

SINDH WATER SECTOR IMPROVEMENT PROJECT PHASE -01



Training Manual on Environmental Management Plan for B1 & B2 Components of WSIP Project



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Forward

Environmental Management Plan is all about Natural Settings within the project area. But it is first about the alternatives and solutions for any disturbances or obstacle towards Natural atmosphere of water bodies as a result of project interventions.

Environment means surroundings. It is impossible to hope that people involved in rehabilitation works willingly engage themselves in environmental management planning and mitigation measures for the betterment and improvement of their surroundings due to their lack of knowledge on seriousness of environmental degradation and often widespread illiteracy.

That is why Environmental Management Unit of SIDA plays leadership role in providing a cornerstone for a lively atmosphere and improved Natural settings surrounding the water bodies through training on Environmental Management Plan.

Environmental Management Unit of SIDA is glad to prepare and share our Know-how and good practices in this field.

Mr. Zahid Junejo
Project Director
WSIP-I

Preface

Environmental Management Planning can be effective tool to enhance quality of socio-economic conditions and livelihood opportunities of project area. Environment Management Plan also helps project managers, staff to develop sense of ownership in stakeholders and this can also be used as effective tool for the participation of stakeholders in project activities especially women and children.

This manual intends to provide some basic information and guidelines on Environmental Issues in order to enhance better understanding on project environmental impacts and their mitigation measures. All modules in this manual are prepared on the basis of SIDA field experiences, environmental impacts during rehabilitation works and stakeholder's complaints / concerns regarding pre- and post construction phases of irrigation channels. The Manual is prepared in simple and easy language for distribution to interested planners, managers, stakeholders, contractors and field staff. It is hoped that, manual will serve as reference to acquire better understanding on project based environmental activities.

We also hope that, this manual will enhance the capacity of stakeholders to understand the institutional setups, roles and responsibility of each actor in implementations of Environmental Management Plan. I would like to thank team of EMU for their contributions and help in the development of this manual.

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Sociologist/ Participation Specialist
EMU.

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INTRODUCTORY SESSION:

1. Introduction

Sindh Irrigation and Drainage authority has currently launched Sindh Water Sector Improvement Project with the financial assistance of World Bank and Sindh Government. The purpose of WSIP project is to strengthen the ongoing institutional reforms in the Sindh Province.

The over all objective of WSIP is to improve the efficiency and effectiveness of water distribution in three Area Water Boards (Nara Canal, Ghotki and Left Bank Canals). Particularly with respect to measures of reliability, equality and user satisfaction. Improvement / Rehabilitation of irrigation system is the key component of the project. About 173 minors / distributaries managed by Farmer Organizations will be rehabilitated along with main and branch canals under WSIP Project.

An Environmental and Social Impact Assessment Study of the Project Area was carried out by Osman Farooqi Group of Consultants incorporating integrated Environmental and Social Impact Management Frameworks The project was rated as category A.

However, the project would generate considerable positive environmental benefits in the long run but during construction there are several issues that needed to be dealt with in order to avoid environmental/ecological damage. Therefore it was decided that, Project Implementation Consultants would undertake a joint Environmental and Social Assessment of the selected minors and distributaries with Social and environmental teams of SIDA focusing potential impacts during the construction phase and the approach would be to provide an overall framework to clearly identify any adverse impacts and develop mitigation measures, and supervise implementation to ensure that environmental mitigation measures are implemented.

Therefore, the approach is to prepare specific EA/EMPs for each contract that would be implemented under the project in accordance with the process defined in the Environment Management Framework. Depending upon nature, scale and complexity of works, contract specific EAs would assess the general as well as site specific environment issues and implementation of associated EMPs would include the contract and addressed under the Project. Separate EA and EMPs would be prepared for the three major construction contracts related to rehabilitation main and branch canals --Ghotki, Nara and Fulleli -- as part of the detailed design report identifying overall and site specific environmental issues along with the management plans. In case of rehabilitation of distributaries and minors the detailed design reports would be prepared for in lots of five distributaries that are adjacent or as close as possible.

2. Objectives of Workshop

The objective of workshop is to provide some basic knowledge and gain a better understanding as well as practical skills for stake holders regarding environmental impacts of the project especially focusing upon the construction phase of civil works. Participants have been selected from those packages where rehabilitation works are under progress.

The training workshop is expected to enable participants to play a crucial role in planning and implementation of Environmental Management Activities and also they will be able to plan monitoring and evaluation activities as task of ongoing civil works.

Following are also the some additional objective of the workshop

- a. To empower Community / Stakeholders in the fight against environmental degradation.
- b. To Activate Participation of community / Stakeholders in Project activities through EMPs.
- c. To Strengthening Farmer Organizations.
- d. To Ensure ecological, social and cultural sustainability
- e. To develop Social Forestry for community management, utilization and environmental conservation.

Introduction of EMP:

Environmental Management Plan (EMP) is a strategic document that describes the positive and negative impacts of project interventions with a comprehensive plan to address the negative impacts and enhance the efficiency of positive impacts.

The EMP addresses the environmental impacts during the design, construction and operational phases of the project. In order to achieve the maximum socio-environmental benefits of civil works, a number of environmental recommendations and standards are being set in EMP. These set standards are aimed to ensure;

- Minimum adverse environmental impact of civil works during construction.
- Appropriate restoration of areas affected by construction works.
- Prevention of long term environmental degradation.

Objectives of EMP:

- To assess existing Environmental conditions of channels and prepare an environmental baseline of the proposed channel.
- To identify necessary parts of channels for environmental improvement.
- To prepare strategy and plan to improve the existing environmental conditions of Channels for community development.
- To do social mapping of the project area incorporating environmental activities for sustainable social and environmental improvement of the project are
- To create and raise awareness amongst stakeholders on the importance of environmental aspects of channels.
- To prepare a Social Action Plan to address the community needs subject to the irrigation channels.
- To ensure the sustainability of social, cultural and environmental behavior of irrigation Channels.
- To ensure stakeholders participation in project activities, through environmental management planning.

Module –I

Expected Environmental Impacts of the Project

1.1 Scope of the Module

This training module describes the expected environmental impacts of the project caused due to the project interventions i.e rehabilitation works under B1 and B2 components of the project. Overall environmental impacts in light of environmental management framework has been presented and discussed in this module.

1.2 learning Objectives

At the end of session and discussions participants in the training workshop are expected to

- (1) Gain a better understanding of project interventions and their environmental impacts
- (2) Learning about the diversity and complexity of the civil works;
- (3) Be able to effectively assess and evaluate the pre & construction phase environmental condition of channels in physical, social, biological setting.

1.3 Introduction

However, a socio –environmental assessment of the project area (WSIP) has already been carried out and it is declared that the proposed project area has limited environmental issues in Nature and project interventions especially physical works may cause some minor impacts. Following is the summary of physical interventions of the project which may affect existing environmental conditions of the project area.

| S# | Physical Intervention | Physical Work Involved |
|----|--|---|
| 1 | Improvement of Drainage & Canal System (including main canals) | -Earth Work |
| 2 | Lining of 10 Distributaries | -Geo-Membrane lining with concrete cover for selective reaches of Akram Wah and distributaries |
| 3 | Restoration of Lining of Akram Wah | -Transportation of earth, sand and cement |
| 4 | Excavation for construction of Gate Controlled SUMPS on Dos and lift schemes on the sides of canals. Alternatively construction of new distributaries and minors parallel to main and branch canals | -Community Structures (Washing Ghats, Cattle crossings, buffalo baths etc -Desilting and removal of silt -Repair of gates & structure -Cattle crossing & water points -Installation of flow measurement devices -Integration of direct outlets and lift machines |

1.4 Expected Environmental Impacts

The impacts on physical and biological environment due to project interventions have been divided into two phases i.e Construction Phase and Post-Construction Phase.

Rehabilitation and new construction work involve major earth work; Desilting and concreting potential impacts are as under.

| S# | Potential Impact | Descriptions |
|----|--|--|
| 1 | Traffic Dislocation | Construction activity such as movement of earth moving equipment, transportation of materials would cause additional load on existing roads. Approach roads to site may cause the crop. |
| 2 | Improperly excavated earth /Silt | Jungle clearance and de-silting during construction work may develop large spoils of excavated earth and silt along the banks. If not disposed off properly it would cause a negative environmental impact of significant and permanent nature. |
| 3 | Borrow Pits | Extraction of earth material will cause Borrow Pits and Unattained Borrow Pit would cause ponds, a breeding ground for mosquitoes, safety hazards and deterioration of landscapes. Borrow Pits may also damage ecosystem balance of the area upset the aquifer and leave and unscented site. The impact will be small and negative but of a permanent nature. |
| 4 | Dust/ Air Pollution | For the construction work and transportation of material heavy machinery will be used. Running of heavy machinery at project site will cause Dust and Air Pollution. This will put serious negative health impact on workers and population living in close proximity to site. |
| 5 | Noise Pollution | Use of earth moving equipments would generate noise levels exceeding the allowable limits. Impact will be medium and negative but of a temporary nature. |
| 6 | Destruction of Flora <u>Fauna</u> At Camp site | The destruction of some flora would take place during the construction of approach roads, area of labour camps, oil and vehicle storage areas High noise level may disturb the fauna in wildlife sanctuaries located close to the project area |

| S# | Potential Impact | Descriptions |
|-----------|---|--|
| 7 | Loss of Embankments side vegetation / Tree Cutting | Heavy loss of embankment side vegetation and Tree cutting may take place during Rehabilitation and up-gradation of channels. The impact is serious and permanent, if not mitigated may cause serious soil and embankment erosion of the channels. |
| 8 | Los/ Damage of Archeological, Cultural Sites, protected area and wetlands | Los/ Damage of Archeological, Cultural Sites, protected area and wetlands may occur during construction phase especially under B1 component of the project. |
| 9 | Diversion of Channel | Under component B1, remodeling of Ranto, Lining of Akram Wah or rehabilitation of Barrages diversion of Channels may be required. Diversion of Channels may cause loss of trees, crops and fertile land. The nature of impact is serious and permanent. |
| 10 | Labour Camp Establishment | Contractors will be required to establish labour camps at project sites in order to stay at project site so that the work can be completed within given time. Labour camp establishment at project site would cause number of environmental impacts i.e sanitation and waste water disposal, solid waste management and management of workshop and oils, liquids etc |

Module –2

Mitigation Measures

2.1 `Scope of the Module

This training module outlines the mitigation measures for expected potential environmental impacts of the project interventions. It has gone through a long process over 20 years with lessons learned, experiences gained and future challenges to determine and develop these mitigation measures. The mitigation measure have been developed in line with World Banks Environmental Management Policy and environmental management regulations of Pakistan Environmental Protection/ Sindh Environmental Protection Agencies. At the end of this module, self evaluation questionnaire will be provided to assess the trainees learning based on the learning objectives stated.

2.2 Learning Objectives

After completing this module 2 the participants shall be able to:

- 1) Gain more understanding of Environmental Issues and their mitigation Measures
- 2) Raise awareness and understanding on prepared ness for various settings such as bio-physical, social and cultural environment
- 3) List a set of guidelines of potential environmental impacts and their mitigation

2.3 Introduction

The EMPs are prepared by adopting a precautionary approach. In the case of environmental management recommendations and mitigation measures philosophy of “Best Practice” has been carried out. Therefore the mitigation measures are more generic in nature without compromising the importance of civil works.

The recommended mitigation measures are set inline with guidelines and instructions of Environmental Protection Act, 1997, National Environmental Quality Standards (NEQS) notified in 1993, Land Acquisition Act 1894, Sindh Wild Life Protection Ordinance and Sindh Water Management Ordinance 2002 and World Banks over all Environmental Management Framework prepared in November 2006.

2.4 Mitigation Measures

| S# | Potential Impact | Mitigations Measures |
|----|----------------------------------|--|
| 1 | Traffic Dislocation | <ul style="list-style-type: none"> ➤ Cultivated Area to be avoided for building approach roads |
| 2 | Improperly excavated earth /Silt | <ul style="list-style-type: none"> ➤ Proper disposal of excavated earth will be carried out as integral part of the rehabilitation works ➤ The silt removal to be utilized as fertilizers in the field ➤ To be utilized for the construction of embankments along the sides of the channels. ➤ Spreading of earth evenly outside the embankments to avoid ugly landscape consisting of uneven heap of earth. |
| 3 | Borrow Pits | <ul style="list-style-type: none"> ➤ Mandatory restoration and leveling of borrow pits. ➤ If borrow pit is in agricultural land than depth of pit will not be more than 03 feet. ➤ Contractor will obtain necessary permits in writing for borrow pits from land owners and the PIC engineer. ➤ Contractor will prepare and get approved detailed plan for execution and site specific EMP for excavation and transportation of borrow material. ➤ If borrow area is in agriculture field it will be restored with top 04 inch soil. ➤ .Borrow pits shall be located away from the canal and where good quality of soil is available. ➤ Standard practices as followed by Irrigation Department Govt. of Sindh will be adopted. |
| 4 | Dust/ Air Pollution | <ul style="list-style-type: none"> ➤ To mitigate the negative impact all approach roads to be sprinkled with water. ➤ Approach roads which are likely to be used in future to be metalled. |
| 5 | Noise Pollution | <ul style="list-style-type: none"> ➤ Working to be continued during day light hours. ➤ No night travel to be allowed. ➤ Vehicles and equipments used should be with silencers ➤ Plants and equipments used must be conform to EPAs approved Noise levels and NEQs Standards |

| S# | Potential Impact | Mitigations Measures |
|----|---|--|
| 6 | Destruction of Flora & Fauna due to Camps | <ul style="list-style-type: none"> ➤ To avoid approach roads ➤ Extensive plantation after construction is over ➤ Photographic record of the site (including vegetation) before establishing the camp. ➤ Site specific rehabilitation and restoration plan to the PIC by Contractor. |
| 7 | Loss of Embankments side vegetation / Tree Cutting | <ul style="list-style-type: none"> ➤ Avoid optional cutting of Trees. ➤ Mandatory plantation of 05 Trees against each removed tree and restoration of vegetation. |
| 8 | Los/ Damage of Archeological, Cultural Sites, protected area and wetlands | <ul style="list-style-type: none"> ➤ If any archeological or cultural site is exists in the project area, contractor will report to the PIC engineer, Project Director and SIDA. ➤ PIC Engineer will bring the issue in notice of SIDA and to the archeological department of Sindh with in one working day. ➤ Archeological expert will decide the further action and his decision will be considered as final decision. |
| 9 | Diversions of Channel | <ul style="list-style-type: none"> ➤ Mandatory restoration of land condition after channel improvement. ➤ Contractor will prepare and get approved site specific EMP, PIC engineer will be responsible to ensure site this plan prior execution of work ➤ Restore the diversion channels with same soil type and level it properly |
| 10 | Labour Camp Establishment | <ul style="list-style-type: none"> ➤ Contractor will sign a agreement with private land owner where the camp has to be established. ➤ Contractor will provide a detailed plan of camp establishment identifying dumping sites, stores, workshop and washing points to PICs. ➤ Prior to the establishment of camp, contractor will provide site specific EMP, rehabilitation and restoration plan of diversion channels as well to PICs. ➤ Contractor will provide the photographic record of vegetation on site before removal of vegetation for camp establishment. |

Module –3

Institutional Setup

3.1`Scope of the Module

The scope of this module is to provide overall knowledge and how know of institutions to be involved in the implementation of Environmental Management Plans. This module also defines the roles and responsibilities of each agency and community participation in environmental management during construction works of channels.

3.2 learning Objectives

After completing this module the participants shall be able to:

- 1) Gain a clear understanding of institutional setup for the implementation of EMP.
- 2) Gain better knowledge of their roles, responsibilities and distribution of work.
- 3) Prepare Tree Plantation Plan

3.3 Introduction

Research and Development wing of SIDA have set up Environmental Management Unit (EMU) to address the environmental concerns, under the WSIP project and as per WSIP ISEA recommendations, the Environmental Management and Social Development Cell (SDC) of SIDA would play key role in implementation of Environmental Management Framework/ EMPs under the project.

EMU is overall responsible for environmental assessments of the investments, assisting in designing investments in a participatory way incorporating environmental issues and monitoring long term as well as during construction impact of major investments in the Province. EMU is fully responsible for the supervision and monitoring of Environmental Management Plans under B1 and B2 components with close coordination of field based staff of SDC.

3.4 Institutional Setup , Roles & Responsibilities

| S# | Name of Institution | Roles/ Responsibilities |
|----|--|---|
| 1 | Project Coordination & Monitoring Unit (PCMU) Planning & Development Department Govt. of Sindh | PCMU would be responsible to monitor all project implementation activities including implementation of project environmental management plans (EMP) as well as individual sub-project specific environmental and social plans (ESP) through Monitoring and Evaluation (M&E) Consultants. |
| 2 | The Project Implementation Consultants (PICs) | <p>The Project Implementation consultants will prepare EMP with a joint team, comprised of representatives from social, environmental and operation wings of SIDA through a survey along the selected channels.</p> <p>Environmental and Social staff of PICs in coordination of EMU staff will be responsible for the day to day monitoring and implementation of the EMP. Environmental and Social staff of PICs would ensure compliances under EMP and report non-compliances to EMU.</p> |
| 3 | Monitoring and Evaluation Consultants (M&C) | <p>M&E consultants would assist PCMU and partner agencies in monitoring and evaluation of project impacts. M&E will provide continuous feedback to the Govt. of Sindh, project steering committees and implementing agencies on the compliances and non-compliances of EMP.</p> <p>M&E consultants may be the over all responsible for supervision of the over all EA/ EMP and SAPs. M&E consultants will also handle any changes in sub-project design and support in handling the change according to national and international practices. The M&E consultants will produce environmental baseline of each sub-project and provide 06 monthly reports on issues which may emerge during EMP implementation as well as monitoring.</p> <p>PICs will report removal of Trees to EMU.</p> |
| 4 | The Contractor | <p>The contractor will be overall responsible for the implementation of EMP. Contractor will establish a health, safety and environmental Unit on project site with sufficient environmental and engineering professionals.</p> <p>The contractor will be responsible to establish labor camps at project site. To establish the camp contractor will be bound to prepare and get approved a site</p> |

| S# | Name of Institution | Roles / Responsibility |
|-----------|---------------------------------------|---|
| | | <p>Specific environmental management (SSEMP) plan.</p> <p>In addition to SSEMP, contractor would also be responsible to produce Health, Environment and Safty Plan, Diversion Restoration Plan, Traffic Management Plan prior to the execution of work.</p> <p>In case of any protected area, wetland or game areas contractor would be responsible to inform PICs.</p> <p>PICs Engineer will be responsible to get necessary approvals and consent from concerned department of Sindh Govt.</p> |
| 5 | Sindh Irrigation & Drainage Authority | <p>EMU of SIDA will act as Environmental Management Office. EMU would supervise, monitor and ensure effective implementation of EMP in timely manner.</p> <p>PICs and Contractor will submit EMP implementation status along with weekly, monthly and quarterly reports on EMP for verification of compliances and necessary actions.</p> <p>EMU will undertake the Trainings on EMP for stakeholders with close coordination of SIDA and AWBs staff.</p> <p>EMU will be responsible for Water Analysis in order to maintain the quality of irrigation channels during construction work.</p> <p>EMU will monitor EMP activities individually and also with M&E consultants, especially during construction phase impacts are to be monitored jointly by EMU and M&E consultants.</p> <p>EMU will also facilitate PCMU for monitoring and supervision of EMP. EMU will get necessary approvals & consent of EPA/ SEPA and Sindh Wild Life Department regarding EMP. EMU will also be responsible for the arrangement of EPA/ SEPAs visits prior to the execution of work.</p> |

| S# | Name of Institution | Roles / Responsibility |
|-----------|-----------------------------------|---|
| | | <p>EMU would work with close coordination of SDC SIDA. SIDA field staff would supervise and monitor the day to day activities of EMP. Field staff would report any environmental non-compliance or any other environmental issues to EMU through Social Development Special.</p> <p>All the complaints regarding environmental issues subject to the EMP such as Tree Cutting received by Complaint Cell will be forwarded to EMU and EMU will address the issues accordingly.</p> |
| 6 | Farmer Organizations (FOs) | <p>Farmer Organizations will be responsible to assist SIDA and partner institutions in implementation of EMP.</p> <p>FOs will play key role in supervision and monitoring of EMP, they will do real time monitoring of EMP as they are available 24 hours at the project site.</p> <p>FOs will keep a check on contractor and consultants to ensure quality of work and to achieve the maximum benefits of EMP.</p> <p>FOs will report any environmental changes expected due to the EMP or any other additional requirements/ changes need to be addressed through EMP to EMU.</p> <p>PIC will report removal of Trees to EMU and EMU will take action for auction and tree plantation with Farmer Organizations under the environmental management rules framed in Irrigation and Drainage Management Transfer Agreement.</p> |
| 7 | Area Water Boards | <p>Area Water Boards also perform tasks of supervision of EMPs with coordination of EMU. Area Water Boards will be playing key role in the implementation of EMPs under B1 component of the project.</p> |

ANNEXURE'S

Tentative Schedule of Training

| Time | | Sessions | Resource Persons |
|-----------------------------|-----------|--|--|
| From | To | | |
| 09:00 am | 09:15 am | Registration of Participants | Mr. Ayaz Khawaja (LBCs AWB) |
| 09:15 am | 09:20 am | Recitation of Holy Quran Sharif | Any from participants |
| 09:20 am | 09:30 am | Welcome to the Participants | Ms. Shakeela Leghari (EMU SIDA) |
| 09:30 am | 09:45am | Aim & Objectives of the Workshop | Ms. Shakeela Leghari |
| Introductory Session | | | |
| 9:45 am | 10:00 | Introduction EMP | Mr. Raja Siraj Channa (PICs) |
| 10:00am | 10:30 | Objectives of The Workshop | Mr. Raja Siraj Channa |
| Tea Break | | | |
| Technical Sessions | | | |
| 11:00 am | 12:00am | Expected Environmental Impacts | Mr. Akber Khatyan (EMU SIDA) |
| 12:00am | 12:30 | Group Work | Training Team |
| 12:30 pm | 1:30 pm | Mitigation Measures | Ghulam Hussain Burdi (EMU SIDA) |
| 1:30pm | 2:00pm | Lunch Break | |
| 2:00 pm | 2:30 | Institutional Setup | Raja Siraj Channa |
| 2:30 pm | 3:00pm | Group Work | Ghulam Hussain Burdi |
| 3:00pm | 3:30 pm | Questioner Answer Session | Training Team |
| 3:30 pm | 4:00 | Training Evaluation | Ms. Shakeela Leghari |
| 4:00 | 4:30 | Vote of Thanks | Ms. Rahat Jabeen (PCMU) |
| 4:30 | 5:00 | Concluding Remarks and Certificate Distribution | Chief Guest Mr. Habib Ursani (Director LBCs AWB) |

a) Contractors Health, Safety and Environment (HSE) Plan

Emergency Response Plan: The purpose of this plan is to describe responsibilities in preparation for response to and recovery from any reasonably foreseeable incident. In the event of any emergency the Site In-charge of HSE/Environmental Manager or a member of the HSE team shall take the following actions:

- _ Shall attend the site of the incident; assess the situation and issue directions to the concerned parties and to the Fire Team in case of fire.
- _ Ensure that message about the incident have been communicated to Site Manager /Environmental Manager of the Contractor.
- _ evaluate the scale of the incident and decide whether additional resources are required to deal with it adequately.
- _ Liaise with site supervision staff for withdrawing any working permits.
- _ Liaise with site supervision staff for the mobilization of any plant and equipment necessary for dealing with the emergency.
- _ Limit access to the area with barriers, or other means to prevent unauthorized excess.
- _ Co-ordinate the re-instatement measures following stabilization of incident.
- _ Prepare a full report on the accident.
- _ will take prompt and appropriate actions for defined events such as serious illness/injury, fatality, and snake bite etc.

Health and Hygiene: The measures should include:

- _ Initial medical examination of all employees of the Contractor to verify their fitness for work.
 - _ Medical screenings for communicable diseases, especially HIV/AIDS, hepatitis, etc.
 - _ Monthly talks on occupational health.
 - _ Provision of qualified medical personnel and adequate medical facilities to the staff.
 - _ First Aid trainings.
 - _ Prohibition to use drugs and narcotics.
 - _ Provision of hygienic food to the employees.
 - _ Provision of cooling and heating facilities to the staff.
 - _ Provision of drainage, sewerage and septic tanks in office buildings and camp areas.
- Security: Security measures should include:
- _ Provision of Identity Cards to the employees.
 - _ Regular attendance and a controlled time keeping of all employees.
 - _ Proper checking of visitors.
 - _ Restriction of un-authorized persons to the residential and work areas.
 - _ Restriction of carrying weapons and control hunting by employees.
 - _ Provision of boundary walls/ fences with proper exits to office and residential areas.

b) Traffic Management Plan

Subject to the approval of the PIC. The cement could be transported to the site through the following

Routes:

Thatta Cement Factory → Badin → Sites

C.iii. Proposed traffic Routes for Sand Carrying Loaders: The sand could be extracted from Bolhari (if so considered appropriate by the PIC Civil Engineer / In-charge).

Bolhari → Badin → Sites

Proposed Traffic Routes for Earth Fill Material Carrying Loaders: It is the responsibility of the

Contractor to arrange earth fill material from the borrow areas. Once the borrow areas has been selected and approved by the PIC Engineer In-charge, the Contractor will submit the traffic management plan for haulage routes to the PIC Engineer for approval.

Proposed traffic routes for steel carrying loaders: The steel is not required in huge quantity for this

Work. It can be purchased from the local market at Badin.

Proposed traffic routes for brick carrying loaders:

The bricks could be obtained from nearby bricks kilns.

Contractor's Obligations

The following steps suggested for proper management of traffic on routes to be used for material transport:

i. The Contractor will display sign boards and banners about traffic diversion at places on detour

Routes.

ii. He will display a traffic man at appropriate places particularly near settlements to control traffic.

iii. Provision of speed breakers at appropriate places in consultation with/approval of the PIC

Engineer In-charge which should be removed after completion of the project.

iv. Obey speed limits as prescribed in Environmental Management Plan.

v. The Contractor will provide copies of his day to day traffic management strategy to the PIC

Environmental Engineer.

vi. The Contractor will arrange a rescue team and first-aid facility in case of any accident.

vii. The Contractor will keep the smoke emission of the vehicles within NEQS.

viii. Water will be sprinkled on earthen routes to control dust emissions.

ix. No private property without permission of the owner will be used for transportation.

x. Restriction on playing radio/tapes at high volumes and on use of noise producing machinery during

Night near settlements.

xi. Drivers will fix net while transporting stones and soil etc.

c) Monitoring Check List

Is the number of routes kept to a minimum?

Yes No

Are short cuts been used?

Yes No

Are all vehicles and construction machinery properly maintained?
and tuned regularly to conform NEQS

Yes No

5-Biological Conditions

1-Flora

Have trees and branches from channel plantation been used as fuel
wood?

Yes No

2-Fauna

Are the drivers careful and watchful about wild and domestic animals? Yes No

Any damage to animals? Yes No

C-Socio-economic

6-Community

During construction have good management practices been by
Adopted by avoiding disturbance to areas adjacent to work area
Including the well site?

Yes No

Are complaints from local communities being registered and
Responded to?

Yes No

Have the local communities been formally notified about methods for
Registering complaints?

Yes No

Are drivers carefully about accidents and vehicles within specified
Limits while crossing community roads?

Yes No

Are pressure horns being used?

Yes No

7-Borrow Areas

Is necessary approval for the borrow areas are obtained from the
PIC Engineer?

Yes No

Is the topsoil of the borrow pits removed and conserved for
Rehabilitation of the borrow area?

Yes No

Is the conditions of approval for excavation of the borrow pits are
Complied with?

Yes No

Is the drainage profile of the area is maintained to avoid
Impoundment of the agricultural runoff or storm water in the

Borrow areas?

Yes No

8-Camp site

Are generators in the construction camp properly maintained? Yes No

Is the emergency response plane available on site? Yes No

9-Camp site

Has vegetation clearing been minimized? Yes No

10-HSE

Is any fatality recorded during the week? Yes No

Is accident insurance claim is forwarded by the contractor to relevant

Insurance company?

Yes No

Name _____ Signature _____

Additional Comments

d) Diversion and Borrow Areas Restoration Plan

The Environmental Management Plan describes the salient monitoring features during construction / restoration of the diversions. The following steps have been proposed for contractor for acquiring and restoration of diversion areas and borrow areas.

1. Systematically, acquiring land and execute the agreement for restoration of land after completion of work.
2. Record of topographic characteristics of the diversion sites/ areas.
3. Pre-construction photographic records of the diversion sites.
4. Preparation of an inventory of trees and infrastructure (if any) existing in diversion areas.
5. If agriculture land is used for diversion, planned removal and safe storage of four inches top soil and re-spreading id during restoration process.
6. Storage of excavated soil for filling of channels after completion of work.
7. Excavation of the channels as per design specifications.
8. Proper filling and compaction of channels after completion of work.
9. Restoration / rebuild infrastructure if any.
10. Replant uprooted / cut trees done at the ration of 1:5 and maintain plantation for five years.

Training Evaluation Form:

Detailed Feedback

Total Trainees: 50

1: Relevance of the course to your current work or function.

| | | | | |
|------|-----|--------|------|-----------|
| None | Low | Medium | High | Very high |
|------|-----|--------|------|-----------|

2: Extent to which you have acquired information / content that is new to you.

| | | | | |
|------|-----|--------|------|-----------|
| None | Low | Medium | High | Very high |
|------|-----|--------|------|-----------|

3: Relevance of the information / content that you have acquired for your work.

| | | | | |
|------|-----|--------|------|-----------|
| None | Low | Medium | High | Very high |
|------|-----|--------|------|-----------|

4 Did the course reach your expectations and objectives?

| | | | | |
|----|--------|-------------|---------------------|--------------|
| No | Little | Just Enough | More than Enough | I don't know |
|----|--------|-------------|---------------------|--------------|

5. The presentation of the different sessions was

| | | | | |
|-----------|-----------|---------|------|--------------|
| Excellent | Very Good | Average | Poor | I don't know |
|-----------|-----------|---------|------|--------------|

6. Participation possibilities during the course were

| | | | | |
|-----------|-----------|---------|------|--------------|
| Excellent | Very Good | Average | Poor | I don't know |
|-----------|-----------|---------|------|--------------|

7. Supporting materials for the different sessions were

| | | | | |
|-----------|-----------|---------|------|--------------|
| Excellent | Very Good | Average | Poor | I don't know |
|-----------|-----------|---------|------|--------------|

8. What action will you take now to implement the knowledge gained from this course?

9. Please comment or make suggestions on the following Course content

Facilitation

Support materials

Course organization

Any other comments _____

Thank you for taking the time to fill out this survey. Your inputs will be considered to improve the quality and relevance of future activities and they are highly appreciated.