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REPUBLIC OF YEMEN

Second Port Cities Development Project (PCDP II)

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN



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EXECUTIVE SUMMARY

FEBRUARY 2010

Section I

Hodiedah City Projects

Rehabilitation and Improvement of Hodeidah Fishing Port (RIHFP)

Executive Summary

Introduction

The Government of Yemen (GoY), through the Port Cities Development Program (PCDP), aims to strengthen the role of the three port cities of Aden, Mukalla and Hodeidah as engines for economic growth. The program's main objective is to create an environment conducive to private sector-led growth in strategic port cities and to the creation of employment opportunities in the three participating port cities.

Phase I of the PCDP was concerned with strengthening local government strategic, financial and physical planning and coordination, improving the efficiency of the administrative procedures at key local government agencies that interface with the private sector and implementing some physical investments for revitalizing port city business districts/clusters that are vital for growth and employment generation. This phase also establishes decentralization mechanisms in order to ensure a wider level of participation of stakeholders in the decision-making process. Phase I of the PCDP started in 2003 with an investment of USD 23.4 million.

The objective of the PCDP II project is to support the urban economy of the three strategic port cities of Yemen through improving the conditions of select infrastructure that supports the urban economy of the three strategic port cities of Yemen. Progress towards achieving the objective of the project will be measured through the following indicators in the three port cities: In *Hodeidah*: (i) reduction in waiting time for boats to access the pier during peak season (ii) increase in the number of households provided with access to all season roads/footpaths, water, and sewerage connections; in *Aden*: (iii) increased available formal retail space utilized in four municipal markets; and in *Mukalla*: (iv) time savings for passengers landing at Mukalla International Airport; and (v) reduced waiting time at the select road intersections during peak hours.

This ESIA is addressing one sub-project that will be implemented in Hodeidah, which is the Rehabilitation and Improvement of Hodeidah Fishing Port (RIHFP) Project. The importance of the Hodeidah Fishing Port (HFP) is that it is the only port in Hodeidah that provides the fishing industry in the city with landing and maintenance facilities. The HFP is currently overloaded with fishing boats and suffers from poor hygienic conditions due to lack of sanitary facilities for fish storage, wastewater and solid waste collection and disposal.

The objective of this ESIA is to prepare a consolidated ESIA report for the proposed projects in Mukalla in compliance with the World Bank policy OP 4.01 for Category B projects. The ESIA also aims to assist the client in the process of environmental reviews and public consultation and in-country disclosure.

In order to prepare the ESIA, the consultant carried out over 20 qualitative interviews, both group and individual in-depth interviews, with various relevant stakeholder groups, namely governmental organizations, donors, NGOs and a wide range of port users

including, but not limited to, older fishermen, small-scale fishermen, workers in boat maintenance, ice sellers and port shop owners. The ESIA methodology employed highly participatory tools and engaged the stakeholders in proposing mitigation measures.

Legislative and Regulatory Considerations

Relevant Legislation in Yemen

The Environmental Protection Law, aimed at environmental conservation and maintenance of natural ecosystems, was issued in 1995. The Executive Regulations of the law were issued by Decree of the Council of Ministers 148 for the year 2000. This law includes certain regulations for performing Environmental Impact Assessment Studies and the handling of hazardous substances and wastes. This law also identifies standards for ambient air quality, air emissions, wastewater discharge, and ambient noise.

Among the legislation that was considered of relevance to the RIHFP are the following:

- Republican Decree 62 of 2007, establishing the Yemeni Arabian Sea Port Corporation
- Republican Decree 9 of 2001, establishing the Yemeni General Authority for Coast Fishing
- Fisheries Law 20 of 1978, amended by Law 43 of 1997
- Law 2 of 2006, regulating fishing, exploitation, and protection of aquatic life
- Resolution 209 of 2003, regulating marine inspection and control as well as offensive and contraventions of fishing vessels
- Law 42 of 1991, regulating fishing and exploitation of aquatic animals as well as their protection
- Law 93 of 1998, regarding Cooperatives Societies and Unions Law
- Laws governing participation including Yemeni Constitution, Elections Law and Local Administration Law

World Bank Safeguard Policies

The World Bank safeguard policies that may relate to the project are OP 4.01 on Environmental Assessment and OP 4.12 on Involuntary Resettlement.

According to the World Bank Operational Policy on Environmental Assessment (OP 4.01), the RIHFP is classified as an environmental Category B, as a project that could have potential adverse environmental impacts on human populations and the environment. However, potential environmental impacts are site-specific, reversible, and can be mitigated by the implementation of an environmental and social management plan.

Although OP 4.12 on Involuntary Resettlement will very unlikely be triggered under the PCDP II, the consultant was requested to prepare a resettlement policy framework (RPF) to be deployed by the NCU as a guide in case any of the implementation components of the PCDP II involved involuntary resettlement. OP 4.12 and Yemeni legislation related to land constitute the legal framework used in developing the RPF.

WB policy OP 17.50 on “Disclosure” is also relevant to the project. This policy details the Bank’s requirements for making operational information available to the public. The Bank reaffirms its recognition and endorsement of the fundamental importance of transparency and accountability to the development process. In addition, timely dissemination of information to local groups affected by the projects and programs supported by the Bank, including non-governmental organizations, is essential for the effective implementation and sustainability of projects.

International Conventions

Yemen has signed the UN Conventions on the Law of the Sea (UNCLOS), the Code of Conduct for Responsible Fishing (CCRF), Convention for the Red Sea and Gulf of Aden Environment (Jeddah), Protocol Concerning Regional Cooperation in Combating Pollution in Cases of Emergency, Convention for the Protection of the Ozone Layer (Vienna), United Nations Framework Convention on Climate Change (Kyoto), Convention on Biological Diversity, Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal (Basel), Protocol on Protection from Substances that Deplete the Ozone Layer (Montreal), Convention on International Trade and Endangered Species (CITES), United Nations Convention to Combat Desertification and Convention of Persistent Organic Pollutants (Stockholm).

Furthermore, Yemen has ratified many international conventions that are of importance to the project. Yemen has ratified around 30 International Labor Organization (ILO) conventions that regulate labor standards and work conditions. The last ILO convention ratified by Yemen was the Seafarer’s Identity Document Convention in August 2008. The oldest Yemeni ratification was the Weekly Rest (Industry) Convention from the year 1976.

Project Description

The objectives of RIHFP are to:

- Alleviate the sediment transport problem and provide suitable depth for the HFP basin and access channel for the movement of fishing boats
- Alleviate the high density of boats and provide extra area for mooring boats
- Improve the infrastructure and provide facilities for adequate fish processing and storage
- Improve hygienic conditions at the port

The marine works proposed for the HFP are aimed at increasing the capacity of the port and protecting it from sediment transport. The marine works consist of five main components:

- Extending the port by adding an area of 7,500 m² to the port basin from the south
- Deepening the port basin to a depth of 2.7 m below sea level
- Deepening the access channel to a depth of 3.2 m below sea level along a distance of 500 m from the port marine entrance

- Constructing a spur breakwater of 75 m to protect the access channel and port marine entrance from sediment
- Replacing the existing mooring jetties in the northern part of the basin with new ones

The proposed onshore works at the HFP aim at increasing and upgrading the port facilities and infrastructure and improving the hygienic conditions thereby enabling the export of HFP products to international markets (including EU markets). Onshore works consist of the following main components:

- Establishing a boat repair yard with paved roads and a boat hauler
- Demolishing old buildings are not in operation and rehabilitation of the existing auction halls
- Establishing a washing and disinfection facility for trucks
- Establishing a waste collection facility that consists of two separate rooms for oil waste and regular waste, respectively
- Upgrading existing infrastructure, including the water supply network and the seawater supply network, while establishing a sewage collection system and a pump station connected to the city network

In addition to the above components, the ESIA team recommends the rehabilitation of the contaminated area around existing ASTs by replacing these ASTs as well as the fueling pump and piping system.

Both marine works and ground-based works will be phased so as not to interrupt the existing activities of the HFP, which will continue to operate during the construction phase. The rehabilitation of the wooden jetties will be undertaken after the southern extension of the port basin is finalized. Boats may then be moved to the new facilities during the rehabilitation. Additionally, the demolition of the existing administration building will not be undertaken unless the new facilities are fully functional.

The construction phase of the marine works is expected to take 14 months while the construction phase for the land-based works is approximated at 16 months.

Project Alternatives

No Project Alternative

The project will provide many environmental and socio-economic benefits for the fishermen and users of HFP by alleviating problems concerning current port-access navigation hazards, overloaded facilities, lack of adequate cold storage and processing facilities, and lack of proper water supply and sanitation facilities. The project shall significantly improve the hygienic conditions at the HFP, which will be reflected in improved efficiency of operations and the opportunity to export fish products to international markets. Generally, the predicted negative environmental and social impacts could be minimized by applying appropriate mitigation measures. Therefore, the ESIA

team believes that there are no environmental and social issues that would lead to a refusal the project and the decision to pursue a "no project alternative".

Relocation or Rehabilitation

Due to the current problems at the HFP, plans existed to construct a new fishing port about 15 km south of the HFP and transfer fishing activities to the new location. The new port would have been compliant with current industry standards and would have fostered an increase in quality and quantity of fishing-related activities. Due to environmental issues associated with the new location and the resettlement of fishermen, it was concluded that the rehabilitation of the existing site (while simultaneously maintaining fishing activities) would be more beneficial for all those involved. It may be necessary to establish a new fishing port in the future in order to accommodate increasing numbers of fishing boats. In such a case, it is recommended that detailed engineering, economic, environmental and social assessment studies should be performed on a number of alternative sites to select the most advantageous option.

Dredging Technique

The information available from the project designers suggests that there are two main alternative dredging techniques: the first is using a trailing suction hopper dredger which applies suction force to the sediment which is then transferred to a hopper in the vessel. When the hopper is full, the dredger then sails to an offshore disposal site and dumps the sediments through a door in the hull. The second technique involves a clamshell dredger which uses a clamshell bucket to collect the sediment then unload it on a barge. The barge then sails either to an offshore disposal site to evacuate its hopper as described above or to an unloading platform to release the sediment for onshore disposal. It was concluded that the trailing suction is more advantageous as the clamshell bucket is more likely to disturb the seabed and accordingly result in increased turbidity. During the preparation of the final ESIA, it was confirmed that the suction technique will be employed.

Onshore or Offshore Disposal of Marine Dredging

The dredged soil from the offshore dredger could either be disposed offshore in a location about 15 km northwest of the HFP, near Ras Kateib, or alternatively could be transferred for onshore disposal in one of six sites, all of which have been analyzed. It should be noted that trailing suction hopper dredgers usually dispose of sediment through doors at the bottom of the hull and accordingly the unloading of the dredger's hopper for onshore disposal may not be practical/feasible in some cases. Although the evaluation of impacts suggest onshore disposal is preferred from an environmental perspective, from a socio-economic perspective, onshore disposal of marine dredging could be unfeasible/impractical in some cases as it could lead to long delays in construction work.

Complete Onshore Facilities before Demolition or Temporary-Use Facilities

The first alternative option for construction allows the contractor to demolish the existing administration building before finalizing the new facilities and, accordingly, temporary administration building will be established to accommodate activities until the new building are ready. The second alternative is that the contractor will not demolish the existing building unless the replacement buildings have been completed. Any temporary facilities used during the relocation of the administration buildings will occupy an additional area before the demolition work is complete, causing further congestion during the construction phase and inconveniencing users. If no clear feasible justification for establishing temporary auction halls and an administration building, and all other factors are equal, it is preferred, from an environmental and social perspective, that the demolition of existing buildings is not carried out before the new buildings are operational.

Description of Baseline Environmental and Socio-economic Conditions

Project Location

Hodeidah Fishing Port (HFP) is located at the southern end of the coast of Al Hodeidah City over an area of about four ha. The area east of the HFP includes a densely populated area that is comprised of different household, commercial and institutional buildings. About 250 m to the north of the existing HFP gate is Al Corniche Secondary Substation and Power Plant which includes 20 MVA transformers and three 2.5-MW diesel generators. The Corniche Citadel, a historic fortress built in 1538 AD and currently used as a military base, is located about 350 m from the HFP gate.

The main environmental issues related to the existing operation of the HFP were recorded during the site visit:

- Absence of wastewater collection infrastructure has led to open discharge of sewage into port basin, leading to the organic pollution of the basin. The open exposure of sewage has lead to offensive odors and breeding of insects.
- There is no adequate system in place for collecting solid waste generated from the port, including regular domestic solid waste and fish remains from the fish market.
- Diesel contamination of the soil around two existing diesel ASTs near the workshops area is evident.
- Diesel contamination of port basin and the landing ramp, near the fueling pump, is evident.
- Scrap including old equipment, vehicles, boats, tanks, etc., has accumulated in the southern area of the port.
- The neighboring Al Corniche Power Plant produced visible air emissions from relatively short stacks.

Air Quality

There were no historical records for air quality available to the ESIA team; therefore, indicative ambient air monitoring was carried out at a location inside the HFP near the auction halls. The results have shown high PM₁₀ and SO₂ values (above the legal standards), high NO_x and TSP values and low CO values.

Noise

There were no ambient noise monitoring data for Hodeidah city available to the ESIA team; therefore, noise monitoring has been undertaken at a location in HFP at eight representative hours during the day. The results indicated that the noise levels recorded during early morning and late evening were within the standards while the noise levels recorded at noon and in the early afternoon, periods of full activity in the fish market and onshore, were high.

Bathymetry

The area around HFP is affected by strong sediment transport and settling, leading to the elevation of the seabed particularly at the boat entrance of the port. The seabed depth inside the port ranges between -1.75 and -3.00 with least depth at the port entrance. Outside the port, the seabed slopes gently towards the west reaching a depth of -4.50 about one km offshore.

Water Quality

The ESIA team has conducted marine survey of water quality, sediment quality and marine biology at the sites that could be impacted by the RIHFP Project activities. This included the HFP basin, the proposed access channel, two sites four km away from the HFP (one north and one south) and the site that will most likely be used for the disposal of dredging waste.

Water quality field measurements, including temperature, pH, Dissolved Oxygen (DO), salinity, conductivity and turbidity, were taken from 13 representative monitoring points. The measured parameters, except DO and turbidity, at all monitoring points indicated no noticeable stratification in the water column and no noticeable zones of difference in the horizontal direction. The DO measurements near the existing ramp were noticeably lower than those at the other measured points. This phenomenon may be in part related to the sheltered and semi-enclosed condition of the port, which limits aeration, and in part to the sewage disposal and littering taking place in the port basin.

Water and sediment samples for physical, chemical and biological analyses were collected from five points. Water samples were taken 30 cm below surface, while sediment samples were taken from the seabed using a Van Veen grab. Generally, the recorded pollutants in water sample concentrations were relatively low. There are no legal standards for ambient water quality in Yemen. Comparison of the analyzed water

quality parameters with the consultant's experience of water quality in other locations (such as the Red Sea and the Mediterranean Sea in Egypt and Saudi Arabia), the concentrations of COD, O&G, heavy metals and faecal coliforms were within the average to low range, with values of TKN and P higher than average and TPH values indicating sources of petroleum pollution.

Sediment Quality

The grain size distribution indicated that the seabed sediment is generally comprised of muddy sand, save for the point located at the edge of the proposed access channel which contains coarser particles. The chemical analysis of the sediment samples indicated that the point located near the diesel pump at the existing ramp has higher hydrocarbon concentrations, followed by the point located at the entrance of the port. The point located at the edge of the proposed access channel indicated very low or negligible concentrations of TPH.

Marine Biology

Transects perpendicular to the shoreline were created to investigate the surrounding marine flora and fauna. The transects covered the entire port area within a four km radius. The investigation revealed that there are two main patch reefs, one to the north and another to the south of the port. Underwater photography and assessment of the habitat were conducted at both sites.

The port area was entirely composed of barren, very fine, deposited clay while further out, at a distance of 700 m, the texture of sediment was coarser and contained shell fragments. Within this area, there was no sign of visible marine life. Seagrass algae benthic and macro fauna were detected and this could be attributed to the mobility of the substrate and the consequent instability which prevents the settlement of marine fauna or flora. The recorded species in the area were mainly phytoplankton, zooplankton and meiofauna. In total, six bird species were observed within the area during the surveys, namely, the Caspian tern (*Hydroorogne tschegrava*), the black headed gull (*Larus ridibundus* and *Larus hemprichii*), the osprey (*Haliaetus* sp), *Ardea goliath*, and *Pelecanus rufescens*. No tracks of turtles were recorded at the project area.

Patch reefs were observed four km north of the port; three patches with uppermost layer projecting above seawater, acting as wave break. Small separated hills, like solitary corals, occur at irregular intervals. The subtidal flat was covered with meadows of brown algae *Padian* spp. Additionally, the reef was composed of hard and soft corals where massive living *Porites* sp, *Acropora* sp., *Fungia* sp., were dominant. Fragments of *Stylophora* sp., *Pocillopora* sp., and *Acropora* were also recorded. The patch gently slopes to a two m depth in the seaward direction and 1.25 m landward. A number of hard corals species were recorded and a sand depression was observed along the reef.

A patch reef was observed four km south of the port, mainly surrounded by sandy bottom and composed of rocky substrate uplifted over sandy substrate. This site was

characterized by shallow depth and dominated by the brown seaweed *Padaina* spp and some individuals of *Halimeda maculopa*. Algae, associated fauna represented by grazers and echinoderms (*Holothuria atra*, *Diadema* spp.) were also observed. Coral heads (*Strombus* spp.) were scarce.

The proposed disposal site of dredging waste, in case of offshore disposal, is located near Ras Kateib, about 15 km away from the fishing port. No critical or sensitive habitats, such as areas containing corals or seagrasses, were recorded at the site. The bottom is sandy and has some pores for burrowing organisms. The site has been used by the Yemen Red Sea Port Corporation (YRSPC), or the Commercial Port of Hodeidah, for the disposal of dredging waste from the port access channel.

Socio-economic Indicators

Hodeidah Governorate is the second largest governorate in terms of share of the country's population (10.9%). The governorate extends to a total area of 13.325 km² and is divided into 22 districts. Most of Hodeidah Districts are actively engaged in fishing activities which represent a major strategic sector for the governorate. Hodeidah City is the governorate administration capital and serves as an advantageous site, encompassing a strong network of roads and transport that connect the city and Saudi Arabia, a strategic port which provides imports for the whole northern part of the country and local markets based in densely-populated neighboring governorates. 2008 national statistics showed that the population of Hodeidah City is estimated at 861,677. The annual average rate of increase is around 3.24%. Hodeidah has historically been an attraction point for migration. The rural to urban migration trend is increasingly observed in Hodeidah, driven by greater work opportunities in the cities and accompanying a decline in the agricultural sector in the villages.

2008 statistics show that illiteracy rates are considerably high, 63% at the city level, with women's illiteracy (77.5%) contributing significantly to this high percentage. Basic education enrollment rate was around 46.4% in 2008. It could be suggested, based on the findings from the field observations, that the enrollment rate and educational attainment has significantly increased particularly in the last few years. This trend was even observed in the discussion with fishermen and the meeting with children working in the fishing port, who stated that children work at the port during the summer holiday but go to school during school months.

Hodeidah City is primarily an urban city with around 98.6% of the population living in urban areas. The economic base in Hodeidah is widely reliant on key sectors that largely contribute to employment and local economic development, namely fishing, agriculture, trade and industry. The labor force in the city is estimated to be 32% of the total population. This low percentage reflects the low level of local participation in the labor force, a phenomenon considered a common characteristic in developing countries. 2008 statistics of the Local Council showed that unemployment reached 42%. This is the highest figure among several other conflicting figures obtained from other sources (HMP and HOSAL).

The Situation of the Fishermen and Other Port Users

It is estimated that around 18,000 are involved in the fishing sector in Hodeidah. However, fishermen are only one category of HFP users. The port involves various other categories including large-scale fishermen, small-scale fishermen, sellers in the auction halls, fish traders, port officials (administrative staff, HFWA staff, GCFMS staff), port guards and security staff, ice sellers, fuel stations owners, daily wage workers and the cleaning crew. The sector is also characterized by seasonal restrictions whereby fishermen are only allowed to work throughout certain seasons which serves as a method to preserve the abundance of fish and allow time for fish reproduction and growth. These findings may help to explain the lack of consistency among the related statistics.

In efforts to properly understand and document the conditions at the HFP, and in addition to the extensive literature review, the ESIA team consulted various relevant port stakeholders. According to the literature and field investigations, the main problems of the existing HFP could be summarized in the following:

- The waiting and parking areas inside and outside the fishing port are insufficient and contribute to congestion as well as unsightly and dangerous conditions.
- The port is characterized by chaotic conditions, resulting from the fact that plenty of various types of activities are done within a limited space.
- The number of boats has been increasing yearly, reaching an annual average of around 2,000 boats in 2009. An average of around 10,000 fishermen work on these vessels.
- The quay provides a very limited space for many activities, including uploading fish, light boat repairs and boat storage.
- The mooring area is congested, resulting in boat parking difficulties.
- Auction halls lack continuous walling and/or doors that ought to prevent fish contamination by sand and dust and to restrict access. The temperature within the halls is not controlled, exposing fish to high risk of contamination.
- Inadequate quality control is a threat to the expansion of fish export activities as well as to public health.
- Sediment deposits pose one of the main problems in the port. This problem is currently very obvious at the northern entrance of the port which port users consider to be an issue of top priority. Deposits significantly obstruct boat maneuvering capabilities.
- No sanitary network exists in the port and sewage is currently dumped and discharged into the sea, causing risk to human health and the marine environment.
- Stakeholders highlighted the unavailability of water in the port as a serious problem. The existing water tank is usually empty and two out of three existing toilets remain unused, as they have been closed due to the absence of water.
- The old age of the port and the increasing demands and pressures on its utilities, accompanied by the very poor level of maintenance of port facilities, has resulted in deterioration of the port infrastructure. The subsequent costs of resulting

complications are borne by the fishermen, administrative officers and others, such as those who sell fish in the auction halls.

- The overcrowding of the port results in the theft of fishing equipment, such as nets and other small spare parts.
- The landing ramp which is currently used for uploading fish has deteriorated due to diesel contamination.
- The current jetties are in a state of deterioration.
- No solid waste management system exists in the port. The solid waste created by workshops, restaurants and other existing facilities are disposed of in the sea.
- The absence of important infrastructure and machinery in the port, for example hoists for lifting boats for maintenance, creates additional costs.

Fishing Cooperatives

The stakeholders analysis carried out by the ESIA team revealed that fisheries cooperatives will be one of the key direct beneficiaries of the project as they are expected to receive a share of the financial return, attained due to the improvement of the HFP infrastructure. They are also key players in arranging work and consulting port users with the aim of mitigating any potential negative impacts, particularly during the construction phase.

The results of previous assessment, carried out by one of the donors projects, showed that only two fisheries cooperatives in Hodeidah were ranked as efficient cooperatives, namely As Salef and Al Khail. A third cooperative was ranked the highest among mid-level cooperatives in terms of efficiency, namely El Ikhlas Cooperative. These results are compatible with the observation and assessment of the General Foundation for Fishing Marketing and Services, HFWA as well as the Office of Social Affairs and Labor, Hodeidah who mentioned that these three cooperatives play an important role in supporting fishermen.

The main role played by the cooperatives include:

- Commercial functions, including auction management, ice supply, workshop services.
- Social support activities, typically coordinated by the cooperatives to produce a surplus from the auctioning activities in a way that allows them to embark on certain income-generating projects (agricultural plantation, investment in small boat-building yards, medical insurance and educational support to fishermen and their families) and some social activities including relief assistance (in cases of unpleasant and unexpected events).

The Yemeni Fisheries Cooperatives Union (YFCU), created in 2002, is an umbrella organization which was established to represent the interests of cooperatives at the national level. In addition to the five percent of annual net profit paid by local cooperatives, the YFCU also receives YR 10 million from the Ministry of Finance to supplement its budget. Although the union could be a catalyst for developing the cooperatives, its leadership remains weak. As a significant portion of its budget comes from the government, its ability to make independent decisions might be compromised.

The Role of Women

The analysis of the role of women in Hodeidah City was hindered by the absence of reliable gender disaggregated statistics that can provide insight about the situation of women. No records or statistics concerning the levels of women's engagement in fishing activities were found. Thus, the ESIA team compiled the following qualitative analysis by relying on findings from the interviews with various stakeholders including women NGOs as well as the literature review.

Generally speaking, the role of women in Hodeidah has progressed significantly over the last few years, as evidenced by increased engagement in the various fields. According to the stakeholders interviewed, women play a minimal role in the outdoor fishing activities. Fishing is a male-dominated activity. Both cooperatives as well as fishermen in the port mentioned that they do not, by any means, perceive fishing as a job that women could engage in. This standpoint is influenced by the nature of the work, different activities associated with fishing and risks as well as the socio-cultural norms and the community traditions in Yemen, which impose restrictions on women's mobility and employment outside the home. Women are occasionally engaged in home-based activities related to fishing, like assisting their husbands in fixing fishing equipment (i.e. nets, etc.).

The review of secondary resources also suggested that within industrial plants (such as canning factories), women are employed at lower levels of the factory chain (e.g. trimming and stuffing cans). About 47% of employees in canning factories are women¹. However, this information was not found on the level of Hodeidah City.

A few fisheries cooperatives are active in implementing projects that target women who are not necessarily members of families containing fishermen. These projects primarily address income generation and skills development for women. Al Salef Fisheries Cooperative is one of the cooperatives with gender-focused projects.

Potential Environmental and Social Impacts and Mitigation Measures

Environmental and Social Benefits

In Hodeidah, fishing is regarded as one of the most important economic activities of the governorate. It is predominantly a traditional activity. The HFP is considered one of the most important investments related to fishing sector in the governorate and is a crucial component of the local economy and the main engine related to the fishing fleet and fish catch. However, the HFP conducts many fishing related activities and is currently facing heavy congestion that threatens the safety of fishermen and induces obstacles to their daily fishing activities, preventing the port from acting as vehicle for the development of this critical economic sector.

¹ Project Appraisal Document, Fisheries Resource Management and Conservation Project (FRMCP), 2005 – Annex (A) Social Issues

RIHFP project is perceived as a pressing and urgently-needed intervention by different related stakeholders. In addition to the predicted localized direct benefits on local beneficiaries, the project's positive impacts are expected to go beyond that by contributing on wider regional and national economic scales.

The main social positive impacts predicted as a result of the project include:

- Temporary job opportunities during the construction phase as well as permanent job opportunities after operation.
- More hygienic working conditions through the provision of drinking water and sanitation services, cold storage facilities and waste management facilities.
- Better accessibility to the port through the alleviation of existing congestion.
- The facilitation of a workplace that is more socially viable.
- Enhanced potential for economic opportunities in the fishing sector, including an increase in the income of poor artisan fishers by improved fish quality and better prices. This also involves improving the level of revenues for the HFP management and the fisheries cooperatives while enabling the governorate to further develop fishing related industries. The improved conditions of the port are even seen as potentially beneficial for tourism in the city.
- The provision of higher quality products for consumers.
- An increased sense of trust between fishermen/port users and the competent authorities.
- A better administrative atmosphere.

In addition, some environmental benefits will be achieved by implementing the project including:

- An improvement in the water quality of the port basin by the prevention of sewage discharge.
- Rehabilitation of the existing contaminated area around diesel ASTs.
- The introduction of waste and scrap management systems that will put an end to the existing uncontrolled disposal.
- The reduction of noise levels at some locations throughout the port due to the alleviation of congestion.

Negative Environmental and Social Impacts during Construction

The ESIA has identified some negative environmental impacts that would be caused by the construction and operation of the project. Mitigation measures were proposed to minimize the influence of most of the identified negative impacts.

The negative environmental and social impacts were classified into three main categories: major, medium and minor impacts.

Only one major negative impact was identified in this ESIA: the risks of asbestos fibers being released during the demolition of auction halls. It was recommended in the ESMP that demolition should be undertaken under the supervision of an international asbestos

management company who would oversee safe dismantling and disposal of asbestos sheets in marked double polyethylene containers. The waste should be shipped to an authorized asbestos landfill outside the country or, alternatively, a special safe disposal site could be prepared in a suitable location within the country, having been approved by competent authorities. Such mitigation measures are believed to reduce the impact significance level from major to minor. It was also proposed that the air around the demolition site be monitored for contamination by asbestos fibers on a daily basis.

The following medium negative impacts were identified during the construction phase:

- Risks associated with removing the contaminated waste soil during the proposed clean-up of the area around the fueling system. For mitigating this impact, it was recommended in the ESMP that the clean-up process be supervised by a specialized environmental consultant who shall oversee the safe shipment and disposal of the waste according to best available techniques. It was also recommended that the clean-up should include the replacement of existing diesel ASTs, fuel pump and piping system to avoid future leaks. Monitoring of waste quantities was recommended.
- Impacts of offshore dumping of dredging waste into the marine environment. For mitigating this impact, it was recommended in the ESMP that an approval be obtained from YRSPC and Coastal Guard for using their offshore disposal site near Ras Kateib. As the marine survey undertaken during the preparation of this ESIA at this site did not note the existence of any sensitive species, it was emphasized that the dredging contractor should limit his dumping to this site, in a dumping grid with at least 600 m spacing between each dumping point. It was proposed that the coordinates of each dumping point should be recorded to ensure compliance with the dumping site procedures and that a marine survey of the seabed should be undertaken after finalization of dumping works.
- Impacts of the temporary storage of construction waste and materials within the limited area of the construction yard. It was recommended in the ESMP that a detailed plan for temporary storage of construction waste and materials be prepared prior to construction, no large volumes of quarry materials be imported during the demolition of the existing breakwater, imported quarry materials be used as soon as possible and that sewage and solid waste produced by temporary construction offices be adequately collected and disposed of in the sewage system and/or approved disposal site. It was also recommended that monitoring of stored quarry materials in the construction yard be undertaken to ensure adequacy of storage capacity.
- Inconvenience and delays affecting fishermen during their current activities. It was recommended in the ESMP that the staging of construction works be in close consultation with concerned stakeholders including various groups of port users (fishermen, shops owners, port officials, maintenance workers, cooperatives, etc.), that working in existing facilities (northern jetties and administration building) should not be stopped unless the construction of replacement facilities is complete, that dredging the port marine entrance should only be performed during the few hours of the day when fishing boat navigation is at a minimum, and that

- during dredging of the port basin, a navigation safety plan should be implemented. The monitoring of fishermen complaints was recommended.
- Impacts of land-based work and emissions from construction machinery on air quality. It was recommended in the ESMP that land-based work and dust-generating activities should be stopped during sand storms, that quarry materials should be sprayed before unloading and that the contractor should be committed to using vehicles with efficient fuel combustion systems. The monitoring of ambient air quality was recommended on a quarterly basis during construction phase.
 - Noise impacts from construction machinery engines, loading and unloading of materials and hammering sheet piles. It was recommended in the ESMP that construction workers use earmuffs in noisy areas and that noisy activities should be arranged around noon and the early afternoon. Monitoring noise levels was recommended on a quarterly basis during construction phase.
 - Impact on HFP local businesses. It was recommended in the ESMP that arrangements for least inconvenience to local business are in place and that assistance (such as moving allowances) is provided. The monitoring of complaints was recommended.

The following minor negative impacts were identified during the construction phase:

- Impacts of onshore disposal of dredging waste on the landscape properties of the disposal site. Of the six onshore sites that were studied, one was excluded and the other five were classified according to environmental preference as follows:
 - o Reclaiming the beach located just south of the HFP
 - o Raising the level of an eroded beach 2.5 km south of the HFP
 - o Transferring the waste to the quarry for possible reuse
 - o Disposal at Al Marma solid waste disposal site
 - o Disposal at an onshore site in Ras Kateib used by YRSPC for the same purpose

During the preparation of the final ESIA a decision was reached by the project stakeholders to use the first option (preferred option). The ESMP included measures to avoid the occupation of a large area in the HFP during the temporary storage of dredging waste and also included preparing an adequate dumping plan for the waste in selected disposal site. It was also recommended that the volume of exported waste should be monitored daily during dredging.

- Dredging impacts on the local environment of the HFP. It was recommended in the ESMP that the dredging contractor be committed to utilizing vessels with high motor combustion efficiency, to prevent the vessel crew members from littering in the water, and to follow the dredging plan exactly. It was recommended that the dredged area be monitored after completion of the work.
- Impacts of construction of breakwater on the water turbidity. It was recommended in the ESMP that these construction works be carried out during summer months to avoid northern currents that will transfer the turbidity cloud to the southern beach. In such case, a silt curtain should be fixed at the southern marine border of the HFP. Monitoring of seawater turbidity next to construction location, at the

- southern beach and next to the silt curtain (in case it is needed), was recommended.
- Impacts of dewatering drainage. It was recommended in the ESMP that the contractor should arrange for discharging the dewatering to the public sewer after obtaining official approval, or alternatively discharge it into the port basin. Discharging into the sea and any open discharge into the ground is not permitted.
 - Safety risks accompanying construction work. It was recommended in the ESMP that the contractor should identify risky zones, types of corresponding risks, and suitable PPE for each zone. Zones of denied access to public should be clearly marked. Monitoring accident records was recommended.

Environmental and Social Negative Impacts during Operation

The following medium negative impacts were identified during the operation phase:

- Poor water circulation in the southern part of the basin extension. It was recommended in the ESMP that a floating surface aerator should be utilized in stagnant areas if unfavorable anaerobic conditions developed, and that waste bins should be distributed along platforms to prevent littering within port basin. Weekly monitoring of DO was recommended.
- Impacts of handling hazardous materials and waste. It was recommended in the ESMP that suitable fire safety precautions should be followed, used lubricant oils should be adequately collected, stored and transferred to refineries or licensed companies for collecting used oil, and that used oil filters and empty chemicals should be adequately collected, stored and transferred to controlled landfills. Keeping records of hazardous materials handled was among the recommended monitoring activities.
- Impacts of scrap and general solid waste. It was recommended in the ESMP that existing scrap items should be sold for recycling/reuse, no scrap boats should be stored at the port, suppliers of equipment that will be replaced should be committed to removing old equipment for reuse/recycling, and a cleaning company should be contracted for regular cleaning of auction halls and other facilities and transferring the waste to approved disposal sites.
- Impacts of new generators and any additional vehicles and boats accommodated in the port on air quality. It was recommended in the ESMP that the generators used have a high level of combustion efficiency. Biannual monitoring of ambient air quality and generator emissions was recommended.
- Financial burden on port users from possible fees of the new services. It was recommended in the ESMP that a WTP survey should be conducted to identify suitability of such fees with regards to fishermen conditions, a subsidy mechanism should be developed according to the WTP survey, and a monitoring survey should be undertaken after implementing the new fees.

The following minor negative impacts were identified during the operation phase:

- Changing the features of the coastline behind the spur breakwater as result of high water sedimentation patterns. No mitigation measures were recommended for this impact. It may be considered a minor impact as no sensitive marine species exist

- in the seabed habitat and the substrate of the main breakwater; most benthic species will adapt to the new situation during the gradual sedimentation process.
- Maintenance dredging impacts on HFP surroundings. It was recommended in the ESMP that the dredging contractor should be committed to using vessels with high motor combustion efficiency and should prevent the vessel crew members from littering in the water.
 - Impacts of onshore disposal of maintenance dredging. It was recommended in the ESMP that careful onshore unloading of dredging materials be planned and disposal in an approved disposal site be arranged. It was recommended that the volume of exported waste should be monitored and reported after finalization of dredging.
 - Noise impacts of the new generators and additional noise from boats and vehicle engines in the southern part of the port. It was recommended in the ESMP that the generators should be equipped with exhaust silencers and that workers in noisy areas should be instructed to use earmuffs.

The main focus of mitigating the potential negative social impacts involves the inclusion of measures and provisions that aim to reduce the impact of construction in the bidding documents. Phasing contracts for the implementing agencies and contractors as well as controlled site monitoring and reporting activities are also important mitigation measures. The potentially affected stakeholders like the fishermen and port shops who might encounter temporary livelihood impacts during construction should be consulted along the process in order to ensure that their views are considered and that suitable measures are in place to eliminate the severity of negative impacts on them. Efficient stakeholders' consultation and a high level of participation are seen as a prerequisite for a successful ESMP. Training, capacity building and awareness-raising were key activities recommended in the ESMP. The ESIA involved intense stakeholder consultation activities that helped ensure that the recommended mitigation measures are practical and applicable from an experience-driven point of view.

ESMP Institutional Set-up

PCDP II National Coordination Unit (NCU) as well as the concerned stakeholders, most importantly HFP management, fishing cooperative, Governorate Executive Authority (Local Council), HFWA and GCFMS are seen to play a crucial role for the success of the ESMP. The involvement of external consultants in implementing certain measures like the formulation of consultation strategy, WTP survey and capacity building programs are also recommended. Monitoring the ESMP measures is a main component of the proposed ESMP in order to ensure efficient implementation and follow up for the various proposed activities.

In estimating the budget for implementing the ESMP, it has been assumed that the measures required by the construction contractors and the site supervising consultants will not entail extra costs above the normal bidding costs and management costs, except those that have been marked in the ESMP matrixes. Moreover, these measures are expected to be followed by the corresponding party during the accomplishment of their

work so as not to cause additional costs to the bidding costs. Also some of the specialized ESMP measures, such as safe dismantling of asbestos structures and replacement of diesel AST, are assumed to be included in the project budget. Although the HSE staff that will supervise the implementation of the ESIA will consist of technical staff that will be recruited for the project, the salaries of these staff members were assumed to be included in the RIHFP budget among salaries of other technical staff that would be recruited during the project operation.

A capacity building program has been recommended for different project stakeholders who will have active role in implementing the ESMP. The input of an external training and capacity building consultant (TCBC) might be required. The NCU shall be in charge of selecting and hiring the consultant and following up on the delivery of the training materials. NCU will also be one of the key beneficiary groups from the training.

ESMP Budget

| Item | Estimated budget (USD) |
|--|--------------------------------|
| Clean-up of contaminated soil in the fueling area | 20,000 |
| Development and implementation of consultation mechanisms (workshops, regular meetings, etc.) | 15,000 |
| Preparation of a navigation safety plan and training for fishermen on its implementation | 10,000 |
| Provision of assistance to port local businesses who will be affected (such as moving allowances or compensation for any temporary earning gaps) | 25,000 |
| Preparation of a marine survey of the benthic marine species after finalization of offshore disposal of dredging waste | 10,000 |
| Turbidity meters, DO meter, GPS | 15,000 |
| Monitoring of ambient air quality and noise during construction | 10,000 |
| Monitoring of ambient air quality and exhaust emissions of the generators for four years of operation | 20,000 |
| Floating surface aerator for better circulation at stagnant points within the port basin | 10,000 |
| Undertaking of WTP survey and monitoring survey for users feedback on service fees | 20,000 |
| Allowance for hazardous waste management for four years of operation | 10,000 |
| Training | 85,000 |
| Total | 250,000 |

Consultation with Stakeholders

Consultations with stakeholders were carried out during the scoping period through FGDs, SSI, in-depth interviews and scoping sessions with various types of stakeholders, namely governmental organizations, fisheries cooperatives and different categories of port users. A public consultation workshop has been carried out after submission of the

draft ESIA with the aim of presenting the ESIA findings and incorporating stakeholders' comments in the final ESIA.

The consultations suggested that the RIHFP is regarded as a pressing need and an issue of priority for different stakeholders. The planned project is seen to be a demand-driven project of high priority to Hodeidah city economy and the livelihoods of local people engaged in fishing activities. The phase of project operation is predicted to result in multiple positive impacts such as improved working conditions, enhanced livelihood opportunities and reducing levels of physical risk and inconvenience to port users. The stakeholders who participated in the consultation contributed to predictions concerning the project's potential impacts. The main finding related to impact identification is that, socially, the positive potential impacts are expected to largely overshadow the minor negative impacts.

According to consultations, the main potential negative impacts are predicted to accompany the construction work. This involves variable levels of inconvenience that might result in temporary negative impacts on the livelihoods of fishermen and other port users, unless properly mitigated. Stakeholders suggested the phasing of work with regards to the rehabilitation activities. They suggested the first phase begin with dredging work at the northern gate, which poses the most serious and persistent problem in the port due to the high silt levels. Dredging works should start every day after fishermen have finished their work (noon) and continue until sunset. The same phase should include preparation for the marine works in the southern part of the HFP. Before starting the land-based rehabilitation of the northern part, fishing activities should be transferred to the new basin at the southern part. Land-based work should be carried out as to ensure access to auction halls and as to allow for some halls to be in use while others are under construction. Different suggestions, comments and recommendations raised during the public consultation workshop were considered in the final ESIA.

Conclusion

The RIHFP project is expected to attain many important social benefits that outweigh the limited negative environmental and social impacts, which could be mitigated through the measures proposed in the Environmental and Social Management Plan (ESMP) .

Section II

Mukalla City Projects

Mukalla International Airport Improvement Project (MIAIP)

and

Traffic Junctions Improvement Project (TJIP)

Executive Summary

Introduction

The Government of Yemen (GoY), through the Port Cities Development Program (PCDP), is aiming at strengthening the role of the three port cities of Aden, Mukalla and Hodeidah as engines for economic growth. The Program's main objective is to create an environment conducive to private sector-led growth in strategic port cities and to the creation of employment opportunities in the three participating port cities.

Phase I of the PCDP focused on strengthening local government's strategic, financial and physical planning and coordination, improving the efficiency of the administrative procedures at key local government agencies that interact with the private sector, and implementing physical investments to revitalize port city business districts/clusters that are keys for generating growth and employment. This phase also established decentralization mechanisms to ensure a high level of stakeholder participation in the decision making process. Phase I of the PCDP started in 2003 with an investment of USD 23.4 million.

Phase II of the PCDP is a continuation to supporting private sector-led development of the three port cities. The development objective of Phase II of the PCDP (PCDP II) is to attract private investment in the three port cities of Aden, Hodeidah and Mukalla that would contribute to economic growth and job creation, by alleviating critical infrastructure and institutional constraints to private investment. PCDP II shall be implemented over 5 to 6 years, and it shall include implementation of a number of sub-projects and institutional strengthening of the three Local Economic Development Departments (LEDDs).

The objective of the PCDP II project is to support the urban economy of the three strategic port cities of Yemen through improving the conditions of select infrastructure that supports the urban economy of the three strategic port cities of Yemen. Progress towards achieving the objective of the project will be measured through the following indicators in the three port cities: In *Hodeidah*: (i) reduction in waiting time for boats to access the pier during peak season (ii) increase in the number of households provided with access to all season roads/footpaths, water, and sewerage connections; in *Aden*: (iii) increased available formal retail space utilized in four municipal markets; and in *Mukalla*: (iv) time savings for passengers landing at Mukalla International Airport; and (v) reduced waiting time at the select road intersections during peak hours.

This ESIA is addressing two sub-projects that will be implemented by the PCDP II in Mukalla. The first is Mukalla International Airport Improvement (MIAIP) project, which is expected to upgrade the operations of the airport and improve the facilities provided to passengers and cargo. The second is Traffic Junctions Improvement Project (TJIP) which is expected to upgrade the traffic flow in the city through improving 15 traffic junctions.

The objective of this ESIA is to prepare a consolidated ESIA report for the proposed projects in Mukalla in compliance with the World Bank policy OP 4.01 for Category B projects. The ESIA also aims to assist the Client in the process of environmental reviews and public consultation and in-country disclosure. The ESIA has been prepared through a participatory methodology and reflects qualitative information gathered through more than 40 interviews conducted with group and individual stakeholders in the two projects.

Legislative and Regulatory Considerations

Relevant Legislation in Yemen

The Environmental Protection Law was issued in 1995 in order to conserve the environment and its natural ecosystems. The Executive Regulations of the law had been issued by Decree of the Council of Ministers 148 for the year 2000. The Environmental Protection Law includes certain regulations for performing Environmental Impact Assessment studies and handling hazardous materials and waste. The Law also stipulates standards for ambient air quality, air emissions, vehicles and motors emissions, wastewater discharge, and ambient noise.

The Yemen Civil Aviation Regulations (YCAR) are published by the Authority of Chairman of Civil Aviation and Meteorology Authority (CAMA). The Law regulates air navigation and operation in the territory.

The Traffic Law no 42 of 2002 regulates rights of ways and the rights of road users. The law includes articles that prohibit narrowing of roads or making modifications or repairs without authorization from the relevant officials, and it clarifies the rights of road beneficiaries.

The Local Authority Law no 4 of 2000 and the Executive Decree no 269 of 2000 vest local authorities with administrative, fiscal, and decision-making responsibilities. These responsibilities are pertinent to many activities in the project, particularly the traffic intersections sub-project.

World Bank Safeguard Policies

The World Bank safeguard policies that could be triggered by these projects are OP 4.01 on Environmental Assessment and OP 4.12 on Involuntary Resettlement.

According to the World Bank Operational Policy on Environmental Assessment (OP 4.01), the MIAIP and TJIP are classified as environmental Category B, projects that could have potential adverse environmental impacts on human populations and the environment. However, potential environmental impacts are site-specific and reversible, and they can be mitigated through implementing an environmental and social management plan.

Although the PCDP II is unlikely to trigger OP 4.12 on Involuntary Resettlement, the consultant was asked to prepare a resettlement policy framework (RPF) to be deployed by the NCU in case any aspect of implementing the PCDP II involved involuntary resettlement. OP 4.12 and the Yemeni legislation related to land provided the legal framework used in developing the RPF .

WB policy OP 17.50 on “Disclosure” is also deemed relevant to the project. This Policy details the Bank’s requirements for making operational information available to the public. The Bank reaffirms its recognition and endorsement of the fundamental importance of transparency and accountability to the development process. In addition, timely dissemination of information to local groups affected by the projects and programs supported by the Bank, including nongovernmental organizations, is essential for the effective implementation and sustainability of projects.

International Conventions

Yemen has ratified many international conventions relevant to the project. With reference to the International Labour Organization's (ILO) conventions, Yemen has ratified approximately 30 conventions that regulate labor standards and work conditions. Yemen ratified in August 2008 the most recent ILO convention, which deals with the Seafarer’s Identity Document. The oldest Yemeni ratification is that of the Weekly Rest (Industry) Convention in 1976.

Project Description

Mukalla International Airport Improvement Project (MIAIP)

The specific objectives of Mukalla International Airport Improvement Project (MIAIP) are:

- To enable the MIA to benefit from the liberalization of air traffic following the application of the Open Skies Policy in Aden and Mukalla.
- To attract a larger number of airline companies.
- To handle a greater number of passengers and visitors to the city and the region.

MIAIP includes three main components: constructing a new terminal building and new parking area; improving runway lighting, replacing transformers of the VOR and transmitter systems, and introducing two diesel generators; and constructing new cargo hangers.

The ESIA team recommended adding two more components the project. First, the team recommended a clean-up of the services area, including a rehabilitation of the existing scrap store and replacement of the existing diesel UST and AST. Second, the team recommended the safe removal of three asbestos hangers located east of the terminal building under supervision of an international asbestos management firm. The budget for these two recommended components has been added to the ESMP budget.

Traffic Junctions Improvement Project (TJIP)

The proposed PCDP II interventions in the traffic system in Mukalla aim at improving the capacity and safety of the city's major traffic junctions. The specific objectives of Traffic Junctions Improvement Project (TJIP) are to:

- Increase vehicle speed and save congestion time.
- Provide facilities for safe pedestrian movement.
- Improve the geometrics and safety.
- Provide sufficient instruction and clear signage for drivers.

Fifteen traffic junctions were selected for improvements, which include ground repairs, road marking, fixing signs and improvements to traffic signals.

In addition to the proposed modification at each of the fifteen junctions, there will be general regulatory measures to control parking habits, which causes narrowing of traffic lanes. These measures include:

- Banning parking within 50 m of the intersection area.
- Banning parking within 50 m on either side of the bus stops.
- Preventing minibuses and taxis from stopping within junction area.
- Reorganizing on-street parking, through limiting parking locations on busy roads, permitting parking only in intense retail commercial areas and where road width is enough, and the application of "pay and park" for all on-street parking.
- Reorganizing off-street parking through marking and monitoring the capacity of these parking areas.

Project Budget

The estimated budget for the two PCDP projects in Mukalla is USD 11,870,000. The estimated budget for MIAIP is USD 8,870,000, while the corresponding budget for TJIP is USD 3,000,000. This budget is assumed to reflect some of the ESMP measures detailed in Chapter 7, including the safe dismantling of asbestos hangers and the clean-up/rehabilitation of the service area.

Project Alternatives

No Project Alternative

The planned two sub-projects under PCDP II in Mukalla are predicted to have plenty of positive impacts that will highly contribute to local communities' immediate well-being, as well as to significant long-term return. The projects will also help the city in achieving its strategic vision described in the City Master Plan. The assessed negative environmental and social impacts could be managed through recommended mitigation measures, which shall minimize the significance of these impacts. Therefore, the ESIA team believes that there are no environmental and social issues that would lead to turning down the project and go for the "no project alternative".

Removing Asbestos Hangers Alternatives

On the one hand, demolition of the existing asbestos hangers will cause release of asbestos fibers in the air that could cause health risks, and accordingly the uncontrolled demolition of these asbestos hangers has been considered as a major impact. However, on the other hand, the ESIA team believes that the controlled removal of these asbestos hangers during the construction phase of MIAIP will be more beneficial from an environmental perspective due to the following:

- The existing asbestos is broken in many parts, which is thought to create a situation of high risk to the people that currently using these hangers and the people in their surroundings.
- With the passing of time, the condition of the asbestos sheets will worsen and that will mean more release of asbestos fibers.
- At a certain time the hangers will be demolished anyway, firstly because they will be close to their lifespan, and secondly because they are occupying a large area that most probably will be needed for other kinds of use, as the development of MIA operations is progressing. A worse case scenario will be if some or all of these hangers collapsed or were demolished in an uncontrolled manner, which would cause generation of considerable asbestos containing dust, posing high risks to workers, passengers and visitors of MIA.

Clean-up Service Area Alternative

The services area near the generator house has a considerable soil contamination around it. The proposed activities of MIAIP include installation of new power generators and transformers, and accordingly this service will be used within the MIAIP activities. The alternatives that the ESIA team recommends are to include clean-up of the contaminated service area and replacing the existing AST and UST among the MIAIP activities. The reasons for this are the following:

- The existing diesel loading system has proven to be inefficient and is believed to be a factor that has contributed to the contamination of service area. Continuing to use the system during the operation of MIAIP will be an important disadvantage
- There are no bounding walls around the existing AST which would contain any spillage.
- The ESIA team is not certain about the status of the UST, however, the contaminated area surrounding the UST could be an indication of the fact that its metal containment is not in a fully effective condition.
- Keeping the contaminated soil could have many environmental risks, such as chronic exposure of the workers in the service area to Volatile Organic Compounds (VOCs) and possibility of contaminants migration through rain fall and groundwater movements.

Description of Baseline Environmental and Socioeconomic Conditions

Project Locations

MIA is located about 30 km east of the Mukalla city center over an area of approximately 20 km². The runway measures approximately 3 km in length and is oriented in the northeast to the southwest direction. During the ESIA team's site reconnaissance, the following environmental issues were identified:

- There were areas of stained soil around the fuel UST and AST of the power generation, indicating several oil leakage incidents, probably during fuel unloading. There were also oil stained areas near the maintenance area of Yamania hanger. It has therefore been proposed, among the activities of MIAIP, to clean-up these areas and install new fuel tanks.
- The scrap store was full, and scrap items were left beside the store
- Three asbestos hangers are located east of the terminal building, and parts of the asbestos were broken.

The 15 traffic intersections that will be improved under the TJIP are located in various central areas of Mukalla city. The junctions are all in the city center, which contains a relatively high population density. The junctions are surrounded by residential areas, commercial areas, and different institutions. Some of the junctions are located beside fuel stations where evidence of soil contamination was observed, for example in the October Petrol Pump Junction. The asphalt surface of other junctions generally contains limited amounts of leaked oil from vehicles, in addition to litter from pedestrians.

Air Quality

There were no historical records for air quality available to the ESIA team. Therefore, indicative ambient air monitoring was carried out in selected points near MIA and some of the 15 traffic junctions included in TJIP. The results have indicated that PM₁₀ and SO₂ values for all monitoring points were above the legal standards. Taking into consideration that there are no ambient standards for NO_x, but rather for NO₂, and assuming that most of the NO_x will be present as NO₂, it could be concluded that ambient NO₂ will be near or in excess of the threshold standards. Regarding TSP, the recorded measurements show high values if compared with the legal limits for black smoke TSP. On the contrary, CO measured values were well below the legal standards.

Noise

There were no ambient noise monitoring data for Mukalla city available to the ESIA team. Therefore, the team has prepared a sample noise monitoring plan in selected points near MIA and some of the 15 junctions included in TJIP.

The results recorded near the service area of MIA indicated relatively high noise levels when compared to the ambient noise standards. The reasons for high noise levels at this area is probably due to the high number of passengers served, with corresponding high

number of vehicles in the nearby parking lot, all within a limited area. The recorded noise levels in three points located in nearby residential areas east and west of MIA show noise levels near the permissible levels for residential areas in districts.

Four monitoring points were selected in the traffic junctions that would be improved under the TJIP, the recorded measures at these points indicated relatively high noise levels if compared to the legal standards for ambient noise in commercial areas.

Traffic

Traffic surveys had been undertaken during the preparation of the Master Plan 2005 and during the preparation of TJIP feasibility study and design report (2008) for the main junctions in the city. The survey results suggested that there are two traffic peak hours in the city: a morning peak hour from 10:00-12:00 with 10.1-15.3% share of the total traffic, and an evening peak hour from 12:00-13:00 with 9.2-17.2% of the total traffic.

The Level of Service (LOS)¹ for the surveyed junctions varied, but it was generally within the higher grades for the base year (2008). The LOS is expected to be downgraded for all the junctions during the coming years due to the increased volume of traffic. The traffic survey concluded that traffic congestions (and consequently higher delay times and lower grade LOS) in the junctions are largely a result of the following main factors:

- Some of the intersections are controlled manually by traffic police. The two existing signalized intersections are pre-timed, but not optimally designed and not respected.
- Lack of traffic management (for instance, poor marking and road signs at the approaches to intersections, and lack of designated pedestrian crossing).
- The offensive behaviors of motorists, and particularly motorcyclists, at intersections (for instance, using incorrect turning paths to clear the intersection via the shortest path and not complying with the roundabout's priority rules).

Socioeconomic Indicators

Mukalla's population is estimated at approximately 231,205 inhabitants (estimates of year 2004). The annual average increase of population is estimated at 3%. Life expectancy at birth was estimated to be around 61.85 years (63.6 females and 60.2 males) on the Governorate level. Family size in Hadramout Governorate recorded 8.2 individuals/family, putting the Governorate in the category of Governorates with largest family size. It should be noted that family size in Mukalla increased from 7.4 in 1994 to 8.2 in 2004. This might to some extent suggest that people still prefer to have a large family size despite the efforts to promote family planning practices.

¹ LOS is an indicator used in Traffic Engineering to determine the effectiveness of the transportation infrastructure. An LOS ranking can range from A (best) to F (worst).

Illiteracy rate for Mukalla city is approximately 12% for men 36% for women. This, in general, suggests that the city has a higher level of educational attainment and literacy relative to the rest of the Governorate.

The portion of Mukalla City that is poor does not exceed 18%. This percentage puts the city in a relatively favorable situation in terms of poverty indicators as compared to the Governorate and many other areas of the country.

Gender Issues

There were no secondary resources available to describe the situation of women in Mukalla. Accordingly, the ESIA team relied on primary information to research this subject. The main findings related to the question of women participation in the city, which are driven from interviews with female residents and women NGOs, indicated that:

- Mukalla is still a male-dominated society where the role of women is usually limited and underestimated.
- Women's situation in terms of education and participation in the civil society organizations has witnessed relative development and improvement over time, according to participants in the consultation activities. Several NGOs focused on women's issues currently exist in the city, and the Yemen Women's Union (YWU) is also seen as an important factor in women's development through its advocacy for women's rights.
- Women's participation is still faced with many challenges, which make it rather superficial and imaginary.
- Further raising of awareness on issues of women's rights and women's roles in society are seen as crucial to achieve balanced and equitable development in the city.
- Youth of both sexes are seen as the ideal category among which to promote awareness-raising programming.
- Although women are unlikely to benefit from the jobs created during the construction phase of MIAIP, project managers and city officials should aim to ensure that women to benefit from the different economic opportunities that are predicted to arise as a result of this project.
- MIAIP, alongside other tourism projects planned by the local Council, other donors, and NGOs, is predicted to encourage more tourism to the city. This influx of tourists could create opportunities for women, as tourism could encourage the revival of some traditional handicrafts. Such a revival could economically benefit women.
- NGOs focused on women's issues could participate in the awareness-raising programmes that need to be implemented as part of the sub-project on traffic improvement.
- Street and traffic conditions improvements planned under TJIP will also bring special benefits to women, who are regarded as one of the main vulnerable road users. Providing safer street conditions will positively impact the entire community, but particularly women.

MIAIP Stakeholders Perception:

According to MIA Engineer and Projects Manager, the main challenge the MIA face is the inadequacy of the present airport facilities to handle the current demand, leading to significant congestion at the Passenger Terminal Building and the cargo storage areas. Lack of appropriate timing and varieties of flights is also a concern.

Some of the secondary references pointed to the limited revenues available to cover operating expenses in MIA. This was perceived to leave little profit. Despite the authority's effort to expand the services offers, the airport receives limited allocations from the Headquarter in Sana'a for maintenance and capital investments because of its currently limited activity level. Although the MIA responsible officials did not agree on this and did not regard this as a challenge, they stressed the fact that, in the future, facilities needed to handle the expected increase in cargo and international flights/passengers which are not presently available. The congestion is expected to exacerbate with the increase in passenger numbers, unless the handling capacity of MIA is enhanced and a few other upgrades are undertaken on the Terminal Building.

TJIP Stakeholders Perception:

In order to get an overview of the current situation in Mukalla and the 15 traffic intersections targeted under the TJIP, literature sources were reviewed and several interviews with intersection users have been carried out. The following findings related to the current situation in the targeted intersections were recorded:

- Absence of safe pedestrians crossing seemed to be a common problem in the targeted junctions. This was, in particular, a concern for female road users.
- Certain problems in the targeted intersections were found to affect certain vulnerable groups. For example, the high platforms and pavements are unsuitable for elders and people with special needs.
- In addition to the problem of poor traffic geometrics of the intersection, other associated conditions further worsened the situation like the commercial shops activities in spare parts and car maintenance shops which increase platform occupation and random parking. In some conjunctions the conditions of streets, including the poor level of leveling and paving, contributed to worsening the situation.
- There is a need for transferring taxis and minibus stops from their current location in some junctions.
- Certain community groups currently benefit from the existing crowd in the targeted traffic junctions. Street sellers, including foods and drinks sellers, are the most important category in this regard.
- Most of the people interviewed pointed to behavioral problems as one of the major problems in traffic-related issues in Mukalla, including the absence of proper law enforcement.
- The potential of accidents is a threat that street users always consider.

Potential Environmental Impacts and Mitigation Measures

Environmental and Social Benefits

In addition to the development objects, the two projects are expected to achieve important socioeconomic benefits including:

- Creating temporary job opportunities for the local people of Mukalla, especially unskilled labor, during the construction phase of both projects.
- Improving MIA's revenues and enhancing economic opportunities for travel and cargo companies, airline companies, hotel operators, and people who could become employed in the tourism, transportation, or manufacturing industries.
- Providing more travel opportunities, which in turn will result in a higher level of convenience to users/travelers in selecting flights times, and thus increase the likelihood of visitors to the city.
- Creating more employment opportunities in various locations including, the airport, travel agencies, transportation, etc.
- Saving passengers and cargo companies time through alleviating congestion and delays with MIA services.
- Improving aviation safety through upgrading the airfield lighting and equipment for navigational services.
- Improving pedestrian safety using the TJIP junctions.
- Generating revenues to the local authority from organized parking areas, which will support the sustainability of the project.
- Enhancing social harmony through reducing the stress associated with traffic congestions.
- Aiding those who, because of limitations in their abilities, including elders, children and people with special needs, are unable to use safely the crowded and congested streets.

Furthermore the two projects are expected to achieve some environmental benefits, including:

- Reducing vehicles air emission through the reduction of traffic congestion and improvement of the level of service at the traffic junctions.
- Reducing noise sources caused by vehicles through reducing traffic congestions.

Environmental and Social Negative Impacts during MIAIP Construction

The ESIA has identified some negative environmental impacts that would be caused by the construction and operation of the two projects. All identified negative impacts are associated with proposed mitigation measures that would minimize their significance.

The negative environmental and social impacts are classified into three main categories: major impacts; medium impacts; and minor impacts.

Only one major negative impact was identified in this ESIA, i.e., the risks of asbestos fibers released during the demolition of three asbestos hangers located east of the

terminal building in MIA. It was recommended in the ESMP that demolition should be undertaken under supervision of an international asbestos management company, which will oversee safely dismantling the asbestos sheets, placing them in marked double polyethylene containment, and shipping the waste to an authorized asbestos landfill outside the country. Alternatively, a special safe disposal site could be prepared in a suitable location in the country with the approval of the relevant authority. Such mitigation measures are believed to minimize the impact of the asbestos removal. In order to monitor this impact, it was proposed that asbestos fibers in the air around the demolition site be monitored on daily basis.

Four medium negative impacts were identified during construction of MIAIP, including:

- Risks of waste contaminated soil that would be removed during the proposed clean-up of the services area. For mitigating this impact it was recommended in the ESMP that the clean-up process should be supervised by a specialized environmental consultant, who shall oversee the safe shipment and disposal of the waste according to best available techniques. It was also recommended that the clean-up should be associated with replacing existing diesel UST and AST to avoid future leaks. In addition, monitoring of waste quantities was recommended.
- Impacts of generated scrap waste from replacing equipment and airfield lighting fixtures. The mitigation measures recommended in the ESMP include adding condition for the supplier of equipment for taking old equipment for reuse/recycling and reorganization/rehabilitation of existing scrap store.
- Impacts on air quality from earthworks, demolitions and emissions from construction machinery. It was recommended in the ESMP to apply water spraying before earthworks and demolitions, and enforce the contractor to use low emissions machinery. It was also recommended to monitor ambient air quality quarterly during construction
- Noise impacts from construction works. The ESMP measures included provided construction workers with ear muffs and arranging terminal finishing works during times where nearby halls have little passengers. It was recommended that noise levels should be monitored weekly during operation of noise machinery.

Three minor negative impacts were identified during construction of MIAIP, as follows:

- Aesthetic impacts related to stockpiling and disposal of construction waste. The ESMP measures included allocating certain areas for stockpiling waste, which should be transferred at the end of each working day to approved disposal site.
- Impacts related to inefficient drainage of dewatering liquid waste that would be discharged during construction of the foundations of the terminal buildings and cargo hangers. The ESMP measures included engineering an effective drainage process either through recharge wells or evaporation ponds. If dewatering waste is to be discharged through evaporation ponds, measures must be instituted to monitor accumulated water and the development of any offensive odors, allowing for the possibility that the pond should be cleared by pumping trucks.
- Inconvenience and delay to passengers from limited access paths during construction. The ESMP measures included providing suitable width and flooring material to the temporary barricaded passages to allow access of trolleys,

providing appropriate safety instructions, and phasing parking organization in a manner that will cause minimum disturbance.

Environmental and Social Negative Impacts during TJIP Construction

Four medium negative impacts were identified during construction of TJIP, which are:

- Impacts on local shops resulting from the limiting of customer access or the temporarily relocation of street sellers during construction. The ESMP measures include selecting traffic route options that would least affect local business and consulting with local business through field surveys
- Inconvenience to pedestrians and traffic delays due to detours. The ESMP measures include identifying most suitable detours, carrying out awareness-raising campaigns, setting coordination mechanisms among construction contractors, PWD, MDT and MLC, establishing complaint mechanisms to ensure that road users' concerns are integrated into the detour plans, and the preparation of safe passages to pedestrians that wheelchairs and handcarts can use. It was also recommended to monitor the number of complaints received from junction users and the actions taken in response to these complaints.
- Noise impacts of construction machinery and demolition works. The ESMP measures include providing construction workers with ear muffs and coordinating with neighbors regard the times of the operation of loud equipment. Noisy activities should be restricted during night hours
- Impacts on air quality from emissions of construction machinery and dust generated from demolition works. The ESMP measures include applying water spray before demolitions, and requiring that the contractor use low emissions machinery.

One minor negative impact was identified during construction of TJIP, namely the impacts of limited quantity of construction waste. The ESMP measures included allocating certain areas for stockpiling waste that should then be transferred at the end of each working day to an approved disposal site.

Environmental and Social Negative Impacts during MIAIP Operation

During MIAIP operation three medium negative impacts were identified as follows:

- Noise impacts within the MIA site related to the operation of new generators and introduction of new parking areas. The ESMP measures included developing a noise map for MIA and surrounding areas, and instructing workers in noisy areas to wear ear muffs. It is worth noting that the indirect noise impact resulting from expected increase of air traffic has not been attributed to MIAIP operation, especially that the project does not include construction of new runway or elongating the existing runway. Quarterly noise monitoring of different locations of MIA has been recommended.
- Impacts on air quality due to air emissions from the new generators. The ESMP measures included providing generators with highest combustion efficiency, providing suitable chimney heights as conditions in the tender document. It was

- recommended to monitor ambient air quality near the generator house and measure air emissions from the generator stacks on quarterly basis.
- Impacts of hazardous waste including used containers of chemicals and lubricant oils, expired chemicals that could be left in cargo stores and wastes of possible future soil clean-up operations. The ESMP measures include enforcing suppliers of chemicals and oils to take back used containers, enforcing owners of expired chemicals to handle these materials on their own liability and manage clean-up operations according to best available technological options. It was recommended to keep records of handled hazardous waste and to provide an inventory monitoring to the diesel UST to avoid future leakages.

Two minor negative impacts were identified during MIAIP operation, which are:

- Impacts of scrap. The ESMP measures include adequate management of scrap store and arrange for selling scrap items for reuse/recycle or adequate disposal for invaluable items. It was recommended to keep an inventory monitoring to the scrap store.
- Impacts of sewage and solid waste. The ESMP measures included recommendation for designing an engineered septic tank or a compact aerobic treatment plant for sewage, and enforcing the cleaning company to dispose solid waste in approved site by the local authority.

Environmental and Social Negative Impacts during TJIP Operation

One negative socioeconomic impact was identified during the operation of TJIP, which is primarily impacting local business. This includes negative impacts on local shops and kiosks, as result of preventing unorganized parking near their shops, as well as impacts related to less customer flow to street sellers near existing bus stops and parking areas, and removal of some street encroaching and platform occupation from local businesses. It was difficult to determine one level of significance for this impact because it is largely a case-specific impact, which depends on the conditions of the group that will be affected. In some cases the impact is seen as direct, for instance, the case where street salesmen might be relocated. It was not clear in this case, however, if the resettlement process might be a preferable option for the street sellers and might be done on voluntarily basis in the future. In other cases, the impact is indirect, such as in the cases where prohibiting car parking or relocating taxis parking might result in reducing the number of client of local business. The ESMP measures included carrying out street sellers' survey to learn more about the recommended actions that best suit their requirements and assets in a case-by-case approach.

One minor environmental impact was identified during operation of TJIP, which is impact of maintenance scrap. The ESMP included measures for adequate storage of scrap items in PWD scrap store and arranging for selling these items for reuse/recycle.

ESMP Institutional Set-up

PCDP II National Coordination Unit (NCU) as well as the concerned Governmental agencies, namely MIA and the PWD, MTD will play a crucial role for the success of the ESMP. NGOs are also assumed to take a lead in many community-related activities. The involvement of external consultants for certain community-based activities like the street sellers survey and capacity building and training is proposed in some instances in order to ensure the efficient implementation of the ESMP. Monitoring the ESMP measures is a main component of the proposed ESMP in order to ensure efficient implementation of the various proposed activities

For implementing the ESMP it was recommended to recruit a HSE Manager in MIA to be responsible for overseeing the implementation of the ESMP measures of MIAIP. The PWD and MTD Managers each will assign a contact person with a technical background to be the point person for ESMP issues and follow-up from PCDP II side. Two of the PCDP IINCU staff will have major roles in the ESMP: the SLO and the MLC shall have a supervisory role on both projects, and both should receive progress reports about the achievements of the ESMP.

A capacity building program has been recommended for different project stakeholders who will have active role in implementing the ESMP.

ESMP Budget

In estimating the budget for implementing the ESMP, it has been assumed that the measures required by the construction contractors, site supervising consultants and the general tasks of MIA, PWD and MTD will not entail extra costs above the normal bidding costs and management costs, as by the corresponding parties are expected to follow these measures during their normal execution of their work. It has also been assumed that some specialized works, such as the safe demolition of asbestos hangers, the replacement of existing UTS and AST, and the rehabilitation of MIA scrap store, will be included in the project budget. Accordingly, such measures are not included in the ESMP. In addition, the salaries of PCDP-NCU, MIA, PWD and MTD staff have not been considered in the budget of the ESMP.

| Item | Estimated budget (USD) |
|---|-------------------------------|
| Clean-up of contaminated soil in the services area | 20,000 |
| Ambient air monitoring during construction and four years operation of MIAIP | 25,000 |
| Monitoring stack emissions from new generators during four years of operation | 20,000 |
| Allowance for hazardous waste management during MIAIP operation | 10,000 |
| Maximizing benefits to local people from of job opportunities in MIAIP and TJIP | 5,000 |
| Noise meters for MIAIP | 5,000 |

| Item | Estimated budget (USD) |
|---|------------------------|
| Complaints and coordination mechanism for TJIP | 5,000 |
| Local business and street sellers survey for TJIP | 15,000 |
| Awareness raising campaigns | 20,000 |
| Training | 90,000 |
| Total | 215,000 |

Consultation with Stakeholders

Consultation with stakeholders has been carried out during the scoping period through in-depth interviews and scoping sessions with various types of stakeholders, including governmental organizations, NGOs, as well as various community groups. The main tools employed in consulting stakeholders were focus group discussions (FGDs), semi-structured interviews (SSI), and one-to-one in-depth interviews. Checklists were designed by the ESIA team and were used to guide the discussion during the interviews. Local facilitators were trained and hired to assist the ESIA team in the consultation process. A public consultation workshop was carried out after submission of the Draft ESIA with the aim of presenting the ESIA's findings and incorporating stakeholders' comments in the final ESIA.

According to the interviews carried out with different types of stakeholders, the planned sub-projects are perceived as a high priority for Mukalla City. They are perceived as key components in enabling the city to achieving the development goals outlined in its Master Plan.

The stakeholders who participated in the consultation contributed greatly to the process of predicting the projects' potential impacts. The main finding related to impact identification is that, in terms of social issues, the positive potential impacts are expected to largely overcome the minor negative impacts. For specific groups that may encounter negative impacts on their livelihoods, mitigation measure were developed and further consultation activities are underway to minimize the negative impact and convert it into new potential for these groups.

The stakeholder consultation carried out for MIAIP showed that no major negative impacts are predicted from the implementation of this project. In particular, according to the consultation, the project is not expected to negatively impact people's livelihoods, health and safety. For TJIP the consultations revealed that there may some effects on local business, such as shop sellers that are benefiting from unorganized parking, shops that are occupying the junctions and platforms with their products, and street sellers who have mobile handcarts to carry their products. Further surveys and consultation are planned, as indicated earlier, to accurately identify the requirements of these groups using a case-by-case approach. Different suggestions, comments and recommendations raised during the public consultation workshop were considered in the Final ESIA.

In conclusion:

The MIAIP and TJIP are expected to achieve many important benefits that outweigh limited environmental and social impacts, all of which can be mitigated through the proposed Environmental and Social Management Plan.