

# Conference Materials

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## Regional Exchange on Good Practices of Environmental Safeguard Management - Supplementary Appendix (Training Workshop under RETA7548-REG: Improving the Implementation of Environmental Safeguards in Central and West Asia)

Prepared by the RETA consultant for the Asian Development Bank. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

**REGIONAL EXCHANGE ON GOOD PRACTICES OF ENVIRONMENTAL  
SAFEGUARD MANAGEMENT**

**Supplementary Appendix**

**CASE STUDIES**

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## REGIONAL EXCHANGE ON GOOD PRACTICES OF ENVIRONMENTAL SAFEGUARD MANAGEMENT

### I. CASE STUDIES

#### A. Introduction

To identify, document, and share good practices in environmental safeguard management, ADB convened a *Regional Exchange on Good Practice of Environmental Safeguards Management* in July and August of 2015. Two workshops were held. The Lahore Workshop was targeted at environmental safeguards staff of executing and implementing agencies for ADB projects in Afghanistan and Pakistan. The Issyk-Kul Workshop was targeted at environmental safeguards staff of executing and implementing agencies for ADB projects in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

The workshops shared lessons drawn from practical experience. In preparation for the workshops, case studies on good practices were prepared based on the experience of executing and implementing agencies in the implementation of environmental safeguards for ADB projects. These case studies were presented and discussed at the workshops. These 32 case studies have been gathered together into this Supplementary Appendix.

The case studies have been organized by sector and then within each sector by country. The case studies demonstrate many good practices in environmental safeguard management (Table S.1). For each case study, the good practices illustrated are listed at the beginning of the case study presentation. Similarly, for each good practice, those case studies that best illustrate the good practice are identified by case study number in Table S.1.

**Table S.1 Environmental Safeguards Management Good Practices Demonstrated by the Case Studies**

Environmental Safeguards Management Good Practice	Relevant Case Studies
Addressing unanticipated environmental impacts	20, 21, 26, 29
Analysis of alternatives	1, 9, 10
Consultation and awareness raising with all stakeholders	5, 7, 8, 10, 15, 29, 31
Conservation of physical cultural resources	2, 14
Environmental assessment and management of an associated facility	19
Environmental auditing	19, 24, 27
Environmental compliance monitoring reports	16, 27, 28
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<b>Environmental Safeguards Management Good Practice</b>	<b>Relevant Case Studies</b>
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Environmental good practices - Slopes and cuts stabilization	18
Environmental good practices - Solid and domestic waste management	8
Environmental good practices - Spoil disposal, re-use and management	25
Environmental good practices - Topsoil removal and storage	3
Environmental management capacity building and training	1, 8, 18, 24, 31
Frequent site supervision and monitoring	1, 2, 3, 8, 9, 10, 24
Frequent ADB Safeguard Review Missions	20
Frequent supervision and participation of PIU environmental staff	11, 16, 27, 28, 32
Grievance redress mechanism	2, 6, 7, 13, 15, 17, 21, 26, 28, 29, 31
Inclusion of environmental management plans in bidding documents, contracts, and bills of quantities	5, 6, 7, 10, 15, 23, 24, 28
Good housekeeping in camp management	13
Institutional arrangements for environmental management	3, 6, 7, 10, 11, 15, 16, 17, 18, 23, 24, 27, 28
Natural habitats, biodiversity, and protected area management	1, 10, 12, 16, 18, 19, 22, 30, 31
Occupational health and safety	8, 9, 11, 24
Protection of water sources	2, 32
Preparation and implementation of site environmental management plans	9, 10, 16, 23
Underfunding of environmental management plans	23

Source: Case studies on good practices in environmental management.

## **B. Case Studies by Sector**

### **1. Agriculture, Natural Resources and Rural Development**

#### **Case Study 1**

##### **PAK: Good Practice in the Application of Analysis of Alternatives in the Rehabilitation and Upgrading of the Balloki Barrage Irrigation Department, Government of Punjab**

**Sector:** Agriculture, Natural Resources and Rural Development

**Good Environmental Safeguard Management Practices:** Analysis of alternatives; Natural habitats, biodiversity, and protected area management; Frequent site supervision and monitoring; Environmental management capacity development and training

#### **Introduction**

The Balloki Barrage was constructed on River Ravi in 1906-1913, about 65 km southwest of Lahore. It supplies irrigation water to 4.8 million acres of land through two off-taking canals, the Lower Bari Doab Canal (LBDC) and Balloki-Sulemanki (BS) Link Canal. The project included the modernization of Balloki Barrage; LBDC, and BS Link Canal head regulators; and LBDC main canal and structures.

ADB Loan 2299-PAK: Lower Bari Doab Canal Improvement Project approved in December 2006 supports this operation. The Project is under the Multi-tranche Financing Facility (MFF): Punjab Irrigated Agriculture Investment Program-Project 1. Punjab Irrigation Department (PID) is the executing agency (EA).

#### **Main Environmental Issues Associated with the Project**

The feasibility study for the project executed in 2005 provided the basis for the project area to be acquired. However, when the design was finalized, it was realized that a large area of the bamboo forest covering around 70 ha of land which is under the Game Reserve would need to be cut. The bamboo forest is inhabited by animals like Chinkara and is covered by controlled poaching practices. The project construction activities would lead to tree cutting and noise generation that would disturb the forest and the animals within it.

The contractor was also not serious in understanding and implementing the contract in respect to the environment and therefore led to non-compliance with the Environmental Management Plan (EMP) during project operations. Violations that were brought to the attention of the Contractor included the non-appointment of a health, safety and environment (HSE) manager, provision of obsolete residential building for workers in the project, labor camp's sanitation and waste water disposal was directed to the BS Link Canal, burning of solid wastes, oil spillage, poor housekeeping, noise pollution from generators, and lack of monitoring of the quality of drinking water and water sprinkling arrangement in the construction site.

## **Environmental Management Plan**

The overall responsibility of overseeing the implementation of the EMP rests with the safeguard cell in the Project Management Unit (PMU) of the PID. The safeguard cell is comprised of the Director for Environment and Social Safeguards, and four Deputy Directors for Social and Environment; Resettlement; Community Relations; and Social Safeguards. The PMU is headed by the Project Director who is in charge of the project.

Prior to the start of project activities, the Contractor was tasked to prepare the Site Specific Environmental Management Plans (SSEMPs) according to site conditions and submit to the Engineer for approval prior to submission to the PMU for review and final approval.

## **Good Practices in Environmental Management Plan Implementation**

### **Bamboo Forest Preservation**

The PMU conducted continuous meetings with stakeholders where an analysis of alternatives was undertaken which led to the amendment of the original project design in order to save an area of ecological significance. It was a team effort that considered the environmental importance of forest preservation to arrive at the consensus to undertake a design change of the spillway to preserve the forest. This is in compliance with the requirement that the project will not affect the environmental conditions in the project area. The change in project design and the EMP mitigation measures helped in abating noise levels and in preventing tree cutting. The Game Reserve has been renamed as “Rana Hunting Resort” and provides hunting facilities, hotel and restaurant facilities and accommodates frequent educational trips by local institutions.

### **Defined Responsibilities of Agency, Consultant and Contractor**

The day to day monitoring of EMP implementation is done by the Engineer and the preparation process for the monthly environmental monitoring report has been established. Non-compliance with environmental management procedures are identified and mentioned in the reports which are provided to the Contractor who is given sufficient time to rectify discrepancies and violations on the EMP. The Engineer provides technical support to the Contractor to help address the violations.

The support of the Design and Supervision Consultants (DCSs) has also been obtained for the implementation and monitoring of the EMP. The Consultants Environment team consists of an Environmental Specialist (ES) and an Environment Inspector. Compliance with the EMP is being assured by the team work of the PMU and the Engineer. The Contractor is responsible for complying with the EMP through the HSE manager. Due to lack of staff, the project civil engineers were also trained on HSE and cooperated with the environment staff on EMP implementation in the construction sites.

In monitoring SSEMPs, each activity is documented by the Contractor HSE Manager and verified by the Engineer. The PMU has been responsible for checking ground conditions and actual implementation of EMP at the site.

The PMU and the Engineer staffs’ site visits became the source of ground information which facilitated the identification and correction of the environmental non-compliances as early as possible. Initially the Contractor was hesitant to improve the HSE conditions and could not



develop interest in environmental compliances but these were reversed through persistent efforts of PID in convincing the Contractor to improve its performance on environment compliance and adherence to given timelines. These included the appointment of an HSE Manager, shifting of workers to a labor camp with improved sanitation and wastewater disposal through the activation of a proper septic tank system and construction of new wash rooms with all facilities, provision of pit for dumping solid waste, constant reminders to control oil spillage, practice of good housekeeping through disposal and proper storage of scraps, installation of silencers in generators, conduct of drinking water tests and giving special attention to water sprinkling arrangements. As a result, HSE activities gained importance because it reduced the lost time injury (LTI) of the Contractor and construction activities progressed with few interruptions. Eventually the Contractor highly demanded for the implementation of the EMP and the adoption of good construction practices.

This case study has showcased the importance of analysis of alternatives, persistence of the PMU in winning the contractors' support and appreciation in complying with the conditions on environmental management, having clearly defined responsibilities within the PMU, staff capacity development and frequent site visits which have significantly contributed to the implementation and monitoring of environmental conditions in the project sites.

### **Lessons Learned and Recommendations**

Documentations like checklists and approved SSEMPs should be completed in all aspects of the project before any civil works is started. The Environment team should be given full authority to stop any construction work if documentation is incomplete or if there is evidence of non-compliance on the part of the contractor. Construction of camps should fully follow the lay out as planned and should not be changed.

Support plans for the implementation of the EMP such as the HSE plan, traffic management plan, waste disposal plan, tree plantation plan, emergency response plan, etc., should also be implemented and monitored.

The seriousness of the contracting parties in implementing the EMP is of great concern. The interpretation by three parties - client, consultants and the contractor –often give rise to conflicts. It is recommended that the contract be clear on the responsibilities of each party in the implementation of the EMP.

Supervision Consultants' (SC) staff should frequently visit construction sites, prepare site reports to be submitted to the client and demand strong support in the implementation of the EMP. The contractor's environment officer under the direct supervision of the SCs may be given authority to disregard the contractor's influence on his performance.

Payments to contractors should be based on a defined set of criteria while payment releases should be in accordance with the schedule stipulated in the contract. Payments should be made conditional with environmental compliances and pendency of environmental compliance should be avoided and if necessary should not be tolerated for more than one month.

The screening and selection criteria for engaging contractors should include good reputation and their performance on environmental compliance in previous project engagements.

Competency in the selection of environment staff is necessary but their willingness to do a challenging job is also an important factor to be considered in their selection. The environment staff of the client should be consulted during the approval of EMP. In defining responsibilities, the mandate to implement the EMP should still rest with the environmental staff.

## References

LBDC Consultant. 2015. *Environmental Monitoring Report: Lower Bari Doab Canal Improvement Project in Punjab Irrigated Agriculture Investment Program-Project 1*. Manila. ADB.

Environmental Management Plan, Site Specific Environmental Management Plans, Traffic Management Plan, Waste Disposal Plan, Emergency Response Plan, Health, Safety and Environment Plan, and Social Framework Agreement for *Lower Bari Doab Canal Improvement Project in Punjab Irrigated Agriculture Investment Program-Project 1*.

## Case Study 2

### **PAK: Good Practice in the Implementation of Grievance Redress Mechanism**

#### **Project Management Office**

#### **Irrigation Department of Government of Punjab**

**Sector:** Agriculture, Natural Resources and Rural Development

**Good Environmental Safeguard Management Practices:** Grievance redress mechanism; Conservation of physical cultural resources; Frequent site supervision and monitoring, Protection of water sources

## Introduction

Khanki Headworks is the oldest headworks in Pakistan. It is located about 52 km downstream of Marala Barrage and 32 km upstream of Qadirabad Barrage and is the second diversion structure on River Chenab after entering Pakistan. The Lower Chenab Canal (LCC) off-takes from the Khanki Headworks and irrigates about 1.4 million hectares (ha) (3.6 million acres) of fertile land in eight districts of Punjab. The New Khanki Barrage Construction Project (NKBP) supports the construction of a new barrage at a distance of 900 feet (ft) downstream of Khanki Headworks. A new head regulator for the LCC will be constructed upstream of the new barrage and the canal will be realigned by 5,000 ft accordingly. The new barrage with automation arrangement for gates and gearing system to regulate discharge in the Chenab River and the off-taking canal will ensure safe passage of floods and sustainable irrigation water supply to the command area.

The project is financed by ADB Loan 2841-PAK under the MFF: Punjab Irrigated Agriculture Investment Program (Facility) Tranche 2 approved in December 2011. The Government of Punjab Irrigation Department is the executing agency (EA) and the initial environmental examination (IEE) on the project was carried out in 2011.

## Main Environmental Issues Associated with the Project

The main environmental issues are tree cutting, increased traffic due to project vehicles, creation of barrier to fish migration, and construction-related impacts like noise, air and water pollution, temporary lowering of ground water, and disruption of surface water drainage.

Main grievances associated with the construction of the project include demands for construction of additional culverts, installation of hand pumps, complaints related to compensation for loss of land, shelter and livelihood along the new alignment of the LCC, and construction of additional facilities such as provision of flood water and surface water drainage, and playground in workers' camp.

## Environmental Management Plan

The mitigation measures to minimize or remove impacts anticipated to arise during construction phase include: water sprinkling in project areas and regulating project vehicle speed near communities to avoid excessive dust emissions, compliance with the Solid Waste Disposal Plan in the SSEMPs, compliance with the framework agreement on source of water for construction

use, adoption of water conservation and water resources protection measures, ascertaining full community participation in operations, establishing contractor's camp sites based on prescribed distance from communities, minimizing noise pollution and avoiding disturbance to natural habitat, formulation of a traffic management plan, provision of basic health care and safety training to community members in civil works, minimizing vegetation clearance, recording and mitigating legitimate community complaints, and systematic community consultations on resettlement plan and budgeting.

The Environment and Social Unit (ESU) created by the PMO in the previous tranche of the MFF is responsible for implementing the EMP during mobilization and execution stages of the project. The Contractor DESCON Engineering Ltd., has prepared three SSEMPs which have been approved by the Supervision Consultant (SC) and ADB.

The SSEMPs are broadly followed by the Contractor, while the SC's environmental specialist (ES) and Senior Environmentalist team are responsible for the strict and regular monitoring of overall compliance related to environmental, social and safety activities/issues.

The monitoring of environmental issues and concerns involves (i) instrumental monitoring by DESCON and the Engineer on a daily/monthly basis through the "Noise Meter, DO Meter and Multi-meter", (ii) use of the EMP Compliance monitoring checklists by DESCON and the Engineer, (iii) EMP compliance monitoring by the Engineer on a daily basis and by the Engineer's ES on a monthly basis, and (iv) inspection and monitoring by the ESU of the overall environmental and social compliance.

In addition, a Grievance Redress System (GRS) has been established by the PMO to handle community complaints and grievances. It consists of a formal three-tier grievance redress mechanism (GRM) and process. The first tier provides for the immediate response to complaints received at the local level of the project by the Grievance Redress Cell (GRC) within seven calendar days. Unresolved complaints and issues on entitlements at the GRC or complaints directly filed with the PMO are formally reviewed by the PID as EA/PMO and subsequently referred to the Grievance Redress Committee 1 (GRC-1) for resolution within 30 calendar days. Any issues on adequacy of the entitlements and eligibility aspects not resolved at GRC-1 are endorsed through the Member Engineering's Office Planning & Development Department to the Grievance Redress Committee II (GRC-II) at the Provincial Government for review and resolution within 60 calendar days.

The GRC is headed by the Head PMO with members consisting of (i) PID officials (three Deputy Directors for Environment, Sociology, and Development Assistance and Resettlement; Executive Engineer for Irrigation at site, and one Sub-divisional Officer); (ii) SC's Sociologist and Environment Specialists; (iii) local administration; and (iv) communities. The Sub-divisional officer is designated as the key Grievance Redressal Officer. A Project Information Centre has been established at the barrage site where the community complaints management register (CCMR) has been placed.

In cases of unresolved grievances, GRS affected persons can appeal to the appropriate court at any stage of the grievance resolution process.

### **Good Practices in Environmental Management Plan Implementation**

Good practices in resolving environmental issues and community complaints and grievances at the local level include (i) environmental progress review meetings and discussions, and consultations with the affected community, (ii) coordination and consultations with all stakeholders including their active participation from initial phase to completion of project activities especially those affecting cultural and religious beliefs and practices, and (iii) prompt and effective response to community grievances.

### **Installation of Water Hand Pump at Mechanical Staff Camp Area**

Monthly environmental progress review meetings (EPRMs) are held to review and discuss environmental and social issues and these have been found to be effective in the timely identification and response to emerging project-related environment and social concerns in the community. Representatives of PMO, SCs and the Contractor DESCON attend the meetings.

The EPRM was instrumental in resolving project-related issues on the (i) drying up of water hand pumps up to 65 ft depth, and (ii) dropping of the water table from 50 ft to 120 ft which were flagged by the community and mechanical staff camp area residents through the Engineer's Environmental Team. These environmental issues resulted from dewatering in the barrage area through the installation of 110 bore holes with water sucking pumps during project construction. The Engineer's Environmental Team brought these to the attention of the Contractor and proposed that if any corrective measures would be required of the Contractor, the SC should officially communicate this to the Contractor who should also bear the cost of the corrective measures. Initially, the Contractor did not acknowledge the gravity of the situation and maintained that the falling water table was not a result of the barrage construction activities. However, through discussions, the Contractor was persuaded and eventually accepted that the problems were caused by intense dewatering at the project site. The Contractor agreed to install the new water hand pumps for all eight affected households at the Contractor's cost.

The environment staff of the SC and the Contractor also carried out consultations with the affected households and community prior to the finalization of location of the new water hand pumps. A satisfaction consultation with the community on the quality and quantity of water was also undertaken after the installation of the new water hand pumps in 2014. The hand pumps have since been operating satisfactorily and the water quantity and quality are regularly monitored by the SC's Senior ES.

This resolution occurred at the first level of the GRM.

### **Shifting of the Grave of Pathan Baba**

Under the design of the New Khanki Barrage, the grave of Saleem alias "Pathan Baba", a laborer who had worked on the original Khanki Barrage construction and had willed to be buried next to the barrage, was falling within the area of the coffer dam site. Disturbing grave sites is a very sensitive issue among the communities and therefore relocation of this grave required careful handling so as to not antagonize the local population.

In view of this, an initial consultative meeting was held with the well-known religious personality in the area, Dr. Muhammad Asif Hizrawi. The purpose of the consultation was to take him on board and seek his advice and consent on the relocation of the grave of "Pathan Baba" from the project area. The meeting was attended by the local mosque's prayer leader (*imam*) and the

environment and social staffs of the SC and the Contractor. The involvement and consent of the religious leaders ensured that the community members would accept the decision to be made on the relocation of the grave. After gaining the consent of the religious leaders and obtaining their advice on the procedure in shifting the remains of “Pathan Baba”, consultative meetings were held with the community members, Local Community Chairman, and members of the GRC to discuss the method of grave relocation in light of the advice given by the religious leaders. After reaching a consensus with all stakeholders, the remains of “Pathan Baba” were relocated to the mutually agreed upon site. The Contractor provided all the resources required and the task was amicably accomplished.

Participation of all stakeholders in resolving issues of sensitive nature has contributed to unimpeded implementation of project activities. Had the religious leaders not been involved at the initial stages, the issue could have led to resistance from the community that could have caused delays in project implementation.

### **Prompt response to community grievances and public consultations**

The complaint on excessive dust generation was received from the community living along Chanawan Road which was undergoing reconstruction. The Contractor who was immediately asked for corrective action submitted a Water Sprinkling Frequency Chart. The effective implementation and supervision of this activity ensured dust abatement in the project area and resolved the community’s grievance. Construction of culverts in Chanawan road was also handled very agreeably through consultations with the local communities.

## **Lessons Learned and Recommendations**

### **Holding of EPRMs**

Team work should be encouraged when enforcing various social safeguards/environmental protection measures. The monthly EPRMs, although not mandated in the SSEMP, was an initiative of PID’s ESU, and proved to be an excellent forum to review and discuss the environmental and social issues in the project. Representatives of the PMO, SCs and the Contractor DESCON participated in these meetings which were found to be very helpful in providing an opportunity for open discussion and facilitating future line of action about various desired actions and activities by all stakeholders of the NKBP.

### **Regular Inspections and Reviews**

Full time Senior Sociologist and Health, Safety and Environment (HSE) Inspector were posted by the SC at site to supervise and guide the Contractor in carrying out their operations in an environmentally sound manner and in accordance with the approved LARP /SSEMPs. The site staff of the SC was assisted and guided by an experienced ES who kept regular contact with the site supervisory staff. This model of operation provided a sound basis for the operations of the environmental team of consultants as well as the necessary support to the Contractor and his staff.

### **Public Consultation**

Meaningful and continuous public consultations are extremely important to ensure that grievances are amicably resolved at the local level. The NKBP was a large infrastructure project and there existed substantial potential for public complaints and grievances. Regular public

consultations facilitated the resolution of several environmental and social issues. Prompt action on community grievances, close coordination with the contractor, effective implementation and supervision of measures to resolve community grievances significantly contribute to the successful implementation of project activities.

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ADB. 2014. *Field Visit Reports*. Construction Supervision Consultant's Report. Manila (L2841-PAK).

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Irrigation and Power Department, Government of Punjab. 2010. *Environmental Impact Assessment: MFF-Punjab Irrigated Agriculture Investment Program (PIAIP)-Tranche 2*. Manila. ADB

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PID Project Management Unit. 2011. *Land Acquisition and Resettlement Plan: MFF-Punjab Irrigated Agriculture Sector Development Tranche 2 (New Khanki Barrage Project)*. Manila. ADB.

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## 2. Energy

### Case Study 3

#### **GEO: Best Practice in Housekeeping in Khorga Substation Construction Site Georgian State Electrosystem (GSE)**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Frequent site supervision and monitoring; Environmental good practice -Topsoil removal and storage and re-use management, Handling and storage of hazardous material and waste, and Petroleum products handling and storage

### Introduction

The construction of the Khorga Electric Substation is envisaged to significantly improve the energy supply in western Georgia. The substation is located on a 13.5 ha. of land owned by Georgian State Electrosystem (GSE). The project includes design works, engineering and technical support, construction, transportation of construction materials and unloading in the site, temporary storage, installation and operating the substation. The construction site is located near Khorga Village of Khobi *Rayon* in the Menji Region of West Georgia. It is 15 km away from the nearest towns of Hovieis and Senaki and 25 km away from Poti. In the South, the project site borders along Tbilisi-Poti railway. Roads and drainage systems run parallel to the Tbilisi-Poti railway.

The project is financed through ADB Loan 2974-GEO: Regional Power Transmission Enhancement Project approved in December 2012. The Ministry of Energy and Natural Resources (MOENR) and GSE are the executing agencies (EAs).

### Main Environmental Issues Associated with the Project

The territory around Khorga Substation is mostly uninhabited except for Akhalsopeli Village which is 3.4 km from the substation and is 35 m above sea level. Moreover, the substation is within cornfields and is about 8-10 km away from Kolkheti National Park. From an environmental point of view, this area is not classified as an area of high sensitivity.

Although the construction of the substation will have positive effects to the population, the main environmental issues related to the project during construction are typical in this type of construction project and consist of: (i) discomfort to local population caused by dust, exhaust emissions and noise of construction equipment and project vehicles, (ii) infection due to breeding of insects resulting from excavation, (iii) secondary contamination from infectious biological materials (anthrax), (iv) contamination of soil and groundwater from oil products and hazardous chemicals, (v) loss of fertile soil layer (black earth) and uncontrolled flushing of soil from the construction site, (vi) waste pollution, (vii) electric trauma for staff, (viii) violation of safety rules, (ix) disruption in road traffic, (x) change in landscape, (xi) change in the local drainage system, and (xii) impact of the development of quarries.

### Environmental Management Plan



Prior to and during the construction works the following mitigation measures have been carried out: (i) clearing of site road for the delivery of building materials, (ii) timely watering of the site road, (iii) keeping construction equipment in good technical condition, (iv) timely draining of open water accumulating in pools and ponds, (v) training for workers on excavation work, (vi) discontinuance of construction works until relevant services became available to deal with discovery of cultural significance such as graves, (vii) posting of proper road signs and training of drivers prior to the start of construction, (viii) preparation of substation design in accordance with the local landscape including subsequent planting of seedlings and shrubs, (ix) prevention of disruption in the local drainage system, (x) preparation of work plans for pollution prevention and waste management and fire prevention prior to the start of construction works, (xi) removal of fertile layer of soil and storage in accordance with construction site restoration plan, (xii) prohibition of washing off of piles of black earth and soil stockpiles, (xiii) strict observance of the implementation plan for the development of quarries, and (xiv) staff trainings to prevent the spread of sexually transmitted diseases. At completion of construction work, the fertile layer of soil will be placed on bare areas within the substation grounds.

To ensure compliance with the environmental measures, special attention was paid to the institutional set up within the agency implementing the project. An Environmental Protection and Safety Project Manager, who is a health and safety expert, has been designated to represent GSE. The Manager reviews and approves plans and guidelines prepared by SIEMENS who is the Contractor. Also, if necessary, the Manager commits in writing or verbally the Contractor to carry out certain activities in compliance with the relevant standards on environment protection. He also organizes regular meetings between the Consultant, Contractor and the GSE in the office of the latter. The SC representative reviews documents provided by the Contractor and makes recommendations to the GSE to improve the documents. The Contractor prepared the SSEMP before the start of construction works clearly stating all the necessary measures needed to prevent the negative impact on the environment of the construction works. The Contractor also hired qualified environmental and safety specialists. The representative of the Contractor prepares and submits appropriate documentation to the GSE for approval.

### **Good Practices in Environmental Management Plan Implementation**

The Supervision Consultant's (SC) representative conducts weekly monitoring of the construction works and provides GSE with a list of environmental issues that require attention. In case of non-compliance with the SSEMP, the Consultant together with GSE issue instructions to the Contractor to immediately respond and rectify shortcomings. The representative of the Contractor is also responsible for conducting daily monitoring of the construction works and in carrying out other instructions from GSE.

At the beginning of the project, it was noted that the Contractor committed the following violations: (i) installation of heavy construction equipment in the construction site without removing the fertile layer of the soil, (ii) placing construction and hazardous wastes directly on the ground without secondary traps, (iii) mixing of extracted fertile layer of the soil with spoiled soil, (iv) unorganized area for refueling and maintenance of construction equipment, and (v) absence of toilets facilities in the construction site.

To improve the implementation of environmental requirements, joint efforts were undertaken by the designated representatives of GSE, Consultant and Contractor which resulted in: (i) engagement of service providers to remove hazardous waste, non-hazardous waste, construction waste and fecal mass with proper disclosure of the relevant contracts in the site and copies of the contracts were provided to the PIU, (ii) removal of fertile layer of soil from the construction site and stored for future re-use in the restoration of the site at completion of construction in accordance with the SSEMP, segregation of piles of fertile layer of soil from ground soil and protected from erosion, (iii) installation of containers for all hazardous and oil product-containing materials in the secondary trap and provision of containers for hazardous and safe construction waste at the site, (iv) provision of toilets facilities separately for men and women; (v) provision of absorbents for petroleum products, first aid kits and fire extinguishers at the site, (vi) posting of warning signs at the site; and (vii) trained staffs on basic environmental protection and safety, fire safety, including the prevention of HIV and malaria, and the dangers associated with anthrax and reptiles. In addition, monitoring of the implementation of work plans for pollution prevention and waste management and fire prevention is being undertaken.

Clear delineation and understanding of responsibilities along with close coordination among GSE, Consultant and Contractor have significantly helped the Contractor in complying with environmental measures in the construction of the Khurta Substation. Engaging qualified experts is key to identifying violations and issues of environmental concerns and the corresponding measures necessary to address these.

### **Lessons Learned and Recommendations**

Based on the foregoing, the following recommendations are offered:

- i. Bidding documents should require the contractor to hire a specialist for environmental protection with knowledge of the local and national laws and legislation on environmental management.
- ii. It is necessary for parties involved in the tender process to know the environmental requirements of the project as provided in EIA, EMP, etc.
- iii. All requirements for environmental protection must be included in the detailed technical specifications of the project documentation.
- iv. It is necessary that penalties on non-compliance with the relevant environmental standards be clearly defined.

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## Case Study 4

### **KGZ: Good Practice in the Identification of Equipment Contaminated by PCBs<sup>1</sup> Based on Laboratory Tests Results**

**Power Sector Improvement Project-Project Implementation Unit (PIU)**

**JSC NEG Kyrgyzstan, Bishkek**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Environmental good practices – PCBs in electrical equipment – handling, management and disposal

## Introduction

Kyrgyz Republic is implementing an energy project designed to enhance the efficiency of energy consumption, strengthen energy security of the country and facilitate regional energy trade. Specifically, the project will modernize substations and establish supervisory control and data acquisition (SCADA) system to manage the energy system. Project works include the replacement of high-voltage (500 kV – 6 kV) current transformers, voltage transformers and Switches: oil, air and vacuum, and external cubicle switchboard (ECS) in 107 substations nationwide. The replacement will involve 849 equipment units, of which 744 units are oil-immersed with a total volume of 532.5 tons of oil and 2 electronegative gas switches. The project will be carried out in Chui, Issyk-Kul, Talas, Naryn, Osh and Jalal-Abad *Oblasts*. In accordance with ADB Safeguards Policy Statement (SPS) 2009 the project is classified as Category B for environment and therefore has potentially less negative impact on the environment.

The project is funded by the ADB Grant 0218-KGZ/Loan 2671-KGZ: Power Sector Improvement Project (formerly Transmission and Distribution Metering Project) with a total of \$39.8 million approved in September 2010. The Ministry of Energy and Industry is the executing agency (EA) and JSC “NES Kyrgyzstan” (NESK) is the implementing agency (IA). The implementation of the project will be carried out by the Project Implementation Unit (PIU) at the National Electrical Grid of Kyrgyzstan (NEGK).

## Main Environmental Issues Associated with the Project

The IEE of the project expects fairly standard environmental impacts during construction and operation activities which include for example, noise and dust production, draining of oil equipment, equipment de-installation and installation activities. However, a key environmental

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<sup>1</sup>Polychlorinated Biphenyls are a class of synthetic organic chemicals used for a variety of industrial uses (mainly as dielectric fluids in capacitors and transformers but also as flame retardants, ink solvents, plasticizers, etc.) because of their chemical stability, i.e., fire resistant, low electrical conductivity, and high resistance to thermal breakdown and to oxidants and other chemicals. Researches in the 70s discovered that these characteristics represented serious threat to human health and the environment causing their production to be gradually stopped. PCBs are considered to be immunotoxic and affect reproduction. Adverse effects associated to the exposure of PCBs are damage to the immune system, liver, skin, reproductive system, gastrointestinal tract and thyroid gland. In <http://chm.pops.int/Implementation/PCBs/Overview/tabid/273/Default.aspx>

concern has been identified and is related to the replacement of electrical equipment and resulting waste: obsolete current and voltage transformers, Switches, ECS, and waste transformer oil, which may contain polychlorinated biphenyls (PCBs) and other possible associated production waste such as ceramics, ferrous and non-ferrous metals, etc. Therefore, the key environmental issue is the management of waste equipment and transformer oil in the project.

### **Environmental Management Plan**

In 2010, an IEE report was prepared for the project in accordance with the requirements of ADB SPS 2009 and the environmental legislation in the Kyrgyz Republic.

In 2014, environmental consultants of ADB jointly with the specialists of NEGK updated the IEE and EMP which included a complex set of mitigation measures and general mitigation measures, e.g., (i) instructions on transportation, de-installation and installation; (ii) storage of equipment; (iii) compliance with H&S rules and specific set of actions such as conduct of laboratory tests for the identification and management of PCBs-containing oil and oil-filled equipment; and (iv) management of waste transformer oil and waste equipment; and (v) monitoring and reporting.

During the IEE updating, a large number of environmental NGOs participated in the discussions on the draft IEE. Consultations were also held with the State Agency for Environmental Protection and Forestry (SAEPF) which is responsible for reviewing the IEE and ensuring compliance with the Stockholm Convention on Persistent Organic Pollutants (POPs). These facilitated the approval of the IEE by the State Ecological Experts of SAEPPF.

The implementation of the EMP is the responsibility of the SC but this task has been assumed by NEGK and its local ESs following the termination of the SC's contract due to unsatisfactory performance of its' contractual obligations.

### **Good Practices in Environmental Management Plan Implementation**

As the first step in implementing the EMP, the ES together with the specialists of NESK developed the terms of reference (ToR) for the study of the PCBs content in the transformer oil which was approved by ADB. The sampling of oil for PCBs in the oil-filled equipment which are for replacement under the project have been carried out in six oil facilities and two repair shops of NEGK. The samples were sent to the Scientific Analytical Center Ltd., an ISO/IEC 17025: 2005 certified laboratory in Kazakhstan, which was selected by NEGK from the ADB-approved list of laboratories.

NESK has fulfilled the conditions specified in the IEE and submitted to ADB the protocols on the collection of samples of transformer oil and laboratory results. The laboratory results showed no PCBs content in all the samples of transformer oil from the tanks stationed in the sample oil facilities and repair shops of NEGK. On the other hand, the NEGK with the support of the Ministry of Energy and Industry has kept the public informed on project implementation and mitigation measures that are being taken to ensure environmental safety.

Undertaking the laboratory tests in the ISO-certified laboratory to detect PCBs in transformer oil is a good practice in ensuring waste equipment and transformer oil are not contaminated by the dangerous substance and therefore helped determine how best the project can dispose these wastes to prevent any negative impact to the environment and the people. Disclosure of information to the public on the implementation of mitigation measures in the project on a regular basis can also be considered a good practice.

### **Lessons Learned and Recommendations**

NESK has gained good experience and learned a lot from the process of identifying PCBs-containing oil and equipment of NEGK including the methods of oil sampling. Based on these lessons, the NESK recommends that all organizations who participated in the PCBs exercise make use of the experiences gained.

Given the time spent in coordinating with all concerned departments, signing of the contract with the laboratory, collecting and transporting of oil samples, and conducting laboratory tests, it is necessary to carry out such complex works within strict timetable in order to avoid delays in the implementation of project activities.

### **References**

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NEGK.2014. *Initial Environmental Examination: Power Sector Improvement Project* in <http://www.adb.org/projects/documents/power-sector-improvement-project-jun-2014-iee>

Russian versions of the documents are available in <http://www.energo.kg/proekty/otchetmonitor.htm>

## Case Study 5

### **PAK: LAR Grid Station: Importance of Raising Awareness to Improve Environmental Safeguards Compliance in Projects**

**Syed Asif Riaz, Assistant Manager (Environment)  
PMU Multan Electric Power Company (MEPCO)**

**Sector:** Energy

**Good Environmental Safeguard Management Practices:** Consultation and awareness raising with all stakeholders; Inclusion of environmental management plans in bidding documents, contracts, and bills of quantities

## Introduction

The Multan Electric Power Company (MEPCO), a public limited utility company established in 1998, is responsible for the distribution of electric power within its territorial jurisdiction in Southern Punjab. The existing state of MEPCO power distribution and transmission systems have become inadequate to meet mounting demand for electrical power. To partially improve the systems, the construction of a new 132 kV grid station and allied transmission lines is necessary. In addition, the enhancement and upgrading of existing power infrastructure require institutional arrangements and capacity development essential for strategic management of the sector, planning and management of investments.

MEPCO has embarked on the Power Distribution Enhancement Investment Project (PDEIP) Tranche-1 to enhance its system capacity and to facilitate increased power supply for consumers in various parts of its territory. This Project has shored up financing through a twin ADB loan (L2489-PAK (SF)/L2490-PAK) approved in September 2008. MEPCO is the implementing agency (IA). An EIA has been carried out for the project.

## Main Environmental Issues Associated with the Project

The main environmental issues and concerns associated with the project include (i) the low level or absence of awareness on environmental management in MEPCO, GSC and Finance, and Contractor; (ii) securing of NOC/Environmental Approval from the Environmental Protection Agency (EPA) of Punjab; (iii) noise generation from the use of heavy machinery during excavation, erection of transmission towers and stringing of transmission lines; (iv) air pollution due to improper water sprinkling especially in areas with temperature of up to 52°C; (v) hydrological flow to sensitive areas such as watercourses or bridges and culverts, e.g., drain, *nallahs*, and irrigation canals; (vi) physical damage to the landscape affecting the aesthetic behavior of local community, loss of vegetation and trees in the project areas; (vii) serious threat of improper sanitation facilities to local areas, wastewater drainage and soak pits, and generation of solid waste in construction camps and sites; (viii) oil run off and spills from heavy machinery containing oil for project vehicles and transformers and for other activities; (ix) non-provision of personal protective equipment (PPE) to workers and project personnel in the project sites; and (x) lack of regard for environmental enhancements in the project sites.

## **Environmental Management Plan**

The EMP was prepared based on the type, extent and duration of identified environmental impacts following best practices and ADB Environmental Assessment Guidelines 2003. The recommendations and mitigation measures were based on the reconfirmation of and additional information on the assumptions made at feasibility stage on the positioning, alignment, location scale and expected operating conditions of the project while taking into account any subsequent changes and fine tuning in the proposals. The measures were also classified according to project stage, i.e., design/preparation, construction, and operation and maintenance.

The institutional responsibilities for EMP implementation and supervision have been defined. The Environment and Social Cell (ESC) has been established in MEPCO and is mandated to be actively engaged in the project prior to the implementation design stage to ensure compliance with the statutory obligations under the Pakistan Environmental Protection Act (PEPA) in 1997. The ESC is also responsible for directly reporting to the MEPCO management. It is comprised of a Deputy Manager for Environment and Safeguards and two Assistant Managers for Environment and Safeguards, respectively. On the other hand, the PMU liaises directly with the ESC to address all environmental aspects during the detailed design and contracting stages. GSC is responsible for ensuring sufficient and timely allocation of resources necessary to support environmental management and monitoring during construction as well as the implementation of mitigation measures. The Contractors carry out their contractual obligations and implement all EMP measures required to mitigate environmental impacts during construction.

The EMP was supplemented with a monitoring plan for performance indicators.

## **Good Practices in Environmental Management Plan Implementation**

Rigorous environmental awareness/training sessions were held for MEPCO higher management, GSC Officers, Contractors, and onsite staff. ESC provided Urdu translations of the EMP for better understanding of all stakeholders involved in the project including the general public, Contractor, staff, GSC Officers, MEPCO management, and affected households and persons. The translated version was also uploaded in MEPCO website.

To facilitate the processing of MEPCO's first application for an NOC/Environmental Approval, the ESC interacted with EPA Punjab and conducted site visits.

Both GSC and ESC ensured that clauses for environmental management implementation were made part of the bidding documents to bind contractors on their contractual obligations in relation to environmental management.

Evidence of good working relationship between the ESC and the Contractor has also resulted in the adoption of the following good practices:

- i. Regular noise measurements were carried out and recording of the same was kept onsite for verification. This entailed detailed acoustic assessment of all residential, school, (other sensitive structures) within 50 m of the project site. Results of the monitoring were also communicated to ADB on a regular basis.

- ii. To address hydrological impacts, weather conditions were monitored especially when construction activities had to be undertaken during hot weather conditions. Limits on excavation depths were also imposed on the use of recharge areas for material exploitation or spoil disposal.
- iii. Formulation and implementation of the Waste Management Plan which stipulates waste segregation, identification of potential safe disposal sites, prevention of washing off of soil and debris towards downstream flood plains, dams, lagoons, etc.
- iv. On the management of oil run off and spills, oil drums were used for storage onsite.
- v. Environmental enhancement through soft landscaping and planting of fruit trees and shrubs at the site.
- vi. Adequate warning signs were placed at the site and workers were provided with hard hats and instructions on health and safety aspects of using safety equipment.
- vii. Proper sanitation with proper wastewater collection and soaking pits were provided to workers for better working environment.

The Contractor's staff and workers were also strictly directed to avoid damaging any vegetation such as trees or bushes. All mitigation measures to prevent air quality deterioration were also adopted. The transmission line route was changed to save the orchards near the project area. At project completion, landscaping and road verges were re-installed, debris and wastes were removed including all project-related temporary structures such as office buildings, shelters and toilets.

Successful awareness raising among key stakeholders including provision of relevant materials in the local language is key in winning their support towards the successful implementation of environmental management measures. Establishing good coordination and collaboration between the IA and contractor helps ensure the proper monitoring of any environmental impact from project activities and implementation of mitigation measures when necessary. Binding contractors through contractual obligations to ensure compliance with their responsibility on environmental management is also evident in this case study. The change in project design to prevent disruption in the environment is always the best alternative. Providing better working environment to workers, promotion of health and safety measures at the site, and providing environmental enhancements also augur well for workers and affected local communities.

### **Lessons Learned and Recommendations**

The actions taken in implementing the EMP enabled the ESC to learn and understand lessons in order to better perform different activities before, during and after completion of the project. Some of the lessons learned and recommendations are as follows:

- i. Effective awareness raising plays a pivotal role in implementing any environmental measure for the first time in a project. It is very important for the entire management of the IA to be on board and be aware of the causes of environmental impacts and the obligation to minimize if not eliminate the causes through mitigation measures. This will provide key implementing unit for environment and safeguard with a strong support in complying with the regulations and laws of Pakistan and guidelines of ADB. Capacity building at all levels and ages should be a permanent feature of projects to attain the desired goal of investment and development.



- ii. Provision of resources is an important aspect of EMP implementation and regular monitoring with adequate logistic support such as vehicle, monitoring equipment and PPEs is necessary.
- iii. Bidding/contract documents are holy books for contractors and should incorporate obligations on environmental management to ensure compliance with and implementation of the EMP as planned. Relatedly, this should result in a change in attitude among contractors to read environmental reports (EIA/IEE) which are appended to the bidding document.
- iv. Bidding documents approved by ADB should include clauses on EMP implementation which need to be reviewed as well as illustration of practical applications to make it more understandable to contractors and IAs. Confusion of contractors on any environment issue in the absence of a comprehensive and integrated environmental and social safeguard requirements have costs and therefore penalties should clearly be defined in bidding documents.
- v. Robust support from senior management is imperative in all stages of the project.
- vi. Consultation with the public starting from the development phase of a project is key in obtaining community acceptance and support to a development project. These consultations are effective in reducing grievances from the local community as well as delays in project execution.
- vii. Specific aspects of environmental management requiring immediate attention are EMP auditing and environmentally responsible procurement.
- viii. Environmental enhancement is not a common practice at the project sites but creating some local hard and soft landscaping and successful planting of fruit trees and shrubs at many sites is a practice that should be encouraged as far as practicable. Other opportunities for enhancements should be assessed prior to construction and proposed enhancements should be discussed with the affected local communities. These discussions also serve as a vehicle for further public consultation during implementation stage and can help improve public relations.

## References

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## Case Study 6

### **PAK: Good Practice in EMP Supervision and Monitoring in the Conversion of 66 kV Talhar Grid Station Environment and Social Safeguards Section – PMU Hyderabad Electric Supply Company (HESCO)**

**Sector:** Energy

**Good Environmental Safeguard Management Practices:** Grievance redress mechanism; Institutional arrangements for environmental management; Inclusion of environmental management plans in bidding documents, contracts and bills of quantities

## Introduction

HESCO has been providing electricity to Talhar town and nearby villages through the existing 66 kV Talhar Grid Station. Over the last few years, the domestic, commercial, industrial and agricultural power demands in the area has rapidly increased causing grid overload and failure in meeting the power requirements of its clients. Grid station enhancement is imperative requiring the conversion from the 66 kV level to a 132 kV level grid station. This substation has been linked (T-off) to the existing 132 kV Tando Muhammad Khan to Badin transmission line by constructing a new 1.0 km long 132 kV single circuit transmission line. The new line starts from Darya Khan Jatoi village of Talhar in Sindh Province.

HESCO obtained an ADB financial assistance to generate the additional power supply for Talhar and nearby towns through the Technical Assistance (TA) Loan 2178-PAK: Infrastructure Development approved in August 2005 under the MFF-Power Distribution Enhancement Program - Tranche 2 (Subproject 2). No land was acquired in the conversion of the grid station and therefore no voluntary or involuntary resettlement was necessary in this component of the subproject. The subproject was classified as Environment Category B and an EIA was required. HESCO was the executing agency (EA) and the subproject was completed in 2014.

## Main Environmental Issues Associated with the Project

The main environmental issues and concerns associated with the project are (i) soil erosion and degradation due to vehicular traffic, land clearing in construction camps, and construction of grid station and transmission line tower; (ii) soil contamination from fuel, oils and chemical spillage and inappropriate waste disposal; (iii) air quality deterioration in the immediate vicinity of project sites caused by construction machinery and project vehicle exhaust emissions and fugitive dust emissions from construction activities and vehicular movement on unpaved tracks; (iv) contamination of surface and ground water due to soil contamination brought about by (a) disposal of construction waste, solid waste from construction camps, and waste effluents, and (b) equipment/vehicle maintenance, spillage/leakage of fuels, oils and chemicals, including vehicle and machinery operation near water bodies/courses; (v) loss of natural vegetation and crops resulting from land clearing for construction work in the grid station, transmission line towers and parts of the transmission line routes in project sites located in cultivated areas; and

(vi) significant loss of biodiversity due to indiscriminate use of chemical herbicides in land clearing and tree/shrub cutting by construction crew for fuel wood.

### **Environmental Management Plan**

The comprehensive EMP prepared for the project includes actions proposed for mitigation of negative impacts and effective monitoring of the implementation of proposed mitigation measures during pre-construction, construction and operation phases.

HESCO established an ESC within its organization to assist the GSC Department and provide policy support in all environmental and socioeconomic matters pertaining to the project. The ESC also coordinated with relevant government departments such as Sindh EPA and other stakeholders. The Environmental and Social Safeguard (E&SS) Section of PMU in HESCO provided overall supervision and advisory services during pre-construction, construction and post-construction phases of the project. The E&SS also assisted and provided advice to the GSC Directorate, Construction Directorate and other HESCO departments on overall environmental and social matters.

### **Good Practices in Environmental Management Plan Implementation**

The E&SS-PMU in HESCO has one Environmental and one Social Impact expert under the supervision of a Deputy Manager for E&SS. HESCO also appointed an SC who through the Project Manager was responsible for ensuring that Contractors adhere to the quality requirements and other commitments including implementation of the EMP and EIA, and the environmental and social soundness of all construction activities. An Environmental and Social Inspector (ESI) was appointed by the SC and was responsible for implementing the EMP in the field and for coordinating with the Contractor's Project Manager and environmental and social monitor (ESM).

Each contractor was bound to appoint a dedicated field ESM at the project site. The Contractor was also responsible for implementing the EMP during construction works and for communication and training of their respective construction and camp crews in all aspects of the EMP. The Contractors' Project Manager assumed the main responsibility for all environmental matters pertaining to their work. SMEC Consultants were appointed to take charge of external monitoring of EMP compliance and reporting to ADB as well as functioned as Facility Management Consultants. The Site Managers of the Contractors were responsible for carrying out construction activities in an environmentally and socially sound manner during the construction phase.

Good practices in the supervision and monitoring of EMP compliance in the Talhar Grid Station involved a three-tiered mechanism consisting of the contractor, consultant and HESCO. These practices included the following:

- i. inclusion of penalty clauses on non-compliance with the EMP in contract documents binding contractors to implement mitigation and monitoring measures;
- ii. establishment of grievances redress committee;
- iii. compliance with environmental agency's guidelines and conduct of public hearing;

- iv. consultative meetings, scoping sessions and group discussions with the local community to ensure participation of local communities and project stakeholders;
- v. trainings and information brochures dissemination in the field to raise the awareness of workers on communicable diseases, drugs, child labor, and general awareness of workers with respect to HSE, PPEs usage, safe drinking water and other aspects identified in the EMP;
- vi. effective monitoring of different parameters through HESCO and SC internal monitoring;
- vii. removal of soil from temporary toilet locations;
- viii. prohibition of night time work to avoid light pollution and disturbance to nearby community; and
- ix. provision of facilities to ensure a safe work environment through the use of PPEs, availability of safe drinking water and construction of septic tanks for workers, avoidance from unsanitary conditions during work and from stagnant water as precautionary measure against malaria, etc., availability of fire extinguishers at the site, and installation of safety signage.

In this case, the successful implementation of the EMP featured the contractual obligation of contractor in implementing mitigation and monitoring measures, setting up of mechanisms for grievance redressal as well as for awareness raising, adherence to environmental guidelines, effective monitoring and implementation of measures to address or prevent environmental impacts of project operations, and implementation of occupational health and safety measures at the site.

### **Lessons Learned and Recommendations**

Important lessons learned from the EMP implementation in the conversion of the Talhar Grid Station basically highlight the following:

- i. There is a need for capacity development on environmental and social management of development projects in general and on donor-funded projects and relevant laws and regulation regarding environmental aspects in particular.
- ii. Inclusion of clauses regarding the implementation of environmental and social plans and measures, i.e. EIA, EMP in bidding documents and contract agreements significantly contributes to compliance of Contractors with environmental management.
- iii. Public disclosure of environmental and social assessment through different medium or recognized channels of distribution is part of the effective dissemination of monitoring results.
- iv. The implementation of GRM at the grassroots level is important to address issues associated with the project that are affecting persons and communities.
- v. Internal and external monitoring of the EMP implementation in the field is necessary.
- vi. Environmental auditing of the projects is important in verifying compliance.

Based on the foregoing the recommendations of this case study are:

- i. A clear structure of the ESC should be formulated in order to conduct and implement environmental and social assessment of all small and large development projects.
- ii. Environmental and social staff should be made part of the site selection committee.
- iii. Environmental and social aspects of a project should be mainstreamed into operations.
- iv. Trainings on environmental and social aspects of development projects (in general and specific) should be organized at WAPDA Administrative Staff College in Islamabad.
- v. The procurement of goods and services which are less damaging to the environment should be preferred.
- vi. Total environmental costs should be given due consideration throughout the product life cycle from manufacturing, use and disposal.

## References

Environmental Management Plan for the Conversion of 66 kV Talhar Grid Station into 132 kV and Allied Transmission Line: MFF-Power Development Enhancement Program Tranche-2.

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## Case Study 7

### **PAK: 132 kV Bagh-Hattian Transmission Line: Institutional Strengthening for Environmental Safeguards Management**

#### **Project Monitoring Unit**

#### **Islamabad Electric Supply Company (IESCO)**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Inclusion of environmental management plans in bidding documents, contracts, and bill of quantities; Consultation and awareness raising with stakeholders; Grievance redress mechanism

## Introduction

The Islamabad Electric Supply Company (IESCO) is a public utility company providing electricity to more than 2.5 million consumers in Islamabad, in four northern districts of Punjab Province (Rawalpindi, Attock, Jhelum and Chakwal), and the southern parts of Azad Jammu Kashmir (AJK). To improve the electric power supply in the Hattian area of Muzaffarabad district in AJK, the existing 132 kV grid station at Hattian will be connected to Bagh 132 kV Grid Station by means of a 27.3 km new double circuit long transmission line with 97 towers.

This transmission line construction is a subproject under the ADB MFF: Power Distribution Enhancement Investment Program (PDEIP) - Tranche II in Pakistan with financing assistance of \$19.0 million from Loan 2727-PAK approved in December 2010. The Pakistan Electric Power Company (PEPCO) and IESCO are the executing and implementing agencies (EA and IA), respectively. IESCO prepared the environmental and social safeguards documents (IEE, EIA and LARP).

## Main Environmental Issues Associated with the Project

The main environmental issues associated with the subproject are: (i) route selection which covers a mountainous area and traverses private farmland, government forest and *nullah*<sup>2</sup>; (ii) landscape issues due to cut and fill activities, and waste disposal during tower construction which entail foundation, erection and stringing; (iii) deterioration in air quality caused by generation of air-borne dust and emissions from machinery; (iv) impact on hydrology arising from water consumption and drainage issues; (v) noise generation by vehicles and construction activities; (vi) ground contamination from oily runoff, fuel spills and leftover waste; (vii) ecological impact of cutting and trimming of 947 trees (842 in government forests and 105 in private plantations); (viii) impact on 167 affected households notwithstanding the absence of displacement; (ix) rights of way (ROW) issues which could bring about crop damage, felling of trees and damage to public property; and (x) other project- and construction-related issues such as camp establishment, material storage, workers' health and safety, and housekeeping at the site.

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<sup>2</sup>*Nullah* is a local name for a stream.

## **Environmental Management Plan**

The planned mitigation measures and monitoring requirements to address the above environment issues include (i) careful route selection through astute planning, coordination with the Forest Department for route provision, public consultation during design phase, and avoidance of populated and commercial areas; (ii) controlled excavation works through restriction of specific sites, removal of extra/waste material, proper backfilling and monitoring through site visits; (iii) dampening of loose soil at the worksite, avoidance of use of unpaved roads, use of properly tuned-up equipment and vehicles, and monitoring of air quality (dust PM<sub>10</sub>, SO<sub>x</sub>, and NO<sub>x</sub>)<sup>3</sup>; (iv) monitoring of daily water consumption and maintenance of drainage ways/slopes; (v) restriction of work activities to day time and daily monitoring of noise; (vi) proper storage of materials with potential for ground contamination, placement of machinery on impervious sheeting, no leftover waste after work completion and monitoring through visual inspection, (vii) cutting and trimming of trees only where necessary (under tower) and at required clearance level, no illegal tree cutting/hunting of animals and issuance of payment to the forest authority; (viii) provision of compensation to affected households per notified price rates, (ix) camp establishment and material storage to be confined within IESCO grid station; and (x) implementation of occupational safety and hygiene measures through orientation of construction crew on hygiene, water-borne diseases, adoption of health and safety measures and use of PPEs etc., during field visits, distribution of pamphlets on communicable diseases and illegal drugs, posting of signboards in required areas, and drinking water analyses.

## **Good Practices in Environmental Management Plan Implementation**

IESCO has established an Environmental and Social Safeguard (E&SS) Section and properly staffed with one Assistant Manager for Environment, and one Assistant Manager for Social Impact working under the Deputy Manager for Environment and Social. The E&SS is responsible for supervising the implementation of the EMP by the Contractor and GSC staff. Vehicles dedicated for field monitoring have been provided. The Contractor nominated its ESM who is responsible for field execution, monitoring and reporting to E&SS.

Good practices in environmental safeguard management in this subproject include: (i) timely preparation, approval and disclosure of comprehensive environment and social documents (IEE, EIA and short LARP) by IESCO as per requirement of ADB and the Government of Pakistan which contained environmental and social management and monitoring plans and defined roles and responsibilities, (ii) approval of these documents by ADB and concerned EPAs, (iii) adjustment in project design such as provision of special/pile foundations in the catchment of *nullahs* in some project areas due to change in route to address ROW problems, (iv) conduct of public hearings on the subproject, (v) inclusion of analysis of environmental parameters in the bill of quantities (BOQ) and relevant clauses in the bid documents, (vi) pre-project orientation of Contractors on their responsibilities and implementation of environmental management plans, (vii) training of GSC and Contractor's staff on environment and social aspects of the subproject, (viii) intermittent field visits to monitor the implementation of the mitigation measures, (ix) internal monitoring at three levels – contractor, GSC, and E&SS

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<sup>3</sup>Coarse dust particles of 10 micrometers or less in diameter, sulphur oxides and nitrogen oxides, respectively.

section of PMU, (x) external monitoring by the Consultants hired by PEPCO, (xi) monthly reporting by the Contractor, and (xii) setting up of a complaint register at the project site, GSC office and PMU, and (xiii) adoption of GRM at each tier for easy access and amicable/timely resolution of complaints.

This case highlights the importance of timely availability of approved environment and social documents, flexibility to change the project design in deference to counter-productive ROW problems, conduct of public hearings, defining contractual obligations in relation to compliance with environmental and social measures by mainstreaming environmental parameters in contracts including BOQ, awareness raising and capacity development, regular field visits to project sites, internal and external monitoring on compliance with environmental and social measures and the implementation of mitigation measures, and setting up of GRM and complaints register.

### **Lessons Learned and Recommendations**

The main lessons learned in the case study and recommendations for improvement in environment and safeguard management are as follows:

- i. ROW problems and land acquisition are the main hurdles particularly in projects involving the construction of transmission lines and thus require extensive efforts from implementing agencies and Provincial Departments. For instance, the procedure for crops compensation and payments should be streamlined.
- ii. Resolving concept and design/specification problems on time is the key issue before and during the implementation of a project in order to achieve requisite targets.
- iii. *“A Stitch in Time Saves Nine.”* Timely release of funds to project-affected persons (PAPs) and Contractors through the Project authority avoids delays in project completion and solving ROW issues during implementation.
- iv. PMU should be strengthened through the provision of assistance by recommended professionals and management tools for procurement, planning scheduling, environmental and social management and monitoring of projects.
- v. Improvement in the coordination among funding/donor agency, government and implementing partner (Project authority) requires close attention.
- vi. Utilization of “carrot and stick” approach when necessary is also recommended to enable timely completion of the project.
- vii. Timely decision making always saves time as well as cost to the project.

### **References**

ADB. 2015. *Land Acquisition and Resettlement Plan for 132 kV Bagh to Hattian Transmission Line Subproject: MFF Power Distribution Enhancement Investment Program (PDEIP) - Tranche II*. Manila.



## Case Study 8

### **PAK: Good Practice in Environment and Safeguards Management in the Construction of Doula Chuchak Grid Station Lahore Electric Supply Company Ltd. (LESCO)**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Environmental management; capacity development and training; Consultation and awareness raising with all stakeholders; Frequent site supervision and monitoring; Environmental good practices - Solid and domestic waste management; Occupational health and safety

## Introduction

Lahore Electric Supply Company Ltd., (LESCO) is a public limited utility company established in 1998 under the Companies Ordinance 1984 and is responsible for the distribution of electric power within its territorial jurisdiction. LESCO serves approximately three million customers (domestic, commercial, agricultural, industrial and others) in the five districts of Lahore, namely: Kasur, Okara, Sheikhu, Pura and Nankana. To efficiently meet the increasing electricity demand in selected areas, LESCO needs to strengthen the capacity of its distribution and transmission networks. This involves the construction of a 132 kV grid station and a 20.0 km 132 kV double circuit transmission line in Doula Chuchak Substation located on Chuchak Road Mouza Chuchak, Tehsil Renala Khurd and District Okarain Punjab. The transmission line will connect Doula Chuchak Substation with Bhaipheru Renala Khurd D/C 132 kV transmission line. The Construction will be on a 6 acre land owned and possessed by LESCO

LESCO through the Government of Pakistan has obtained ADB support under MFF-Power Distribution Enhancement Investment Program- Tranche II with financing from Loan 2727-PAK. The funding will be released in several stages/tranches.

## Main Environmental Issues Associated with the Project

The main environmental issues associated with the project are noise and vibration, health and safety of labor, impact on water and air quality, compliance with the use of PPE, solid waste management, compensation issues involving project-affected persons (PAPs), information disclosure, and site restoration and landscaping.

## Environmental Management Plan

The preparation process for the Environmental Management and Monitoring Plan (EMMP) for this subproject included the following activities: (i) collection of baseline data on environment and socioeconomic aspects of the area through site visits, (ii) screening of potential environmental impacts, (iii) consultation with PAPs to inform the formulation of mitigation measures but keeping in view the actual data, and (iv) assessment of mitigation measures and the required institutional arrangement.

A summary of the planned mitigation measures to address the environmental concerns are: (i) ensure that damage on flora and fauna will be at the minimum, (ii) formulate waste management policy and bind the Contractor to undertake proper waste disposal, (iii) inclusion of EMMP

matrix in the contracts to ensure its implementation, (iv) include landscaping as an integral component of construction activities; (v) conduct quarterly quality tests on air, water and noise to monitor any impact, (vi) planting of trees and plants for aesthetic value of the sites, (vii) contractor will be obligated to restore the site to pre-construction work condition after completion of the project, provide PPEs to workers for their safety and conduct training and information dissemination workshops on communicable diseases, and environment and safety at the workplace, (viii) develop a traffic management plan which will include a provision on transportation of heavy vehicle and equipment only at night time, (ix) maintain a complaint register in each site to record and enable prompt action on the concerns and grievance of people /community, (x) capacity development of the Environment & Social Safeguard (E&S) Cell through training on E&S safeguards and experience sharing visits to other distribution companies such as DISCOs, and (xi) timely payment of compensation to PAPs for damages to crops, etc.

LESCO created the E&S Cell in the PMU in LESCO which is fully functional and is responsible for carrying out all activities related to implementation of environment and social safeguards in accordance with ADB policies and guidelines as well as with national laws and regulations. The E&S Cell is comprised of a Deputy Manager for E&S and one Assistant Manager each for Environment and Social under the Chief Engineer (Development) of the PMU.

### **Good Practices in Environmental Management Plan Implementation**

The E&S Cell in PMU LESCO is responsible for overseeing the proper implementation and internal monitoring of EMMP activities to be carried out by the Contractor - M/s Pinggao-Potential (JV), Lahore - since the construction of the substation and the associated transmission line is considered a turnkey project. On the other hand, M/s SMEC is ADB's facilitating management consultant (FMC) and carries out external monitoring of all activities. The E&S team of M/s SMEC consists of an Environment Specialist (ES) and a Social Officer.

Specific activities undertaken by the E&S Cell which can be considered as good practices include: (i) orientation of Contractor's staff on the implementation of the EMMP, (ii) preparation and dissemination of monitoring checklists to the Contractor to ensure compliance and monitoring of all parameters identified in the EMMP, (iii) on-site training sessions/workshops for contractor's staff and workers on all activities to be carried out in relation to the EMMP, (iv) ensured that the Contractor provided trainings to workers on HSE issues and communicable diseases, (v) regular site visits for internal monitoring and guidance to Contractor's staff on the proper implementation of the EMMP, (vi) establishment of E&S Complaint Register at the construction site for recording of complaints, and (vii) consultations with PAPs to solicit their views, concerns and suggestions.

Meanwhile, good practices in the implementation of mitigation measures by the Contractor are evident in the checklist for monthly monitoring and compliance with environmental safeguard. These are (i) disclosure of information on the project is undertaken as a continuing activity, (ii) awareness raising on safety requirements among the Contractor's staff working at the site, (iii) advisory to staff to use appropriate/best engineering practice during implementation as well as applicable international good practices to minimize emission and to ensure proper liquid

discharge from workers' camps, (iv) adoption of a conservative approach on solid waste disposal by re-collection, re-use and landscaping resulting in the absence of concrete aggregate on site, (v) conduct of trainings on E&S for own staff, (vi) labor camps have been kept away from local settlements and awareness raising on human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and hepatitis have been undertaken for workers, (vii) working environment has been kept safe and healthy including installation of first aid boxes in the construction sites, camps, and site offices, and first aid training for site in-charge, (viii) all staff are required to use PPE and site markings have been placed in densely populated areas, (ix) stakeholders and public consultations with PAPs are undertaken to help resolve their issues and complaints, and (x) women and children have not been allowed to work in the project sites.

In summary, capacity development and training for contractor's staff and workers, preparation of monitoring checklists and their dissemination to contractors, regular site visits for internal monitoring, promotion of best engineering practice in construction works as well as international good practices to address environment issues on site, establishment of complaints register on site, stakeholders' consultations particularly with affected persons and communities, disclosure of public information on the project, and awareness raising on occupational health and safety requirements and provision of logistics thereon are considered best practices in this case study.

### **Lessons Learned and Recommendations**

Highlights of lessons learned from the implementation of the EMMP to address environmental impact associated with the construction of Doula Chuchak Grid Station and transmission line are as follows:

- i. There is a need to establish a coordination mechanism with the contractor before awarding the contract.
- ii. Contractors and workers lack knowledge and understanding on the proper implementation of EMMP and safety measures.
- iii. There is a need to include EMMP in the BOQ of contracts.
- iv. Delay in compensation payments hinders commencement of work.
- v. There is a need to strengthen the coordination between the PMU and the GSC to obtain support and avoid undermining of project activities such as non-acceptance of the E&S's recommendations by GSC Department.

Some of the recommendations of PMU LESCO are:

- i. EMMP should be included in BOQ with item-wise rate/price.
- ii. E&S Cell should increase its' staff complement particularly field surveyors, environment and social mobilization personnel to enhance its capacity and performance.
- iii. Contractor's/GSC staff training on E&S safeguards must be done prior to the mobilization of the Contractor and refresher courses or sessions should be conducted at regular intervals at LESCO's level.
- iv. Contractor should be made liable to pay for penalties in case of non-compliance with the implementation of the EMMP.
- v. Contractor may be allowed to pay compensation to PAPs in order to expedite the process and prevent any delays.

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## Case Study 9

### **PAK: Good Practice in the Provision of Facilities to Labor Environment and Social Impact Cell (ESIC) National Transmission and Despatch Company Limited (NTDC) Pakistan**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Analysis of alternatives; Frequent site supervision and monitoring; Preparation and implementation of site environmental management plans; Occupational health and safety

## Introduction

The construction of the 500 kV grid station with an 18 km double circuit and 3.2 km single circuit 500 kV in and out transmission lines which connects to the Guddu-Multan 500 kV transmission line is nearing completion. The 500 kV in/out transmission lines required the construction of 67 towers (6 incoming towers, 6 outgoing towers and 55 double circuit towers) on its 3.2 km single circuit and 18 km double circuit components. The subproject is located in the District of DG Khan, Province of Punjab.

The subproject is financed by ADB Loan 2396-PAK approved in December 2007 under MFF-Power Transmission Enhancement Investment Program (PTEIP) – Tranche II. ADB funded the design, civil works and supply of equipment. A support component has also been provided to assist NTDC in various aspects of project preparation and implementation. NTDC is the executing agency (EA).

## Main Environmental Issues Associated with the Project

The major environmental impacts associated with the construction of the DG Khan project include: (i) soil erosion due to cut and fill works in the construction of tower foundations of transmission lines and construction of buildings and switch yards at the grid station, (ii) air pollution from dust generation caused by movement of and emissions from vehicles, construction machinery, and power generators; (iii) noise and vibration caused by vehicular movement, and operation of construction machinery and power generators, (iv) improper waste (e.g., solid, liquid, chemical, oil spillage etc.) management, (v) impact on flora and fauna such as tree removal to give way to the construction of towers and wire stringing, and disturbance to local fauna due to movement of vehicles and construction machinery, and hunting by laborers, and (vi) health and safety issues affecting workers and communities to include safety hazards to labor during construction works especially wire stringing and tower construction works, to communities located along transmission line route, and to road users during wire stringing along the road.

## Environmental Management Plan

A comprehensive EMP was prepared at the stage when the environmental assessments (IEE and EIA) were being conducted. Consultations with local communities were undertaken as part of the assessments. The mitigation measures to address each of the above environmental issues are: (i) soil erosion - prepare temporary erosion control plan, proper compaction of

backfill at tower foundation sites, minimize vegetation clearing during site preparation, and prevent ponding of surface water and scouring of slopes; (ii) air pollution - compliance with the National Environmental Quality Standards (NEQS) on gaseous emissions from all heavy equipment and machinery, slight wetting of stockpiled soil and sand before loading, and water spraying of bare areas; (iii) noise and vibration - compliance with NEQS on noise emissions from all heavy equipment and machinery, operation of heavy equipment at daytime only, and installation of effective silencing apparatus in construction equipment; (iv) waste management - assess the possibility of water reuse by the project or by other interested parties, identify potential safe disposal sites close to the project site, recovery of used oil and lubricants, or their reuse or removal from the site in full compliance with national and local regulations, and solid waste disposal in approved solid waste facility; (v) impact on flora and fauna - payment of compensation to landholders for their standing trees in accordance with prevailing market rates, contractor's staff and labor will be strictly directed not to damage any vegetation such as trees or bushes, minimize clearing of green surface cover, and undertake compensatory planting of trees/shrubs/ornamental plants (at a rate of 5:1) to contribute to the aesthetic value of the area; and (vi) health and safety issues – provide adequate safety signage and warning signs as well as PPEs to workers, communities to be sensitized on safety precautions during construction works, traffic management to be carried out during wire stringing at road crossing, and formulate and implement a plan on alternate routes for heavy vehicles.

The Contractors and SCs are responsible for implementing these measures. The Contractors of various subprojects have designated Environment, Health and Safety Officers to ensure the implementation of EMPs on site.

### **Good Practices in Environmental Management Plan Implementation**

Project Management Consultants (PMC) and Environment and Social Impact Cell (ESIC) are responsible for monitoring the implementation of all mitigation measures. The PMC team has one environmental specialist (ES) and one social expert. ESIC which has been established in the PMU in NTDC has one Manager for environment and social impact, one Assistant Manager each for environment and social safeguards. In addition, the Grid Station Operation (GSO) Division of NTDC has also been tasked to monitor the implementation of measures to address the impact on flora and fauna.

ESIC duties, role and responsibilities include: (i) review environmental and social safeguard measures and provide technical support to project implementation teams; (ii) advise the EA, project sponsors, consultants and non-governmental organizations (NGOs) on donor agencies' environmental and social safeguard policies, guidelines, procedures and best practices, and assist in preparing appropriate frameworks, plans and actions to address related issues during project development and implementation; (iii) participate in project/safeguard review/supervision missions and administration of loans and TA projects to assess compliance with environmental and social safeguard policies, guidelines, recommendations in safeguard planning documents, and related loan covenants, and address implementation issues identified during project implementation; (iv) undertake reviews on progress/monitoring reports on environmental and social safeguards for ongoing projects in the country; (v) interact with the government, civil society, other national/local organizations, and other project stakeholders; (vi) review

environmental and safeguards monitoring and evaluation reports and project progress reports and assess the quality of compliance with donor agencies' environmental and social safeguard policies; (vii) prepare recommendations for follow-up actions, provide technical assistance to executing/implementing agencies and external monitors to improve their monitoring, evaluation, supervision and reporting; and (viii) participate in project completion review missions.

Good practice in environmental assessment and impact reduction are: (i) NTDC adoption of analysis of alternatives in best site selection which factored in the requirement of minimum environmental and social impacts, (ii) application of specific design features/parameters including ROW width, pole type and height, and span lengths were considered at the design stage; (iii) social, cultural, and economic impacts on affected populations were included as an integral part of the environmental assessment process; (iv) conduct of expert assessment in the field where empirical investigations of conditions and potential impacts were undertaken by appropriate experts; (v) public input including those from affected communities and NGOs was given due consideration during environmental assessment; and (vi) preparation of comprehensive mitigation and monitoring plans as part of the Environmental Assessment Report. These plans have been implemented accordingly.

At project implementation phase, good practice have been underscored in (i) avoidance of sensitive and high value areas in terms of ecological, cultural, economic, and aesthetics aspects; (ii) use of existing corridors on utility and transportation for transmission facilities were preferred over construction of new corridors; (iii) land restoration in construction sites into better state if not in its original shape; (iv) preparation and implementation of resettlement and compensation plans where in this case study a full-fledged Land Acquisition and Resettlement Plan (LARP) where the provision on entitlements served as basis for compensating all affected persons; and (v) continuous monitoring of project construction sites which facilitated the establishment of a full-fledged dispensary with available qualified dispenser/doctors at site, provision of first aid boxes, proper fencing of construction site perimeter, and workers' use of PPEs.

Analysis of alternatives, application of special design features and parameters, comprehensive environment assessment process, expert assessment of environmental conditions and potential project impacts in the field, stakeholders' consultations especially with potentially affected communities and persons, preparation and implementation of comprehensive mitigation and monitoring plans including resettlement and compensation plans, land restoration, and continuous monitoring of compliance with environmental and social measures in the project sites, not to mention clearly defined roles and responsibilities of implementing, supervision and monitoring units are critical in effective environmental assessment, implementation of environmental management measures and impact reduction.

### **Lessons Learned and Recommendations**

The involvement of ESIC at the very early stage of the project cycle, i.e., planning and site selection, proved very effective in management and keeping project-associated environmental and social impacts at minimum. Continuous monitoring of project sites was also key in achieving the target of proper implementation of EMP provisions.

It is recommended that evaluation of contractors' at selection must consider their previous practice on EMP implementation. Specific provisions must be included in their contract where releases of payments are made conditional to the implementation of EMP provisions. Every contractor must have one dedicated environmental expert in each project. And finally, ADB should pay more attention to the monitoring process, i.e., increasing the number of monitoring visits could prove to be more effective in achieving proper EMP implementation.

## References

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## Case Study 10

### PAK: Good Practice in Preserving a Forest Area Quetta Electric Supply Company (QESCO)

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Analysis of alternatives; Natural habitats, biodiversity, and protected area management; Institutional arrangement for environmental management, Preparation and implementation of site environment plans, Inclusion of environment management plans in bidding documents, contracts and bills of quantities, Frequent site supervision and monitoring, Consultation and awareness raising with stakeholders

## Introduction

Quetta Electric Supply Company (QESCO) is a public limited utility company in Pakistan, established in 1998 by virtue of Companies Ordinance 1984 and is responsible for the distribution of electric power to the entire Province of Balochistan excluding District Lasbela. It serves approximately over 0.5 million customers (domestic, commercial, agricultural, industrial and others) in 30 districts of Balochistan. QESCO has ventured into the enhancement of its system capacity for power distribution to better serve its consumers in various parts of its territory through the construction of new 132 kV transmission lines and upgrading and conversion of grid stations via extension and augmentation. The enhancement covers Quetta, Mastung, Kalat, Khuzdar, Loralai, Qilla Saifullah and Pishin Sibi, Naseerabad, Gwadar Turbat and Zhob Districts of Balochistan.

QESCO power distribution enhancement is a component of ADB MFF (Facility) - Power Distribution Enhancement Investment Program (PDEIP) – Tranches I-IV approved in 2008, 2010, 2012, and 2013, respectively. The financing assistance has reached \$127.5 million through Loan 2438-2439-PAK, Loan 2727-PAK, Loan 2972-PAK, and Loan 3096-PAK. QESCO is the IA for its components in the MFF Tranches while PEPCO is the executing agency (EA) for the Facility. ADB has also required QESCO to carry out the projects in line with prevailing environmental legislation in the country, and ADB safeguards policies.

## Main Environmental Issues Associated with the Project

QESCO projects under Tranches I and III are classified as Category B for environment. These include the construction of new transmission lines, and extension and augmentation of grid stations. The significant environmental issues associated with these projects are orientation of construction staff, public consultation, damage to flora and fauna, waste disposal, noise, dust, ground vibration, excavation, handling, transportation, storage of construction material, and capacity to comply with safety precautions for workers. Projects under Tranches II and IV are classified as Category C and have very minimal environmental issues associated with them.

## Environmental Management Plan

The activities undertaken in the preparation of the EMP include engaging the participation of local communities and stakeholders, consultative meetings, scoping sessions, group discussion,

collection of primary and secondary data during site visits, and coordination with the Geological Survey of Pakistan, Forest Department, International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF), and the Agriculture and Statistics Departments of Balochistan. Consultation with the stakeholders facilitated the identification of concerns resulting in the suggestion of the following mitigation measures: (i) compensation to project-affected persons (PAPs) for loss of livelihood, (ii) use of silencers and ear muffs to address noise problem, (iii) sprinkling of water two to three times a day and controlling the speed of moving vehicles to mitigate dust pollution, (iv) compensatory trees to replace those that are cut, (v) careful collection and disposal of oil and lubricants, (vi) proper waste disposal, and (vii) implementation of safety precautions for workers.

To effectively execute the EMP and monitor the projects' compliance thereon, a PMU has been established under the supervision of the General Manager/Chief Engineer (Development) comprising of four sections: (i) Planning, Scheduling and Coordination; (ii) Project Procurement; (iii) Project Finance; and (iv) Environment and Social Safeguard (E&SS) Cell in coordination with the Project Director for Grid System Construction (GSC). In particular, QESCO E&SS is responsible for monitoring the implementation of the EMP. The Contractor is responsible for the implementation and compliance with the suggested mitigation measures in the EMP. The third party consultant (external monitor) is responsible for monitoring the performance of EMP implementation in the projects. The Office of Project Director in GSC is responsible for collecting data on affected persons and coordination with district governments on land issues.

### **Good Practices in Environmental Management Plan Implementation**

The implementation of the QESCO projects supported by ADB PDEIP has marked a paradigm shift within QESCO to adopt environmental safeguards management procedures in project activities. In line with this change, QESCO has (i) established an E&SS Section in the PMU per ADB requirement, (ii) prepared IEE/EIA report to facilitate the assessment of any impact which can arise during execution of the projects following government's environmental regulations, (iii) submitted the environmental report to Balochistan EPA (BEPA) for approval and subsequent issuance of the Environmental Approval/NOC in compliance with Pakistan's environmental regulations and ADB Safeguard Policy 2009, and (iv) satisfied BEPA and ADB requirement on disclosure of approved environmental report in QESCO and ADB websites, local libraries and at project sites.

The specific role and responsibilities of the E&SS Section are: (i) oversee day to day environmental issues related to the ADB-funded projects and suggest mitigation measures to prevent negative environmental impacts, and (ii) carry out clean development mechanism (CDM) activities to achieve energy conservation as well as earn carbon credits and prevent air pollution. It is comprised of a Deputy Manager and one Assistant Manager each for Environment, and Social Impact.

The main activities undertaken by QESCO on environmental safeguards management which helped achieve its target of minimum environmental impacts of projects are: (i) ensuring the implementation of the EMP, (ii) binding contractors to strictly comply with EMP implementation, (iii) regular monitoring of performance of EMP implementation by E&SS staff, and (iv)

participation in various environmental safeguards activities such as planting trees under the Sursubz Pakistan Program and Compact Florescent Lamps (CFL) Distribution Project as part of the CDM activities.

The adoption of reforms in institutional structure/arrangement in the implementing agency, compliance with the requirements of own country environment regulations and ADB policy on environmental and safeguards management, setting the condition for contractual obligation of contractors to implement environmental measures, ensuring and supporting regular monitoring activities of the primary unit in-charge of EMP implementation in projects, participation in environmental safeguards activities, and coordination with relevant environment agencies are essential in achieving effective environmental management.

### **Lessons Learned and Recommendations**

Adopting good environmental practices in QESCO projects resulted in awareness raising among stakeholders on the importance of environmental protection. Public consultation with various stakeholders has proven that “it is very easy to execute the project by resolving the grievances of stakeholders”. With EMP implementation, various environmental concerns have been identified, mitigated, resolved and restored in their original state.

To further improve the performance of QESCO in EMP implementation, it is recommended that: (i) E&SS staff should observe the need to educate affected communities, (ii) higher authority/management should be sensitized through seminars and workshops to make them fully aware of the importance of environmental management in projects, (iii) E&SS staff should be fully equipped with the required logistic support (i.e. assigning a project vehicle, GPS, camera, and support staff, etc.), (iv) E&SS staff should participate in the preparation of bidding documents and tender opening, (v) continuous professional development (CPD) trainings and experience-sharing meetings should be held to enhance E&SS staff capability to tackle environmental issues professionally and efficiently, (vi) contractors of projects should be bound to submit EMP implementation reports to E&SS on a monthly basis, and (vii) all public sector development projects (PSDPs) should be executed in accordance with Pakistan Environmental Protection Act 1997.

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## Case Study 11

### **PAK: Deg Outfall Hydropower Project: Good Practices in Construction Site Management Punjab Power Management Unit Punjab Energy Department**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environment management; Occupational health and safety; Frequent supervision and participation of PIU environmental staff

## Introduction

The Government of Pakistan has requested ADB assistance to develop renewable energy resources in the country through five hydropower projects (HPP) including feasibility studies. This case study presents the experience of Punjab Energy Department in complying with environmental and safeguard regulations and policies in implementing Deg Outfall HPP, one of the five HPPs in Punjab Province supported by ADB. This HPP is being constructed as a run of the river hydropower project in the Upper Chenab Canal (UCC) (Main Line Lower) in Sheikhpura District of Punjab Province. It is about 6 km from Lahore-Faisalabad Road and about 19 km from Sheikhpura City, the district headquarters. The UCC Main Line Lower which offtakes from the tail of the UCC Main Line Upper serves as a link canal to feed water into the Ravi River as well as irrigates different areas. The Banbanwala Ravi Bedian Depalpur (BRBD) and Nokhar Branch Irrigation Canals also offtake from the same source. The canals off-taking from Balloki barrage mainly rely on supplies of Marala River (MR) Link and UCC.

The construction of Deg Outfall HPP involves the following major civil works as defined in the contract document: (i) construction of 5.2 km long x 3.7 m wide access road with double surface treatment, (ii) dismantling/removal of fall structures, (iii) raising of UCC embankment between the fall and upstream of the powerhouse, (iv) construction of power canal works in by-pass arrangement, (v) construction of protection works including station, etc., (vi) construction of aqueduct over power canal and relocation of the Sikhanwala Distributary, (vii) relocation of Mangtanwala Feeder and construction of its new outlet from the power canal, (viii) construction of a bridge crossing over the realigned Mangtanwala Feeder, (ix) remodelling/protection of district road bridges and gas pipeline, (x) gated spillway structure with service bridge, (xi) powerhouse buildings and ancillary structures, (xii) intake and outlet bay structures, (xiii) offices and residences for the employer and Contractor's temporary staff and workers and infrastructure, and (xiv) ancillary and environmental works necessary for the proper operation of the Project.

Deg Outfall HPP is a package of subprojects with funding from ADB Loans 2286/2287–PAK approved in December 2006 under the MFF-Renewable Energy Development Sector Investment Program (REDSIP) - Project I. The loan projects will close in June 2016. Government of Punjab is the executing agency (EA) and Punjab Energy Department is the implementing agency (IA).

## **Main Environmental Issues Associated with the Project**

There are no anticipated major environmental issues associated with implementing this project considering that it is small scale, involves renewable and clean energy and is expected to affect only a small number of households. However the following environmental concerns were identified as needing attention for efficient environmental management: (i) excessive noise and smoke from generators, vehicles and other equipment, (ii) open dumping of solid waste at different locations, (iii) poor housekeeping at the sites, (iv) lack of knowledge in using PPEs, (v) oil spillage resulting from oil storage, handling, transportation, fuelling, and operation of generators, vehicles and other equipment, (vi) heavy dust generation along access road during vehicle movement, (vii) lack of first aid facilities including hiring of medical staff, and provision of ambulance service for workers when needed, and (viii) absence of direction and safety sign boards at the construction sites and camp area.

## **Environmental Management Plan**

The planned mitigation measures in the EMP basically focus on issues related to waste material management; soil erosion, land degradation and loss of land use and trees; soil, water, air and noise pollution; disruption in operation of water infrastructure and public utilities; and health and sanitation on site.

Re-use of materials in different construction phases will be maximized to avoid or reduce the need to find areas to dispose them. A tree planting program will be implemented on canal banks to replace the existing tree plantation. Agricultural topsoil will also be stored and reused when renovation of diversion canal is completed.

Fuel storage and refueling will have adequate containment away from the canal while construction equipment will be properly maintained. Any waste petroleum products will be collected, stored, and disposed of at approved sites. All precautions to reduce dust level emissions from batching plants and portable crushers, and regular water spraying in all mixing sites and temporary service roads will be undertaken. In addition, all delivery vehicles will be covered with tarpaulin and mixing equipment will be sealed and equipped per existing standards. To minimize noise, all construction equipment and plants will conform to EPA NEQS noise standards and all vehicles and equipment will be fitted with noise abatement devices. Construction workers will also be provided with earplugs in high noise environments.

Appropriate rain and stormwater channels will be constructed. Planning of diversion canal and coffer dam system will ensure that water flows for irrigation are maintained at all times when the canal system is in operation. Any affected public utilities, such as water wells, power/phone lines etc., will be relocated to suitable places, in consultation with the local communities.

In camps and residential areas, sewage system for wastewater effluent and solid waste collection will be properly designed.

### **Good Practices in Environmental Management Plan Implementation**

In order to handle any emerging environmental issues, the Punjab Energy Department's initial action was to undertake proper staffing in the Client Punjab Power Management Unit (PPMU) as well as changes in institutional arrangements with the Supervision Consultants (SCs) and Contractor. A Social and Environmental Safeguard Unit was established in the Client's Office, an Environment Specialist (ES) was deputized by the SC while an Environmental Management Unit (EMU) was created by the Contractor in collaboration with the employer. Extensive joint site visits and environmental safeguards meetings were continuously held at the site.

In addition to institutional arrangements, the following measures have been implemented to prevent any of the identified associated environmental issues:

- i. proper covering and positioning of septic tanks inside the camp areas,
- ii. provision of PPEs. (safety shoes, gloves, and masks) to workers/staff at the site with arrangement to issue the PPEs in the morning and collect these back at the end of the shift,
- iii. provision of good quality drinking water to workers during working hours at the site by installing water filters,
- iv. installation of fire extinguisher with regular compulsory weekly monitoring checks to ensure these to be in good working condition,
- v. training of workers on the use of fire extinguisher arrested any threats of fire, and workers who showed interest and better response during the training were asked to act as trainers in succeeding training session resulting in increased workers' motivation and development of sense of ownership of the activity,
- vi. weekly checking of complaints register/first aid box record on site,
- vii. display of sign boards/safety warnings and daily checking of proper placement of the same,
- viii. construction of barricaded platform at the embankment of the powerhouse to see activities inside the powerhouse,
- ix. strict monitoring of prescribed activities to develop the culture of complying with health, safety and environmental safeguards on site, and
- x. continuous monitoring of construction activities related to manual lifting to avoid work-related upper limb disorder (WRULD).

The flexibility to undertake institutional change and recognition of need for staff complement with appropriate skills are basic in effective implementation of environmental management measures in projects. Implementation of mitigation measures to address environmental impacts on sanitation and occupational health and safety, giving attention to grievance, and strict monitoring of activities and facilities on site is equally important.

### **Lessons Learned and Recommendations**

Based on the foregoing, Punjab Energy Department provides the following recommendations to further improve EMP implementation in projects: (i) provision of training on basic life-saving skills (BLSS) including cardiopulmonary resuscitation (CPR) must be made a compulsory requirement of EMP at IEE stage, (ii) water testing and ambient air testing should be conducted

before, during, and at completion of construction activities, (iii) require workers to undergo health test before and during project implementation, and at project completion to evaluate any environmental impact on workers, and (iv) social survey should be conducted during and after the project to determine any social impacts.

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## Case Study 12

### **TAJ: Good Practice in Birds Protection Arrangements Project Management Unit**

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Natural habitats, biodiversity, and protected area management

#### Introduction

ADB has approved the Grant on Regional Power Transmission Project (RPTP) for the Republic of Tajikistan on 13 August 2010 amounting to \$122 million to help improve the overall performance of the power sector in the country. The project aims to increase energy efficiency and achieve energy security in Tajikistan by making available adequate and reliable power supply to households, commercial, and industrial sectors. It also aims to enhance regional connectivity and ensure power trade among Central Asian countries including Afghanistan. The project is comprised of the following activities: (i) construction of a 220 kV Kairakkum-Asht transmission line covering a distance of approximately 70 km on a 50 m wide corridor with 255 conventional and angle lattice transmission towers, rehabilitation of Kairakkum 220 kV substation, and an additional one new bay in Asht 220 kV substation; (ii) construction of a 220 kV Geran-Rumi transmission line with length of approximately 69 km on a 50 m wide corridor with 240 conventional and angle lattice transmission towers, rehabilitation of Rumi 220 kV substation, and rehabilitation and expansion of Geran 220 kV substation; (iii) rehabilitation of Regar 500 kV and Baipaza 220 kV substations; (iv) installation of supervisory control and data acquisition (SCADA) system at the national control center and 32 key substations; (v) support for project implementation, including supervision, procurement, project monitoring and evaluation; and (vi) power sector operational performance improvement program.

The executing agencies (EAs) are: (i) Barki Tojik Joint Stock Holding Company for the physical investments, and (ii) the Ministry of Energy and Water Resources for the sector operational performance improvement program. The EIA for the project was carried out in 2010 and the project has been categorized as Category B for environment.

#### Main Environmental Issues Associated with the Project

The project area in the south is characterized by agricultural land, orchards and gardens, some desert-like areas and wetlands at the Vakhsh River. There are no significant forests in the area but tree rows can be found along pathways and channels. In particular, the area for the new Geran Substation switchyard has extensive agriculture on cotton but there is no remarkable plant or animal species nor are there any rare and endangered or protected animal species similar to the project area in the north. The Vakhsh River valley is important for migratory water birds. The Tigrovaya Balka National Reserve, which is situated between Pyandj and Kafirnighan rivers near the border with Afghanistan, is a valuable habitat for both flora and fauna.

However, only minor environmental impacts are expected from project operations. A large section of the transmission line alignment passes through farmland and areas that are already



affected by anthropogenic activity. The environmental impacts of the power enhancements will mostly take place during construction stage. There are also some noise impacts and waste management issues during operational stage that must be addressed by the detailed design through environmentally responsible procurement. As such, the expected environmental and social impacts of construction works and project operations are as deemed by the IEE to be fairly standard including for example, noise and dust production, transportation and storage of construction materials, construction waste disposal, camp site operation and location, loss of trees and vegetation cover in areas where transmission towers will be constructed and temporary workspace will be set up, and safety precautions for workers, etc. No significant or irreversible impacts are expected with the operation of the new lines.

The specific environmental issue in this case study is associated with the technological safety of the new transmission lines and management of their impact on the safety of different birds during project design, construction and operations so as to avoid loss of birds as well as protect the transmission lines from short circuit.

### **Environmental Management Plan**

The project has three Contractors and each of them was required to develop a health, safety and environmental SSEMP describing in detail the safety and mitigation measures, environmental monitoring, GRM, and other relevant information. The Contractors have been supported by the Supervision Consultant (SC) and ADB Environment Specialists (ESs) in the preparation of SSEMPs where substantial efforts have been made in order to ensure that the environmental documents are relevant and highly specific with respect to the mitigation measures required to address the impacts in the project site, i.e., the project's activities and construction methodologies and local environmental conditions.

The final SSEMPs include a variety of safety and mitigation measures which are largely "site rules" such as prohibition of storage of hazardous materials near watercourses and prohibition of open burning, and specific preventive measures such as conducting surveys on PCBs contamination and protection of ornithological fauna, etc.

More importantly, the technical aspect of the project significantly considered environmental management by ensuring the protection of both transmission lines and birds. In addition, the transmission lines which run through areas with low environmental sensitivities do not traverse any village or settlement but the distance to any dwelling or settlement will be kept to a minimum of 50 m. While there will be some temporary impacts during the construction phase, the appropriate mitigation measures have also been developed. This is in line with the IEE conclusion that if an environmental management and monitoring program for the project is properly implemented, these impacts will not be significant.

The implementation of the SSEMPs is the direct responsibility of the Contractors through their Environmental Protection Managers (EPMs). The SC local and international ESs supervise the Contractors' implementation of SSEMPs on behalf of the EAs. The supervisory work entails periodic site inspections, follow-up on non-compliance/areas of concern which have been previously brought to the attention of the Contractors, review of the Contractors' deliverables

and environmental monitoring results, and checking of documentation such as the grievance register.

### **Good Practices in Environmental Management Plan Implementation**

The specific aspect of environmental management considered in this case study relate to the protection of transmission towers from birds which can cause short circuit and which can in turn result in loss of the birds.

The contractors who participated in the bidding process were requested to specify relevant standard technologies that will help manage and prevent short circuits to protect the transmission lines and birds. The Contractor (Kalpataru Power Transmission Ltd.) who was awarded the contract prepared a special design for a device named “bird guard plates” which take the shape of nails and are installed on the transmission tower cross arms to prevent birds from sitting on the towers. This simple but effective device has been installed on all transmission towers in the northern line in the frame of the completed Lot 1. The same will be done in the frame of the on-going implementation in Lot 2 covering the southern line.

The good practice of undertaking early planning with the involvement of contractors from the bidding process stage to address the identified key environmental issue on impact to birds and protection of transmission lines has contributed to the successful implementation of this particular mitigation measure in the project. With the design for the device coming from the Contractor and its subsequent approval for adoption in the transmission tower design, the project has also established a sense of ownership by the Contractor which resulted in compliance with the required safeguards measure. The simple but effective design signifies a well-studied and informed process has been undertaken in its development.

### **Lessons Learned and Recommendations**

The involvement of contractors to provide relevant technical solutions taking into account environmental considerations should be made a requirement from the bidding stage of the project. In the bid documents, the health, safety and environmental plan (HSEP) or SSEMP can already be included incorporating environmental considerations to inform the selection of proper technical designs before starting construction works. Designs should be simple and effective and suitable for wide application without causing any further concerns in the management of the environment. A well informed and proper technical design process can help prevent or mitigate potential negative impacts in an effective and sustainable way.

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## Case Study 13

### UZB: Good Practice in Environmental Monitoring Talimarjan Power Plant Project Management Unit

**Sector:** Energy

**Environmental Safeguard Management Good Practices:** Good housekeeping in camp management; Grievance redress mechanism

#### Introduction

Uzbekistan is currently implementing a project to expand the capacity of Talimarjan Power Plant (PP) by constructing two additional combined cycle gas turbine (CCGT) units with total capacity of 800 MW–900 MW. The project site is located in Kashkadarya Province, 440 km southwest of Tashkent and is next to an existing generating facility with gas fired power plant generating 800 MW of electricity. The original design of the existing plant envisaged a total generating capacity of 3200 MW but this has not been realized partly due to the break-up of the Soviet Union. The project is classified as Category A for environment and the environmental assessment for the expansion project undertaken in 2009 assumed a total installed capacity of 800 MW.

ADB assistance supporting the project are Loan 2629/2630-UZB: Talimarjan Power Project (formerly CASAREM-Talimarjan Energy Development Project) approved in April 2010. UzbekEnergO (UE) State Joint Stock Company is the executing agency (EA) while Talimarjan Power Plant is the implementing agency (IA). Corporate Solutions and Mott MacDonald (CSMM) Team, and Hyundai Engineering and Construction Co., LTD. (HDEC), are Supervision Consultant (SC) and Contractor, respectively.

#### Main Environmental Issues Associated with the Project

This project is one of the biggest projects currently being implemented in Uzbekistan and the main environmental issues are the involvement of a significant number of workers, impacts of construction works during dry climatic conditions, proximity to settlement areas, disturbance from traffic and noise, and possibility of non-compliance with local environmental regulations.

#### Environmental Management Plan

The mitigation measures spelled out in the EMP are: (i) implementation of materials control where size and duration of stockpiles are kept to a minimum, e.g., cement are to be deposited directly from the train into the bunkers, and only authorized transportation of equipment and materials will be allowed entry to the site, with checks to be made on a random basis; (ii) good dust control during construction works in dry conditions through adequate and timely watering of roads 4 times a day using a water truck including watering of stockpiles and exposed areas, and spraying of water on materials before transporting these; (iii) traffic control through posting of traffic signals and road signs on site, monitoring of drivers by the Contractor to prevent driving at high speed or use of phones while driving, imposition of speed limit on vehicles in access road to Talimarjan PP and requiring trucks to have proper fitting side and tail boards, and banning trucks during night shifts; (iv) noise measurements in construction site will be carried out four times a month using a hand held device and the data collected will be provided to CSMM and

PMU for inclusion in the monthly environmental monitoring reports; and (v) to comply with local environmental regulations, measures for site control include keeping of exposed areas to a minimum wherever possible and restoring these areas, and maintaining hauling roads in decent condition. Preventive maintenance of vehicles and equipment will also be done.

To effectively organize EMP implementation and environmental performance during construction works, the necessary institutional structure has been set-up. The Environmental Protection Service of UE is oversight to overall implementation of the EMP. The ES in PMU Talimarjan PP is responsible for ensuring the implementation of environmental measures by the SC and Contractor.

### **Good Practices in Environmental Management Plan Implementation**

According to the EMP, the Contractor is responsible for conducting regular environmental meetings with internal organization and Sub-contractors to ensure that works are carried out on site with minimum adverse impacts to environment, workers and the public. The Environmental Meeting is part of the Safety and Health Committee meeting, at which safety, health and environmental matters are to be discussed.

The PMU in cooperation with the environmental expert in Headquarters of the EA carefully reviews the Contractor's monthly environmental report. The PMU also works closely with CSMM who is responsible for preparing monthly reports on environmental issues that have been brought to the attention of the Contractor.

Good housekeeping has been observed in the organized workers camp area which are tidy and clean as well as in the vehicle repair shop on-site. In addition, no open burning has been observed in the project site and no vehicles are left with engines on or idling. The Contractor has been responsible for ensuring that vehicles are kept in good condition and random checks are carried out to determine inadequate vehicles for removal.

As part of the GRM, a logbook has also been placed at the entrance of Talimarjan PP and a designated person from PMU Talimarjan PP is responsible for liaising with the community.

Good housekeeping in the workers' camp site and the vehicle repair shop including maintenance of vehicles and setting up of GRM are good practices exhibited by the Contractor and PMU.

### **Lessons Learned and Recommendations**

The recommendations offered in this case study are specific to the compliance with local environmental regulations as follows:

- i. Keeping of resource records is considered an international best practice. It is recommended that standard forms for record keeping be included in contract/bidding documents. The contractor should also produce statistical reports on these records for submission to the local environmental authority.
- ii. In accordance with the local environmental law, the following requirements should be added in contract/bidding documents:

## Supplementary Appendix

- iii. Monitoring of water quality where data collected on drinking water and wastewater should be presented in the Contractor's monthly environmental report. The quality indicators for discharge should specify the locations and quantities of discharge.
- iv. Identifying all possible air and soil pollution sources related to construction activities and findings and recommendations of ecological experts should be obtained from local environmental authorities.
- v. Identifying all possible waste pollution sources and the contractor should maintain a "Keep a waste log" for all types of wastes produced in the construction areas.

### 3. Transport

#### Case Study 14

##### **ARM: Good Practice in Environmental Safeguards Management in the Road Corridor Project**

**Project Management Unit (PMU), North-South Road Corridor Investment Program-SNCO  
Ministry of Transport and Communications (MOTC)**

**Sector:** Transport

**Environmental Safeguard Management Good Practice:** Conservation of physical cultural resources

#### Introduction

The Republic of Armenia (RoA) has selected the Bavra-Yerevan-Agarak route as the north-south road corridor to improve the transportation links with both Iran and Georgia to international standards. This involves the widening of existing two-lane roads which are often in poor condition to become four-lane divided roads along the existing alignments wherever possible or construction of new alternate two-lane roads where a single four-lane road would not be feasible. The construction of the north-south road corridor is ongoing and consists of three phases. Phase 1 has rehabilitated the M-1 section of the road north from Yerevan to Ashtarak with length of 11.4 km and the M-2 section of the road south from Yerevan to Ararat with length of 38.1 km or a total length of 49.5 km. Phase 2 has three components: (i) road construction with length of 41.9 km from Ashtarak to an area near Talin, (ii) construction of two bypasses in Agarak and Ujan, and (iii) new road alignment of 8.95 km at Katnagbyur located on the left side of the existing highway to be connected to the existing road alignment in Talin. Phase 3 which has yet to start will upgrade a portion of M1 between Talin and Gyumri to a four-lane dual carriageway equivalent to 18.4 km out of the total length of 45.6 km through the reconstruction of the existing two-lane road and construction of a second carriageway alongside.

ADB is providing the Government of Armenia (GoA) with \$500 million under MFF-North-South Road Corridor Investment Program (NSCIP) - Facility approved in September 2009 to provide assistance to the north-south road corridor to help bolster economic growth in the country. The Facility has three tranches providing loan financing to the respective construction phases as follows: Tranche 1 supported Phase 1 through Loan 2561-ARM: NSCIP-Project 1 with \$ 60.0 million approved in October 2009, Tranche 2 supports Phase 2 through Loan 2729-ARM: NSCIP-Project 2 with \$ 170.0 million approved in December 2010, and Tranche 3 will support a portion of Phase 3 through Loan 2993-ARM: NSCIP-Tranche 3 with \$ 100.0 million approved in March 2013. The North-South Road Corridor Investment Program (SNCO) of the Ministry of Transport and Communications (MOTC) has a PMU to coordinate the road works. All loan projects under the Facility will close in 2017.

## **Main Environmental Issues Associated with the Project**

Construction works in Tranche 1 have been classified as Category B for environment and have caused minor environmental impacts. The construction works have been limited to shoulder, drainage, and culvert improvements so the impact of the materials removed or disposed of and the new material placed are minimal. Two borrow pits and two excavated material dump sites operations had potential to create a number of short-term impacts on air and land quality, health and safety. A number of elements of the construction activities also had the potential to cause noise. Other activities with the potential for negative impacts are concrete plant operation, transport of materials, and traffic in and near work sites. Heavily laden trucks carrying earth, gravel and other works materials have damaged rural roads.

Tranche 2 classified as Category B has impact on the artificial wetland, Red Book flora and fauna species in 20 locations, and 11 archaeological sites. Road construction is considered to be aggressive crossing several surface water bodies and there is concern on preventing the choice of concrete mix for the concrete roadways. The Project will also affect several areas where trees and bushes are growing along the highway while 9 topsoil stockpiles and 11 excavated material dump sites from operations had potential to create a number of short-term impacts on air and land quality, and health and safety.

Tranche 3 has been classified as Category A because it will affect 10 archaeological sites, 10 cultural monuments and one natural monument. Other identified potential impacts are: nuisance from noise; dust/air pollution; disruption of traffic flow; disposal of garbage, surplus materials and construction debris; surface run-off from borrow pits, stockpiles, and dump sites adjacent to one reservoir and one pond; disturbance and displacement of Red Book migratory species of birds; unnecessary cutting/removal of trees along the highway; lack of public information about the EMP; and lack of health and safety measures.

## **Environmental Management Plan**

In general, the mitigation measures related to Tranches 1 - 3 include: (i) preparing and implementing the Physical Cultural Resources Plan; (ii) undertaking archaeological excavations prior to road construction; (iii) obtaining the necessary approvals for archaeological finds; (iv) redesigning the road section in case of discovery of unmovable archaeological site, preparing "chance find" procedures and applying them during works implementation; (v) protecting historical-cultural sites from negative impacts during construction works; (vi) managing traffic and promoting public awareness; (vii) ensuring dust suppression by water sprinklers; (viii) ensuring regular collection and disposal of solid waste and garbage; (ix) stabilizing denuded slopes; (x) identifying appropriate dumpsite and sites for topsoil stockpiling, and preparing SSEMPs; (xi) monitoring, supervising and managing construction and work sites; (xii) preparing and implementing vegetation, flora and fauna protection plan; (xiii) restricting construction works and workers' activities along the road alignment by fencing the area to control encroachment, degradation and disturbance of Red Book species; (xiv) maintaining trees until they are viable; (xv) planting replacement trees at a ratio of 10:1; (xvi) conducting public consultation and preparing communications plan; (xvii) preventing negative impacts on public health including increasing site sanitation; (xviii) providing protective clothing; (xiv) conducting public information

on traffic management; and (xv) ensuring soil covering is effectively and efficiently implemented.

The International and National Environmental Specialists (ESs) and National Archaeologist have prepared the IEE for Tranche 1 during feasibility stage. During the design stage, they also prepared the IEE report and EMP for Tranche 1 and the EIA and EMPs for Tranches 2 and 3. In addition, an Archaeological Work Plan (AWP) was prepared describing in detail the archaeological units in RoW boundaries, principles of their excavations, mitigation measures to protect the archaeological units during excavations and construction works, estimated volume of work and timetable of archaeological excavation and workforce. The AWP was submitted to the Ministry of Culture (MoC) for approval and subsequently to the Interdepartmental Archaeological Commission (AC) for issuance of permit to commence excavations. Permissions were obtained to undertake archaeological excavations in 11 sites (Nerkin Naver and Agarak Historical-Cultural Preserves; Aruch, Verin Sasnashen, Davtashen, and Katnaghbyur archaeological complexes; and Aghtsk-1, Kakavadzor, Nerkin Bazmaberd, Nerkin Sasnashen, and Talin tomb fields) as contained in the AWP.

The PMU is responsible for the management of environmental, social and archaeological aspects of the project. The Project Management Consultant (PMC) is responsible for supervising the construction works in relation to environmental and archaeological impacts and reports on the Contractor's performance in implementing the EMP. The Contractor's Environmental Unit is responsible for implementing the EMPs and SSEMPs, monitoring of on-site construction activities, and reporting thereon.

### **Good Practices in Environmental Management Plan Implementation**

The archaeological, historical and cultural resource requirements of Tranche 2 were identified and included in the EIA preparation. Before commencement of construction activities, the impact of construction and level of damage on the sites were verified and served as basis for the mitigation measures included in the AWP.

The process of contracts preparation included discussion with excavating entities, Contractor, PMC and PMU, and signed between the Contractor and excavation entities. The specialized entities engaged to undertake excavations were the Scientific Research Center of the Historical and Cultural Heritage-SNCO and Institute of Archaeology and Ethnography of the National Academy of Sciences (NAS) in Armenia.

Monthly monitoring site visits were done by PMC and PMU on the progress of archaeological excavations including compliance of implemented works in accordance with the contracts signed between the Contractor and excavation entities, and compliance with the AWP and time schedule. At completion of the excavations, the entities prepared reports and submitted to AC for approval and all reports have been accepted. In addition, all archaeological sites, except the Agarak Historical-Cultural Preserve and Nerkin Sasnashen tomb field have been cleared by MoC and certified free of archaeological remains prior to the commencement of any construction activity in each site.

There was a delay in issuance of MoC clearance and certification for Nerkin Sasnashen tomb field due to the discovery of a new archaeological site during digging works which was not identified in the AWP. The chance find has archaeological and scientific significance upon



assessment of PMC Archaeology Specialist which included a Chalcolithic settlement dated around the mid V Millennium BC and represents the so-called Middle Chalcolithic or Sioni cultural tradition which is very rare in Armenia. AC has granted permission to commence a new excavation in Nerkin Sasnashen for which a new AWP was prepared. Excavation in the new site started in July 2015. Agarak Historical-Cultural Preserve, on the other hand, will be preserved and a new road pass re-design will be proposed. The 200 ha cultural preserve bears traces of intensive stone working transforming the natural landscape into a gigantic monument complemented by evidence of habitation tracing back to the Middle Bronze Age to the Early Iron Age, inclusive (XIX/XVIII – IX centuries BC).

The Ashtarak-Gyumri highway also benefited from the adjustment in design due to the outstanding new discoveries in the area. Agreement was made with MoC to allocate the highway from the left (south) to the right (north) side or to use the northern portion of the site for future road construction activities. Excavations undertaken in the boundaries of RoW to save artifacts with historical and cultural value resulted in the opening up of about 3 ha of surface revealing evidences of important archaeological structures from Bronze and Iron Ages, and Hellenistic and Medieval Periods. A new road pass re-design will also be proposed.

Agarak-Aruch and Kosh interchanges have been redesigned to avoid significant excavation costs and delays in commencement of construction works. The re-design resulted from the investigation of the area, the comparison of the planned road construction with the proposed excavation and new alignment design and construction which also show a decrease in the volume of planned future archaeological excavations.

Access roads from the highway to the archaeological sites for servicing the sites and for tourism have been confirmed through observation. A chance-find procedure was also developed and implemented with joint input from the Contractor, PMC and PMU. The procedure requires training of Contractor's technical field staff and machinery operators on how to deal with chance find.

Mainstreaming of archaeological, historical and cultural requirements in EIA, and in the EMP and SSEMPs, including the initiative to prepare AWP and ensuring that approvals on these documents are obtained and permits to undertake archaeological activities are secured are very important pre-implementation activities for projects that will cover areas with potential or substantial evidence of artifacts and structures of significant value. Adjustments in project design to safeguard or preserve an environment of high socio-cultural value are always the best option to take. Close coordination among PMU, PMC and contactors including concerned government agencies and institutions, and frequent monitoring of site activities by PMU and the consultant including verification of information are effective in forging agreements and ensuring compliance with environmental management measures and schedule. Introducing new procedures such as chance find procedure is a practical approach unique to this case study.

## Lessons Learned and Recommendations

In general, the experience related to the archaeological component of the project shows that any area of impact from construction activities can have potential historical-cultural significance because many sites can be buried under thick portions of sediment and may not readily be recognizable to archaeologists before construction activities. The use of three independent archaeological tools – systematic excavations of previously identified sites, chance finds procedure, and systematic monitoring of the construction excavations and the archaeological excavations – have resulted in minimal impact and allowed full control of the process of preserving historical and cultural structures of high value in the whole construction area. And lastly, it is better to organize archaeological excavations in the final stage of project design.

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## Case Study 15

### **ARM: Benefits of Environmental Management in Yerevan Construction Projects** **Ruzanna Voskanyan, Environmental Specialist** **Project Implementation Unit (PIU), Yerevan Municipality**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Consultation and awareness raising; Inclusion of environmental management plans in bidding documents, contracts, and bills of quantities; Grievance redress mechanism

## Introduction

Yerevan Municipality (YM) in Armenia has developed its Sustainable Urban Transport Sector Development Plan and institutional development and capacity building plan for all municipalities within its jurisdiction.

On behalf of Yerevan, the Government of Armenia (GoA) has availed of a 9-year MFF on Sustainable Urban Development Investment Program (SUDIP) (Facility) from ADB to finance the investment requirements of Yerevan urban transport sector and allied plans. The investment program targets a range of urban connectivity and mobility improvements in all parts of Armenia aimed to improve transport efficiency, reliability, and safety, and reduce congestion. The impact of the investment program is improved urban environment, local economy and enhanced private sector within the urban areas. The Facility consists of two tranches approved in May 2011 and September 2015, respectively. Tranche 1 (T1) provides loan financing of \$48.6 million through Loan 2752-ARM: MFF-Yerevan Sustainable Urban Transport-Tranche 1 while Tranche 2 (T2) will provide \$113.0 million through Loan 3293-ARM: SUDIP-Tranche 2. Yerevan Municipality is the PIU.

## Main Environmental Issues Associated with the Project

As a matter of policy, all projects supported and funded by ADB must satisfy the requirements of ADB SPS 2009. In Armenia, most of the environmental, social risks and the potential cultural impacts occur during construction stage of projects implemented in populated urban areas, often in locations where traffic and transportation problems are prevalent along with the existence of historical and cultural sites. However, most construction impacts are temporary being related to the construction and can be mitigated by relatively straightforward measures that are common practice in urban construction sites.

During the construction phase of the ongoing SUDIP project, the following specific environmental and safeguards issues were observed:

- i. vibration levels caused several existing structural cracks to expand and damage already aging neighborhood structures and buildings;
- ii. seasonal impacts of the project plan resulted in the rescheduling of the associated replanting of trees to maximize effects and reduce environmental impacts;

- iii. construction activities and related road closures affected the availability of parking spaces which brought about complaints from affected residential areas;
- iv. waste management issues where nearby local residents used construction areas as dump sites for residential refuse;
- v. safety issues arising from the removal of construction zone fencing and trespassing by local residents; and
- vi. safety issues associated with construction workers' neglect to wear proper personal safety uniforms including steel toe boots, hard hats and vests.

### **Environmental Management Plan**

SUDIP's EMP provides a set of mitigation and monitoring measures to be undertaken during project implementation in order to avoid, reduce, and mitigate adverse environmental impacts of construction activities. The entities responsible for mitigation and monitoring activities including estimated costs are also presented. It also describes how mitigation and other measures will be implemented and monitored, including the institutional arrangements for these activities.

The following roles and responsibilities are defined according to the best practices in the SUDIP project:

- i. PIU Environmental Specialist (ES) - carry out overall environmental program management to ensure full compliance with Armenian legislation and ADB SPS 2009. The ES serves as liaison between stakeholders to include the safeguard team of Engineer, YM as EA, Ministries of Nature Protection (MNP) and Culture (MoC), project affected communities, and ADB.
- ii. Contractor ES – prepared the SSEMP with assistance from the Engineer and PIU ESs.

### **Good Practices in Environmental Management Plan Implementation**

PIU ES manages the Engineer's and Contractor's implementation of the EMP, reviews reports and submits biannual environmental reports to ADB. The Engineer ES implements, supervises and inspects the EMP and SSEMPs during construction activities as well as generates and submits weekly monitoring checklists and monthly reports to PIU ES who is oversight to the Engineer ES. Based on the SSEMP and with the supervision of Engineer ES, Contractor ES implements environmental mitigation and corrective measures and related monitoring activities on a daily basis at specific construction sites as prescribed by PIU ES and the Engineer ES. The Contractor ES also generates and submits reports to the Engineer ES.

The good practices by the Contractor ES in effectively mitigating and resolving environment issues are:

- i. efficient use of GRM in recording seven complaints received from affected residents regarding vibrations that exacerbated structural cracks on their houses which resulted in the modification in compacting machinery levels to reduce overall vibration impact, provision of compensation for damages to all affected residents and rehabilitation of affected buildings by the Contractor;

- ii. organized the installation of temporary refuse bins at strategic locations around the construction site to be used by residents to address the issue on waste management;
- iii. to resolve issues on safety in the construction zone:
  - a. directed a site foreman to conduct daily walks on site to check the condition of site fencing; any damage on the fence was immediately repaired; and
  - b. together with site foreman, created and installed site specific signs to instruct people on no trespassing and to direct them to the aforementioned temporary refuse bins for garbage disposal; and
- iv. as overall in-charge of the construction site, enforced compulsory use of safety uniform code among all construction workers.

On the PIU side, prior to 2013, projects in Yerevan did not incorporate any environmental safeguards programs. However following ADB requirement in implementing environmental management measures in SUDIP, the Government Supervisory Board (GSB) created an ES position in the PIU on 14 August 2012 as well as approved the implementation of environmental safeguards program in SUDIP. The ES was engaged on 26 December 2012.

Good practices undertaken by the PIU to efficiently manage the environmental component of SUDIP T1 and T2 projects and to prepare for subsequent tranches are:

- i. review of consultant's deliverables, including the revised environmental assessment and review framework (EARF), archaeological surveys, IEE, EIA, and EMPs to ensure quality; and facilitate Municipality, Government and ADB approval processes;
- ii. ensuring all bidding documents for contractor require the hiring of environmental and health and safety specialists who will implement the EMP during construction activities.
- iii. provision of overall guidance and leadership to the Engineer, YM, and GSB on all matters relating to environmental issues;
- iv. organizing public consultations in coordination with the Engineer in compliance with ADB SPS 2009 and Armenian legislation;
- v. monitoring of Engineer's activities to ensure project performance in accordance with the ADB SPS 2009 and relevant Armenian laws and regulations on environment, including archaeological finds;
- vi. facilitate and close coordination with Engineer ES on the implementation of his activities;
- vii. regular site visits to construction sites;
- viii. review of reports on the implementation of projects to ensure that all works are carried out in full compliance with the EMPs;
- ix. monthly and quarterly reporting to the Project Director and submission of biannual safeguards compliance reports to ADB;
- x. review of the recommendations of the Consultant and Contractor on the final reception works and corresponding closing of contracts to ensure that all works are carried out in full compliance with the EMPs; and
- xi. ensure the preparation of environmental documents for subsequent tranches of SUDIP.

The foregoing provides insights on the good practices in the implementation of environmental measures in Yerevan urban transport projects. Immediate action and use of appropriate approaches by the contractor to resolve local community grievances and environment issues surrounding construction sites were effective. PIU demonstrated strong vertical and horizontal coordination and close supervision over focal persons and units responsible for implementing the EMP, institutionalized EMP implementation as a contractual obligation among contractors, created a focal position to oversee and supervise EMP implementation, conducted frequent site visits and monitoring including submission of regular reports on the implementation of EMP and mitigation measures, and ensured timely approval of quality environmental and related documents. PIU is also exerting efforts to sustain the gains in successful environmental management by already undertaking preparations for the formulation of environmental documents for subsequent tranches.

### **Lessons Learned and Recommendations**

Because of the lack of environmental safeguard specialists in prior construction projects in Yerevan, most contractors, engineers and IAs resisted and had difficulties adapting to environmental safeguards programs. There were also many difficulties in implementing safeguards measures, corrective actions, and mitigating factors in specific construction sites. In addition, difficulties were experienced in community outreach programs. Regular public hearings with communities and NGOs are important in the pre-construction stage. In addition, ongoing public consultations at implementation stage are essential in order to educate, inform and address any concerns, issues or graveness related to the environment that may impede the successful implementation of projects.

Based on the lessons learned, the following recommendations are proposed for future projects:

- i. the roles and responsibilities of the SUDIP ES, the Engineer ES and the Contractor ES should be clearly defined and disclosed to the entire organization before commencing a project.
- ii. Public hearings and consultations with affected communities and NGOs should be held to minimize the impact of construction projects on local communities and environment.
- iii. Any environmental safeguards programs, EMPs, implementation plans and related required reports must be included in all bidding documents in order to ensure that contractors are aware, educated, and responsible for including these measures in their bid submissions. The inclusion of commitment in their respective bids to constitute qualified environmental safeguards staffing such as Contractor ES and site representatives must also be required.
- iv. For all future projects, it is strongly recommended to increase and establish solid training and education programs for the entire environmental safeguards team. The training should include standards based classes on environmental management, occupational health and safety, best practices in similar projects, and project management.

In conclusion, the implementation of the Environmental Safeguards Program in SUDIP projects in Armenia and in Yerevan in particular has yielded great benefits for all involved entities and

stakeholders. Prior to SUDIP, there was no GRM and no responsibility for any environmental, community and safety issues in construction projects in Yerevan. The SUDIP project has offered rich experiences on increasing community awareness, improving health and safety standards, minimizing community grievances, more efficient project implementation, increasing responsiveness and accountability, and overall greater oversight responsibilities on projects.

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## Case Study 16

### **AZE: Good Practice in the Hirkan National Park Azeri Road Servis**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Frequent supervision and participation of PIU environmental staff; Environmental compliance monitoring reports; Natural habitats, biodiversity and protected area management; Institutional arrangements for environmental management; Preparation and implementation of site EMPs

### Introduction

The Masalli to Astara Motorway is a new 62 km motorway section of the M-3 highway corridor in Azerbaijan that links the Capital City Baku to the southern parts of the country and the town of Astara, which straddles the Azeri/Iranian border. The project is split into three sections: A (0 - 22.15 km), B (22.15 - 45.00 km), and C (45.00 – 62.14 km).

The project is being financed by ADB MFF-Road Network Development Program in the Republic of Azerbaijan through Loan 2354 AZE: Road Network Development Program-Project I approved in October 2007 and Loan 2831-AZE: Road Network Development Program-Tranche 3 approved in Dec 2011. The executing agency (EA) is Azeri Road Service (ARS) Open Joint Stock Company. An EIA was carried out for the project in 2007.

### Main Environmental Issues Associated with the Project

This case study covers the entire Project but focuses on only a small section of the overall project. A large section of the planned 62 km road alignment passes through farmland and areas that are already affected by anthropogenic activity. As such, the expected environmental and social impacts of construction and operation along the majority of the project areas are deemed to be fairly “standard” by the EIA including for example, noise and dust production, severance, and pollution of watercourses.

However, the main concern is the design of Section B of the project which involves the alignment of new road passes between km 39+000 to km 40+000 and will pass through a narrow corridor between the village of Dasdaligjar and the north-eastern edge of the Hyrcanian Lowland Forest (HLF). The HLF is the only surviving fragment of the original dominant ecosystem of the Caspian plain and is known locally as “Moscow Forest”. It is part of the Hirkan National Park and consists of a small isolate lying several kilometers from the main protected area. By virtue of its unique assemblage of species, the 91 ha Moscow Forest is a Critical Habitat based on ADB SPS 2009.

The key environmental issue is the loss of a small (0.75 ha) area of the forest on the narrow corridor during construction. There is therefore need to develop and implement satisfactory mitigation measures during construction and operation so as to avoid the negative impacts on the ecology of the forest and on the inhabitants of Dasdaligjar village.

### Environmental Management Plan



As the project is split into four packages (Sections A, B, and C, and Lenkaran Bridge), each contractor was required to develop an SSEMP describing in detail the mitigation measures to be taken on the respective sections, as well as providing information on environmental monitoring, GRM, and other relevant information. The Contractors were supported in their preparation of the SSEMPs by the Supervision Consultant (SC), and by ADB environment specialists (ESs). Much effort went into the preparation of the SSEMPs, so as to ensure that the documents were meaningful, and highly specific to the project site, project features and construction methodologies, and local environmental conditions.

As the contracts were awarded in a staggered manner, it was also possible to reflect some of the immediate lessons learned from previous SSEMP preparation in the contract conditions for the subsequent contracts. (Whilst we believe that even the first SSEMP for Section A was of a good standard, each subsequent SSEMP was considered to be an improvement on those before).

The implementation of the SSEMPs is the direct responsibility of the various contractors involved in the project via their respective Environmental Protection Managers (EPMs). The SC, representing the Client's interests, supervises the Contractors' implementation of the SSEMPs via their local and international ESs. The supervision work includes periodic site inspections and follow-up on non-compliances/areas of concern, review of Contractor's deliverables and environmental monitoring results, and checking of documentation such as the grievance register.

The final SSEMPs included a wide variety of general and specific mitigation measures. The general mitigation measures largely pertained to "site rules", e.g., prohibition of storage of hazardous materials in proximity to watercourses and open burning, and compulsory use of PPE. Specific mitigation measures included: (i) installation of temporary noise and light barriers during construction to reduce disturbance to wildlife in the forest area in order to avoid possible loss of biodiversity as well as to reduce disturbance to local people in the affected village, (ii) careful shifting of boundary stream to a new channel, (iii) provision of access to the site along the road alignment only and not through the village to avoid disturbance of village people during construction works, (iv) regular monitoring of dust and noise in areas where the road alignment is close to human settlements, (v) presence of representative of Hirkan National Park during all site clearance work, (vi) noise, air quality and water quality monitoring in sensitive project areas during project implementation, (vii) installation of crash barriers to reduce the chance of tanker overturn, (viii) prohibition of stockpiles and spoil disposal in the Contractor's facilities within the construction areas, (ix) imposition of limits on work hours and noise levels, (x) re-vegetation of embankment with approved indigenous species, (xi) regular site reports during construction, (xii) speed restrictions on vehicles during operations, and (xiii) appropriate timing of bridge construction activities to avoid fish-spawning season

### **Good Practices in Environmental Management Plan Implementation**

The ES of the Contractor conducts daily visits to the site during the construction period. But on visits during special works such as tree cutting or relocation of channel or any other works which will be observed, the ES of the Contractor is joined by the SC ES. The Contractor is responsible

for the timely removal of all materials for disposal from the construction area. The SC is responsible for monitoring contractor's compliance on environmental measures in the site.

The following good practices have been undertaken for Section B of the project:

- i. Two separate SSEMPs have been prepared – a general plan covering construction and a specific plan for the site/project area;
- ii. no works are undertaken in the project areas until approval on the SSEMP is obtained;
- iii. preparatory works before SSEMP development including researches and surveys, data collection, securing all necessary permits, identification of all possible environmental impacts, meetings and consultations are undertaken with all involved parties;
- iv. conduct of a special biodiversity survey was required prior to development of environmental management measures due to the known rarity of the HLF adjacent to the project road and to the fact that no recent study on the forest isolate exists; the objectives of the survey are to determine the ecological value of the protected area, the extent of current anthropogenic impacts on the forest, and if there is any indication of physical boundary and whether these correspond to the gazette boundaries;
- v. as proposed by the SC, confirmation of the gazette boundary was also initiated in parallel to the ecological survey to establish clear boundaries of the forest and determine whether or not the physical edge of the forest is the official gazette boundary of the protected area;
- vi. whilst the forest survey, boundary determination and preparation of the "special" SSEMP were ongoing, no works were permitted in the area;
- vii. to minimize delays in the construction plan due to the survey and boundary determination, ADB proposed the early development of a "general" SSEMP for Section B, covering all locations other than the area adjacent to the National Park, to be followed by a special SSEMP governing the immediate environs of the National Park;
- viii. since the confirmation of gazette boundaries was taking time, clarification was solicited from the ARS on jurisdictional rights over project areas to be cleared and confirmation was obtained that the areas are in fact on municipal land thus enabling the project to proceed with activities such as application for forest clearance;
- ix. careful shifting of boundary stream to a new channel by undertaking preliminary works of cleaning of water drainage channel at the boundary of the forest that was extremely polluted by domestic waste from the village;
- x. invitation to forest representatives to be present during forest clearance;
- xi. site monitoring and preparation of regular site reports;
- xii. preventive measures against accidents involving project vehicle through crash barriers and speed restriction which also avoids noise pollution that can disturb the wildlife especially birds during breeding season;
- xiii. compliance with limits on work hours following the discussion with village people during public consultations and obtain an agreement with the village if there is need to undertake work beyond the allowed work hours;

- xiv. requiring the Contractor to carefully plan for all needed materials to be delivered at the proper time of the day as agreed upon with the SC to prevent stockpiles and spoil disposal in the construction sites;
- xv. avoidance of disruption in community through construction of access directly to the project area; and
- xvi. Contractor has to obtain approval of SC on indigenous species for re-vegetation of embankment to avoid invasive species and protect the forest area's highly valuable and unique nature especially trees, bushes and general vegetation cover.

To summarize, the good practices in environmental management demonstrated in this case study are: strict compliance with country rules and regulations and ADB Safeguards Policy, close coordination among focal persons and units responsible for implementing and monitoring environmental measures as well as with other concerned institutions in the country to address environmental issues and thus minimize delays, frequent site monitoring and preparation of monitoring reports, careful execution of construction activities, occupational health and safety, and giving importance to affected people and communities by undertaking measures to minimize disturbance or disruption in their daily activities.

### **Lessons Learned and Recommendations**

The main lessons learned and recommendations for improvement on environment management are:

- i. The development of two different SSEMPs: (a) general plan covering construction; and (b) specific plan for the project area avoided delays in construction. No works should be done in sensitive areas until the SSEMP is approved.
- ii. Start activities involving processing of documentary requirements as early as possible. Bureaucracy and lack of coordination between different governmental organizations could result in longer processing time.
- iii. Development of additional actions out of the project frame, e.g., fencing of the whole forest line, isolation of the forest in order to support restoration of wildlife, can be undertaken.
- iv. Positive impacts of the project to the area are significant if development projects are planned and managed properly and give importance to caring for nature and improving service to the local people, and reducing the chances of influence to affect the project.
- v. Partnership with experts (individuals, NGOs) for regular monitoring of the project area is recommended in order to have a broad-based assessment of impacts of the project during construction and operations on the flora and fauna and general ecosystem

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## Case Study 17

### **GEO: Improving ADB Projects' Environmental Safeguards Performance through Increased Involvement of Safeguards Unit in Project Implementation Processes at the Municipal Development Fund Municipal Development Fund, Georgia**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Grievance redress mechanism

#### Introduction

Upgrading and improvement of local transport and transport-related infrastructure plays a significant role in the development of infrastructure in Georgia. In line with this, several projects are being implemented in different municipalities of Georgia to have an efficient, reliable and affordable urban infrastructure and service improvement in the transport sector. In particular, the Anaklia Coastal Improvement Subproject is undertaking shoreline rehabilitation and restoration of the full profile of beaches to possible limits to stop the intense and permanent washing-out of the beach. Anaklia is a small seaside town resort where the Enguri River flows into the Black Sea and is envisioned to become a tourism center in western Georgia in the Samegrelo-Zemo Svaneti region. The best-designed hydrotechnical structures spanning 4 km along the coastline has been considered to protect the beaches from further erosion involving the construction of underwater breakwaters that will encompass Enguri and Tikori River mouths, artificial nourishment, and river revetment. The project design will create a new and attractive tourist destination on the Black Sea Coast envisaged to spur development in Zugdidi City, and Ganmukhuri and Anaklia resort towns.

The subproject is financed by ADB Loan 2655-GEO: MFF-Sustainable Urban Transport Investment Program (SUTIP) Tranche 1 approved in July 2010. The project is classified as Category B for environment and is not expected to have significant irreversible or permanent negative environmental impacts during or after construction and requires an IEE. The Municipal Development Fund (MDF) of Georgia is the executing agency (EA).

#### Main Environmental Issues Associated with the Project

Notwithstanding the numerous positive benefits from rehabilitation, improvement and expansion project on the beach of Anaklia, primarily on protecting land and infrastructure from erosion and damage and secondarily the significant socioeconomic returns from tourism industry and to the local population, the implementation of the subproject may also induce certain negative impacts as project activities physically interacts with the environment during construction and operation phases. Coast protection measures need to be taken to protect the unique place and landscape.

The main environmental issues and concerns associated with the implementation of the project are: (i) nuisance during construction to include dust, noise, and emissions, (ii) disturbance of seawater and loss of aquatic benthic biota, (iii) seawater and groundwater pollution, (iv) increased suspended sediment in streams, (v) impact on terrestrial ecology, (vi) noise pollution

from project vehicle operation in populated areas and other transport-related impacts, (vii) labor safety, (viii) construction-related impacts at quarrying sites, (ix) accumulation of hazardous and construction waste, and (x) poor sanitation and solid waste disposal in construction camps and worksites.

### **Environmental Management Plan**

Environmental protection and monitoring measures developed and reflected in IEE, EMP and SSEMP documents include details of how the measures will be carried out and monitored. Generally, the identified actions to ensure environmentally sound implementation of the project are on avoidance and/or mitigation of adverse effects. Specific measures are: (i) implementation of construction activities only during dry weather, (ii) locating the construction machinery and other equipment at a distance of at least 50 m from surface water bodies where possible, and if impossible permanent control and safety measures will be taken to avoid water pollution; (iii) prohibition of washing of vehicles and other machinery near surface water bodies; (iv) collection of waste generated during construction works and providing storage facilities at designated places, (v) driving of project vehicles at optimal speed; (vi) watering of non-asphalt ground or bare ground surfaces once every four hours on work days and during dry or windy weather; (vii) fueling and preventive maintenance of project vehicles and equipment will be undertaken in designated areas only; (viii) provision of and conduct preventive maintenance of PPEs; (ix) directly ensure compliance with meeting labor safety requirements, and (x) conduct of regular site inspections.

The Contractor who developed the SSEMP is directly responsible for its proper implementation. The Contractor has been supported by the Supervision Consultant (SC), and MDF and ADB environment specialists (ESs) in SSEMP preparation. The Contractor is also obligated to follow EMP/SSEMP good construction practices during construction activities. In case of deviations from the EMP and SSEMP, corrective actions and mitigation measures are to be applied. Meanwhile, the MDF is responsible for overall environmental management in projects as well as for the general implementation of all safeguards tasks and for guaranteeing that mitigation measures provided in the EIA or IEE are implemented. The MDF also ensures the availability of all environmental information and facilitates environmental supervision of the projects.

### **Good Practices in Environmental Management Plan Implementation**

Site supervision and inspections, as well as monitoring of compliance of construction activities are important aspects of proper implementation of EMP/SSEMP requirements. The Contractor has one ES on site that is responsible for supervising all environmental issues during project implementation and conducts daily environmental monitoring and reporting. The Contractor is responsible for preparing monthly progress reports on SSEMP implementation, discrepancies from the SSEMP and list of all HSE relevant incidents and accidents that occurred during the implementation. These reports are submitted to MDF quarterly.

The SC local and international ESs supervise the Contractors in implementing the SSEMPs through periodic site inspections and follow-up on non-compliances/areas of concern, review of Contractor deliverables and environmental monitoring results, and checking of documentation

such as the grievance register. The status of implementation and outcome of monitoring are reported to ADB regularly through biannual environmental monitoring reports (EMRs).

All environmental issues arising from construction activities are immediately brought to the attention of MDF's environmental safeguards unit by the ESs of the Contractor and Supervision Companies in order to coordinate efforts and ensure immediate mitigation of impacts, protect the environment and safeguard the health and welfare of local communities.

Prior to April 2014, there was no separate unit responsible for the management of environmental and social safeguards issues in the project. An ADB Environmental Safeguards Review Mission was conducted at MDF and after the site monitoring visit the Anaklia Coastal Improvement Subproject was assessed as 'partly compliant' with respect to ADB environmental safeguards requirements. The assessment is based on the following observations of the Mission: (i) the IEE report was not available in the project files and not known to the SC and Contractor, (ii) absence of monitoring records at the site, (iii) the SC international ES has not been mobilized since the project started, (iv) the SC national ESs and Contractor need improvement and training on safeguards requirements, (v) the SSEMP has not been reviewed and endorsed by the SC, (vi) GRM and complaint logbook has not been established; (vii) PPE were not provided by the Contractor to the workers, (viii) activities which could produce noise and dust should not be allowed at the campsite when the summer camp is in use, and (ix) monitoring should be conducted by the SC and include the results in the biannual EMR for January to June 2014 for submission by MDF before end July 2014.

MDF started to pay sizeable attention to pending issues after the ADB Environmental Review Mission and undertook deep institutional reform where the Environmental and Resettlement Unit (ERU) in MDF was created in October 2014. ERU is responsible for ensuring that environmental and social safeguards issues are addressed. ERU positions have been increased from 6 to 9 and currently consist of: a Head of Unit, three environmental safeguards specialists, one safety specialist, one social safeguards specialist, two resettlement specialists, and one ADB individual consultant on resettlement issues. MDF also designated the ES to supervise ADB projects which entailed the review of environmental documents of the project, supervision of performance based on the approved environmental documents of the project and environmental standards in accordance with ADB SPS 2009 and Georgian Laws, and occasional site visits. Specifically, MDF ES was assigned to oversee the implementation of corrective measures to address the existing problems identified by the Mission. Immediate actions taken by MDF ES include: (i) issuance of notifications to the SC to improve its supervision activities, and (ii) conduct of site visits to check environmental compliance of construction works and effectiveness of supervisory company's activities, and (iii) reporting on a weekly basis in May-June 2014. Construction works were resumed in accordance with the action plan developed jointly with ADB during the mission to ensure the implementation of corrective measures. The SC also mobilized the international ES for the project site who conducted training on the validation of monitoring plan and improvement of safeguards files and GRM system. The SC Engineer also reviewed and endorsed the SSEMP. The national ESs of both SC and Contractor have been replaced by new staff, which were trained by the international ES. The Contractor

has also provided PPE to his employees including masks to avoid dust and has set up the GRM and complaint logbook.

The increased involvement of the MDF environmental team in project implementation processes has significantly improved the environmental safeguards performance of Anaklia Coastal Improvement subproject. MDF top management has also carried out further enhancement and strengthening of its environmental and social safeguards team through the establishment of a separate unit in MDF responsible for handling environmental and social issues in all of its projects financed by ADB, WB, EBRD, EIB and other donors. The increased involvement of the Safeguards Unit in project implementation processes has caused considerable improvement in ADB projects' environmental safeguards performance.

In retrospect, the EA's clear understanding of the significance of its responsibilities and the need for an oversight in environmental management in project implementation is critical in ensuring avoidance or prevention of environmental impacts. Only then will the other elements required in implementing environmental management fall into place, e.g., undertaking change in EA institutional structure with the corresponding qualified manpower complement, serious supervision of activities and performance of SC and Contractor in complying with the planned mitigation measures.

### **Lessons Learned and Recommendations**

The establishment of a separate unit in MDF for environmental and social issues was a step towards better management of environment and safeguards issues which significantly contributed to improving environmental performance of ADB projects in the MDF. Based on lessons learned, MDF has made the following recommendations:

- i. To improve environmental performance of ADB projects, regular monitoring and supervision should be carried out by all parties involved in project implementation process especially the MDF environmental staff.
- ii. All necessary environmental documentation should be kept and maintained in the respective project sites as required since these facilitate better implementation of environmental requirements.
- iii. International consultants play a significant role in improving environmental performance of projects and should therefore be mobilized and be actively involved in EMP/SSEMP activities at the project site.
- iv. GRM is necessary and should be established for all projects.
- v. A separate unit to be responsible for overseeing the implementation of measures to address environmental and social issues should be created.

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## Case Study 18

### **GEO: Good Practice in Wetland Protection, Borrow Pits Restoration and Slope Stabilization**

#### **Roads Department**

Ministry of Regional Development and Infrastructure (**MoRDI**)

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Institutional arrangement for environmental management; Environmental good practices – borrow pit management, and slopes and cuts stabilization; Environmental capacity development and training; Natural habitats, biodiversity, and protected area management

## Introduction

The Roads Department (RD) of the Ministry of Regional Development and Infrastructure (MoRDI) is executing the Adjara Bypass Project which forms part of the main road corridor of East-West Highway between Azerbaijan and Georgia considered to be an important trade and tourism road in Georgia because it connects the Black Sea ports of Batumi and Poti and tourist beaches in Kobuleti. Specifically, this case study will deal with Kobuleti Bypass section (subproject) of the Project located along the Poti – Batumi – Sarpi road on the west of the Black Sea coast in Georgia. Kobuleti Bypass Subproject has a total road length of around 32 km, mostly two-lane with a number of bridges, culverts, retaining walls, and tunnels. The subproject entails new road alignment and has been packaged into two contracts to facilitate preparation of detailed designs and implementation as follows: Contract 1 from Km0 - Km12.4 bypassing Kobuleti Town is nearing completion of construction works, and Contract 2 from Km12.4 - Km31.3 bypassing Kobuleti Town is at full scale of civil works.

Kobuleti Bypass Subproject is financed by ADB MFF-Road Corridor Investment Program (RCIP) through Loans 2560- and Loan 2843-GEO: Road Corridor Investment Program Project 1 and Tranche 3 (Additional Financing) approved in October 2009 and December 2011, respectively. The subproject is classified as Category A for environmental for which an EIA has been processed.

## Main Environmental Issues Associated with the Project

The subproject area is generally characterized by pastureland with cornfields, rolling lands, and wetlands. The first 16 km and the last 4 km of road alignments traverse flat terrains of coastal plain with elevations ranging from 0 to 30 m. The rest of the road runs through rolling and hilly terrain with elevations ranging from 20 m to 192 m. The area also traverses four major rivers, five smaller rivers, and 16 streams<sup>4</sup> and falls within the classification of seaside humid subtropical climatic zone. Moreover, the construction site is about 350 m from the protected area Ispani mire which is a RAMSAR wetland site (RAMSAR Convention No. 894)<sup>5</sup> with an area

<sup>4</sup>The major rivers are Natanebi, Choloki, Kintrishi, and Chakvistiskali and smaller rivers are Ochkhamuri, Achkva, Kinkishi, Dehkva, and Korolistiskali.

<sup>5</sup>The Convention on Wetlands or Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. in <http://www.ramsar.org/>

of 770 ha and contains the (i) Kobuleti State Nature Reserve - Ispani II with 331.3 ha on the north and (ii) Kobuleti Managed Reserve - Ispani I with 438.8 ha on the southwest. The Contractor is aware of this site and special attention is paid to avoid any direct impacts to this protected areas. In addition, the area has 55 species of mammals including bats considered as vulnerable terrestrial mammal and is one of the important sites for Western Palaearctic birds' migration.<sup>6</sup> Out of 54 species of reptiles recorded in Georgia, about 16 species can be found along the subproject alignment while 10 of the 12 species of amphibians that thrive in Georgia exist in the area. On fisheries, there are 47 freshwater *anadromous* fish species in addition to the endemic Black Sea salmon (*Salmolabrax*).

Taking into account the topography and rich ecosystem and associated environmental risks in the subproject, the key issue is the development of satisfactory mitigation measures which can be implemented during construction /project operations to avoid negative impacts.

### **Environmental Management Plan**

The Construction Contractor<sup>7</sup> was required to prepare the updated EMP as well as provide information on environmental monitoring and other relevant information prior to commencing construction activities. The Contractor was supported by the environment specialists (ESs) of the Supervision Consultant (SC)<sup>8</sup> and RD-MoRDI on the EMP updating.

The Updated EMP includes a wide variety of mitigation measures and grouped as follows: (i) general mitigation measures which include (a) practice of good housekeeping encompassing arrangement, regular cleaning and disposal of waste from campsites; covering of drums containing waste oils to prevent accumulation of rainwater and subsequent spillage into the soil, and provision for storage on a concrete pad; cleaning of oil spills in the campsite; and cleaning drains in and around the campsite on a monthly basis to avoid stagnation of water, etc.; and (b) obligating workers to use PPE; and (ii) specific mitigation measures such as (a) re-cultivation of quarries allowed for operation under governmental orders; (b) implementing slope strengthening and stabilization at embankments and in cuts; (c) proper removal and storage of top-soil; and (d) posting of safety signs onsite, etc.

Environmental monitoring is overseen by RD-MoRDI through the Resettlement and Environmental Protection Unit which reviews the EIAs and EMPs, and monitors the compliance of Contractor with the updated EMP implementation, EIAs, environmental standards and other environmental commitments. The SC international ES conducts seminars onsite for Contractor's staff for more efficient and effective implementation of mitigation measures and is considered a major contribution in EMP implementation.<sup>9</sup>

### **Good Practices in Environmental Management Plan Implementation**

To improve compliance monitoring on site, the Contractor has assigned a Director for Environmental, Health and Safety who is responsible for environmental compliance. To ensure

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<sup>6</sup> These include eagle, vulture, falcon, and owl; other fowl species are duck, crane, grebe, pelican, etc.

<sup>7</sup> Sinohydro Company, China.

<sup>8</sup> DOHWA Engineering Co., Ltd., South Korea.

<sup>9</sup> DOHWA International ES has conducted two HSE seminars.

efficient monitoring activity at all times, the Contractor was required to come up with an SSEMP as guide for self-monitoring of environmental aspects of construction. The SC Engineer is responsible for environmental monitoring in the field and any environmental issues arising from construction activities are immediately brought to the attention of the SC team who will coordinate efforts to immediately mitigate impacts guided by the framework for overall construction management and supervision.

During project operations, poor management of project, reporting delay and unsatisfactory quality of the works were observed which prompted RD-MoRDI to request SC to hire an international ES and two domestic environmentalists. The SC international ES was mobilized on an intermittent basis to undertake field audit and prepare necessary periodic environmental reports for submission to RD-MORDI and ADB. It has also conducted spot surveys and assessments of environmental situations and conditions at the site to ascertain the compliance of the Contractor with EIA and EMP. Variances from the established baseline environmental parameters were noted and brought to the attention of the Contractor for corrective measures. Whenever necessary, certain modifications on the work program are recommended to assure compliance on the part of the Contractor.

Good practices in this subproject involved the mitigation of three environmental issues. First, protection of wetland area of Ispani mire was upheld to remain faithful to the Ramsar Convention. Instead of proceeding with the original road design which was too close to the protected area, a special research was carried out by the SC on particular routes, areas and periods of bird migration to determine optimal distance of the project that will ensure that Ispani mire will remain undisturbed. As a result, the optimal distance of the highway from the wetland areas was defined and the route was moved away by 2 km. Second, the restoration plan for borrow pits was developed which was not required under Georgian national legislation but was a requirement under ADB Safeguards Policy to preserve pastures and ecosystem. The construction works required 1 million m<sup>3</sup> of gravel and was sourced from four borrow pits located within the river valley. Each pit was divided into four parts and after extraction of gravel engineering drainage design was developed in each part which prevented the pastures from being converted to wetlands, reduced the risks of bogging and preserved the ecosystem. At present, the restored borrow pits are used as pastures. And third, stabilization of slopes and cuts have been undertaken on Section km12.4 - km31.3 of Kobuleti bypass road to prevent further soil erosion from the slopes of embankment and cuts along the highway caused by heavy rains. Planting of local species was implemented and stabilization works using accumulated top soil was only carried out after 3 weeks to allow the development of root system on the grasslands.

The use of informed alternative project design, planning on the implementation of appropriate engineering designs to preserve the ecosystem and environments are major achievements in implementing environmental measures in the Kobuleti Bypass subproject. In addition, providing the necessary institutional and technical support and arrangements helped in mitigating poor management and monitoring of the measures.

## Lessons Learned and Recommendations

The main lessons learned in implementing environmental measures include:

- i. creation of a separate environmental protection unit in the Resettlement and Environmental Protection Division of RD-MoRDI is important in carrying out oversight functions on the implementation and monitoring of environmental measures in the project;
- ii. increase in staff complement with expertise on environment in the environmental protection unit is necessary to effectively and efficiently undertake EMP/SSEMP implementation;
- iii. International ES hired by RD-MoRDI for SC has conducted capacity development that are useful for Contractor staff as well as for RD-MoRDI and SC; and
- iv. the Director for Environmental, Health and Safety assigned by the Contractor to be responsible for environmental compliance in the project was necessary.

The following are RD-MoRDI specific recommendations to further improve the implementation of environmental measures:

- i. International Conventions should be carefully studied besides national laws to avoid further problems;
- ii. specific features of existing protected areas that will be affected by projects should be considered in the project design and accompanying environmental documents;
- iii. borrow pit restoration plan on sustainable use of gravel should be developed describing relevant methodology in order to effectively restore the area after gravel extraction; and
- iv. to ensure effective stabilization of the slopes, local topsoil and seeds of local species should be used instead of foreign hydro seeds which may not adapt to local climatic and environmental conditions.

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## Case Study 19

### **KAZ: Good Practice in Environmental Arrangement and Management of an Associated Facility** **Committee for Roads** **Ministry of Investments and Development**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Environmental arrangement and management of an associated facility; Environmental auditing; Natural habitats, biodiversity and protected area management

## Introduction

Kazakhstan is also currently undertaking further development of its transport sector within the scope of MFF-CAREC Corridor 2 – Tranches 1 and 2 through the rehabilitation of roads in Mangystau Oblast Sections. It consists of two reconstruction projects: (i) Project 1 covers 200 km road sections between Shetpe and Beineu located in km 372.6-514.3 and km 574-632.3 and (ii) Project 2 has 3 components - 86.7 km road section between Shetpe and Zhetybay, 83 km road between Zhetybay and Aktau, and 73 km on Zhetybay-Zhanaozen road.

Financing of Project 1 was provided by Loan 2728-KAZ: Central Asia Regional Economic Cooperation Corridor 2 (Mangystau Oblast Sections) Investment Program - Tranche 1 approved in December 2010 and was classified as Category B for environment. The Construction SC of Project 1 is DOHWA (South Korea) and the Contractor is Alsim Alarko (Turkey). Project 1 was completed in December 2014. Project 2 is supported by Loan 2967-KAZ: Central Asia Regional Economic Cooperation Corridor 2 (Mangystau Oblast Section) Investment Program - Tranche 2 approved in December 2012. Additional funding from Tranche 1 savings is planned for the 73 km Zhetibay-Zhanaozen road, for which project preparation is ongoing. The implementation of Project 2 is managed by the Committee for Roads (CoR) in Astana and PMC in Astana/Aktau. Safeguards are managed by PMC in Astana/Aktau, regional branch of National Road Operator JSC “Kaz Avto Zhol” in Aktau, and the Consultant SC SMEC (Australia) on site. The Contractor is CengizInsaat (Turkey). CoR is the executing agency (EA).

## Main Environmental Issues Associated with the Project

An IEE report was prepared and the EMP was developed at project preparation stage for Project 1. Contractor Alsim Alarko developed the SSEMP for managing the environment on site and identified project-associated environmental issues typical for road construction.<sup>10</sup> In relation to Project 1 design, a 60 km long road section of Shetpe-Beineu km 514.3 to km 574 was omitted from financing under Tranche 1 because this is where the Government planned to establish the Regional Natural Park “Kyzylsai”<sup>11</sup> and the IEE report for Project 1 explains that Kyzylsai road section will be financed under Tranche 2. But for some reasons, the Government

<sup>10</sup> These include (i) construction noise, (ii) dust, (iii) vegetation removal, (iv) risks of erosion, (v) oil spills, (vi) alteration and contamination of water bodies, (vii) generation of wastes, (viii) improper location of facilities and material storage, (ix) emissions from equipment, (x) borrow pits, (xi) archaeological finds, and (xii) disturbance to wildlife.

<sup>11</sup> Kyzylsai Regional Natural Park was established in 2012 by Resolution No. 136 dated 22 June 2012 issued by Akim Office of Mangystau region.

decided to finance the construction of Kyzylsai section from State Budget resulting in its exclusion from Tranche 2 financing scope. The construction works on this section started in 2014.

The natural park has an area of 68.4 thousand ha with protected zone area of 47.5 thousand ha. The protected zone has high biodiversity and tourism value. Endangered species and valuable sites found in the area consists of: (i) 11 plant species listed in the Red Book of the Republic of Kazakhstan and Mangystau region<sup>12</sup>; (ii) 16 wildlife listed in the Red Book of the Republic of Kazakhstan<sup>13</sup>; (iii) landscapes of Tuzbair mountains, steep slope and vast panorama of snow-white ledges and Tuzbairsor; and (iv) numerous archaeological sites.<sup>14</sup>

According to ADB Good Practice Sourcebook on Environmental Safeguards, the Project has considered Kyzylsai road section as an associated facility, i.e., facilities that are not funded as part of a project but whose viability and existence depend exclusively on the project, or whose goods or services are essential for the successful operation of the project.<sup>15</sup> The EIA for Project 2 which was developed in January 2013 required a comprehensive biodiversity survey of baseline parameters for Kyzylsai Regional Natural Park before any construction could commence. The cost of survey was included in Tranche 2 budget but the survey never took place. To comply with ADB safeguards requirements, an environmental audit of the subject section was undertaken in September-November 2014 by Kazecoproject a licensed company engaged by the EA. The environmental audit revealed that there was no adequate EMP in place resulting in multiple violations on (i) air protection from dust, emissions, asphalt plant, and transport of soil from the pit; (ii) water environment particularly on absence of contracts on water supply and wastewater disposal, (iii) soil and vegetation cover with the absence of land remediation, portable toilets, and containers for collection of solid domestic and industrial waste, and unauthorized disposal of solid domestic and industrial waste; (iv) wildlife protection with the absence of informative and warning signs; (v) non-use of PPE for noise impact, (vi) waste production and management where no contracts on removal, disposal and utilization of solid domestic waste and industrial waste are enforced, and no containers provided for collection of solid domestic and industrial wastes in camps; and (vii) absence of an integrated environmental monitoring system. The Contractor for this road section is local company LLP Niyaz-Muhammed.

## Environmental Management Plan

The Environmental Audit proposed a list of mitigation measures which are mandatory for implementation by the Contractor under strict supervision of the CoR. Several mitigation

<sup>12</sup> Endangered plant species are *Nitrariaschoberi*, *Salsolaarbusculiformis*, *Salsolachiwensis*, *Haloxylonaphyllum*, *Haloxylonpersicum*, *Malacocarpuscrithmifolius*, *Onosmastaminea*, *Astragalusustiurtensis*, *Tulipaborszczowii*, *Zygophyllumturcomanicum*, and *Crambeedentula*.

<sup>13</sup> Wildlife in the protected zone are four-lined snake, steppe eagle, imperial eagle, golden eagle, vulture, saker falcon, Mac-Queen's bustard, black-bellied sandgrouse, eagle owl, white-bellied long-eared bat, *Vormelaperegusna*, dune cat, manul cat, caracal, goitered gazelle, and moufflon.

<sup>14</sup> Archaeological sites include Stone Age workshops, caravansarai ruins and burial sites of 14<sup>th</sup> century in Manat ascent area, arans - corrals in Manat ascent and Tuzbair area, family crypt remains of the early iron age on the west side of Kyzylsai.

<sup>15</sup> ADB. 2012. *Environment Safeguards: A Good Practice Sourcebook, Draft Working Document*. Manila.

measures were identified for each violation: (i) air protection - measure air pollutant emissions from coating plant and establish maximum permissible emission (MPE) standard, prohibit operation of coating plant until treatment facilities are installed, dust control of roadway surfacing by bitumen emulsion in accordance with design solutions, provide tents to vehicles transporting soil from pits; (ii) water environment – conclude contracts for potable water supply and removal of wastewater; (iii) soil and vegetation cover – develop land remediation program, installation of portable toilets in field construction camps and on sites along the road, put containers for collection of solid domestic and industrial waste in field construction camps, removal of unauthorized domestic and industrial waste disposal on sites, and conclude contracts for removal, disposal and utilization of solid domestic and industrial waste; (iv) wildlife protection – posting warning signs for drivers to see on all crossings used by animals and speed regulating signs before Manat ascent and before descent from the plateau, warning devices (reflectors, signals) to deter animals by reflecting approaching vehicles during nighttime, and setting out fodder plants (fodder grass seeds endemic for the territory) in areas of installed crossing points for wildlife use; (v) noise impact - posting signs in areas where construction equipment with noise level above 80 dBA is operating; (vi) waste production and management - conclude contracts for removal, disposal and utilization of solid domestic and industrial waste and provide containers for their disposal in field construction camps; and (vii) integrated monitoring system - establish environmental control service, and develop and implement a program for industrial environmental control (PIEC).

### **Good Practices in Environmental Management Plan Implementation**

The initiative taken to assess and eventually consider and declare Kyzylsai road section as an associated facility of the corridor project following ADB Sourcebook on Environmental Safeguards is well recognized. In addition, the environmental audit conducted in place of the biodiversity survey of the road section significantly facilitated the collection of information on the required environmental management and disclosure of the many violations being committed by Contractor “Niyaz-Mukhammed” not only in terms of compliance with ADB requirements but also with the national environmental legislation.

### **Lessons Learned and Recommendations**

The environmental audit significantly helped in assessing the compliance of a corridor project with environmental management in relation to an associated facility. It also identified the necessary mitigation measures to address serious violations committed by the contractor and clarified the institutional arrangement for strict supervision of the contractor in implementing the measures. The mitigation measures will reduce project footprint and, ultimately, reduce disturbance to wildlife that is protected by law. After project completion, CoR plans to implement a nationwide tree planting program along the main road corridors including CAREC 2.

For many projects it is often hard to avoid impacts on environment but there is always an optimum way towards pursuing development while at the same time ensuring the promotion and protection of nature and the environment. Agencies responsible for managing projects should have a way of thinking that allows good understanding of how violations on basic environmental

management tasks can have radical consequences and the best way to address these is to develop a comprehensive EMP which will be seriously implemented on site.

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## Case Study 20

### **KAZ: Resolving Unanticipated Environmental Issue on Illegal Dumpsite in a Project Area** **Committee for Roads** **Ministry of Investments and Development**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Addressing unanticipated environmental issue; Frequent ADB Safeguard Review Mission

## Introduction

Taraz City bypass road construction project in Kazakhstan is part of the 2,787 km long Central Asia Regional Economic Cooperation (CAREC) Corridor 1 Investment Program. The Project is located in Zhambyl Oblast and involves the rehabilitation of the old bypass and reconstruction of a new 65 km bypass in Taraz City. The project is classified as Category A for environment.

The financing of the project through ADB Loan 2824-KAZ: Central Asia Regional Economic Cooperation Corridor 1 (Taraz Bypass) Project was approved in December 2011. The Ministry of Investments and Development (formerly Ministry of Transport and Communications) is the executing agency (EA). The Project is managed by the Committee for Roads (CoR) in Astana while the aspect of safeguards is managed by the Project Management Consultant (PMC) SAI Consulting Engineers Pvt. in Astana, Regional Branch of National Road Operator JSC “Kaz Avto Zhol” in Taraz City, and the Construction Supervision Consultant (SC) KOCKS (Germany) at project site. The Contractor is KCC (Korea).

## Main Environmental Issues Associated with the Project

The full EIA and preliminary EMP were developed at project preparation stage. Contractor KCC developed the SSEMP for managing the environment on site. Project-associated environmental issues considered in the EMP are those typical for road construction, i.e., (i) construction noise, (ii) dust, (iii) topsoil and vegetation removal, (iv) risks of erosion, (v) spills, (vi) alteration and contamination of water bodies, (vii) generation of wastes, (viii) improper location of facilities and material storage, (ix) emissions from equipment, (x) diversion roads, (xi) borrow pits, (xii) archaeological and cultural finds, and (xiii) disturbance of wildlife.

However, shortly after the mobilization of the Contractor, it was discovered that the road alignment passes through a municipal solid waste dumpsite at km 11 of the project which was not described in the EIA and therefore was not considered in the project design. The issue was raised as an unexpected environmental issue and was taken into special consideration by ADB, CoR, PMC, and the Construction SC.

The municipal dumpsite was designed for household wastes in 1976 during the Soviet Union. As of 2012, it was servicing 17 rural counties of Baizak *rayon* with total population of 84.7 thousand people. The dumpsite is an authorized area for landfill and privately owned by LLP Aldi iKo, but the plot size has expanded to 14 ha from the official 3 ha due to encroachment thereby reducing the distance from the project alignment to 350 m. The owner of the dumpsite claimed it was due to illegal dumping by local residents that caused the encroachment and refused to take any responsibility. Wastes are disposed of by open combustion and covering

with isolating layer of soil. The works conducted on the dumpsite include: unloading, leveling and compaction of municipal solid wastes; combustion of solid wastes; filling and leveling of isolating layer of soil.

### **Environmental Management Plan**

Contractor KCC developed the EMP to address the impacts identified in the EIA. The EMP specifies regular monitoring at approved locations by Construction SC for (i) noise and vibration, (ii) water quality, (iii) air quality, and (iv) flora and fauna. The EMP also provides for environmental management measures for the following sites: (i) on quarries and borrow areas – monitoring of quarry areas for any potential local contamination to the ground and/or surface water, such as oil spills, solid and liquid waste discharges and related worker's safety impacts, (ii) on bridge and interchange sites – monitoring of works on bridges across Talas and Asa Rivers for potential water contamination; and ground contamination, and safety of workers, pedestrians and motorists at interchange bridges, (iii) in Contractor's camp / Subcontractors' temporary camps – proper management of campsites, waste and wastewater, fire safety, and disturbance to flora and fauna, and (iv) on concrete plant, crusher plant, asphalt plant – frequent monitoring of air, noise, petroleum and chemical spills, solid waste and workers' safety. The Construction SC has approved the EMP in October 2013 with possibility of adjustment, if necessary.

The EMP was subsequently updated to incorporate provisions for management of the area near the dumpsite which include: (i) addition of monitoring point for air quality at km 11 where the dumpsite is located; (ii) monitoring the condition of the land adjacent to the road and maintaining it clean from wastes; and (iii) laying of top soil on the cleared area to reinstate soil with natural vegetation.

### **Good Practices in Environmental Management Plan Implementation**

The resolution of the issue on project road alignment traversing an expanded dumpsite illustrates good practice on coordination efforts of key players and stakeholders on environmental safeguards management. Based on site inspections, Construction SC International environmental specialist (ES) prepared a separate report for assessment of the dumpsite issue and proposed several options to address the problem as follows: (i) relocating the dumpsite to another place and completely clearing the area; (ii) organizing an official waste landfill with monitoring points for air quality; and (iii) clearing the area up to the edge of the official dumpsite and maintain the area clean.

After reviewing all possible options, their implications and feasibility, and conducting multiple consultations and discussions with the local authorities, dumpsite owner, PMC, Construction SC and Contractor, an agreement was reached that the Contractor and local *akimat* will clear the wastes in the area adjacent to the road and execute landscaping works and restore the area to be aesthetically pleasant and safe in terms of environment and traffic safety. Contractor KCC together with local authorities provided the equipment and cleared the wastes up to 350 m from the road towards the official dumpsite and leveled the area. These works were organized at no cost to the project. After the ADB Review Mission in June 2014, the issue was considered

resolved. Construction SC KOCKS has included a separate appendix dedicated to this issue in the Biannual EMR for the period January-June 2014.

The dumpsite owner has taken responsibility of preventing illegal dumping by local communities on the area near the road and has organized a security point with 24/7 monitoring of the area. As of 2015, the area is kept clean and being monitored by the Contractor. There is no incidence of any established breach in air quality parameters while the CoR is already considering implementing a tree planting program along all national level roads including Taraz bypass section in the future.

The cooperation and coordination among stakeholders is important in promptly arriving at agreements in a manner acceptable to all to resolve unanticipated environmental issue affecting an ongoing project thereby preventing substantial delays in operations. ADB Safeguard Review Missions are wake up calls for project management, consultants and contractors on oversights in environmental management and implementation of mitigation measures.

### **Lessons Learned and Recommendations**

The main lesson learned in this case study is that projects can encounter environmental issues that can affect its operations. These are not captured in the EIA and EMP but need to be addressed in order for project operations to continue. Cooperation and coordinated efforts of all stakeholders is necessary to resolve the issue in a collegial and effective manner. In order to prevent such cases, it is recommended that project preparation stage be thorough and comprehensive especially over ROW and adjacent areas of project sites in order to accurately inform project design preparation and EIA. In this way, the encroaching dumpsite could have been considered in project design and EIA to allow for resources to cover dumpsite area clearing and prevented delays in project operations. In case an unanticipated environmental issue affects an ongoing operation, all stakeholders should work together to come up with the optimum solution and EIA and EMP should be updated to reflect this.

### **References**

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## Case Study 21

### **KAZ: Resolving Unexpected Project Impact on Irrigation through Grievance Redress Mechanism**

#### **Committee for Roads**

#### **Ministry of Investments and Development**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Grievance redress mechanism; Addressing unanticipated environmental impact

## Introduction

MFF-CAREC Transport Corridor 1 Investment Program Tranche 2 in Zhambyl Oblast is being implemented in Kazakhstan to reconstruct a 79 km road section of Km 310.5-389.4 and construct road maintenance facilities in four sites along the Corridor. The Project is categorized as Category A for environment and required a full EIA report.

Financing for the project is provided through ADB Loan 2562-KAZ: MFF-CAREC Transport Corridor I (Zhambyl Oblast Section) [Western Europe-Western People's Republic of China International Transit Corridor] Investment Program - Project 2 approved in October 2009. The executing agency (EA) is CoR under the Ministry of Investments and Development. The Project is managed by CoR in Astana, and safeguards are managed by PMC in Astana, regional branch of National Road Operator JSC "Kaz Avto Zhol" in Taraz City, with assistance of the Construction Supervision Consultant (SC) DOHWA (South Korea). The Contractor is Kazakhdorstroy (KDS) (Kazakhstan).

## Main Environmental Issues Associated with the Project

A full EIA has been conducted and the EMP was developed at project preparation stage. Contractor KDS has also developed the SSEMP for managing the environment on site. Project-associated environmental issues are those typical for road construction, i.e., (i) construction noise, (ii) dust, (iii) vegetation removal, (iv) risks of erosion, (v) oil spills, (vi) alteration and contamination of water bodies, (vii) generation of wastes, (viii) improper location of facilities and material storage, (ix) emissions from equipment, (x) borrow pits, (xi) archaeological finds, and (xii) disturbance of wildlife.

However, in October 2011, after the construction of road embankment and cement concrete pavement residents of Zhanaturmys village raised their problem on irrigation that has emerged. The landscape in the area generally allows water to naturally flow from the Tian Shan Mountains downhill in the northern direction and settle in the agricultural fields. According to the complaint, affected residents have observed that after construction of the new road 86 households were left without water for their crops as well as for household consumption including gardening. Prior to construction, the old road had a culvert at Km 383+784 which was connected to the irrigation tray system but this culvert was removed during construction and the new road design did not include a culvert at that location.

### **Environmental Management Plan**

Contractor KDS developed the EMP for impacts identified in the EIA which was subsequently approved by the Construction SC DOHWA with provision for adjustment if needed. The execution of works in compliance with the official design and approved EMP is ongoing.

### **Good Practices in Environmental Management Plan Implementation**

The complaints were subjected to the GRM that was successfully established under CAREC 1 Project and was recorded in the complaints database. Following the registration of the complaint, the GRM Committee consisting of the Community Liaison Group coordinator, representative from CoR, representatives of the Construction SC and the Contractor, and local authorities convened and met with affected people on January 17, 2012. During this meeting it was decided that the only option to resolve this issue is to construct a water well with pumping station to be connected to a dedicated power line which entailed the processing of project variation. The total cost of these works was estimated at \$131.7 thousand.

In February 2012, following the issuance of the Project Variation Order the Contractor commissioned the services of LLP “Girdogeologiya” specializing in the construction of water well and pumping station. Works were completed in June 2012 and the water well and pump system consisted of: (i) 180 m deep water well , (ii) pumping station, (iii) 200 m discharge pipe, (iv) 500 m power line, (v) transformer substation, and (vi) chemical and biological analysis of water. The village residents are grateful.

The operation of the GRM shows the effectiveness of the process and mechanism to resolve grievances of affected persons resulting from environmental impacts of project operation.

### **Lessons Learned and Recommendations**

This case shows how errors during project operation such as the removal of the culvert that was diverting water for irrigation and at design stage with the oversight on the existing irrigation infrastructure can have significant impacts on environment and the community where 86 households suffered from discontinuance of water supply. If the culvert was kept in the project design, there would have been no complaint and no additional project cost. More importantly there would be no burden to the affected people with respect to the assumption of operations and maintenance costs to include the cost of ground water use and electricity bills, and repair and replacement in case of water pump breakdown. The original design of the irrigation efficiently provided water to the households without cost and risk.

Therefore, it is recommended that high importance be given to thorough community consultation and detailed site visits and inspection during design stage in order to capture all technical and environmental requirements in the project design and prevent unexpected impacts.

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## Case Study 22

### **KGZ: Good Practice in Environmental Management Planning Ministry of Transport and Communications, Bishkek**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Environmental good practices – Borrow pit management; Natural habitats, biodiversity, and protected area management

#### Introduction

The 540 km Bishkek-Torugart road is part of CAREC Transport Corridor 1 linking the Kyrgyz Republic with other Central Asian countries, the People's Republic of China (PRC), and Russia and is undergoing improvement in road alignment from Km 479 up to PRC border at Km 539.

ADB is providing loan financing through Loan 2755-KGZ: CAREC Transport Corridor I (Bishkek-Torugart Road) Project 3 approved in June 2011 which became effective on 17 June 2014. The completion date is on 30 April 2020. The Ministry of Transport and Communications (MOTC) is the executing agency (EA) while the Investment Project Implementation Group (IPIG) is in charge of project administration being the PIU which administers all donor-funded projects at MOTC.

#### Main Environmental Issues Associated with the Project

Based on ADB SPS 2009 and Methodological Guidelines on Environmental Assessment the Project is classified as Category A. The road alignment from Km 479 up to Km 501 passes through mountain pastures and Kyrgyz border service infrastructure facilities. However, from Km 501 to the border control holding area at Km 531 the alignment passes through Karatal-Japyrak State Nature Reserve (KJSNR). KJSNR which covers Lake Chatyr-Kul is a recognized Ramsar site as a critical habitat for migratory species and is therefore considered an ecological asset causing KJSNR to be awarded the status of special protection. The Lake Chatyr-Kul area has been defined as nesting zone of rare/Red Book birds, stop-by station for rest and feeding of migratory birds during spring and autumn flights and habitat area of the Red Book mountain sheep.

The main concern is for the project not to result in degradation of the Chatyr-Kul Lake protected area. The main environmental issues are: (i) proximity of the project to the environmentally sensitive Chatyr-Kul Lake and thus requires the implementation of special environmental protection measures, and (ii) environmental impacts on the Lake of short- and long-term nature during construction and operation phases of the project.

In addition to the impacts on Chatyr-Kul Lake, other expected environmental impacts of the project as reported in the results of the EIA are: (i) noise and vibration from construction equipment; (ii) soil erosion and waste water discharge from work sites and construction camps; (iii) wastewater, waste lubricants, and minor fuel spills from construction and maintenance areas; (iv) dust from earthworks; (v) exhaust emissions from construction equipment; and (vi) construction spoils and other construction-related solid wastes.

## Environmental Management Plan

The project being a Category A for environment was required a full EIA which was prepared and endorsed to ADB by the Government in December 2009. The EIA report was subjected to improvement based on recommendations of ADB and a group of seven environmental experts from research institutions in Kyrgyz Republic to be fully compliant with ADB SPS 2009 particularly the sections on natural and critical habitats. IPIG of MOTC also developed the ToR for baseline studies on ornithology, zoology, flora, hydrobiology, soils, entomology and environmental monitoring in Chatyr-Kul Lake area.

The updated and approved EIA is the basis of the EMP prepared by the Contractor. EMP formulation considered the request to incorporate satisfactory measures for borrow pit management plan and capacity development for KJSNR with the overall objective of avoiding, mitigating, and minimizing both short- and long-term negative impacts to acceptable level and gain net environmental benefit. According to ADB SPS 2009, “*the project mitigation measures should be designed to achieve at least no net loss of biodiversity*”<sup>16</sup> which could be achieved by post-project restoration of habitats or ecological offset through the creation or effective conservation of ecologically comparable areas.

The Contractor was also fully responsible for preparing the SSEMP in coordination with the SC for submission to IPIG. The SSEMP oversight implementation is vested with IPIG which is supported by two safeguards specialists and since 2013 by an additional international environmental consultant. The IPIG has also designed the project’s grievance complaint mechanism so that any potential flaws in the course of SSEMP implementation are brought to the attention of the responsible parties for immediate corrective actions.

## Good Practices in Environmental Management Plan Implementation

The EMP design has been informed by several alternatives taking into consideration economic, financial, environmental, and social factors. It includes a two-track strategy for pollution source control and ecological receptors protection: (i) a comprehensive program for enhancing protection of the Chatyr-Kul Lake reserve ecology, and (ii) environmental public awareness in the area. It also has a two-track monitoring plan comprising of: (i) pollutant source control and monitoring with proactive mitigation of potential impacts from road construction and operations; and (ii) receptor protection for upgrading protected area facilities and management capacity, and restoration of sensitive habitats in the Chatyr-Kul ecosystem or an *in situ* biodiversity offset.<sup>17</sup>

Borrow pits in Km 501 to Km 532 in KJSNR are environmentally sensitive and are subject to the Borrow Pit Management Plan (BPMP) which is accompanied by a Borrow Pit Action Plan (BPAP) prepared by the Contractor. The BPAP has been endorsed by KJSNR authorities and is a guide used by a dedicated Borrow Pit Monitoring and Response Team (BPMRT) in borrow pit operations in KJSNR. The BPMRT consists of the Contractor, SC and KJSNR representative

<sup>16</sup>ADB Safeguard Policy Statement, 2009, Appendix 1, paragraph 27.

<sup>17</sup> In the context of biodiversity offsets, the term ‘*in situ*’ does not imply that the offset will be undertaken ‘on site’ within the area affected by the project, but rather that the conservation outcomes must be generated in natural conditions. in [http://www.forest-trends.org/documents/files/doc\\_3100.pdf](http://www.forest-trends.org/documents/files/doc_3100.pdf)

responsible for daily monitoring of each operating borrow pit and for responding to any environmentally-related incidents. BPMP is an appendix to the EIA for the project.

The development of an environmental monitoring system in the territory of KJSNR and the area of Lake Chatyr-Kul is the main focus of this case study on environmental management in the project. One of the requirements from the project is to provide a complete set of environmental monitoring equipment for water and air quality, and project vehicles to include car, trailer and boat. Additionally, the SC also conducts onsite hands-on training on monitoring and track record management for KJSNR designated staff to enable KJSNR to conduct its own ecological monitoring from 2016 construction season.

The identified good practices in environmental management in the project are (i) formulation of an informed EMP with a two-track strategy for pollution control and ecological protection and a monitoring system for this strategy, (ii) comprehensive borrow pit management plan providing proper guidance to borrow pit operators consistent with the EIA, and (iii) development of an environmental monitoring system where the project provides technical equipment and logistics support for monitoring purposes and capacity development to KJSNR for ecological monitoring.

### **Lessons Learned and Recommendations**

The two-track EMP remains valid and a variety of “no regrets” mitigation measures on spill prevention, countermeasures and heavy metals control are incorporated into the road design providing insurance against loss of biodiversity. There are few specialized suppliers of field monitoring equipment in Kyrgyz Republic and even fewer with experience in tendering under international procurement rules and this has caused extreme difficulties in obtaining compliant bids and procuring the necessary equipment for KJSNR. The involvement of the international expert in mitigating environmental issues has produced positive results in developing the capacity of local ESs in environmental monitoring and reporting according to ADB requirements and for KJSNR staff to undertake continuous monitoring activities even after project completion.

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All environmental safeguards management documents related to CAREC Corridor 1, Bishkek – Naryn-Torugart Project 3 are in <http://www.adb.org/projects/42399-023/documents>



## Case Study 23

### **PAK: Good Practice in Camp Site Management Environment Cell, National Highway Authority Islamabad Ministry of Communication, Government of Pakistan**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Institutional arrangement for environmental management; Preparation and implementation of site environmental management plans; Underfunding of environment management plans; Inclusion of environmental management plans in bidding documents, contracts, and bills of quantities

## Introduction

The National Highway Authority (NHA) has constructed a section of Faisalabad-Khanewal Motorway as part of ADB MFF - National Trade Corridor Highway Investment Program (NTCHIP) - Tranche 1. The NTCHIP will provide reliable, safe and throughway for transportation of goods between Central Asian and PRC from Karachi and Gwadar ports to uplift trade activities and in turn increase the economic growth rate of the country. Faisalabad-Khanewal Motorway which provides easy access to the residents of Faisalabad, Toba Tek Singh, Khanewal and Multan Districts and facilitates transportation towards Islamabad, Rawalpindi and Lahore is aimed at improving trade flows and lower transit costs and time by providing a high speed, safe and reliable access controlled motorway system. In particular, the completed section of the motorway is about 58.0 km in length consisting of a four-lane motorway from Faisalabad to Gojra, including a full depth asphalt pavement, bridges, flyovers, underpasses and interchanges.

The ROW of Faisalabad-Khanewal Motorway is 100 m wide and is 300 m at the locations where interchanges are to be constructed. Major construction works in the completed section have been generally confined within the ROW. Most of the land acquired in the ROW is agricultural.

ADB Loan 2400-PAK approved in Dec 2007 provided financing of \$10.3 billion for the construction of this motorway. NHA Islamabad was the executing agency (EA); M/S China International Water & Electric Corporation and M/S Renardet S.A. Geneva, Switzerland were Contractor and Supervision Consultant (SC), respectively. Construction activities commenced in February 2010 and ended in January 2015.

## Main Environmental Issues Associated with the Project

The key environmental and social issues associated with this project were generally on the impact of structures, materials and activities during both construction and operation phases on communities and persons and natural resources. Specifically, these included: (i) resettling of houses and commercial structures owned by residents and squatters who were operating within the proposed construction limit of the project corridor, (ii) appropriately locating temporary construction camps, asphalt plants, and waste disposal sites, and the environmental impact of operating these facilities, (iii) regulating the procurement of borrow material and topsoil erosion, (iv) avoiding obstruction of motorway drainage system, (v) enhancing and maintaining avenue

tree plantation along the entire length of the project corridor, (vi) minimizing impact on cultural sites or structures and community-owned assets, and (vii) ensuring pedestrian and traffic safety.

### **Environmental Management Plan**

Based on Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations 2000 Schedule II, Pakistan Environmental Protection Act 1997 and ADB Safeguards Policy the project was classified as requiring an EIA. The EIA study was made part of the design and feasibility study and outsourced to the National Engineering Services Pakistan (Pvt.) Limited (M/S NESPAK). The purpose of integrating the EIA in the design and feasibility study was to assess environmental impacts at very early stage and to design the project in an environmentally sound manner. M/S NESPAK prepared the comprehensive EIA Report listing various activities for design, construction and operation phases and assessing resultant positive and negative impacts. M/S NESPAK also prepared a comprehensive EMP describing various mitigation measures for probable impact and defining roles and responsibility of NHA, funding agency, SC, and Contractors.

After the peer review of EIA, NHA submitted the document to Punjab EPA and ADB for review and subsequent approval and issuance of environmental clearance. NHA also integrated the EMP in construction and supervision contracts of the project for effective implementation of EMP.

### **Good Practices in Environmental Management Plan Implementation**

This case study on Faisalabad-Gojra Section of the motorway illustrates a good example of environmental compliance achieved through joint and coherent efforts of ADB environment specialist (ES), the Environment Cell of NHA, and ESs of the SC and Contractor.

NHA as EA of national highways and road projects is primarily responsible for meeting environmental safeguards requirements of national and funding agencies. To take care of environmental safeguards, a focal person for the Project was designated from the Environment Cell which was formed within the Environment, Afforestation, Land and Social (EALS) Wing of NHA Headquarters. The ES/Engineer was also hired by the SC, as well as by Contractor as per contract. An independent consultant hired by ADB was responsible for environmental audit of the project.

The environmental management activities undertaken in the project included: (i) preparation of the SSEMP which was approved by ADB, (ii) adoption of GRM at site as specified in the EIA, (iii) environmental monitoring as stipulated in the EMP and SSEMP, (iv) regular environmental monitoring of construction site and contractor camps by ADB ES and focal person from the Environment Cell, (v) preparation of environmental monitoring reports which were submitted to ADB and NHA as specified in the EMP and were found to be useful as these served as basis for formulating and implementing corrective actions or plans, and (vi) independent environmental audit which reported that no major environmental noncompliance was observed.

Two site camps were approved by the Consultant (Renardet S.A) and NHA. Camp Site - I was located near Km 8+800 and Camp Site - II was near Gojra near Km 58+00. Asphalt plant 2 was located in Km 07+300 to Km 07+400 while Asphalt plant 1 was at Km 41+000. Asphalt plant 1

was working for Asphalt Base Course Plant Mix. Camp site and asphalt plant management were critical as the project passes through densely populated areas and fertile agriculture land. However, since it was first time for Pakistan to prepare and implement SSEMPs, huge efforts were made to mitigate all adverse impacts in every possible manner keeping in view the environmental conditions of the areas. Initially camp site conditions were pathetic with very poor housekeeping practices, unhygienic conditions, non-provision of PPE to workers, absence of fire extinguisher, first aid boxes, and clean drinking water, and no waste segregation and management. These prompted the ES of SC, focal person from NHA and ES of ADB to jointly persuade the Contractor to implement all the mitigation measures mentioned in SSEMP.

As a result, significant efforts have been done to safeguard the community and construction sites from the detrimental effects of construction. Specific activities carried out in the camp sites and asphalt plants were: (i) proper fencing of all sites, (ii) dust recycling for use in the operations of the asphalt plant as refill, (iii) provision of bag filters in the asphalt plant to capture dust; (iv) fitting of dust guard at junction of conveyor belts to reduce dust; (v) installation of septic tank at the sites; (vi) waste segregation was done before dumping into waste disposal area onsite; (vii) dumping of rejected asphalt into a pit covered with plastic; (viii) good housekeeping including the three-bin system; (ix) PPEs were provided to workers; (x) installation of fire extinguishers at designated locations; and (xi) provision of first aid tool boxes and clean drinking water to workers.

This case study has exhibited the importance of strong collaboration among donor agency, EA, consultants and contractor to ensure compliance with and implementation of environmental management measures in projects sites. The integration of EMP in contractor's contract prevents contractors from renegeing on obligations to implement SSEMPs. Regular monitoring by designated focal persons and conduct of external audit proved to be effective in identifying environmental impacts and in promptly implementing appropriate mitigation measures in the construction/camp sites.

### **Lessons Learned and Recommendations**

The following lessons learned from complying with environmental management in the construction of Faisalabad-Gojra Section of the motorway have been recognized:

- i. ES/Engineer's man-month defined in the contract were less compared to the construction period which caused a big issue on effective implementation of the EMP and preparation and timely submission of environment reports ;
- ii. contractor's bill and payment releases were not linked with any environmental management performance so the contractor did not seriously comply with environmental management;
- iii. environmental mitigation costs are not reflected in the bill of quantities (BOQ) so there is no adequate funds for implementing mitigation measures;
- iv. the contractor and project management did not share any information with the Environment Cell of NHA on the review and revision of work schedule and construction methods; and
- v. the responsibility of landscaping and tree plantation at completion of the project was not defined nor linked to the contractor.

Recommendations to further improve compliance with environmental management include:

- i. ES/Engineer's man month should be for the full length of construction period;
- ii. Contractor's IPC Clearance should be linked to the Environmental Clearance Certificate from the Environment Cell of NHA. In cases where the contractor fails to obtain the certificate from IPC, a penalty equivalent to 1 % of the contract amount should be deducted;
- iii. environmental mitigation and construction cost should be made part of the BOQ; and
- iv. landscaping and tree planting responsibility should be fixed with contractor and the cost should be included in the BOQ.

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## Case Study 24

### **PAK: Road Construction in an Ecologically Sensitive Mountainous Area (Reconstruction and Rehabilitation of the Chakdara to Kalam Bridge (N-45))**

**Nosheen Yaqoob Butt, D.D. (Environment) In-charge**

**Environmental and Social Unit-Flood Emergency Reconstruction Project (ESU-FERP)**

**National Highway Authority (NHA)**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Inclusion of environmental management plans in bidding documents, contracts and bills of quantities; Frequent site supervision and monitoring; Occupational health and safety; Environmental management capacity development; Environmental audit

## Introduction

In July 2010, heavy monsoon rains resulted in devastating floods in Khyber Pakhtunkhwa (KPK), Sindh, Punjab and Balochistan Regions of Pakistan where approximately one-fifth of Pakistan's total land area went underwater and about 20 million people were affected mostly due to destruction of property, livelihood and infrastructure. Death toll was close to 2,000 persons. Damaged highways were estimated to be 2.4 thousand miles (4.9 thousand km) and repairs were estimated to cost at least \$158.0 million. Chakdara-Kalam Bridge which was identified for rehabilitation and reconstruction is located in KPK near Batkhela on N-45 from where N-95 (Batkhela-Kalam) starts. This bridge has significant socioeconomic benefit because it services the entire area of Dir and Chitral Districts. Batkhela, Allahabad, Shamoos, Dargai, Sakhakot and Shamlai are contiguous areas.

ADB has provided support and assistance to the NHA through the Flood Emergency Reconstruction Project (FERP) in Pakistan for the reconstruction and rehabilitation of highways damaged by the devastating flood. FERP has facilitated loan assistance to a large number of projects in Pakistan. Specifically, Loan 2742-PAK has financed the rehabilitation and reconstruction of Chakdara-Kalam Bridge. The Project was classified as Category B for environment based on ADB Safeguards Policy and Pakistan national environmental laws. An environmental approval was acquired from both ADB and Provincial EPA-KPK after submission of the IEE. The loan project was approved in March 2011 and closed in May 2015. NHA was the executing agency (EA).

## Main Environmental Issues Associated with the Project

The major environmental issues associated with the project were as follows: (i) deterioration of water quality in River Swat and destruction of fish habitat, (ii) air quality contamination, (iii) harm to nearby flora and fauna, (iv) high noise levels, (v) improper storage of material, (vi) improper disposal of waste, (vii) controlling sewage pollution, (viii) borrow area management and restoration, (ix) disruption in traffic, (x) disruption in local businesses, (xi) threats to workers' safety, (xii) unsafe drinking water, (xiii) avoidance of conflict with locals, (xiv) controlling chemical and climate change, (xv) unclear roles and responsibilities for environmental safeguards governance, and (xvi) improper implementation of SSEMP.

## **Environmental Management Plan**

A detailed EMMP as part of the IEE was prepared to address the major environmental concerns associated with bridge construction has received support from ADB technical assistance. Activities undertaken in the preparation of the EMMP included: (i) initial site visits after project inception and design, (ii) public consultation after project inception and design, (iii) identification of major risks and hazards through rapid environmental assessment (REA) checklist and categorization of project, and (iv) baseline studies. The EMMP was planned based on environmental issues mentioned above.

Institutional arrangements for implementation of the EMMP in Chakdara-Kalam Bridge construction involved designated key units and positions in the EA, SC, Contractor, and ADB. NHA was responsible for overall safeguards management from planning to operation stage of the project. Deputy Director (D.D.) (Environment) In-charge of Environment and Social Safeguards Unit (ESU)-FERP in NHA was focal person for safeguards management and was responsible for carrying out overall supervision and conformance of operations to ADB SPS 2009. ESU supervised the activities of the Supervision Consultant (SC) and Contractor and was in charge of disseminating periodic reports as per requirement. SC environment specialist (ES) was in charge of onsite direct monitoring and provided monthly and collective reports to NHA-ESU. The Contractor Environment Officer carried out day to day implementation of environmental safeguards in the project site and reported to the SC. ADB ES provided technical assistance to NHA to help improve compliance with ADB local and legal requirements.

## **Good Practices in Environmental Management Plan Implementation**

NHA carried out all necessary tasks to ensure compliance with ADB requirements. It coordinated and cooperated with ADB and fulfilled its responsibilities on site including documentation requirements. It managed, supervised, and monitored the activities carried out by the Design Consultant, SC and Contractor. NHA deputized dedicated staff for FERP-PMU.

The following specific activities were undertaken by NHA-ESU: (i) verification of REA checklist, (ii) fulfilled national environmental requirements and obtained NOC from provincial EPA-KPK, (iii) disclosure of requisite IEE and EMMP in NHA website, (iv) incorporated EMMP in contract agreement of both Contractor and Consultant, preliminary meetings/briefing with the SC on ADB safeguards requirements, (v) ensured the preparation and approval of SSEMP before Contractor mobilization, (vi) periodic site visits to monitor progress of safeguards activities, (vii) ensured proper staffing of SC and Contractor for safeguards, (viii) provided training onsite on safe work and emergency situation management to Contractor staff before the start of work, (ix) coordinated and cooperated with ADB, EPA, Project Staff, SC and Contractor on safeguards management, (x) facilitated TAs on best management practices, (x) disseminated documents, checklists, and management plans to PDs, SC and Contractor, (xi) ensured best implementation of EMMP on the site, (xii) timely submission of environmental reports and documents to EPA and ADB; (xiii) executed internal environmental audit to improve project compliance, (xiv) executed follow-up audit one month after the first audit, (xv) developed a checklist for review of significant environmental indicators on site, and (xvi) provided biannual training on safety, use of PPEs and firefighting onsite.

Overall, compliance with ADB and own country documentary requirements to secure NOC, mainstreaming of EMP in contract agreements, periodic site visits and monitoring with adequate monitoring tools, proper staffing of SC and contractors, on-site trainings and compliance with occupational health and safety measures, strong coordination among ADB, EA, SC and contractors including timely submission/dissemination of reports and documents, and environmental audits proved to be good practices on environmental management in this case study.

### **Lessons Learned and Recommendations**

NHA had the experience of carrying out similar projects in the past which provided substantial records of failures and successes. But for this project not a single incident of injury or major environmental violation occurred during the entire operation. The most important aspects of the operations which contributed to the success of the project were as follows: (i) adherence to timelines, (ii) periodic and appropriate monitoring, onsite visits, audits, and follow-ups, (iii) development and implementation of practically possible mitigation and environmental control measures, (iv) periodic trainings for workers, and (v) consultations and agreements with local community. NHA has set these activities as benchmarks to make future projects environmentally sustainable.

Notwithstanding these, several impediments were encountered while implementing the Safeguards Management Plan in the project site as follows:

- i. The EMMP was made part of the contract agreement with contractor but was not reflected in the BOQ. This led to low interest of the contractor to implement EMMP but project environmental managers like supervision consultant/PIU/PMU could penalize the contractor and withhold payment releases if mitigation measures associated with construction activities are not implemented. It is recommended that the EMP be made a requirement in the BOQ to ensure compliance with environmental safeguards implementation through contract agreements.
- ii. There was a general lack of aptitude to carryout environmental safeguards activities and lack of understanding of safeguards especially among people who were not trained as environmentalists or engineers. To remedy this, quarterly workshops should be conducted at the project site for concerned PDs, PM, REs, site inspectors, ESs and Environmental Officer and other staff of EA, SC, and Contractor.
- iii. Participation of environmental consultant in biannual ADB project review missions was encouraging for PIU/PMU. This also led to serious adoption of environmental safeguards in institutional arrangements within the EA.
- iv. SC had very significant role in overseeing the contractor and construction site and had proper staffing of REs and material engineer. However, the ES qualification and presence have been compromised. It is suggested that an independent ES of the consultant and EA be engaged with defined terms of references, schedule plan and a strengthened contract agreement for better environmental safeguards management.
- v. ADB may carryout annual workshops with foreign consultants and give PMU the opportunity to discuss environmental issues as well as guidance on site. Video

- conferencing can also be held.
- vi. Categorization formula of ADB and national environmental requirements for construction projects may be reconsidered. Not all reconstruction works come under Category C (as per ADB) which does not have to comply with NOC requirement (as per Pakistan EPAs). Categorization should be defined depending on site sensitivity, e.g., Kohala- Muzaffarbad (S-2) is a reconstruction project on the same alignment but due to difference in topography is prone to landslides and may fall under Category B.
  - vii. For better environmental safeguards, the EMP should not be generic and identical but should be specific to environmental management requirements of project construction activities, areas of project operations and affected communities and persons taking into account topography, presence of human settlements, and specific project activities including structures and inputs, e.g., asphalt plant/batching plants and material storage, waste disposals and oil spills which can deteriorate river water quality.
  - viii. ESU-FERP in NHA was lacking in provision of training sessions except on SSEMP delivered by Hagler Bailey. Concerned staff and personnel must be trained well on SSEMP and environmental audits.

For successful implementation of environmental management in projects the following good practices should be adopted: (i) a ground-based EMP, (ii) deployment of dedicated staff, i.e., ESs/environmental officers within ADB, NHA, SC and Contractor, (iii) regular monitoring of project site, (iv) training for workers on site, and (v) internal and external environmental audits.

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## Case Study 25

### **TAJ: Good Practice in Spoils Area and Wastes Management Project Implementation Unit - Road Rehabilitation Ministry of transport of Tajikistan**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Environmental good practices – Spoil disposal, re-use and management

## Introduction

CAREC Corridor 3 covers almost 7,000 km of roads and runs across Central Asia in the north-south direction, linking the Russian Federation to the Persian Gulf. The corridor serves as the main conduit for regional and international trade. However, the corridor has a missing link in the Tajikistan territory - the section from Dushanbe to the Uzbekistan border. To complete the link, Tajikistan is implementing a project that involves the (i) reconstruction and widening of Dushanbe–Tursunzade–Uzbekistan border road, (ii) modernization of border crossing infrastructure and facilities at Dusti on the border with Uzbekistan; (iii) gender mainstreaming and development of border communities in the project area; and (iv) improvement in transport sector operations. Overall, the project is envisaged to improve connectivity and mobility along the Tajikistan section of CAREC Corridor 3, and increase national and regional and transit trade in the CAREC region that can enhance economic growth. The project which is nearing completion has covered about 57 km of CAREC Corridor 3 in Rudaki, Gissar, Shakhrinav and Tursunzade districts. The project is classified as Category A for environment for which an EIA was processed.

Financing of the project is provided by ADB Grant 0245-TAJ: CAREC Corridor 3 (Dushanbe-Uzbekistan Border) Improvement Project amounting to \$120.0 million approved on 18 January 2011. The executing agency (EA) is the Ministry of Transport (MoT) and the construction contract was awarded to China Road and Bridge Corporation.

## Main Environmental Issues Associated with the Project

The main environmental issues associated with the project are categorized by project phase. Issues expected during the design and pre-construction phase are: (i) impact on private property mostly on houses in the outskirts of Dushanbe near Gissar district turnoff and at Sharinav, (ii) loss of roadside trees from road widening and realignment, and (iii) effects of accumulated cut material from the slopes. On the other hand, the environmental issues during the construction phase are: (i) effects of extraction of river gravel on the stability of riverbanks and on landscape in case of over extraction, and nuisance to local communities due dust and noise produced from gravel crushing operations; (ii) effects of transporting of materials from riverbed to crusher site and asphalt plant to include disruption to local traffic, damage to minor roads due to heavily loaded project trucks, and noise and dust nuisance; (iii) impact of borrow pit in terms of removal of vegetation damaging land and affecting the landscape and accumulation of stagnant water; (iv) pollution of watercourses from spills and leakages from depots, vehicles and equipment, and from waste from temporary workers' toilet facilities causing

temporary damage to the productivity of nearby agricultural land; (v) release of sediments from earthworks operations and bridge replacement works into watercourses and on arable land ; (vi) utilities service interruption during construction due to accidental damage during the relocation of overhead telephone and power cable ; (vii) dust emissions from excavations and operation of vehicles and plant; (viii) noise and vibration from haulage, excavation and compaction operations resulting in (a) hazards to workers, and (b) nuisance to local residents; and (ix) impacts to local population emanating from workers temporarily housed on site in terms of spread of communicable diseases, conflicts over access to water supplies and facilities, and other forms of disharmony.

### **Environmental Management Plan**

The detailed EMMP was developed within the framework of the EIA which served as the basis of the SSEMP prepared by the Contractor. The SSEMP describes in detail the mitigation measures for main environmental impacts mentioned above, with the environmental monitoring plan, GRM, and other relevant information.

The measures include general mitigation measures such as (i) the implementation of the Resettlement Plan for the project; (ii) preparation of a plan detailing haulage routes to be submitted for approval prior to the works; (iii) restoration of any damage to public roads that occurred as a result of hauling of materials during construction works; (iv) prohibition of storage of hazardous materials in proximity to watercourses; (v) prohibition of open burning; (vi) compulsory use of PPE, etc. The specific mitigation measures are: (i) distribution of surplus cut material to users in the local village for creating building platforms or levelling of land; and (ii) avoidance of cultivable land and residential areas in the selection of borrow sites, and obtaining the concurrence of landowners and securing of appropriate permits thereon.

The quarterly monitoring reports will provide information on the environmental performance of the project with respect to the SSEMP, revised EIA and environmental permit issued by the State Ecological Expert to the project.

### **Good Practices in Environmental Management Plan Implementation**

This case study focuses on the management of spoils and stockpile area in the project. Earthworks for road widening and vertical alignment adjustment can lead to surplus of cut material. The prescribed mitigation measure in the EMP and SSEMP is the distribution or sale of surplus cut material to users in the area for purposes of creating building platforms or levelling of land in the local villages. There were two stockpile areas of spoils from the excavation at Km 12 -13 and were located 2 km from the highway and along the road that leads up to the Shambari Sanatorium, a spa hotel. The first stockpile was used in the gully next to a mosque while the other stockpile was used to fill the slopes located half a kilometer further up the road near the mosque in Navobod village. The filling of these areas were upon the request of the respective communities to help them create a usable flat area next to the mosque and in converting the slopes into an area suitable for planting fruit or other types of trees. The spoils from the surplus cut materials were also used in filling the big gully erosion along the highway near the aluminum plant in Tursunzade district which was observed in June 2013 following the

relocation of water channels during the rehabilitation works at Km 48. The gully erosion is about 6 m wide and 1.5 - 2 m deep.

The good practice of re-using spoils from construction works in this case study worked to the advantage of both the Contractor and local communities resulting in the elimination of construction spoils and restoration of the environment and thus can be considered an effective management of the environmental issue.

### **Lessons Learned and Recommendations**

The main lesson and recommendation to further improve environmental management in the project are:

- i. cooperation among contractors, consultants and local population as well as relevant and timely consultations can contribute to the effective execution of EMPs/SSEMP; and
- ii. where possible, good practices on spoils management should be applied during road rehabilitation to restore the environment and mitigate construction wastes and impact.

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## Case Study 26

### **UZB: Good Practice in Biodiversity Protection in Road Projects in CAREC Corridor 2 PMU - Republican Road Fund**

**Sector:** Transport

**Environmental Safeguard Management Good Practices:** Addressing unanticipated environmental impacts; Grievance redress mechanism

#### Introduction

Uzbekistan has been provided with a loan financing within the Central Asia Regional Economic Cooperation Corridor (CAREC) program to improve the efficiency of international road corridors across the country. The road improvement will be along A-373 highway which is the main road in the country and also serves as an important international corridor for Uzbekistan, Kyrgyz Republic, and the PRC. Project works include the reconstruction of an existing four-lane road by substitution of existing pavement for concrete pavement and asphalt-concrete pavement for concrete-cement pavement. It will also cover the protection of slopes, embankments, third lanes in some road sections, and improvement of drainage and equipment of the road. It will connect the Fergana Valley with the rest of Uzbekistan from in Km 116 – Km 190, with the exception of a few segments from Km 123-136 and Km 173-176 (covering two tunnels of the Kamchik pass) which have been improved prior to the current project. The total stretch of highway works is 58 km and passes through a mountainous part which is 1,500 m above sea level. The project was classified as Category B for environment and the EIA was undertaken in 2010 and is considered to have low risk environmental impact according to the rules and regulations in Uzbekistan.

The project is funded by ADB Loan 2772-UZB: Second Central Asia Regional Economic Cooperation Corridor (CAREC) 2 Road Investment Program - Tranche 1 under the MFF of the same investment program. The Republican Road Fund of the Ministry of Finance is the executing agency (EA). The loan took effect in January 2012 and the construction contract was awarded to Corsan-Corviam Construction S.A. (Spain) and JSC Elektrtarmoqqurilish (Uzbekistan) in September 2012 while Sambo Engineering Co., Ltd was engaged as the Construction Supervision Engineer in January 2013. The Project completion date has been extended to June 2016 in view of the serious shortcomings in the performance of construction works and the transfer of significant amount of work to Sub-contractor LLC Alliance Capital.

#### Main Environmental Issues Associated with the Project

This case study focuses on the water supply issue in Rezak village situated between km 175-180 of A-373 highway representing a small section of the overall project. Mountain snow fields act as natural reservoirs for the region's water supply system storing precipitation from the cold season when most precipitation falls and forms into snow packs until the warm season when snow packs melt releasing water into rivers and canals. During project implementation, the environmental issue occurred when a small water canal (ditch) which is the main water source of the Rezak village was destroyed affecting the mountain village with 42 houses. It was only after backfilling the canal when it was discovered that it supplies water to the village located 5 km away from the construction site. The unexpected environmental issue occurred in early

spring in 2014 when road construction works caused the filling of a canal ditch which at that time had water at its lowest level and seemed to be inactive. In April 2014, the Contractor received the first complaint from the Kushminormakhalla Committee representatives and in June 2014, the Republican Road Fund received a complaint letter from the Kushminormakhalla Committee.

### **Good Practices in Environmental Management Plan Implementation**

The following activities were undertaken to resolve the unexpected issue of damaged source of water supply of Rezak village. In July 2014, a round table discussion was held between the affected persons and the representatives of the Kushminormakhalla Committee, Contractors, Engineers and PMU-Republican Road Fund and where the decision was made for the Contractor to take corrective actions in restoring the canal which was destroyed during construction works. In July 2014, the Contractor designed the action plan for the rehabilitation of the canal but it took a long time to implement the plan. To prevent further delays in resolving the issue, the PMU with the help of volunteers from Rezak village fitted a 20 cm wide tube to partially restore water supply to affected households in August 2014. Two months after, the PMU together with representatives from the NGO East Woman and Association of Chefs of Uzbekistan held a series of workshops and training wherein village residents were taught techniques and methods of water purification for drinking water and in preparing healthy diets. The workshops were held from Friday to Monday as these are considered to be the most appropriate time for conducting socio-educational activities since weekends are devoted to celebrating special family events such as engagements, weddings and other family celebrations. In January 2015, a request was also made to the Regional Office of the Asian Vegetable Research and Development Center (AVRDC)<sup>18</sup> for the Regional Coordinator in Central Asia and the Caucasus to help select the optimal acceptable vegetable crops that will do not require continues watering by the village. With the assistance of AVRDC, the Institute of Botany, Academy of Sciences of Uzbekistan purchased, and introduced and distributed new varieties of soybean (Wagon and the Sultan sort), onions, eggplant, and artichoke tubers seeds in the village. The idea of introducing the new vegetable crops it to decrease the demand for water for purposes of gardening and horticulture in the village. In February 2015, the Association of Chefs of Uzbekistan was also requested to develop recipes using local ingredients and the new vegetable crops taking into account the affordability and availability of local ingredients to the village families who are on low budget without compromising taste.

The good practices identified in this case study are as follows: (i) the use of GRM to arrive at an agreement to resolve the environmental issue, (ii) PMU decision to undertake the corrective measure together with village volunteers to avoid further delay in restoring water supply to Rezak village, and (iii) the initiative of PMU to involve NGOs and relevant organization for awareness raising and technical assistance to help improve the lives of affected households

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<sup>18</sup> Now called The World Vegetable Center actively builds networks and conducts research and promotion activities to raise the profile of vegetables for improved health and global poverty alleviation. In <http://avrdc.org/about-avrdc/about-us/>

through better and practical diet and planting of vegetable crops that will ease the pressure on demand for water supply.

### **Lessons Learned and Recommendations**

During project preparation and implementation, it is highly important that contractors pay serious attention to all ecosystems to minimize the negative impact of project operations whether these are on dried small ditches or riverbed during the dry period or on snow-covered canals during the winter season. The accidental filling of the canal could have been avoided if the contractor was well informed of the topography of areas surrounding the project site and its relationship with existing settlements, if any. Consultations with the local community on environmental safeguards should be mandatory before embarking on project works to avoid actions that disturb nature which in turn affect the local communities.

#### 4. Water Supply, Sanitation, and Urban Development

##### Case Study 27

##### **ARM: Environmental Safeguards Management in Armenia Water Supply and Sanitation Sector Project – Additional Financing**

**Lilit Hovhannisyan, Environmental and Social Specialist**

**Investment Projects Coordination Directorate, Armenian Water and Sewerage Company**

**Sector:** Water Supply, Sanitation, and Urban Development

**Environmental Safeguard Management Good Practices:** Environmental auditing; Institutional arrangements for environmental management; Frequent supervision and participation of PIU environmental staff; Environmental compliance monitoring reports

##### Introduction

A water supply and sanitation sector project is being implemented in Armenia to rehabilitate, replace and/or extend drinking water distribution systems in 18 towns and 92 villages throughout the country, except in the Capital City Yerevan. Ten subprojects for the administrative region (*marz*) have been designed. The main technical activities are: (i) reconstruction of mains water lines to be laid in various villages; (ii) fitting of distribution pipeline in villages and connections with water meters; and (iii) repair/renovation of existing and construction/creation of new daily regulating reservoirs, catchments, sanitary zones, chlorination plants, and pumping stations. The installation of distribution pipeline involves trenching in towns and villages and installation of water meters at users' connection points. The trench is lined with sand and high-density polyethylene (HDPE) pipes are laid on the sand. The trench is then backfilled and soil is compressed. The line is then rinsed and sanitized with chlorine solution. The project is classified as Category B for environment and an IEE has been prepared for each subproject.

The Government of Armenia (GoA) and ADB signed the Loan Agreement in May 2012 for financial assistance of \$ 40 million under Loan 2860-ARM: Water Supply and Sanitation Sector Project - Additional Financing (WSSSP-AF). On the same date, ADB and Armenian Water and Sewerage Company (AWSC/CJSC) as the implementing agency (IA) signed the Project Agreement for implementation. The project will be completed in April 2017.

##### Main Environmental Issues Associated with the Project

The main environmental issues associated with the project are: (i) excavation and construction works which can cause negative impacts such as air pollution; noise and vibration; soil erosion; environment and water resources pollution and household wastes; soil and water resources pollution by fuels and lubricants, and chlorine; and traffic disruption; and (ii) physical and biological impacts on soil and groundwater, air quality, surface waters, flora and fauna and landscape; and temporary works.

##### Environmental Management Plan

By June 2015, 28 EMPs have been prepared for WSSSP-AF. The EMPs were tailored to each package under the subprojects and provide a summary by type of planned activities. According to Armenian laws and regulations, the EMP design documentations for the project are not subject to environmental impact assessment because of the insignificant impact of the planned activities on the environment. Positive environmental and population health influences are mainly expected such as protection and sustainable use of water resources, provision of high quality drinking water, prevention of water-related diseases and contaminants in the water system, and water loss reduction, etc.

The Armenian Water and Sewerage Company (AWSC) operates under the supervision of the state authority, and has engaged consultants for detailed design, supervision and for environmental risk management in each of the ten subprojects. During implementation, PMU environment specialists (ESs) are responsible for ensuring timely and reliable implementation of mitigation measures as laid out in EMPs and SSEMPs. Design Consultants determine the implementation of the framework of measures for environmental protection as appropriate for each of the subprojects reflecting local conditions and risks. The Consultant is responsible for supervising the implementation of mitigating measures during construction. It was the Contractor who was responsible for preparing the IEE and EMP and made sure that all required agreements and permits from corresponding state and local authorities were obtained before bidding of the construction works. The Contractor is in charge of physical implementation of the mitigating measures in the EMP.

### **Good Practices in Environmental Management Plan Implementation**

Monitoring of environmental management helps keep track of compliance with safeguards requirements. The ESs hired by the Contractor conduct daily supervision at construction sites or weekly visits if there are several sites which are far from each other. Record keeping and monthly reporting considered to be useful tools for safeguards management are done by both Contractor's and Consultant's ESs. The Contractor provides photo reporting with short description on progress and rules followed by the workers at construction sites. The Consultant provides monthly reports with details on the situation at construction sites based on site visit checklist and keeps the database in Excel format, and on compliance of on-going construction activities with the implementation of mitigation measures per EMPs and SSEMPs.

In case of non-compliance with EMP requirements, a written notice on the failure to do so as prescribed by the Consultant/Technical Supervision Company (TSC) is furnished the Contractor. After the issuance of the Notice to Correct, the next recorded violation would trigger charging of liquidated damages equivalent to 0.1% of the total value of the contract. In addition to liquidated damages the Contractor has to rectify the violation within two working days. The liquidated damages are retained until the issuance of the next performance certificate and placed in the Retention Money after completion of construction activities. In case of three liquidated damages, the contract could be terminated unilaterally. Fortunately, AWSC has not terminated any contract for failure of implementation of environmental mitigation measures.



Environmental issues during implementation of WSSSP-AF are closely supervised. The project does not have serious environmental impacts and therefore simple mitigation measures have been planned. However, sometimes the problem is on the execution of mitigation measures because Contractors are not always ready to implement projects that follow safeguards standards. In response to this, semi-annual workshops have been organized to introduce all packages of environmental and social requirements, as well as occupational health and safety measures to ESs, safety specialists/engineers of Contractors and technical supervisors of consulting companies. Consultants' ESs are now demanding to undertake more frequent site visits with daily reporting to PMU and Contractor about the problems in construction sites.

Another good practice is the compliance with the requirement on engaging ESs at Contractor's company based on recommendations of environmental auditing to PMU. A positive change after the environmental audit is the inclusion in bidding documents of the requirement to hire ES at Contractor's company with qualification of at least 5 years work experience with specialization preferably in water and sanitation sector and/or construction activities. This helped a lot in organizing daily monitoring and mitigation measures, and in getting feedback in an efficient manner. Majority of the new Contractors now have ESs but there are still few companies which in spite of complying with the documentary requirement of engaging ESs by including curriculum vitae (CV) in the submission of bidding documents, have not hired the ES and opted for other specialists, like engineers.

The EMP has been included in bidding documents of the Contractor and the resources required in implementing all measures prescribed in the EMP and SSEMP are incorporated in the total value of the contract. The Contractor is supervised to strictly follow the environmental mitigation measures prescribed in the EMP and SSEMP.

The summary of the elements of good practice are: (i) having a multilevel environmental staff (contractor, consultant, PMU) for supervising implementation of mitigation measures, (ii) daily monitoring by contractors, (iii) frequent monitoring by consultant, (iv) leverage through issuance of notice for corrective actions and follow-up on further activities, and (v) complementing PMU with a field monitoring specialist.

The key points of good practices in this case study are: (i) mutual understanding of roles and responsibilities, and expectations of key stakeholders, (ii) awareness raising among ESs through workshops that clearly and concisely present what are acceptable and what are not in environmental management, (iii) frequent site visits and monitoring, (iv) recruitment of qualified ESs and institutionalizing this requirement along with inclusion of EMPs in the bidding process, and (v) availability of instruments such as notice of failure as an option to leverage compliance among contractors.

## Lessons Learned and Recommendations

The main new challenge and lesson learned by PMU is dealing and pushing contractors to follow rules and pay more attention to safeguards management. This mechanism still needs improvement. Other lessons learned so far in WSSSP-AF and recommendations to further improve the implementation of environmental safeguards measures are:

- i. All new contractors should pass the training on environmental and social requirements as well as occupational health and safety measures before starting construction works. The AWSC is providing training to contractors to support the implementation of the works in the framework of the EMP and the ADB SPS 2009.
- ii. Providing non-compliance report after each site visit helps to keep track of the activities in several construction sites which are simultaneously implementing environmental measures.
- iii. Exchanging experiences and knowledge with other PIU/PMUs implementing ADB projects are very useful in preventing possible negative impacts.
- iv. Annual environmental auditing helps keep contractors to follow the standards on safeguards management. It also justifies the implementation of preventive measures which sometimes are not popular among state authorities executing ADB projects.
- v. Contractor's ES should be involved in daily field environmental monitoring and record keeping processes.
- vi. PMU ES should conduct field monitoring more frequently and organize exchange visits between contractors for sharing of best practice and exemplary work style.

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## Case Study 28

### **AZE: Construction of Water Supply and Sanitation Systems and Wastewater Treatment Plants in Goyghay, Agdash and Beylaqan Towns** **PMO-Engineering Group** **Azersu OJSC, Azerbaijan**

**Sector:** Water Supply, Sanitation, and Urban Development

**Environmental Safeguard Management Good Practices:** Institutional arrangements for environmental management; Frequent supervision and participation of PIU environmental staff; Environmental compliance monitoring reports; Inclusion of environmental management plans in bidding documents, contracts, and bills of quantities; Grievance redress mechanism

## Introduction

The State Program on Poverty Reduction and Sustainable Development (SPPRS) of Azerbaijan provides for improvements in water supply and sanitation (WSS) systems in the country. In line with this, a Framework Financing Agreement (FFA) was signed on 15 August 2009 between Azerbaijan and ADB where Azerbaijan has committed to implement the MFF (Facility) - Water Supply and Sanitation Investment Program (WSSIP). The Facility has three tranches which will provide loan financing for construction and improvement projects in four selected towns namely: Goyghay, Agdash, Beylaqan and Aghjabedi. Major construction activities in the three projects will generally include (i) excavation, (ii) land replacement, (iii) pipe installation, (iv) backfilling and compaction, (v) installation of asphalt/concrete roads, and (vi) road protection and other works.

This case study focuses on Agdash Town Water Supply and Sewerage Subproject which involves the construction of the wastewater treatment plant (WWTP). The Project site was shifted some 2.8 km to the southwest of the old WWTP site near Qaradagli village per the Planning and Design Department of AZERSU. The new WWTP will treat the sewage generated from the entire town by collecting 3,359m<sup>3</sup>/day of sewage from western part of the town, covering 100 % of total population.

The Agdash Subproject will be financed by Tranche 2 of the Facility - Loan 2842-AZE approved in December 2011 with Azersu OJSC (ASERSU) as the executing agency (EA). AZERSU is the water utility responsible for supplying drinking water and sanitation services in a centralized manner. It also engages in design, construction, operation and maintenance of intake structures, reservoirs, pumping stations, water pipelines and sewer collectors. The contract for construction works has been awarded to ALKE İnşaat Sanayive Ticaret A.Ş. in July 2012. Construction works commenced in November and the contract duration has been extended for 365 days from the original duration of 548 days.

## Main Environmental Issues Associated with the Project

WWTPs are designed to treat and dispose wastewater which meets disposal standards. As such, the necessary provisions for green buffer zone within Agdash WWTP premises have been considered in the design. However, during the construction of the WWTP, there will be chances of odor nuisance to houses in the government-owned land adjacent to the WWTP site. In

addition, some industries in Agdash which are mostly food-based might dispose their wastewater into the WWTP. Other environmental issues that may crop up during operations and may have considerable impacts on the physical and human environment may arise from the invasive nature of trenching and the fact that the pipe/sewer network is located in a densely populated town. It is anticipated that improper or inadequate implementation of the EMP may also lead to disturbance and inconvenience to local people.

### **Environmental Management Plan**

The EMP includes mitigation measures for (i) significant environmental impacts during implementation, (ii) environmental monitoring program including responsible entities for mitigation, monitoring, and reporting, (iii) conduct of public consultations and information disclosure; and (iv) resolution of grievances of affected persons. The IEE has also been updated due to the change in location of the WWTP.

To minimize the impact of odor nuisance to houses, the maximum distance from problematic units will be observed and green buffer zone will be maintained. To mitigate the impact of wastewater disposed from food-based industries, a monitoring system will be put in place to ensure that wastewater is pre-treated before disposing into the sewers. Treated water will be discharged into Sorsu Channel as before and the outfall length will be about 500 m from the new WWTP site. Alternatively, the treated wastewater can be used for irrigating the fields around the WWTP. The pollution loads into the receiving water body will be tested again during operation.

The WWTP is designed to meet the disposal standards, so no impact on receiving water body is envisaged. The designers have determined that the receiving water body can assimilate the expected pollution load from the WWTP. There are no endangered species or sites of historical significance recognized along the alignments or within the project area designated for the proposed works. The environmental safeguards include a detailed measurement survey to ensure that the scope of project designs will not cross culturally sensitive areas. The Resettlement Study will also ensure appropriate compensation on any damage to crops or agricultural areas according to ADB standards.

Other proposed mitigation measures are: (i) waste/surplus soil will be utilized for beneficial purposes in construction activities or in raising the level of land prior to the construction of roads, buildings, or in filling previously excavated areas; (ii) surplus soil /debris that could not be put to beneficial use will be disposed at a designated site approved by local authority/Ministry of Ecology and Natural Resources (MENR); (iii) disposal sites identified prior to the start of construction shall be approved by the Program Management Facility/Joint Stock Company (PMF/JSC); (iv) surplus soil/debris shall not be disposed in water courses or along the roads; (v) asphalt waste from road cutting shall be transported to bitumen plants for reuse, where possible; and (vi) a log book on waste soil/debris disposal indicating the material, source and quantity will be maintained at the site.

The institutional arrangement for the implementation of the EMP involves ASERSU as the overall responsible unit for the implementation of WSSIP. A PIU has been created in AZERSU specifically for WSSIP where a fulltime environmental specialist (ES) has been employed to

oversee the implementation of environmental safeguards and mitigation measures. ASERSU acting as the PMF has significant experience in managing water and wastewater treatment systems throughout the country. Prior to the project, there was no ES affiliated with the PIU.

The Design Supervision Consultant (DSC) has hired the national and international ESs responsible for implementing the EMP. The DSC provides support to AZERSU on technical matters related to EMP implementation. The Contractor has also engaged a fulltime professional safety and health specialist who is the concurrent ES. The Contractor ES has designed the SSEMP for the WWTP with details covering all identified environmental impacts specific to the location and civil works. PMF is responsible for establishing the GRM which will function throughout the construction period to enable affected persons to approach project authorities and have their grievances recorded and redressed within the prescribed timeframe. The ADB staffs is responsible for providing support to implementation especially on AZERSU compliance with their obligation and responsibilities on project implementation in accordance with ADB policies and procedures.

The International Consultant Company – AYKO-ART-NKUK hired by AZERSU JSC as Project Supervision Consultant (SC) provides capacity building training to Contractor staff for the management and operation and maintenance of the project. The SC assists AZERSU in implementing the project according to specified standards. The SC is also involved in updating the EMP.

### **Good Practices in Environmental Management Plan Implementation**

Environmental monitoring and reporting by PIU, consultants, and construction contractor are within the terms specified in the agreement. PIU ES is responsible for submitting biannual environmental monitoring reports (EMRs). In addition, an Ecological Management Team has been formed in AZERSU to be mainly responsible for monitoring the EMP. It is comprised of (i) construction specialist, (ii) site Inspectors of the Consultant Company, (iii) supervision engineer, and (iv) site inspector of AZERSU JSC. The specific responsibilities of the Team are: (i) dissemination of EMP to contract parties, site workers, inspectors and other related personnel; (ii) daily site visits to control emerging ecological process during construction; (iii) review and implement EMP; and (iv) inform contract parties on issues on implemented works identified during monitoring and which need to be resolved.

The DSC prepares and submits quarterly environmental reports to AZERSU. Consultants' site inspectors also observe safeguards measures on site. The Supervision Consultant (SC) assesses the cost, responsibilities schedule, location and monitoring framework associated with the implementation of the mitigation measures and the EMP. The Contractor ES accomplishes daily questionnaire developed for the project. The Contractor also prepares monthly progress reports on SSEMP and EMP implementation and submits to the DSC. The Contractor and the SC jointly develop quarterly environmental reports. The monitoring reports are available both, at the construction site and at the head office of the ARS while the biannual reports of AZERSU are available in ADB website.

Some of the good practice in this case study are (i) all construction contracts are appended to the IEE and EMP and includes specific provisions stipulating the Contractors' obligations to

meet environmental management requirements, (ii) per ADB request, the engagement of ES with relevant qualification has been included as a requirement in tenders for the Project, and (iii) unofficial participation of the SC Company ES in developing tender documents.

Based on the foregoing, a well-defined institutional arrangements including the creation of focal units and engaging qualified focal persons, close coordination among main parties responsible for implementation and monitoring of environmental management measures, frequent and coordinated site visits, establishment of GRM, and institutionalizing contractors obligations to implement environmental management and engagement of ES in contracts and bid documents have ensured the project's compliance with environmental management.

### **Lessons Learned and Recommendations**

The general lessons and recommendations related to environmental management in WSSIP are:

- i. Loan agreements concluded within the scope of the project, PAM, IEE, bidding proposal, contract and other relevant documents must indicate environmental requirements in greater detail.
- ii. The positions of professional safety and health specialist, and ES should not to be occupied by the same person. In consideration of financial and technical conditions of the project, it is more relevant and practical to hire an ES.
- iii. Azerbaijan clearly lacks ESs with relevant qualification. Bidding documents already require Contractor to engage an international ES at the project mobilization stage. Further to this, it is recommended that ES be considered as a permanent staff of the Contractor and for this to be included as an official requirement in bidding documents.
- iv. The timing of preparation and approval of IEE document makes it difficult to identify all negative environmental impacts at the project implementation phase. It is also clear that the EMP has limitations and cannot provide all the necessary mitigation measures. Therefore, updating of the EMP must be considered as a requirement in the contract of the Contractor and in the IEE document itself.
- v. The risk assessment methods should be perfected.
- vi. Monitoring reports have not been submitted to the communities since it is not specified in the EIA document as a requirement of the borrower. It is recommended that EIA be made consistent in the context of disclosing environmental documentation to the public as provided in the IEE.
- vii. For contracts to comply with the requirements of ADB SPS 2009, the Consultant recommends that the PIU expand the coverage of disclosure of project information to include the local population and other concerned organizations.
- viii. Trainings on environmental issues are held regularly, and there are relevant records available on these. However, an imbalance was noted in the coverage of training modules on professional health and health issues, and environmental issues understandably because of the qualification of the ES hired by the Contractor. It is recommended that only an ES with appropriate qualifications and experience be engaged by both Contractor and Consultant.

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## Case Study 29

### **GEO: Good Practice in the Implementation of Grievance Redress Mechanism United Water Supply Company of Georgia (UWSCG)**

**Sector:** Water Supply, Sanitation and Urban Development

**Environmental Safeguard Management Good Practices:** Grievance redress mechanism; Addressing unanticipated environmental impacts; Consultation and awareness raising with all stakeholders

#### **Introduction**

The Government of the Republic of Georgia is undertaking improvements in water supply and sanitation infrastructure in the country with support from ADB MFF-Urban Service Improvement Investment Program (USIIP). USIIP was developed in response to the lack of adequate and safe water supply, sewerage and sanitation in urban areas in Georgia. The 9-year Investment Program is intended to optimize socioeconomic development in selected provincial capitals and secondary towns through improved urban water and sanitation services (WSS) in seven selected towns. The improvements in WSS involve the rehabilitation of existing infrastructure and/or creation of new and expansion infrastructure to meet present and future demands. The projects aim to improve public health in urban centers of Kutaisi, Poti, Marneuli, Zugdidi, Anaklia, Ureki and Mestia. In addition, the USIIP will improve institutional effectiveness of organizations responsible for the provision and regulation of WSS services.

The Investment Program is being financed by ADB loans under the five MFF Tranches which have been approved from April 2011 to September 2015. The Ministry of Regional Development and Infrastructure (MoRDI) and United Water Supply Company of Georgia (UWSCG) are EA and IA, respectively.

#### **Main Environmental Issues Associated with the Project**

While there are numerous positive benefits in terms of improving quality of life and raising standards of both individual and public health, the subprojects being implemented may also induce negative impacts from considerable construction activities in urban and heavily populated areas. Almost all of the design impacts can generally be mitigated, but there can be significant impacts if the components are located in environmentally sensitive areas.

The main environmental concerns associated with the implementation of water supply and sewerage projects are: (i) nuisance from dust, noise, vibration, exhaust and influx of insects and rodents, etc., in neighboring areas, (ii) damage to historical/cultural monuments/areas, (iii) social conflicts due to displacement of communities, (iv) pollution of source water from upstream, (v) excessive/unsustainable groundwater extraction, (vi) pollution due to inadequate sludge disposal, (vii) social conflicts between construction workers originating from other areas, (viii) increased road traffic, and (ix) road blocks and safety risks due to land /deep excavation.

#### **Environmental Management Plan**



The mitigation measures set out in the EMP are fairly standard methods of minimizing disturbance from construction in urban areas. These include: (i) adoption of appropriate design and technology to treat sewage to Georgian standards; (ii) proper sludge treatment and disposal; (iii) employing local people to the extent possible; (iv) avoidance of land acquisition through best location and design; (v) use of PPEs by workers on site; (vi) preparation of transport plans for construction activity; (vii) provision of temporary access wooden planks/metal sheets over trenches; (viii) use of tarpaulins to cover loose material transported by truck; (ix) control of dust generation and monitoring vibration; (x) keeping noise-generating activities associated with construction activities to a minimum; and (xi) keeping the public away from the site through enclosure of construction area and posting of warnings and signs.

MoRDI is oversight to and provides overall guidance on the Investment Program implementation. UWSCG is responsible for ensuring compliance with Investment Program covenants. In line with this, UWSCG has established the Division of Resettlement and Environmental Protection (DREP) under the Investment Projects Management Department. DREP is staffed with a Head of Division, who is responsible for both resettlement and environmental issues assisted by Resettlement and Technical Specialists. An ES has also been hired by UWSCG to assist and advise DREP on: (i) USIIP program implementation and compliance with ADB safeguards policy and national legislation, (ii) overseeing the work of SCs on safeguards compliance in terms of Environmental Assessment Review Framework (EARF) implementation, (iii) review of IEE and EIAs, and (iv) overseeing the implementation of EMPs and training and capacity development activities. Responsibilities of DREP in complying with EARF include among others conducting IEE and EIA and public consultation and disclosure per ADB 2009 SPS; obtaining environmental impact permits for projects notified by law and clearances from other regulatory agencies; implementing the EMP and providing appropriate responses to any unexpected impacts that may occur and addressing grievances; and preparing and implementing resettlement plans. The SC assists UWSCG in assuring that the project is implemented according to specified standards. All mitigation measures during construction have to be implemented by the Contractor who is monitored by the SC. The Contractor has employed an environmental consultant who has prepared the SSEMPs and provides corresponding information to UWSCG and SC, etc.

### **Good Practices in Environmental Management Plan Implementation**

The SC is responsible for regular monitoring of implementation measures carried out by Contractors. Monitoring during the operation stage is conducted by the UWSCG. Monitoring of such measures normally involves making observations during site visits, although some more formal checking of records and other aspects are implemented. The ES of UWSCG prepares biannual and annual environmental monitoring reports for submission to ADB.

Georgia's unique GRM system was put in place in UWSCG local service centers during the implementation of USIIP Reg-01 project on rehabilitation of water supply system in Kutaisi, Poti, Anaklia and Zugdidi. Local service centers are primarily responsible for management of WSS networks in cities and municipal centres including management of damages in WSS systems, assessment of needs and development of additional networks, and maintenance of existing infrastructure. However, UWSCG designated the local service centers as the unit for receiving

complaints. This logic defined the advantage seen and taken by UWSCG in using its own existing permanent structures (local service centres) at the municipal level for GRM instead of creating temporary, project-specific structures that are typically used by other PIU/IAs.

UWSCG issued Special Order No.122 on 30 April 2014 on the “Establishment of GRM within the Framework of the ADB-funded Projects” giving clear instructions to every involved stakeholder on management of grievances of affected people in relation to the implementation of USIIP. UWSCG has 56 local service centers, except in Anaklia, to receive application for claims from affected persons through walk-ins, letters or by telephone. Affected persons in Anaklia are served by the local service center in Zugdidi. GRM allows affected people to appeal any disagreeable decision, practice or activity arising from project implementation. With the improvement in the GRM system, local service center operators were trained on electronic intranet system and general procedures of GRM functioning in order to ensure proper coordination with different departments. The electronic intranet tracking system has been installed in the centres and allows the Heads of Environmental and Resettlement Division and Investment Projects Management Office (IPMO) in UWSCG Tbilisi Office to monitor the claims. Operators also fill in ADB complaints log with registered grievance that coincides with local internal forms.

The GRM has been operational since April 2014 and operates in three stages. Stage One involves discussions and resolution of claims within two weeks from time of their receipt. Authorized representative of the local service center is responsible for ensuring the registration of claims and engages managers and ESs of Contractor and SC and representatives of UWSCG central office in the grievance review and resolution process. Resolution at first stage entails closure for grievance through an agreement protocol which is reflected in e-Document in the Task Management System. If unresolved, the grievance case is elevated to Stage Two where a package of grievance application is prepared with the help of local centre operator and submitted to the Grievance Redress Committee (GRC) comprising of the representative of the Self-government as Chair and the following as members: (i) Director/ Manager of UWSCG service center, (ii) Investments Project Management Division representative, (iii) representative of local NGO, (iv) representative of women’s group, (v) representative of informal sector, and (vi) head of local municipalities. GRC has two weeks after the registration of grievance to review and hold discussion with claimant, and prepare an action plan. For resolved cases, GRC will prepare a brief resume and protocol signed by the complainant and all parties and will be registered in the grievance logbook. If the grievance is unresolved at GRC, Stage Three mechanism is activated where claimant prepares grievance documents with the assistance of GRC for submission to the *Rayon* (municipal) court. Grievance claims can also be submitted to ADB.

To ensure the effectiveness of GRM, SC (Eptisa) and UWSCG/DREP/PR Division have carried out public awareness campaigns among affected people to inform them of their rights and procedures for addressing complaints. UWSCG contact details and information on the GRM were distributed to 4,000 affected households in Kutaisi. Public awareness campaigns are also being conducted in other cities.

Since the establishment of GRM system in Kutaisi 24 complaints have been logged, out of these 5 cases are related to environmental issues. All these cases have been satisfactorily closed where most cases were resolved at first stage of GRM. To illustrate, a complaint about a road blockage due to excavation works prevented household members from accessing their house was registered, reviewed and processed at the local service centre. Being a minor complaint, the local service centre operator immediately informed the representatives of both Contractor and Supervision Companies, and the Contractor remedied the situation by providing wooden walkways/planks across trenches for pedestrians and metal sheets for vehicles.

Another example of good practice on GRM involved the case of cracks on two houses due to trench excavation works. This is the first case registered in the local service centre since the establishment of GRM and was closely followed up. Construction works in the area were immediately stopped and UWSCG and SC jointly assessed the situation and identified affected persons needing temporary resettlement, prepared detailed compensation plans and remuneration matrixes and drafted corresponding documents such as Emergency Temporary Resettlement Framework (ETRF), Temporary Resettlement Plan Contract (TRPC), all in accordance with ADB SPS 2009 and recommendations of ADB Safeguards Specialist. This case reached GRM Second Stage and was resolved by GRC. UWSCG also engaged an independent agency to investigate the exact reason for damages in the houses. UWSCG has engaged local municipal authorities to provide suitable protection to the houses resulting in some delays in project execution. In September 2014 the immediate relocation of affected persons was conducted and substantial rehabilitation was carried out on the damaged houses before household members were allowed to move back.

The success of GRM in USIIP implementation in Georgia is anchored on (i) a well-defined GRM system with appropriate information technology support, (ii) wide outreach of information awareness campaign among stakeholders, and (iii) exercise of prudence and good judgement in utilizing and taking advantage of existing institutional set up of local service centers to efficiently carry out GRM activities.

### **Lessons Learned and Recommendations**

The electronic intranet system developed for GRM system has significantly enabled efficient management and resolution of a large volume of grievance claims under USIIP. It facilitated electronic circulation of all applications including supporting documents and tracking of progress of resolution for each application. It is recommended that the good practice in implementation of GRM in Kutaisi, Poti, Zugdidi, and Mestia be disseminated not only in other target cities of USIIP, but also in other cities with projects financed by other international financial institutions (IFIs). To minimize the impact on the population preventive approach should be adopted. Survey and study of the project area, especially on narrow streets of cities and historical and cultural heritage should be conducted before commencement of civil works. Training of local service center staffs should be encouraged and supported by DREP. Involvement of communities in the design stage of projects to ensure that affected people are adequately informed and consulted must be supported. Informational materials, including leaflets and brochures, should be distributed among affected people giving full information on operations of

the GRM system and contact details of focal persons/unit who can accept applications for grievance claims associated with project construction works.

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## Case Study 30

### **GEO: Good Practice in Preserving Endangered Species of Red Book Trees United Water Supply Company of Georgia (UWSCG)**

**Sector:** Water Supply, Sanitation and Urban Development

**Environmental Safeguard Management Good Practices:** Natural habitats, biodiversity and protected area management

## Introduction

This case study discusses the experiences in implementing environmental management in the (i) Improvement of Kutaisi Water Supply Subproject one of the three subprojects under Tranche 1- Kutaisi, Poti and Anaklia Water Supply Infrastructures and ii) Improvement of Ureki Water Supply System Subproject under Tranche 3 both of which are under MFF-USIIP in Georgia. Kutaisi Subproject covers the reconstruction of Tetramitsa reservoir and construction of new access road to Tetramitsa reservoir. Kutaisi construction site is approximately 5,500 m<sup>2</sup> on a small hillock on the northwest side of the city and close to an existing water reservoir surrounded by a forest with different species of trees included in the endangered red book trees. By virtue of ADB SPS 2009, Kutaisi construction site is included in the area considered as critical habitat.

Kutaisi Subproject has obtained financing of \$80 million from Loan 2749-GEO: MFF-USIIP Tranche 1 approved in April 2011 while Ureki Subproject is funded by Loan 3078-GEO: MFF-USIIP Tranche 3 approved in December 2013. MoRDI as the executing agency (EA) oversees progress and provides guidance on the Investment Program implementation while UWSCG as IA ensures compliance with USIIP covenants.

## Main Environmental Issues Associated with the Project

Kutaisi subproject has been expected to have major the impacts on flora during construction of Tetramitsa Reservoir because site clearance and reservoir construction activities are mostly concentrated on an area adjacent to where rare and protected trees have been observed. The area comprises a fenced reservoir site with total area of approximately 0.7 ha and associated pipeline route 250 m long and 5 m wide. Tetramitsa Reservoirs construction area also lies close to Kutaisi City adjacent to a populated place. The nearest access road to a community is on the east of the construction site and the nearest house is 75-80 m away.

The key environmental issues in this subproject are the negative impacts on the ecology of the territory near the reservoir on endangered species of Red Book trees and on the inhabitants of Kutaisi City during construction and operation phases.

## Environmental Management Plan

Four SSEMPs have been developed for Kutaisi Subproject as requirement for linear projects with large area coverage. The general mitigation measures are: (i) avoiding land acquisition through best location and design, (ii) use of PPEs by workers, (iii) preparing transport plans, (iv)

controlling dust and noise generation and vibration, and (v) enclosure of construction area and posting of warnings, signs and security personnel to keep the public away from the site. Specific measures include: (i) tree species assessment and identification of tree felling areas subject to the approval of local municipality or governmental environmental officials and procedures in national legislation, (ii) fencing of trees in construction site to avoid inflicting damage, (iii) clearing of vegetation to be limited in construction area, (iv) top soil removal to be within 30 cm depth with separate storage facility in appropriate location, (v) re-use of spoil soil in construction or in raising ground level; (vi) correct disposal of extra waste soil in local municipal landfill, (vii) limit in work hours from 8:00 a.m. – 6:00 p.m., (viii) adequate fencing of site including warning signs or safety tapes around all open trenches, (ix) use of appropriate layout for construction site including internal access roads, (x) adequate lighting to avoid accidents, (xi) washing of project trucks' wheels in area with concrete floor and separate drainage, (xii) use of tarpaulins to cover loose materials transported to and from the site; (xiii) planning transportation routes in consultation with the municipality and police; and (xiv) providing wooden walkways/planks across trenches for pedestrians and metal sheets where vehicle access is required.

The institutional arrangement in UWSCG for EMP implementation in the Kutaisi and Ureki Subprojects is basically the same institutional arrangement described in the previous case study on good practice in GRM in Georgia. The Contractor (*Cobra Instalaciones y Servicios*) has employed an Environmental Consultant (National environmental specialist (ES)) to prepare the SSEMPs and provide corresponding information to UWSCG and Supervision Consultant (SC) (Eptisa), etc. The SSEMPs were prepared with support from SC as well as ES of UWSCG. The Contractor National ES is responsible for implementing all mitigation measures under the supervision of the SC. The SC assists UWSCG in ensuring that the project is implemented according to specified standards.

### **Good Practices in Environmental Management Plan Implementation**

UWSCG ES oversees the work of the SCs on safeguards compliance and prepares biannual and annual environmental monitoring reports (EMRs) submitted to ADB. The SC conducts regular site monitoring visits where some visits are carried out jointly with UWSCG ES.

During field visits a number of environmental, health and safety issues were noted and brought to the attention of the Environmental Consultant and the Health and Safety (H&S) Manager of the project. Mitigation measures were discussed with the Contractor onsite and detailed instructions were given. The good practice is in terms of compliance with Georgian and international H&S legislation and enforcing the provisions on environmental management in the Contractor's contract for REG-01 project.

In consideration of Red Book trees in the site, a biodiversity survey was required prior to developing environmental management measures. Changes in design was favorably considered in avoidance of cutting endangered trees have been experienced in the Kutaisi Subproject as follows: (i) the reservoir construction site will affect two types of endangered trees which are protected by Georgian legislation and included in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species namely: *Zelkovacarpinifolia* (*Zelkova* or *Caucasian Zelkova*) species of *Zelkova* native to Caucasus-Georgia, and

*Quercusimeretina* (Imereti oak) also native to Georgia. UWSCG instructed the Contractor to adequately preserve the trees and convened a meeting with contractor, SC, UWSCG's design department and DREP to optimize reservoir's design which resulted in change in design relocating the reservoir site and saving four Zelkova trees but nevertheless caused the necessary removal of 5 Imeretian oaks; and (ii) some 27 specimen of four woody plant species consisting of five walnut trees (*Juglansregia*), seven Imeretian oak (*Quercusimeretina*), 20 (*Zelkovacarpinifolia*) and two smooth-leaved elm (*Ulmus minor*) included in the Georgian Red List were observed on roadsides and degraded communities at the distribution network on the initial access road to Tetramitsa Reservoir. These have been recorded in high-conservation value forest patch. UWSCG also instructed Contractor to preserve all trees and held parallel discussion with the SC, Contractor and UWSCG/Design Department. The Contractor subsequently presented a new alignment and levelling for the access road to Tetramitsa Reservoir valve chamber and chlorination.

In the Ureki Subproject, the site for the reservoir has no Red Book listed trees but there are 100-year old patriarchal varieties of trees. In particular, one 100-year old pine tree has been observed on the border of the reservoir design, close to the residential house and the households' graveled road. ADB's position was to keep the tree and requested to discuss with the Contractor's representative all possible options to avoid cutting the tree. UWSCG/DREP organized a special meeting involving company's design staff, SC and Contractor and in the course of discussion it was reported that saving the tree would not be a problem but this implies shifting the location of the red line of the reservoir by 5-6 m which would compromise the planned capacity of the reservoir. The original design has two 3,000m<sup>3</sup> reservoirs to be constructed on the territory to provide 24-hour service by 2040 to approximately 50, 000 people. The agreement reached favorably considered saving the tree and shifting the reservoir by six m thereby reducing the capacity of one reservoir to 2,000m<sup>3</sup>.

In accordance with Georgian legislation, cutting of Red Book tress would require UWSCG to go through the long process of obtaining the approval of the Ministry of Environment and Natural Resources Protection (MoENRP) while final decision rests with the Prime Minister.

In Tranche 1, UWSCG through MoRDI requested permission from MoENRP to cut down Red List trees. In its reply MoENRP clearly stated the type, age and exact geographical coordinates of the trees which can be removed. As a result, the Government of Georgia has issued Ordinance N0. 1147 entitled "About removal of wooden plants included in the Red Data list from natural environment" on 26 July 2014 where Government requested UWSCG to develop a compensation action plan for damages done to the biodiversity in Georgia. MoENRP and its LEPL National Forestry Agency also identified suitable place for planting trees. In response to the Ordinance, the Contractor has already developed a compensation action plan and submitted to MoENRP and has taken the responsibility of launching appropriate actions to plant and take care of 50 individual saplings (10 saplings for each cut tree) of the same species in suitable environment. This responsibility includes purchase of the needed saplings, and planting and taking care (during the 5 years) of purchased saplings in natural environment as prescribed by the MoENRP.

Preservation of habitats and biodiversity and flexibility in adjusting project designs when necessary are always the best solution to avoid losing environmental assets of very high value

or inflicting irreparable damage to nature in developmental project areas. Clear institutional arrangements and responsibilities especially at EA/IA level also help in timely resolution of issues particularly the unanticipated ones.

### Lessons Learned and Recommendations

The good practice in the implementation of compensation of Red Book trees in Kutaisi shall be distributed not only in other target cities of USIIP funded by ADB, but also in cities with projects financed by other international financial institutions (IFIs).

UWSCG also recommends the following: (i) carry out biodiversity survey in project areas covered by wood and trees before starting construction; (ii) proper identification of species of trees in accordance with local laws to inform decision making on removal of trees, when necessary; (iii) prior to construction all Red List trees should be marked with warning tape and fenced where necessary in order to ensure their preservation and Contractor personnel should be well aware of and give due attention to these trees; (iv) compensation tree planting should be carried out by a tree planter company on suitable adjacent habitats using government prescribed ratio and who should also be responsible for monitoring tree growth for at least five years, (v) given the short planting season the tree planter company should be promptly hired, (vi) identification of all relevant alternative measures and options should be exhaustive and considered to avoid cutting of trees, (vii) tree removal process should be observed by representatives of contractor, IA, SC and relevant local authority, and (viii) a document should be drawn up clearly specifying the number of cut trees and the parties involved in the observation process with their respective signatures affixed on the document.

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## Case Study 31

### KGZ: Good Practice in Environmental Monitoring

Dr. Richard J Snowden, International ES

Issyk-Kul Sustainable Development Project, PMO - Ministry of Finance, Bishkek

**Sector:** Water Supply and sanitation and Urban Development

**Environmental Safeguard Management Good Practices:** Consultation and awareness raising with all stakeholders; Environmental good practice – Handling of hazardous materials and waste, Environmental management capacity development and training; Grievance redress mechanism; Natural habitats, biodiversity and protected area management

## Introduction

Issyk-Kul Sustainable Development Project (ISDP) is part of an ongoing assistance by ADB to support the Kyrgyz Republic (GKR) in improving environmental management and urban services in Issyk-Kul *oblast* in the northeast of the country. The project aims to improve public health and protect the environment in Issyk-Kul through better infrastructure in sanitation, sewerage, solid waste discharge, water supply as well as better quality of urban services through enhanced enterprise resource and institution management in three project cities in the *oblasts* - Karakol, Cholpon-Ata, and Balykchy. Temporary or short-term socioeconomic benefits are also envisaged from availability of jobs in construction sites for local people. The project has planned to employ at least 30% of the workforce from communities near worksites without discriminating women and disabled if and wherever possible.

Financing of ISDP is provided through Loan 2556-KGZ/Grant 0163-KGZ: Issyk-Kul Sustainable Development Project approved in September 2009. The EA is the Ministry of Finance and the IA is Issyk-Kul Oblast State Administration. The project is administered by a Project Management Office (PMO) in Bishkek and a Project Implementation Office (PIO) in Karakol. Infrastructure construction began in October 2013 and is scheduled to finish in June 2016. There are 10 contracts in progress.

## Main Environmental Issues Associated with the Project

The project is classified as Category A for environment considering that Issyk-Kul has the world's second largest saline lake which is internationally important for biodiversity as the basin supports rare and endemic species and significant flocks of visiting birds. It is also a major tourist attraction, bringing large numbers of visitors annually. The *oblast* was declared a Biosphere Reserve by GKR in 1998 and by UNESCO in 2001. The project is not expected to cause major environmental impacts. Water supply, sewerage and solid waste infrastructure normally bring environmental benefits by reducing pollution and improving the quality of life and health of the population in urban areas.

The main environmental concerns are: (i) limited awareness on environmental issues and lack of experience in complying with international safeguards requirements amongst domestic contractors and specialists; (ii) health and safety risks associated with construction work in urban areas, and the potential disturbance to residents and disruption in their lives and activities; (iii) unexpected activity related to mismanagement of hazardous wastes such as used asbestos

pipes; and (iv) Impact of construction activities on natural environment located outside the urban areas such as Karakol Natural Park, Karakol River and semi-desert habitat outside Balykchy City. The Identified environmental impacts typical from construction activities include: (i) soil and water pollution from fuel spill and toxic materials, rain washing silt from mounds of excavated soil, and non-collection or improper disposal of site sewage; (ii) noise and low air quality due to dust from excavation and other site activities; (iii) loss of flora and fauna resulting from removal of trees and shrubs during construction work; and (iv) risks of injuries affecting health and safety of workers and the public. Impacts from particular aspects of construction process are: (i) disturbance to classes and school community of noise from construction of sanitary facilities in schools; (ii) significant loss of flora and fauna due to new or refurbished sewers near natural habitats and loss of businesses' income if construction works impede customer access; (iii) silted water discharged from cleaning new boreholes could pollute land, streams or groundwater; (iv) disturbed silt and attached pollutants in sewer bridge across Karakol River may affect Lake Issyk-Kul and flora and fauna; and (v) loss of flora and fauna due to pipeline fitting in Karakol Natural Park which is a protected area.

### **Environmental Management Plan**

The EMMP based on recommendations of the State Agency on Environmental Protection and Forestry (SAEPF) on the EIA report has been submitted to State Environmental Expert for review and endorsed to ADB for approval.<sup>19</sup> It incorporates planned measures against environmental risks and hazards. The Supplementary Environmental Management Plans (SEMPs) has also been prepared describing environmental impacts from handling of hazardous wastes, construction activity in highly urban populated area such as city market, etc., and the corresponding mitigation measures and monitoring scheme. The SEMPs have been included in tender documents and all construction contracts.

The EMMP mainly comprises mitigation measures classified by type of impact as follows: (i) measures to address common construction impacts are: (a) undertake preventive maintenance, repair and refueling of vehicles and machinery in appropriate offsite areas, disallow storage of oil and fuel products in any construction site and disposal of excess oil as soon as practicable, excavate trenches in short lengths where feasible, install portable toilets and washrooms at all sites, and dispose of sewage at city WWTP; (b) avoid use of old vehicles and machines with excessive noise and exhaust emissions, water unpaved site roads and exposed soil three times a day in dry and windy weather, bring other loose material to site only when needed; and disallow stockpiling of sand onsite; (c) design/adjust pipeline routes to avoid trees/shrubs, but if necessary undertake tree compensation by planting and maintaining two of the same species for every tree lost; and (d) prepare and implement health and safety plan prescribing PPE for all workers and prohibition of asbestos or lead paint; etc., and removal or disposal of any asbestos-containing material (ACM) in accordance with ISDP ACM Management Plan from site; and (ii) measures for identified impacts of particular aspects of construction process are: (a) carry out construction work on school holidays when possible and monitor noise in classrooms to ensure that >70 dB(A) is not repeated; (b) adjust pipeline routes to avoid mature trees and significant areas of vegetation in natural habitats where possible, minimize footprint of construction works,

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<sup>19</sup>Report on EIA was prepared in 2009 and approved by SAEPF.

provide spaces for access between mounds of stored soil and provide walkways across open trenches, and limit lengths of trenches (50 m) and ensure refilling before starting the next length in business areas; (c) retain borehole water in tanks or ponds to allow silt to settle down before releasing to the river, drains or sewer, monitor water turbidity on entry and exit from tanks or ponds using permitted maximum = 150 NTU (ca. 500 mg/l) as benchmark; (d) avoid site flooding by restricting works in rivers during low flow season, minimize the size of construction area in rivers; and (e) adjust pipeline route to avoid trees and other vegetation, minimize footprint of construction sites, and raise awareness; prohibit hunting and fishing, and prevent fires.

PIO has no technical staff so EMMP and SEMP's implementation is coordinated by the PMO. Per SEMP, the responsibility of mitigating environmental impacts lies mainly with the Contractor and jointly with the Design and Supervision Consultant (DSC) or PMO for some measures. GKR assigned the responsibility of overseeing EMMP implementation to two main environmental agencies in Issyk-Kul *oblast* - Biosphere Reserve Directorate (BRD) and Issyk-Kul Territorial Department for Environmental Protection (IKTDEP). ISDP has also supported institutional strengthening in both agencies by providing equipment, training, planning support and practical assistance to enable them to fulfil their responsibility. Oversight implementation of the EMMP by the two agencies is supported by the PMO International ES who also designed the plan.

### **Good Practices in Environmental Management Plan Implementation**

BRD monitoring activities covered (i) noise in four school sites in November 2013 before meter malfunction precluding further collection data on noise thereafter, and (ii) water quality at Balykchy New Sewage Pump Station twice per day from December 2014 to June 2015 while IKTDEP monitored water quality in Cholpon-Ata New Borehole site several times a day during borehole pumping in May 2015 (8 days) and June 2015 (4 days). Like most government agencies in Kyrgyz Republic, BRD and IKTDEP operate on limited resources in terms of staff complement and logistics but have dedicated staff that perform routine work to enable the agencies fulfil statutory obligations. Staff who have participated in EMP monitoring have good work ethics and strong desire to learn and advance themselves and have gained significantly from their work, training and support received from ISDP. Their work is considered a major contribution to environment management in ISDP.

Good practice elements of environmental management in ISDP construction works also include: (i) support to expanded technical capacity of two government agencies through provision of over \$0.5 million for laboratory and field monitoring equipment, vehicles and facilities; (ii) support to expanded staff capacity in both agencies through extensive training, new monitoring experience, participation in international project, data analysis, and report preparation; (iii) control of potentially polluting activities by collecting reliable data and application of trigger levels and maximum allowable concentrations to protect sensitive receptors including Lake Issyk-Kul; and (iv) enhanced policing of Contractors through regular presence on site of government environmental agencies, visible close monitoring of Contractors' activities, and providing PMO with additional observations on other potential environmental issues.

Frequent monitoring of environmental impacts especially on water quality was not compromised in spite of inadequate provision for staff time to undertake monitoring activities and the instances where staff goodwill prevailed to do their job beyond official work hours are laudable good practices. Other good practice in monitoring are (i) application of benchmarks to protect sensitive receptors and regular site visits with high visibility of representatives of government environmental agencies as policing mechanism for contractor activities, and (ii) provision of required logistics support and capacity development to key agencies.

### **Lessons Learned and Recommendations**

There have been some inevitable difficulties in EMP implementation which if addressed could deliver improvements in any future similar exercise. These are as follows:

- i. The ISDP budget includes funds to provide equipment, facilities and training for monitoring but does not cover for other essential items such as fuel and travel/subsistence expenses so the project relied on goodwill of environmental agencies and SAEPF.
- ii. There are no written agreements regarding the participation of the agencies beyond the general commitment in the loan agreement. Any service rendered beyond official work hours are out of goodwill of individual monitoring staff thus limiting data collection to weekdays.
- iii. BRD and IKTDEP have limited staff support and high personnel turnover so the monitoring teams were understaffed and several individuals who received training subsequently left their organization requiring additional training for new recruits.
- iv. There are few specialized suppliers of laboratory and field monitoring equipment in the Kyrgyz and even fewer with experience in tendering under international procurement rules. These created problems in obtaining compliant bids which led to repeated tender exercises over a three-year period before a successful procurement was concluded. This delayed some monitoring activities which required specialized field equipment such dust meter and replacement noise meter.

Recommendations to help improve environmental management in projects are: (i) project budgets should cover all costs associated with implementing EMPs; (ii) participation of concerned government agencies in implementing environmental measures should be bound by written agreements between parties clearly defining responsibilities of and requirements from each party such as provision for rendering out-of-hours work, committing specified number of participating staff; etc.; and (iii) countries with little experience in international tendering and procurement in connection with environmental monitoring should consider these as priority activities and should incorporate sufficient lead time in the procurement process.

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## Case Study 32

### **KGZ: Good Practice in the Organization of Sanitary Protection Zones Emergency Assistance for Recovery and Reconstruction-Project Coordination Office State Agency for Architecture, Construction and Communal Services (SAACCS), Bishkek**

**Sector:** Water Supply and Sanitation and Urban Development

**Environmental Safeguard Management Good Practices:** Protection of water resources; Frequent supervision and participation of PIU environment staff

## Introduction

The Emergency Assistance for Recovery and Reconstruction (EARR) Project Component 3A is ADB assistance in improving the water supply, sanitation and urban development sector in Kyrgyz Republic. Specifically, the project aims to improve water supply infrastructure in Suzak District and Jalal-Abad City through the reconstruction of "Prigorod" water intake in order to increase existing intake capacity and provide continuous supply of good quality drinking water to the population of Jalal-Abad City. The general location of the subproject and "Prigorod" water intake is in Susak District, which borders Jalal-Abad City. The water intake area is on the right bank of the Kugart River 2.9 km north of the road bridge across the Kugart River and 3 km north of "Prigorod" microdistrict of Jalal-Abad City.

The project is financed by ADB Loan 2668-KGZ / Grant 0217-KGZ: Emergency Assistance for Recovery and Reconstruction approved in September 2010. The design works for the project started in 2012 and completion of construction works is expected in September 2015. The executing agency (EA) is the Ministry of Finance and the implementing agency (IA) is the State Agency for Architecture, Construction and Communal Services (SAACCS). The Project management consultant (PMC) acts on behalf of SAACCS. Design and supervision consultant (DSC) is EPTISA (Spain)/Kyrgyzgiprostroy (KR) and Contractor is Ludwig Pfeiffer Hoch und Tiefbau Gmb H&Co. KG (Germany).

## Main Environmental Issues Associated with the Project

In spite of delays, the IEE report has been prepared in accordance with requirements of Kyrgyz Republic Environment Legislation and ADB SPS 2009. PIU encountered a problem during the development of IEE and supporting project documentation because all fundamental design and estimate documents on existing water intake have been lost and as such existing water intake for zones II and III have not yet been defined and delineated. The major challenge was to re-establish sanitary protection zones (SPZs) and develop supporting documents. According to sanitary rules and norms in Kyrgyz, all water intake facilities should have SPZs and non-compliance may lead to significant risk of well contamination.

The main environmental issues are: (i) absence of established boundaries of the SPZ on the source of drinking water supply of an existing water intake; (ii) absence of fencing on the first level of SPZ; (iii) presence of sources of unprotected aquifer groundwater in the territory such as broken wells, cultivated paddy fields, free access by unauthorized persons and animals; and (iv) lack of information on the process of establishing boundaries of SPZ for water sources.

## **Environmental Management Plan**

The IEE conducted in 2012-2014 identified the main potential impact of the project, as well as the proposed measures to avoid or mitigate these impacts. The results of the engineering survey and IEE have been incorporated in the EMP including measures which should be implemented during construction to protect groundwater in "Prigorod" from pollution.

The works on plugging four idle wells in water intake, fencing and landscaping the first SPZ have been included in tender documents and contracts for "Prigorod" subproject. The SSEMP for a particular project site has been prepared by the Contractor based on the EMP with detailed description of potential impacts, mitigation measures and environmental monitoring, taking into account the peculiarity of works in each construction site.

## **Good Practices in Environmental Management Plan Implementation**

In the design stage of the project, draft calculation of the three SPZs of "Prigorod" water intake was done in order to protect groundwater from contamination. The draft calculation of SPZ includes: (i) a description of the sanitary condition of water sources, (ii) water analysis for safety indicators, (iii) hydrological data, (iv) justification for boundaries for first, second and third SPZs, (v) rules and mode of economic use of territories in SPZs, and (vi) cartographic materials. Initially, there was reluctance from the DSC to undertake draft calculation but SAACCS insisted on DSC to do this in accordance with the legal norms on the need to recalculate the boundaries of SPZ.

Before the start of project works, SAACCS presented the draft calculation of SPZs of "Prigorod" water intake in order to make key decisions on the organization and establishment of SPZs II and III of "Prigorod" water intake prior to commissioning. A working group was established to develop a plan on preventive restrictive measures in each water intake facility zone with deadlines, responsible agencies and the necessary funding for approval of the Local Self-Government bodies and for incorporation of SPZs boundaries in the Master Plan of Jalal-Abad City.

The case study provides insights on the good practice of an IA in ensuring the compliance of the project with the required safeguards to protect water resources. In particular, the Contractor's draft calculations of SPZs boundaries for the water intake helped key agencies to arrive at informed decisions on how to proceed with the reconstruction of "Prigorod" water intake following the required safeguards. In addition, the development of the plan on preventive restrictive measures including coordination with the Local Self-Government on the approval of the plan and the subsequent incorporation of SPZs boundaries in the City master plan signify the serious efforts of the IA towards institutionalizing the protection of groundwater thus ensuring sustainable quality water supply in Jalal-Abad City.

## **Lessons Learned and Recommendations**

SAACCS' decision to prevail over DSC reluctance to undertake draft calculation for establishing SPZs boundaries in spite of lack of provisions in the ToR on settlement of boundaries of SPZs II and III showcases the importance of the level of awareness of IA in complying with the



requirements on safeguards for water resources and on its responsibility for ensuring that the contractor carry out these requirements prior to project operations.

This project confirms the need for participation and control of environmental experts from the IA in all project stages - IEE process, design, bidding, construction and commissioning to ensure that environmental issues associated with the project are effectively addressed.

## References

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