creation and local economic development

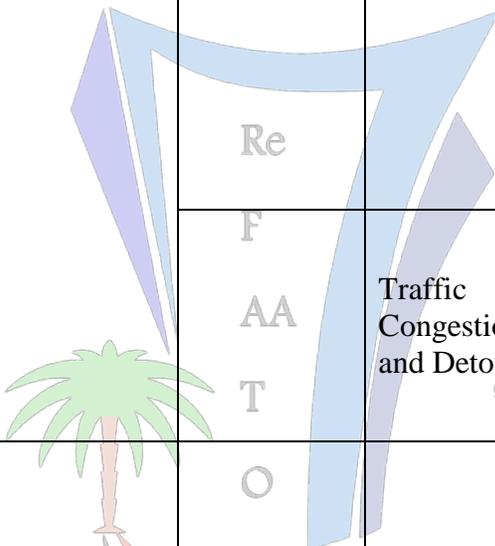
### 5.2.2 Overall negative impacts of the project

The preliminary assessment of impacts that can be linked to the EODP and EODP-AF can be generalized under (i) typical construction/rehabilitation impacts which can be mitigated with good construction practices and (ii) specific impacts that can arise due to engineering interventions proposed for some sub-projects and hence require more detailed analysis at a later stage.

In general, the following is the list of broad negative impacts that are very likely to arise from the sub-projects funded by the EODP and EODP-AF. These impacts though occurring in most of the sub-projects will vary in extent and significance **hence individual assessment for each subproject is of utmost importance.** However, for ease of presentation and reference typical construction impacts related to the project have been discussed under the following thematic categories.

**Table 4: Preliminary Identification of Potential Negative Impacts during Construction**

EODP Component(s)	Activities	Receptor/EHS Aspects	Related Potential Impacts
1,2, 3, 7, 8 and 9 	General construction activities	Air	<ul style="list-style-type: none"> <li>• Emission of pollutants from engines of construction machinery and equipment.</li> <li>• Dust “lifting” due to earthwork and movement of construction trucks and equipment on unpaved roads.</li> </ul>
		Noise	<ul style="list-style-type: none"> <li>• Noise emission from engines of construction machinery and equipment</li> </ul>
		Soil, subsoil and land	<ul style="list-style-type: none"> <li>• Land occupation due to the installations in the working areas</li> <li>• Soil/subsoil contamination due to accidental spills and leaks from construction equipment</li> <li>• Improper discharge of domestic sewage from construction camps/offices.</li> <li>• Improper disposal of wastes from construction camps/offices.</li> </ul>
		Solid and hazardous waste	<ul style="list-style-type: none"> <li>• Production of construction wastes/demolition debris</li> <li>• Solid wastes from construction camps/offices</li> <li>• Improper disposal of fuel barrels, removed asphalt, paint containers, asbestos materials.... etc.</li> <li>• Improper disposal of dredging waste of irrigation channels</li> </ul>
		Water resources	<ul style="list-style-type: none"> <li>• Improper disposal of debris or construction wastes on river banks</li> <li>• Improper discharge of domestic sewage from construction camps/offices into surface or subsurface water bodies</li> <li>• Improper use of construction chemicals in underwater structures. Water consumption for construction works</li> </ul>
Biodiversity and sensitive habitats	<ul style="list-style-type: none"> <li>• Removal of trees or green cover for rehabilitation or construction purposes may result in loss of habitats</li> <li>• Pollution of rivers or waterways may negatively affect the aquatic ecosystem,</li> </ul>		

EODP Component(s)	Activities	Receptor/EHS Aspects	Related Potential Impacts
		Cultural heritage	<ul style="list-style-type: none"> <li>• During rehabilitation, sites or structures of cultural significance may be negatively affected from construction works.</li> </ul>
		Socio-economic environment	<ul style="list-style-type: none"> <li>• Temporary nuisance and inconvenience as a result of the construction activities including noise, emissions.</li> <li>• Influx of workers and the potential implications on host communities.</li> <li>• Employment, working conditions and safety of workers at the construction site</li> <li>• Potential child labor employment by local subcontractors</li> <li>• Disturbance of public health and quietness due to construction/rehabilitation activities;</li> <li>• Land acquisition or obstructing access to amenities due to construction/rehabilitation activities.</li> </ul>
		Traffic Congestion and Detours	<ul style="list-style-type: none"> <li>• Traffic impacts due road blockages for construction purposes and detours. This may be associated with traffic congestions, increasing commuting time and creating inconvenience to roads users.</li> </ul>
		Health and Safety	<ul style="list-style-type: none"> <li>• Falling from moderate heights;</li> <li>• Vehicle/pedestrian accidents;</li> <li>• Falling into trenches;</li> <li>• Being buried in tunnels/excavations;</li> <li>• Breathing dust and other air pollutants;</li> <li>• Back aches caused by handling heavy material;</li> <li>• Suffering hearing loss from noise</li> </ul>

**Table 5: Preliminary Identification of Potential Negative Impacts during Operation**

Receptor/EHS Aspects	Related Potential Impacts
Air	<ul style="list-style-type: none"> <li>• Emission of pollutants due to increased traffic and mobility on the rehabilitated roads</li> <li>• Emissions from landfill operations and waste incinerators in veterinary clinics</li> <li>• Increased emissions due to increase in electricity consumption</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Increase in noise emission due to increased traffic and mobility on the rehabilitated roads</li> </ul>
Soil, subsoil and land	<ul style="list-style-type: none"> <li>• Improper management of landfills may result in contamination of soil and land</li> <li>• Improper disposal of sewage</li> <li>• Leakages in sewage networks</li> </ul>
Solid and hazardous waste	<ul style="list-style-type: none"> <li>• Improper management of waste disposal sites and untreated sludge</li> <li>• Disposal of empty chemical containers used in water/wastewater treatment and agrochemicals</li> <li>• Medical wastes from mobile clinics and hospitals</li> </ul>
Water resources	<ul style="list-style-type: none"> <li>• Increase in fresh water consumption</li> <li>• Leakages in water network</li> </ul>
Biodiversity and sensitive habitats	<ul style="list-style-type: none"> <li>• Improper disposal of sewage and wastes</li> <li>• Improper use of pesticides</li> </ul>
Cultural heritage	<ul style="list-style-type: none"> <li>• Increase in vibration levels due to heavy traffic in roads passing through culturally important sites.</li> </ul>
Socio-economic	<ul style="list-style-type: none"> <li>• Positive Social amenities and social benefits</li> </ul>

## 6. Environmental Management & Monitoring Framework

### 6.1 Objectives of the ESMMF

The objectives of this Environmental and Social Management and Monitoring Framework, is to outline a mechanism for analyzing and mitigating potential negative impacts and for monitoring the application and performance of mitigation measures. The ESMMF identifies roles and responsibilities for different stakeholders for implementation and monitoring of mitigations.

As explained previously, the proposed project (parent EODP and Additional Finance) is to be implemented mainly in 4 governorates (with possibility to expand in other governorates depending on government priority and agreement with the Project). Institutional and technical capacities, as well as physical and social environments may vary between them. Identical mitigation measures for all governorates may not provide the flexibility required for dealing effectively with some of the negative impacts which require taking the local context into account. Wherever applicable, the ESMMF is designed to accommodate alternative context-specific mitigations.

### 6.2 General Mitigation Measures

The following are general mitigation measures that need to be detailed according to each subproject and in relation to the site specific baseline conditions.

#### 6.2.1 During Construction

With the purpose to reduce the impacts related to emissions of gaseous pollutants from construction equipment, the following mitigation measures and good practice are to be taken into account:

##### Air

- Employ construction machines with low emissions to reduce pollution, arranging sources of emission far from people's houses and public places
- All construction machines and vehicles should meet the standard on emissions and have passed the emission test
- No burning of wastes on site
- Limit traffic congestion through proper planning and operating of traffic diversions
- Do not let machines idle when not necessary

Concerning dust control methods and measures, the following actions are to be taken into account to reduce the generation of dust:

- Regular watering of roads for dust suppression in urban, residential areas and in areas with sensitive receptors
- Covering of excavated soil temporary stored on site
- Daily cleaning of tires of vehicles
- Covering up any vehicle transporting materials and spoil to and from construction sites
- Daily cleaning of streets and pathways in vicinity of construction site that are affected by soil and dust
- Imposing speed controls for construction vehicles

## **Noise and vibration**

Mitigation measures foreseen to minimize the impact related to the noise emission during the construction phase are:

- Apply appropriate schedule to avoid any works that may cause noise and vibration during 10 pm – 6 am especially near inhabited areas. Any nighttime activities should be done using noise reducing means or low-noise technologies
- Use vehicles and equipment that meet national standards for noise and vibration.
- Publishing and registering working time of construction machines with local authorities and strictly compliance therewith.
- Restricting use of noisy machines near sensitive receptors such as schools and hospitals, use noise-reducing means for construction machines, if required.

## **Soil, subsoil and land**

- Earthwork should be carried out during dry weather periods;
- Stockpiling of earth should be done a safe distance away from waterways;
- Other construction materials containing small/ fine particles should be stored in a place not subjected to flooding;
- If necessary, silt/sedimentation traps should be used to prevent soil particles from getting into drains and canals.

## **Solid and hazardous waste**

- Work sites should be cleared of residual solid waste and wastewater before work commences;
- Temporary storage of solid wastes shall be done with appropriate containment to avoid spreading of waste, odor and avoid dust;
- Temporary storage of solid waste should be done to avoid interfering with traffic obstacles and aesthetics;
- Sites for collecting solid waste in each sub-project area should be determined prior to commencement of construction. These sites must be suitable with the transport, in order not to obstruct the activities of human beings and the waste must be transported during the day;
- Construction wastes should be removed as much as possible within 24 hours from the site to ensure public safety in urban areas;
- All waste should be collected and disposed in compliance with the local and national laws, in sites identified by the respective local authorities;
- Excavated soil, if suitable, should be used for leveling and backfilling;
- Dredging waste, resulting from clearing the canals, need to be handled according to its constituents;
- No solid waste should be burned at the site;
- Clean the construction site of solid wastes, wastewater etc. before its closing

## **Domestic waste**

- Construction camps should be sited appropriately with consent from the necessary public authority or the implementing agency,
- Labor camps shall be provided with adequate and appropriate facilities for disposal of sewage and solid waste

- Domestic solid waste shall be collected and disposed of daily at the local authorities designated site or given for collection by the local authorities
- Discharge and disposal domestic waste from worker camps into water sources should be strictly avoided
- Burying and burning domestic waste in the project site should also be strictly avoided
- Avoid construction workers staying overnight in the construction sites

### ***Hazardous wastes***

- Wastes identified as “hazardous” will need special handling, transportation and disposal. For contaminated sites, a hazardous waste disposal plan will need to be prepared.
- The contractor should be trained and made aware of the requirements prior to commencement of the sub-project. Special guidelines for handling of contaminated soils or hazardous wastes should be prepared and published.
- Hazardous wastes and contaminated soils should not be dumped on-site but removed to landfill/dumpsite designated by the local authority or the environmental agency as appropriate;
- Oil and lubricant waste should not be buried or burnt in the project site, but collected and stored in proper oil-cans and disposed for re-use or local authority approved designated sites.

### **Water resources**

- Identification of the reliable water resources and obtain necessary approvals from the relevant authorities to extract water prior to commencement of construction work;
- Contractor should not obstruct or prevent water flow when working closer to water bodies;
- Silt traps and erosion control measures should be used where the construction carry out closer proximity to the water bodies to avoid entering of construction materials which cause turbidity and sediments;
- Construction material and stock piles should be covered to avoid wash off to water bodies;
- Water conservation practices should be in place in construction offices and camps;
- Camps should not be located near water ways, human settlements or near drinking water intakes.

### **Biodiversity and sensitive habitats**

- Underwater construction chemicals should be friendly to the marine environment;
- A compensatory tree planting program should be developed to replant native species wherever available space beside the proposed project;
- Workers should be instructed to protect flora and fauna including aquatic life as well as their habitats;
- Hunting and pouching should be strictly prohibited;
- Washing, maintenance and service of vehicles and machinery should not be done closer to the freshwater habitats;
- Solid waste, construction debris should not be dump into wetlands or natural habitats.

### **Cultural heritage**

#### ***1. Infrastructure Development***

The initial impact assessment on PCRs from infrastructure development interventions under the project will be undertaken as part of the environmental screening. This would involve a site

inspection and reference to maps of heritage building, property and landscapes prepared by the competent authority<sup>4</sup>. The goal of environmental screening is to:

- determine the presence or absence of PCR sites within the project boundary and its area of influence
- if yes, to describe the extent, character and ownership of the PCR and investigate the significance of it
- Evaluate the scope for impacts on each site in the event of project proceeding and document them.

Depending on the significance of the PCR, its ownership and location, EMPs may need to be reviewed and cleared by the SBA&H. For municipal projects that may include restoration of PCRs, this should be supervision of a specialized person after being reviewed and cleared by SBA&H.

## **2. *Chance finds procedures***

Contracts for civil works involving earth moving and excavation activities, especially in known archaeological and heritage areas, should normally incorporate procedures for dealing with situations in which buried PCRs are unexpectedly exposed.

## **3. *Recognition of unknown PCRs***

For EODP contracts, an initial consultation with the Department of Antiquities should be held before work commencement to identify the likelihood of such material being uncovered, especially where trenching work is expected for pipe laying etc. Upon discovery of such material during execution of work, the contractor should carry out the following;

- Immediately stop construction activities.
- With the approval of the resident engineer delineate the discovered site area.
- Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard should be present until the responsible authority takes over.
- Through the Resident Engineer, notify the responsible authorities (SBA&H and local authorities) within 24 hours.
- Submit a brief chance find report, within a specified time period, with date and time of discovery, location of discovery, description of finding, estimated weight and dimension of PCR and temporary protection implemented.
- Responsible authorities would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out.
- An evaluation of the finding will be performed by the SBA&H who may decide to either remove the PCR deemed to be of significance, further excavate within a specified distance of the discovery point and conserve on-site, and/or extend/reduce the areas demarcated by the contractor etc.
- Construction work could resume only when permission is given from the Department of Archaeology after the decision concerning the safeguard of the heritage is fully executed.

## **Socio-economic**

<sup>4</sup> State Board of Antiquities & Heritage (SBA&H)

- In case of temporary or permanent land acquisition, apply the Resettlement Policy Framework (RPF)<sup>5</sup> and the implement a Resettlement Action Plan (RAP).
- Mobilizing maximum capacity of skilled and unskilled labor force from the surrounding project area;
- Identify location of camps with consultation with the local community and local authority;
- Ensure installation of adequate construction camps and sanitation facilities for construction workers to control of transmission of infectious diseases.
- The social risk related to labor influx for EODP AF might not be high. The contractors for efficiency purposes will resort in many cases to local labors as long as the qualifications are met. The number of skilled and non-skilled workers would be between in the age between 40-60 years old. The majority of the workers do not need accommodation onsite because they have regular transportation to/from their nearby home towns/villages. Few non-skill workers may require accommodation in the construction camps such as guards, cooks and drivers. (see Annex 9 on labor influx guidance note).
- PMTs should intervene and monitor closely the working conditions and ensure appropriate accommodation on site (if necessary).
- Child labor should be totally prohibited. PMTs should include clear clauses in their work contracts to prevent child labor. In addition, close monitoring and supervision, especially on local subcontractors, should be performed by the PMTs.

### **Health and Safety**

The proposed project interventions will mostly involve small to medium scale construction sites. As such, extreme dangers posed by working in environments such as great heights, deep water and involving dangerous chemicals and radioactive material will not be present. Health and safety of workers and the public should be designed into constructions, before and during and after the building phase.

The following safety measures can be used as general guidelines:

Environmental Assessment for each site should mandatorily include a risk assessment as to what are the hazards involved in the work site, who might be harmed and how seriously, how likely this harm might happen and what actions are required to eliminate or reduce the risk and incorporate such measures in the EMP and clearly set out in the tender documents. All sub-projects must observe health and safety regulations, hence during implementation it is important to check if these control measures are put in place and are meeting the legal requirement.

### **Training**

- Ensure constructors carry out suitable training programs on occupational health and safety for workers prior to commencement of construction.
- Ensure only experienced and well trained workers are used for the handling of machinery, equipment and material processing plants
- Ensure all persons, including managers, are trained and able to carry out their work without risk to the safety or health of themselves, other workers or the public

---

<sup>5</sup> A Resettlement Policy Framework (RPF) is separately prepared which outlines the necessary procedures to be followed in case of involuntary resettlement.

### ***Personal Protective Equipment***

- Ensure appropriate safety equipment, tools and protective clothing are provided to workers and that safe working methods are applied. A safety inspection checklist should be prepared taking into consideration what the workers are supposed to be wearing and monitored.
- Any person who works or operates in an area where there is a risk of flying objects, such as splinters, should wear safety goggles at all time. These should be securely fitted to the face. Welders should protect the entire face from hot sparks and bright rays by using a welding mask.
- Any person exposed to high levels of dust or hazardous gases (when working in tunnels) should wear respiratory protection in the form of disposal masks or respiratory masks which fit more snugly around the nose and mouth.
- Any person working in an area where there is the risk of being struck on the head by a falling or flying object should wear a hard hat at all times. These should be well maintained in order to be fully effective, and any helmets or hard hats that are damaged or cracked should immediately be replaced.
- All workers will be required to wear shoes or strong boots to prevent sharp objects from penetrating or crushing the foot. Those working in muddy conditions and in canals with polluted water should avoid hand/foot contact with water and should never wear slippers.
- Road workers should wear reflective vests to avoid being hit by moving vehicular traffic.

### ***Site Delineation and Warning Signs***

- Ensure delineation devices such as cones, lights, tubular markers, orange and white strips and barricades are erected to inform oncoming vehicular traffic and pedestrians in the area about work zones.
- Ensure all digging and installing work items that are not accomplished are isolated and warned of by signposts and flash lamps in nighttime.
- Ensure dangerous warning signs are raised to inform public of particular dangers and to keep the public away from such hazards.
- Ensure rehabilitation of trenches progressively once work is completed.
- The safety inspection checklist must look to see that the delineation devices are used, whether they are appropriately positioned, if they are easily identifiable and whether they are reflective.

### ***Equipment safety***

- Work zone workers use tools, equipment and machinery that could be dangerous if used incorrectly or if the equipment malfunctions Inspections must be carried out to test the equipment before it is used, so that worker safety can be secured. Inspections should look for evidence of wear and tear, frays, missing parts and mechanical or electrical problems.

### ***Traffic management***

- Ensure traffic control plans and procedures are in place when work zone is set up and how to handle full or partial road closure, blocked intersections, sidewalk closure etc
- Ensure installation of transport signs and lighting systems in conspicuous places to assure transport safety. Transport signs should be installed at places where accidents may be easily happened (populated centers, schools, hospitals, commercial areas etc )

### ***Material management***

- Ensure easily flammable materials are not be stored in construction site and that they are transported out of project site

### ***Emergency Procedures***

- Ensure an emergency aid service is in place in the work zone.
- Ensure all site staff is properly briefed as to what to do in the event of an emergency, such as who to notify and where to assemble for a head count. This information must be conveyed to employees by the site manager on the first occasion a worker visits the site.

### ***Construction camps***

- Ensure installation of adequate construction camps and sanitation facilities for construction workers to control of transmission of infectious diseases.

### ***Information management***

- Provide advance notice to local communities by way of information boards about the schedule of construction activities.
- Develop and establish contractor's own procedure for receiving, documenting and addressing complaints that is easily accessible, culturally appropriate and understandable to affected communities.

### **Worker consultation**

Consulting the workforce on health and safety measures is not only a legal requirement, it is an effective way to ensure that workers are committed to health and safety procedures and improvements. Employees should be consulted on health and safety measures and before the introduction of new technology or products.

### **6.2.2 During Operation**

During operation, each of the EODP and EODP-AF subprojects should follow the requirements of the national environmental legislations and maintain records to ensure continuous environmental compliance. During handling of pesticides adequate storage, application procedures should be applied and handling persons should use adequate PPE. Site specific instruments (ESMPs and PMPs) would detail those procedures.

## 7. Institutional Framework for Safeguards Management

It is necessary to have a well-defined institutional and implementation mechanism for identifying, appraising, managing and monitoring safeguards at all levels. The focus of this section is to lay out the roles, responsibilities of various parties and the due diligence process that will need to take place from the preparation of an investment through implementation completion.

### 7.1 Overall project implementation arrangements

The overall responsibility for Project coordination lies with Iraqi Council of Ministers through a Project Coordination Unit (PCU) under the Reconstruction Fund for Areas Affected by Terroristic Operations<sup>6</sup>. In turn Project Management Teams (PMTs) established within counterpart Ministries will be responsible for sectoral (energy, transport, water and sanitation, municipal solid waste management, housing, health, agriculture, water resources and governorates) project implementation. During implementation, additional sectors may be added to the Project, subject to these fulfilling the basic selection criteria. Furthermore, it is possible, that additional ministries and PMTs would be added to the overall implementation structure. At each of the municipalities (project sites), the PMTs will be supported by Technical staff from the Ministries' regional offices.

To identify and prioritize the subprojects, the Ministries and their PMTs will coordinate closely with the local Governorate staff and authorities, to ensure the identified subprojects are in line with local expectations.

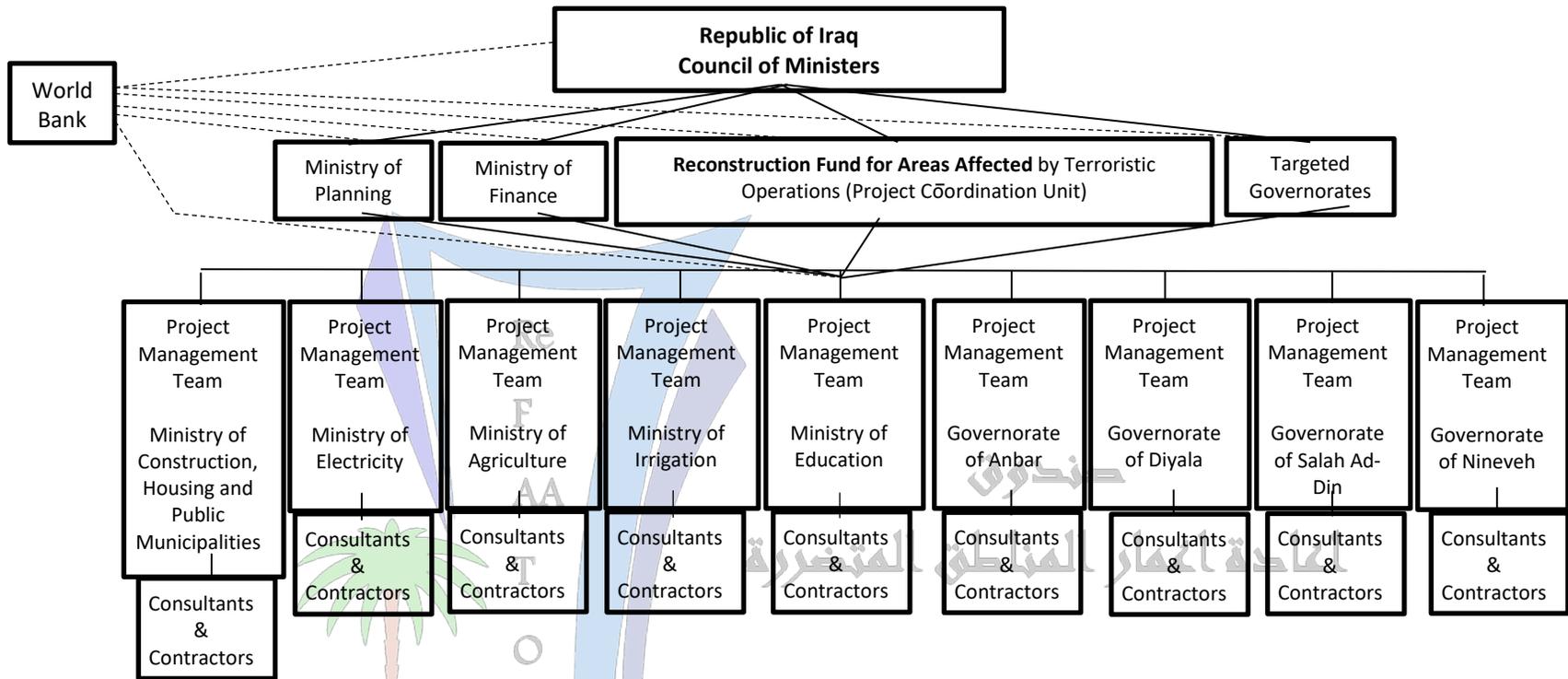
### 7.2 Implementation arrangements for environmental and social safeguards

Planning, implementation and supervision of environmental safeguards will take place at three levels;

#### 7.2.1 PCU Level

Among its key tasks, the PCU will be responsible for providing the overall policy direction, technical assistance, review and endorsement of screening reports, environmental and social assessment and management plans, capacity building for effective safeguards management to the implementing agencies, monitoring of environmental compliance and progress reporting to the World Bank.

<sup>6</sup> The Reconstruction Fund has been established by the Government of Iraq reporting to the Council of Ministers with an allocated budget of 500 trillion Iraqi Dinars, equivalent to about USD 431 million, to reconstruct damages incurred from the liberation activities from ISIS insurgency.



### 7.2.2 Project Management Teams (PMTs)

The responsibility of day to day planning, implementation and supervision of environmental/social safeguards specific to sub-projects will be borne by the PMTs. Each agency will assign focal point(s) for environmental and social safeguards who will ensure timely and sound application of the ESMPs to the planned investments. The environmental/social focal points will work closely with the PCU environmental/social consultants to ensure harmonization and coordination of activities according to the ESMMF requirements. The focal points for environmental and social affairs should have sufficient background to support the implementation of the ESMPs. In case of need for additional capacity, the PMTs may recruit external consultants who have sufficient expertise to support PMTs' focal points.

At the field level, it is expected that the PMTs environmental and social focal points will conduct regular field supervision to ensure compliance of contractors, their workers and practices, to the ESMPs. PMTs will also require the engineering and technical firms to recruit specialized staff in environment, social development and health and safety to conduct daily supervision on field activities and prepare non-compliance reports on which the PMT will investigate and take action accordingly.

### 7.2.3 Contractors

Implementation of the ESMPs will largely be the contractors' responsibility and for this the contractor will have to nominate qualified environmental, health and safety consultant and a social development consultant (if needed) in order to ensure compliance with the ESMPs during construction.

## 7.3 Environmental Monitoring

The EODP will focus on effective environmental monitoring. As majority of the anticipated environmental impacts from the project are general in nature and related to construction and civil works, site management, worker/public safety...etc., monitoring will be largely carried out in the form of compliance monitoring through regular site supervision by the responsible officers. A general monitoring checklist and a specific construction safety monitoring checklist to be used and filled during site supervision is provided in Annexes 3 and 4 in the main ESMF document. These lists should be updated and expanded to include impacts which are mostly case-specific and other site-specific environmental impacts based on actions agreed in the EMPs.

Monitoring of environmental parameters (such as air, water, salinity, sediment quality, etc.) will be conducted based on the requirements specified in the individual ESMPs. However, given the ambient levels of noise and emissions in the surroundings, pollution in the waterways...etc., no significant impacts on the surroundings' environmental quality are anticipated as a result of project activities.

As such, the need for regular and systematic measuring of air, noise and water quality to monitor contribution to environmental degradation from the project per se is not considered essential except in few cases.

The overall project impacts will be monitored during project implementation through a number of selected indicators which reflect the positive environmental contribution from the project to the overall environment. As such, no additional environmental indicators are proposed.

Most importantly, the project will support independent environmental audits on an annual basis throughout project implementation.

#### 7.4 Progress Reporting

Progress reporting on safeguards compliance will take place as indicated below.

- Contractor's environmental compliance reports to the PMTs on a monthly basis;
- PMTs environmental/social progress reports to the PCU on a quarterly basis
- PCU environmental/social progress reports to the WB, Council of Ministers on a quarterly basis (this will be part of the quarterly project progress report produced by the PCU)

#### 7.5 Capacity Development Requirements

For effective environmental/social safeguards management, the project agencies will require implementation support in three main areas; (i) dedicated staff and resources (ii) technical assistance and (ii) training and awareness.



## 7.6 Estimation of Environmental Safeguards implementation cost

Table 6: Estimated Cost of Environmental Monitoring

Activity	Unit	Unit Rate (US\$)	QTY	Total in US\$
<b>1. ESMP preparation</b>				
- Simple checklist	Checklist	5000	150	1,750,000
- Extensive ESMP/ESIA	Report	20000	50	
<b>Sub-total (1)</b>				<b>1,750,000</b>
<b>2. Personnel</b>	Man Month (MM)			
<b>PCU Level</b>		3000	30	90,000
- Environmental/social Consultant				
<b>PMT Level (10 PMTs)</b>		3000 x 10	48	1,440,000
- Environmental and social Officer/Consultant				
<b>Contractor Level</b>		Included in construction costs		Included in construction costs
- Environmental Officer/Consultant				
- Social development officer/consultant				
<b>Sub-total (2)</b>				<b>1,530,000</b>
<b>3. Training and awareness</b>				
- Training and awareness programs (short-term and long-term)				
- Training on sector environmental/social management issues	Lump-sum	Lump-sum	Lump-sum	
- Training programs on environmental safeguards, monitoring for project staff, contractors...etc.				
<b>Sub-total (3)</b>				<b>100,000</b>
<b>4. Environmental monitoring (through independent third party institutions) to be covered in construction contracts</b>				Included in construction costs
<b>5. Contingencies (approx. 7% of total costs)</b>				<b>234,000</b>
<b>Total Cost</b>				<b>US\$ 3,614,000</b>

## 8. Determination of E&S Instruments

This section will provide clear guidance on

1. Which types of safeguards instruments will be required;
2. Examples for damage patterns and related project typologies, ranging from simple, routine civil reconstruction works (e.g. road repair and building rehabilitation) to more complex repairs of e.g. bridges and larger structures;
3. Reference to the entire anticipated scope of management, mitigation and monitoring measures (as shown in Annex 3 in the ESMF main document).

### 8.1 Types of Safeguards Instruments

The types of safeguards instruments anticipated for the project range from abbreviated, checklist type ESMPs for simple, routine repair works, over more elaborate and comprehensive ESMPs to ESIA within clearly defined project boundaries. All project activities involving civil works on any scale will require some type of environmental / social management instrument, which will be determined and defined by the methodology presented in this section.

Most typologies within the expected scope of subprojects are expected to involve routine, simple civil works pertaining only to existing structures and footprints, where conflict-related damage was incurred. All of the expected types of interventions and civil works, e.g. repair / reconstruction of roads, transmission lines, municipal infrastructure, health, agriculture and irrigation infrastructure, social services as well as the restoration of public services, will require safeguards instruments in form of ESMPs (E&S management plans) that would become part of the works contracts, set the E&S standards and compliance mechanisms, and serve as contractual basis for supervision and enforcement of good E&S practice during the works. However, considering the mostly simple nature of such repair and reconstruction works, for these typologies abbreviated, “checklist type” ESMPs (see Annex 4 in the ESMF main document for a template) will be prepared as appropriate safeguards instrument.

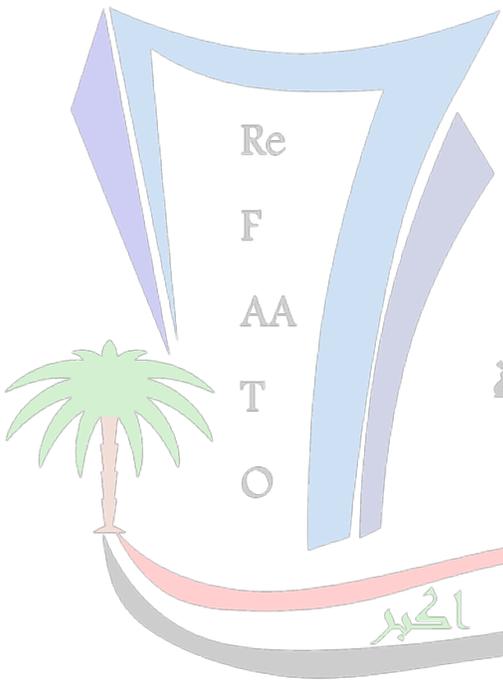
For some larger projects, e.g. reconstruction of bridges, barrages, airport or wastewater treatment plants (WWTP), a limited ESIA (meaning within clear project boundaries) may be required (see Annex 5 in the ESMF main document), as the works would be more substantial in scale, and rivers are more sensitive and vulnerable to environmental impacts. Also the ESMPs produced with input from the ESIA would be more specific on measures to protect water quality, riverine / aquatic ecosystems, and retain the hydrological regime around the bridge. Additional social considerations, such as continued access to the river for fishing and water abstraction, may become relevant. Similar principles would apply to projects that are located close to, or affecting natural habitats, including wetlands or forests.

The majority of projects, namely roads repair and reconstruction, water and energy infrastructure, and large buildings in urban and rural settings will only require the “checklist type” ESMP as appropriate due diligence instrument (see Annex 4 in the ESMF main document for template). If only minor repairs are planned for bridges and WWTP, even if in sensitive settings, that same principle applies.

The following table allocates to each component the likely type(s) of E&S instruments:

**Table 7: Anticipated E&S Instruments by Component**

Component / Activities	Anticipated E&S Instruments
<p><b>Component 1:</b> acquisition of equipment for the repair and reconstruction of damaged electricity distribution and transmission infrastructure; through technical assistance, supervision of the implementation of Electricity Subprojects, which will include engineering and civil works.</p>	<ul style="list-style-type: none"> <li>• No E&amp;S instruments for sourcing for equipment</li> <li>• Checklist ESMPs for most planned repair and reconstruction works</li> <li>• Possibly specific ESMPs when encountering sensitive baseline conditions</li> </ul>
<p><b>Component 2:</b> (Year 1) urgent restoration of water, wastewater and solid waste services, repair, reconstruction and rehabilitation of damaged infrastructure; including water intakes, pipelines, treatment / purification plants, pumping stations, storage tanks, distribution networks, house connections, sewers and trunk lines, wastewater treatment plants, and storm water drains, reservoirs and outfalls.</p> <p>(Years 2 - 5) (i) additional water and sanitation damage and needs assessment, identification of further water and sanitation subprojects; (ii) preparation of detailed plans and designs; and (iii) provision of TA for implementation of water and sanitation subprojects.</p>	<ul style="list-style-type: none"> <li>• No E&amp;S instruments for sourcing for equipment</li> <li>• Checklist ESMPs for most planned repair and reconstruction works</li> <li>• Site-specific ESMPs for larger reconstruction works (WWTP, pumping stations) combined with <i>less sensitive baseline conditions</i></li> <li>• ESIA + ESMPs for larger reconstruction works (e.g. WWTP, pumping stations) in combination with more sensitive baseline conditions</li> <li>• E&amp;S assessments and management systems will be mainstreamed into identification of further subprojects, as well as planning / design works and the TOR for supervision.</li> </ul>
<p><b>Component 3</b> improvement of road assets, repairing and rehabilitating highly damaged segments of primary road network</p> <p>Repairing and reconstructing critical bridges and major culverts</p> <p>Rehabilitation of Mosul Airport</p>	<ul style="list-style-type: none"> <li>• Checklist ESMPs for most planned road repair and reconstruction works, site-specific ESMPs for road works in combination with more sensitive baseline conditions</li> <li>• Checklist ESMPs for minor bridge repair works, such as repairing the deck and surface.</li> <li>• site-specific ESMPs for more extensive reconstruction works (e.g. involving abutments and pylons, requiring access to river) combined with <i>less sensitive baseline conditions</i></li> <li>• ESIA + ESMPs for more extensive reconstruction works (e.g. involving abutments and pylons, requiring access to river) in combination with <i>more sensitive baseline conditions</i>. <b>Rehabilitation works of Mosul airport will also require an ESIA+ESMP.</b></li> </ul>

Component / Activities	Anticipated E&S Instruments
<p><b>Component 8 and 9:</b> Restoring Social Services (education and social centers)</p>	<ul style="list-style-type: none"> <li>• No E&amp;S instruments for sourcing for equipment</li> <li>• Checklist ESMPs for most planned repair and reconstruction works</li> <li>• Possibly specific ESMPs when encountering sensitive baseline conditions</li> </ul>
<p><b>Component 7:</b> Restoring Agriculture Infrastructure</p> 	<ul style="list-style-type: none"> <li>• No E&amp;S instruments for sourcing for equipment (except pesticides applying equipment)</li> <li>• Checklist ESMPs for most planned works of rehabilitation of agriculture support services buildings (such as stores, cold stores, extension buildings ... etc.) and repairing small irrigation canals (secondary canals or smaller)</li> <li>• site-specific ESMPs for more extensive reconstruction works of seeds multiplication, processing facilities (which will use pesticides), more extensive reconstruction works of irrigation canals (e.g. primary canals directly fed from a river) combined with <b>less sensitive baseline condition</b> and <b>vet clinics without an incinerator</b></li> <li>• Pest Management Plan (PMP) for procurement and distribution of pesticides and applying equipment on centers and farmers</li> <li>• ESIA + ESMPs for <b>vet clinics with an incinerator</b> , irrigation canals (e.g. primary canals directly fed from the river) in combination with <b>more sensitive baseline conditions and barrages (all barrages need ESIA)</b></li> </ul>

## 9. Disclosure and Consultation Activities

The parent EODP ESMF was consulted upon with a number of stakeholders twice. The first consultation was mainly conducted with representatives from the participating ministries in a meeting that was held on September 22, 2015 at the Reconstruction Fund (RF) headquarters in Baghdad (Annex 8 in the ESMF main document).

The second consultation meeting was held with representatives of nine (9) Nongovernmental Organizations (NGOs) and Civil Society Organizations (CSOs) on May 16, 2016 also at the RF headquarters in Baghdad (Annex 8 in the ESMF main document).

For this updated ESMF, RF carried out two new rounds of consultation with the main stakeholders, line ministries, and government officials. Please refer to annex 8 for further details.

For all types of environmental analyses conducted under the EODP/EODP-AF (including screening), communities in the project sites should be consulted within a structured and culturally appropriate manner. Further, environmental assessment documentation and ESMPs should be made available to the public (in accordance with the World Bank's policy on Access to Information) by the RF PCU/PMTs prior to tendering of works contracts through the website of the project and notices through media, as appropriate.

In addition, it will be necessary to conduct discussions with the regulatory agencies on relevant issues and other implementing agencies who would have a stake in the project due to various reasons. Consultation will enable the project implementing agency to understand the stakeholder's requirements and for the stakeholders to develop an understanding of the project so that potential conflicts could be eliminated or minimized.

The process of consultation should be documented and account taken of the results of consultation, including any actions agreed resulting from the consultation. Public disclosure of the relevant safeguards documentation will be a pre-requisite for tendering civil works contracts.

The contract documents for each contract package will mandatorily include the relevant environmental mitigation provisions stipulated in the ESMPs (which would have community concerns reflected, if any) for the given sub-projects in order to ensure contractor compliance with safeguards requirements.

### 9.1 Results of the ESMF Public Consultation

Stakeholder consultations have been carried out as part of the ESMF preparation process. The purpose of the consultations sessions is to present the overall project design; explain its broader benefits at the national level; and begin to outline some of the anticipated adverse environmental and social impacts expected to result from project activities, and to enable the stakeholders to understand the project and its activities, as well as to ensure that their concerns and issues are considered during all phases of the project, including at the planning phase. Specifically, the objectives of the consultations sessions will be to:

1. Inform the stakeholders and the public about the project.
2. Identify the main project stakeholders and their concerns.
3. Provide the opportunity for identified stakeholders to participate in the process of scoping significant environmental and social impacts.
4. Identify those environmental and social impacts/concerns which are considered to be of key relevance and importance for the ESMF.

5. Ensure that appropriate approach and adequate focus are adopted during the RPF.

For this updated ESMF, the RF representative carried two round of consultation meetings with key stakeholders, line ministries and government officials in Mosel and in Ramadi on Aug 22, 2017 and on Aug 30, 2017). See annex 8 of the main report.

