



Environmental Management System

**ENHANCING
TEACHERS
EFFECTIVENESS
IN BIHAR**

Prepared by



WORLD BANK GROUP

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1 Environmental Management System

The Environment Management System for the Teachers' Training Programme in Bihar has been developed to address the core principle of sustainability, health, safety and overall principle of management. The system would be an integral part of the operation of Teachers' Education programme and thus has been developed taking into consideration the existing processes and modified to meet the sustainability challenges faced by the programme.

The system of environmental management proposed would be traceable, and auditable and would is thus expected to evolve further through a process of continual improvement.

1.1 OBJECTIVES

The Environmental Management System (EMS) has been developed taking into consideration the activities related to the programme. However, the weakness or gaps which have been identified in the existing system and could potentially lead to the environmental risk have been modified to minimize or mitigate the same. Thus while the process reengineering has on one hand tried to maintain normal work flows but at the same time made definitive interventions to ensure that the risks arising out of the present process are minimized.

The EMS system thus tries to integrate the principle of sustainability, health and safety into the normal business process of the functioning of the Teacher's training programme and ensures that the environmental risks are minimized. By adoption of the procedures, guideline presented the principle of sustainability, health and safety would be integrated into the normal business process and it is expected that the learning environment would improve and also the impact of the programme on the environment would reduce.

1.2 ELEMENTS OF THE SYSTEM

The Environment Management System essentially contains three elements i.e. Procedures, Guidelines and Checklists. The components of the individual element are elaborated below.

1.2.1 Procedure

The major processes in the development and operation of the Teacher's Education Programme include Planning, Construction and Operation of the facilities. For undertaking these processes the procedures define the sub-processes which should be undertaken to ensure compliance with environmental core principles and also defines the roles and responsibilities of each stakeholder i.e. Directorate (Research & Training), BSEIEC and Training Institutes. Procedures in each of the stages of the project are defined in the following sections:

Planning Process

- **Needs Assessment:** The Needs Assessment procedure would be adopted during the planning stage for construction of new institutes. In certain cases where existing institutes need to be upgraded the same procedure can be used. This procedure would be used to identify the requirement of facilities required in any training institute. The tools/checklists associated with the procedure would facilitate in identifying the facilities. The needs identified through the process would be used to formulate planning norms/requisition for BSEIDC.
- **Planning:** The planning process would commence after the needs assessment. The planning process would include three sub-processes i.e. site analysis, campus planning and preparation of architectural drawing. BSEIDC on receipt of the planning norm/requisition from the Directorate stating the detailed requirements at the training institute would initiate the process. The site assessment would be carried out by BSEIDC and based on the planning norms and making provisions for future a campus plan would be developed and finally approved by the Directorate. The architectural drawing would be prepared by BSEIDC once the concept plan is approved and the same should also be approved by Director (Research & Training) based on the non-technical summary and checking compliance as per the checklist provided.

- **Preparation of Working Drawing & Bidding Documents:** The Preparation of working drawing of Infrastructure will commence once the architectural drawing has been approved by Director (Research & Training). The approval of Architectural drawing marks the end of the planning process. The procedures specified in this document would help in integrating the environmental health and safety aspects into the design. The procedure would also help in ensuring that the EHS clauses are incorporated into the bidding process i.e. Bid Documents and Bill of Quantities. This would ensure that the EHS aspects are implemented. The procedure described in the document can be used both for construction of new institutes and up gradation of existing institute. The development and approval of Bill of Quantities would complete the planning.

Construction

- **Contractor Procurement:** The Contractor Procurement Process would initiate once the bidding document have been prepared. It can be used for all procurement of contractor of work e.g. construction of new building, up-gradation of existing building and also for maintenance.
- **Construction Management:** The construction management primarily focuses on activities to be undertaken during the construction process to ensure that the environmental and health and safety aspects are adequately addressed. The primary objective of this would be to ensure that the provisions of the Construction Management Plan are being implemented and that the EHS clauses in the standard bidding document are implemented.

Operations

- **Asset Management & Maintenance:** During the operation period it is important to ensure that the assets are managed and maintained so that their effective life is increased. The Asset management and Maintenance Procedures ensure that the assets are systematically managed through a system of inventory management to optimize the effective use of the assets. Simultaneously to ensure systematic maintenance of the assets, it is important that the maintenance protocols are defined and followed to ensure that the effective life of the asset is improved.

1.2.2 Guidelines & Plans

The EHS management Guidance's (EMG) which are being proposed in the EHSMS are:

- **EMG 1- Needs Assessment:** The Needs Assessment guidance is intended to be used by the Directorate (Research & Training) to ensure that the EHS aspects are included during preparation of requisition for infrastructure.
- **EMG 2:-Planning:** The Planning Guidance is intended for the architects and Directorate to ensure effective environmental planning of the site is carried out and EHS aspects are included in the project design.
- **EMG 3- Designing:** The Design Guidance is intended to help in facility design. This guidance does not provide design specification but would help in identifying and integrating the EHS issue in design.
- **EMG 4 – Handing & Taking Over:** This is an important phase of the asset creation and also would be a crucial stage to improve EHS performance and rectify EHS deficiencies. The Guidance would help the project implementing agencies e.g. BSEIDC and Directorate to test and verify the EHS Aspects.
- **EMG 5- Asset Management & Maintenance:** This has been an essentially weak area especially with public infrastructure and stress has been laid on tracing and tracking assets to ensure that they effectively function and their economic life is enhanced. The maintenance of assets has been ascertained as one of the main reason for poor performance of these assets. The Guidance would help the Directorate to schedule and priorities the maintenance so that the assets can perform better.
- **Construction Management Plan:** The Construction Management Plan is primarily targeted at small construction activities, where the risks are quite well established and would only occur if the activities are not undertaken with due precaution or care. The Construction Management Plan tries to delineate the safeguards the contractor has to take during the construction process to ensure that the EHS risks can be minimised if not avoided.

1.2.3 Checklists

To assist the implementation of the guidelines and plans, checklists have been developed. These checklists identify key points or checks which should be undertaken

during the implementation of the work. Adherence to these key points or compliances to these checks would ensure that the EHS risk are identified and minimized or addressed. For the purpose the following checklists have been developed:

Checklist 1 Needs Assessment: This would help to identify the EHS requirement of the training institutions. It also contains simple rationale guidance for identifying the EHS requirements. The use of the checklist would ensure that the EHS requirements are incorporated in the EHS checklist right at the time of formulation of the plan.

Checklist 2 Site Inspection: This would help in systematic analysis of the EHS aspects at site and record EHS observations. The checklist would help in identifying the EHS risks which can arise from the external environment. The site assessment checklist would use information recorded during the site analysis and would help to identify the EHS issues in the site which need to be managed during the site planning.

Checklist 3: Architectural Drawing Checklist: The checklist would help ascertain that EHS requirement specified in the needs assessment have been incorporated during Site Planning and architectural drawing.

Checklist 4: Detailed Drawing Checklist: The checklist would help to assess whether all EHS aspects have been incorporated in Design of the building.

Checklist 5: Construction Supervision Checklist: The checklist contains EHS aspects which should be assessed during the supervision. This would act as ready reference for the site supervisor to improve EHS performance.

Checklist 6: Supervision Register: The individual EHS non-compliance pointed out during supervision would be compiled and actions which are taken would be recorded. This would help in tracking and closing non-compliance and also take necessary actions.

Checklist 7: Testing & Commissioning: The EHS aspects which need to be tested before the commission would be listed so that they can be assessed during final inspection.

Checklist 8: Handing & Taking Over Checklist: The checklist would be helpful in identifying EHS documents and aspects which need to be provided to the institute during the transfer of asset after the completion of construction.

1.2.4 Reports

Templates of reports have been provided in the document to ensure that the EHS aspects are effectively analyzed and incorporated into the decision making process. The template reports which have been provided include:

- **Report 1: Site Assessment Report:** The site assessment report would be prepared by BSEIDC after carrying out the site inspection. The site assessment report is intoned to provide summary of the site and include factors e.g. climate, site features, environmental influences, historical data, land-use and regulatory controls, building codes and requirements, visual analysis, circulation and access.
- **Report 4: Environmental Method Statement:** The Environmental Method Statement will contain a description of activates and the EHS issues which can arise out of them. It also identifies the source of such issues and details out the management & mitigation measures and the responsibilities for their implementation.

The other reports include Report 2: Campus Planning and Report 3: Detailed Project Report.

1.3 ORGANISATION STRUCTURE

Organizational supports in terms of manpower and skill are required to operate and maintain the system are discussed for each of the organization i.e. Directorate (Research & Training), Training Institute and Bihar State Education, Infrastructure Development Corporation (BSEIDC).

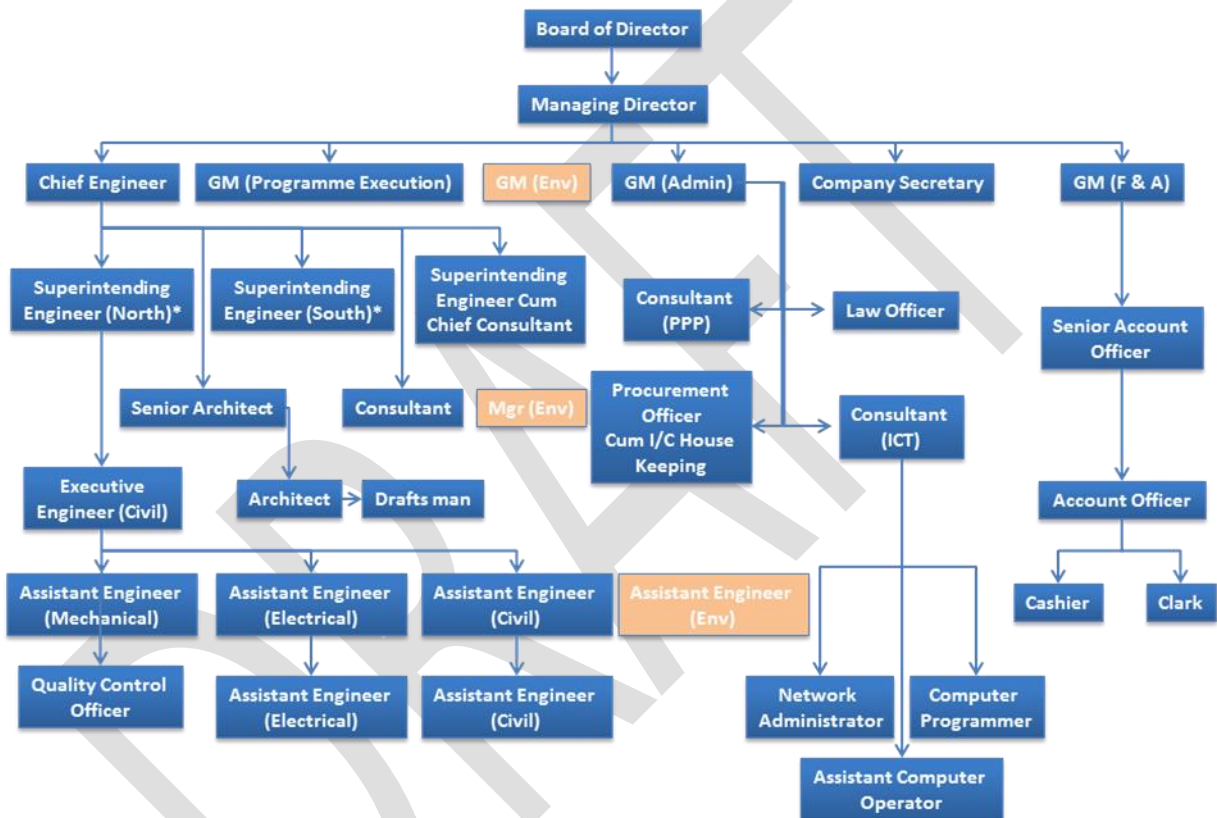
Directorate (Research & Training)

The Directorate core function is related to planning and providing support to the teachers training programme. The organisation structure of the Directorate has not been augmented because it was found to be fitted to manage its core functions. Since it would only be playing an administrative role in the implementation of the Environmental Management System, the organisation has not been augmented rather the responsibilities of administration has been redefined.

BSEIDC

The role of BEIDC is pivotal in the development, maintenance and management of the assets of the Teachers Education Programme. The organisation thus would require to be upgraded to meet the requirement of implementation of the Environmental Management System. The modified organisation structure of BSEIDC is provided below.

BSEIDC Organization Chart



Training Institutes

The primary responsibility of the training institute would be in programme execution. Even though they would be the custodian of all assets and would be principally responsible for maintenance of the assets, the activities with respect to environmental management would primarily be limited to administration of maintenance. Since administrative staff is already present and responsibilities of management and maintenance of assets are undertaken by them, the status quo has been maintained.

Training Institute

The organisational structure of the training institutes would be similar to the one existing at present.No new positions are being envisaged.

The responsibilities of the staff in different organisations with respect to the implementation of the EnvironmentalManagement System during the different stages of the project i.e. planning designing, construction, Handover and maintenance are described in the next section.

1.4 RESPONSIBILITIES

The responsibility matrix of the Directorate(Research & Training), BSEIDC and the Training Institutes in each of the three stages i.e. Planning & Designing, Construction and Operations are presented in the table below.

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Stage	Institution	Position	Responsibility
Planning	Directorate (Research & Training)	Officer Designated by Director (Research & Training)	Would be responsible for undertaking the Needs Assessment for new institutes. Would be responsible for preparation of Checklist
		Director (Research & Training)	Responsible for the Needs Assessment Process. Approval of the Needs Assessment Process
Site Analysis & Assessment	BSEIDC	Officer designated by the Senior Architect	Carrying out Site Analysis Preparation of the Checklist 2: Site Analysis
		Asst Engineer (Environment)	Carrying out Site Analysis Preparation of the Checklist 2: Site Analysis
		Senior Architect	Carrying out Site Assessment Approval of Checklist 2: Site Analysis
		Manager (Environment)	Carrying out Site Assessment along with Senior Architect Approval of Checklist 2: Site Analysis
Campus Planning	BSEIDC	Manager (Environment)	Would be responsible for Campus Planning (especially environmental planning)
		Senior Architect	Would be responsible for Campus Planning (architectural aspects)
		Managing Director	Approval of the Campus Plan
		Directorate (Research & Training)	Director
Architectural Drawing	BSEIDC	Architect	Development of Architectural drawing
		Asst Engineer (Environment)	Integration of EHS aspects into the Architectural drawing
		Senior Architect	Approval of the Architectural drawing Preparation of Non-technical summary

Stage	Institution	Position	Responsibility
		Manager (Environment)	Preparation of Non-technical summary Presentation of Non-Technical Summary to Directorate
	Directorate (Research & Training)	Director	Review & Approval of Architectural Drawing
Preparation of Working Drawing	BSEIDC	Assistant Engineer	Development of Working Drawing Preparation of Checklist 5: Checking of Drawings
		Assistant Engineer (Env)	Providing EHS inputs into the workingdrawing
Approval of Working Drawing	BSEIDC	Executive Engineer	Preparation of the Non-technical summary Approval of Checklist 4: Detail Drawings Checklist Presentation to Directorate comparing Needs Assessment with the Detailed drawing
Preparation of BoQ	BSEIDC	Assistant Engineer	Preparation of BoQ
		Manager (Environment)	Provide inputs into the BoQ Preparation of EHS clauses for Bidding document
Method Statement	Contractor	Project Manager/ Site Engineer	Preparation and Submission of Method Statement
	BSEIDC	Manager (Environment)	Provide inputs into the Method Statement Vetting of Method Statement
		Executive Engineer	Approval of Method Statement
Construction Supervision	BSEIDC	Assistant Engineer	Day-to-day construction worksupervision Preparation of the Checklist 6: Supervision Checklist
		Assistant Engineer (Environment)	Construction supervision Preparation of the Checklist 6: Supervision Checklist
		Manager (Environment)	Preparation of Checklist 7: Supervision Register

Stage	Institution	Position	Responsibility
			Follow-up action on supervision register
		Executive Engineer	Approval on corrective actionbased supervision register
Asset Management	Training Institute	Officer Designated by Head of Institution	Preparation of Asset Register Updating of Asset Register Facilitate Updating of Register at Directorate
		Principal/Head	Approval of Asset Register
	Directorate (Research & Training)	Officer Designated by Director (Research & Training)	Collection & Collation of Asset Register Updating of Asset Register for the Teachers Training Programme
		Director (Research & Training)	Approval of the Asset Register
Maintenance of Assets	Training Institute	Administrative Staff Designated by Head of Institution	Carrying out the Annual Maintenance Audits Carrying out Non-Technical Supervision
		Principal/Head	Approval of the Annual Maintenance Audits Prioritization of Annual Maintenance Presentation of Annual Maintenance Budget to Directorate
	BSEIDC	Assistant Engineer	Technical Supervision of the Annual Maintenance Works
	Directorate (Research & Training)	Officer Designated by Director	Planning and Budgeting of the Annual Maintenance
Training	BSEIDC	Manager (Environment)	Internal Review & Training
Audit	BSEIDC	Manager (Environment)	Leading Internal Monitoring Assisting in External Audits Assisting in Reviews
		Manager (Environment)	Assisting in Internal Monitoring Assisting in reviews

1.5 CAPACITY BUILDING

For implementation of the system, it is important that the officials are sensitized about the systems as well as the technical aspects of environmental planning and environmental management systems. For the technical aspect, Department of Education, Government of Bihar has drawn up plans for collaborating with technical institutes for training and capacity building of their staff. As planned this would be a long term partnership and would help in upgrading technical knowledge of the personnel in the organization.

However for implementing the environmental management system, knowledge on its different processes, guidelines and tools i.e. checklists, plans and reports are required. Thus for the capacity building of the staff, the following plan is prepared.

Type of Training	Frequency	Duration	Target Group	Content of Training
Sensitization Training	Once	One Day	All personnel associated with the Planning, Designing, Construction and Asset management & Maintenance	Overview of the Environment Management System (EMS) Overview of the Processes & Guideline Overview of the Responsibilities
Systems Training	Once	One day for each organisation	Directorate (Research & Training) all personnel designated for EMS BSEIDC all personnel involved in the Planning, Designing, Construction and Asset Maintenance Training Institutes (principal/Head along with administrative staff)	Environmental Management System pertaining to Directorate Processes and Guidelines to be followed Tools to be used Communications & reports or records Audits, feedbacks & Reviews Corrective Action to be taken
Internal Review & Training	Six Monthly (after internal monitoring)	One Day	Same as above i.e. all the three organisations	Discuss on the findings of the internal review Develop action Plan for corrective action

Type of Training	Frequency	Duration	Target Group	Content of Training
Annual Refresher Training	Yearly (after annual audit)	One Day	Same as above i.e. all the three organisations	Discuss on the findings of the Annual review Discuss on the Gaps and its implications Identify the reason for the shortcomings Assist in developing the action Plan

While the Internal Review and Training can be carried out by the General Manager (Environment) for the remaining training i.e. Sensitization, Systems Training, and Annual Refresher Training external agencies would be required.

1.6 AUDITING

A system of Internal Monitoring as well as External Auditing is being envisaged during the implementation of the Environmental Management System. The objective, scope and focus of these exercises are discussed in the sections below.

1.6.1 Internal Monitoring

The Internal Monitoring of the Environmental Management System (EMS) is intended to strengthen the internal systems and ensure integration of the EMS with the overall functioning of the programme. This would be a process of concurrent monitoring of the activities to ensure that integration can occur and a seamless process can function.

Objective & Scope

The Internal Monitoring would thus cover all the organisations associated with the Teachers' Training programme involved in the Planning, Designing, Construction, Asset Management and Maintenance. The monitoring would primarily focus on the three organizations, (Directorate (Research & Training), BSEIDC and Training Institutes) who are the key stakeholder in the programme. The activities of consultancy firms and contracts which are related to the project would also be under the monitoring mechanism.

The internal monitoring mechanism would primarily be focused on:

- Whether the system is being followed i.e. procedures are being adopted,
- Whether records are being maintained i.e. auditable verifiable records of the implementation

Indicators

Some of the indicators which can be used for assessing the performance would include:

- % compliance of Process: $\frac{\text{No of Compliance interms of checklists complete}}{\text{No of Projects}} * 100$
- Non – conformance of Process: $\frac{\text{No of non conformance}}{\text{No of Projects}}$
- Completeness of Checklist: $\frac{\% \text{ completeness of checklists}}{\text{No of Projects}}$

Organisation

The Internal Audit would be carried out by a team comprising of the General Manager (Environment), Manager (Environment) and one member from each of the organisation who is designated by the head of the institution. While the major activity related to the audit would be undertaken by the General Manager (Environment), Manager (Environment) and the other members would be a facilitator in the process. The finding of the internal monitoring would be place before the heads of the respective institutions along with the recommendation. The internal monitoring would be followed by the Internal review & Training.

1.6.2 External Auditing

The External Audit is primarily intended to focus on the effectiveness of the process along with the extent of compliance. It would not only provide measures required to improve compliance and effectiveness but also provide direction for system modification and up gradation.

Objective & Scope

Similar to the internal monitoring, the External Audit would cover all the three organisations and the activities of consulting organisations and the contractors associated with the programme.

The External Audits would focus on the following:

- Assessing the effectiveness of the system
- Understanding the compliance with respect to the overall process

The findings would help to assess the shortcomings in the system and help to identify changes which are required in the system to improve its effectiveness.

Indicators

Some of the indicators which can be used for assessing the efficiency and effectiveness would include:

Efficiency of Process

Compliance to Guidelines: $\frac{\% \text{ projects where guidelines have been adhered to (document review)}}{\text{NoofProjects}}$

Compliance of process: $\frac{\% \text{ projects where non compliance has been closed (document review)}}{\text{NoofProjects}}$

Effectiveness of the Process

% projects where non-compliance has led to degradation of external environment:

$\frac{\text{Projects where non compliance has caused env degradation}}{\text{NoofProjects}} * 100$

% of project where non-compliance has resulted in deterioration of Learning Environment

$\frac{\text{Projects where non compliance resulted in degradation of learning env}}{\text{NoofProjects}} * 100$

Effectiveness of the Process:

Organisation

The External Audit would be carried out by World Bank/ an External Agency appointed by the Directorate (Research & Training) as part of the Teachers' Training Programme. The Audit Team would comprise of a Lead Auditor, Environmental Specialist and Environmental Engineer from the agency. The General Manager (environment) and any officer designated by the Directorate would facilitate the process. The finding of the audit would be placed before the Director (Research & Training) and Managing Director (BSEIDC). The findings and the causes would be discussed in the review meeting and with the recommendations made for improvement of the process. The External Audit would be followed by the Annual refresher Training.

1.7 REVIEWS

To effectively imply the system, a review mechanism has been proposed. The review of the projects would be undertaken by Director (Research & Training) and the Managing Director (BSEIDC). The review meeting following the Internal Monitoring and External Audit would be chaired by these officers. Following the meeting after the annual external audit a closeout meeting is proposed which would deliberate on the action plan to be undertaken for compliance. The Action Plan would mention specific targets and responsibilities which would be tracked during the implementation of the project.

1.8 UPDATING

The Environment Management System might require updating and up gradation. The updating or up gradation would not involve dilution of any provisions of guidelines or the system proposed. The updating process would be primarily used for improving on the system and integrating it with the work processes. The General Manager (Environment) and Manager (Environment) shall make necessary changes in the Environmental Management. The updated system has to be ratified by Director (Research & Training), Managing Director (BSEIDC) and the World Bank.

1.9 SYSTEMS ROLL OUT

To facilitate the implementation of the system it is proposed that a web based information system be developed which would make transfer of document easy as well as ensure easy storage of documents.

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