

YEMEN

**BASIC EDUCATION DEVELOPMENT
PROGRAM
(BEDP)**

**ENVIRONMENTAL MANAGEMENT
PLAN
(EMP)**

Environnemental Management Plan (EMP)

At the concept stage, the Basic Education Development Program (BEDP) was called the Second Basic Education Expansion Project (BEEP II). It is a follow-up and expansion of the Basic Education Expansion Project (BEEP) approved by the World Bank in August 2000.

BEDP involves (a) the construction and rehabilitation of schools (grades 1-9), including latrines, hygienic hand washing and drinking water facilities, boundary walls and laboratories, and (b) the procurement of laboratory equipment (including chemical materials) for grades 1-9.

Major negative environmental impacts are not anticipated; therefore, the project is under category “B”.

For civil works, minor issues such as (a) site selection for schools, (b) water availability for hygiene purpose, and (c) operation and maintenance of schools (including sanitation facilities) are expected. They would be monitored and mitigated from three project processes: (a) involvement of communities for site selection; (b) standard design and specifications; and (c) implementation of the maintenance program developed under BEEP. These issues were satisfactorily addressed under BEEP and they are not expected to have a major negative impact under BEDP.

The site selection process itself would include criteria that would minimize some of the issues identified in the plan. These relate to safety, proper disposal of debris from construction sites, proper sewage, drainage, and sanitation services at the sites.

Chemistry is taught from grade 3 in basic schools and includes experiment and practical assignments in grade 4. More complex subjects and experiments are introduced from grade 5-9. The results of the experiment are limited and consist of solid compound or gas. Chemicals mentioned in the curriculum have no negative impact on the environment. However, there is potential danger for the users, especially when teachers do not follow properly safety instructions (students do not handle the chemicals – demonstration by teachers only). Specific instructions (in the form of manuals and posters) are provided to students and teachers in all schools. In addition, science teachers and laboratory assistants are trained in how to manipulate and discard chemicals and are supervised quarterly.

1.MITIGATION PLAN

			Cost		Institution		Comments (Secondary Impacts)
Phase	Issue	Mitigation	Install	Operate	Install	Operate	
Site Selection	<u>Encroachment/Reduction of green areas:</u> Site with mature trees and other vegetation that should be saved;	Ensure that siting of buildings avoid the need to cut mature trees and other natural vegetation.	NA	NA	NA	NA	<u>Positive Impact</u> includes the shade and protection associated with trees.
	<u>Flooding:</u> Site prone to flooding	A voided through proper site selection criteria. Or address the problem with appropriate site design measures	NA	NA	NA	NA	<u>Positive Impact</u> avoidance of disasters associated with floods
Design	<u>sanitation:</u> Proper attention to sanitary services for building occupants and students. Current issues include: lack of toilets in design, shortage of water, odors due to poor engineering of the system, risk of underground water contamination due to poor design of septic tanks, etc. Furthermore, it is now established that availability of toilets is a factor in girls' attending school.	The standard school designs being developed would include toilets for new as well as for rehabilitated schools. The new designs would include appropriate solutions to the various sanitation problems currently experienced. For example, the problem of water may be solved through the use of dry latrines	Include in construction contracts	Routing building maintenance program	Contract-ors of the works.	School authorities and DEOs.	<u>Positive Impact</u> enrollments is expected. Environmental impact.

Phase	Issue	Mitigation	Cost		Institution		Comments (Secondary Impacts)
			Install	Operate	Install	Operate	
	<u>Asbestos products:</u> Insulation, roofing materials, pipes etc. The use of asbestos is being investigated including what uses were or continue to be in practice today.	Asbestos products would be barred from use in new project sites. Asbestos in existing buildings would be dealt with applicable laws for safety and environmental risks of asbestos use is unknown.	Included in construction contacts	NA	contractors of the works	NA	
	Earthquakes: Sites prone to earthquakes.	Address the issue with appropriate engineering for seismic resistance.	NA	NA	NA	NA	
	Archeological / Historical Sites: Risk of damage to unknown historical and archeological finds or other cultural property	The standard school designs being developed would include toilets for new as well as for rehabilitated schools. The new designs would include appropriate solution to the various sanitation problems currently experienced. For example, the problem of water may be solved through the use of dry latrines.	Included in construction contacts	Routine building maintenance program	contractors of the works	School authorities and DEOs.	

Phase	Issue	Mitigation	Cost		Institution		Comments (Secondary Impacts)
			Install	Operate	Install	Operate	
	Potential nuisances during construction (dust, wastes, heavy construction traffic and noise) Accidental spillage of machine oil, lubricants and other toxic substances.	Dust and other wastes are expected to be minimal and proportionate to the scale of works which are very small. However, the contracts would be supervised by site engineers who would be instructed to insure that nuisances associated with construction are minimized, and that debris from building sites, including toxic substances such as paints, solvents lubricants, hazardous chemicals, are disposed of in an environmental appropriate manner.	Included in construction contracts	NA	NA	NA	
	Potentially toxic lead-based paints: it is generally believed (but not yet verified) that old schools used lead-based paints and products (grazing putty).	In existing schools where lead-based paints have been used, special caution would be taken to neutralize the exposed lead paint by an appropriate method. In new sites, lead-based paints would not be used.	Included in construction contracts	NA	NA	NA	
	Construction debris: Most construction wastes are non-hazardous with the exception of solvents, paints and machine oils.	The Construction documents would include clauses to insure that these substances are properly disposed of.	NA	NA	NA	NA	
	Noise: Associated disruption and nuisances associated with noise during construction.	Noise is not expected to be a major nuisance because of the relatively small scale of works, and the limited use of mechanical equipment.	NA	NA	NA	NA	

Phase	Issue	Mitigation	Cost		Institution		Comments (Secondary Impacts)
			Install	Operate	Install	Operate	
Delivery and utilization of chemical materials	Safe storage and disposal of chemical materials	A written protocol, instruction manual and posters are kept in the laboratories for both teachers and students to observe and comply with. Teacher training.	Included in general practices of the MOE	NA	NA	NA	

2.MONITORING

Phase	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/Type of monitoring equipment?	When is the parameter to be monitored-frequency of measurement or continuous?	Why is the parameter to be monitored (optional)?	cost		Responsibility	
						Install	Operate	Install	Operate
Site selection	<u>Flooding</u>	District maps and land survey records	Records of flooding	During the site selection process.	Sites prone to flooding are to costly to render usable	NA	NA	NA	NA
	<u>Earthquakes:</u>	District maps and land survey records	Official records of earthquakes.	During the site selection process.	Earthquakes can cause buildings to collapse unless proper design has been applied	TBD	NA	MOE	NA
Design	<u>Sanitation:</u> Appropriate and functional design.	Architectural drawings and specifications.	Checked by experienced engineers for compliance with appropriate practices	During the preliminary design stage	Improper sanitary engineering can cause contamination of ground water. Students will not use the facilities unless they are functioning properly.	NA	NA	NA	NA

Phase	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/Type of monitoring equipment?	When is the parameter to be monitored-frequency of measurement or continuous?	Why is the parameter to be monitored (optional)?	cost		Responsibility	
						Install	Operate	Install	Operate
	<u>Use of hazardous materials:</u> (lead-based paints asbestos products)	Specifications in construction documents	Checked by MOE engineers approving the specifications	Before construction documents are completed and issued to contractors	To ensure that hazardous materials are not used	NA	NA	NA	NA
Construction	<u>Lead-based paints and painted materials:</u> appropriate disposal of wood and other materials painted with lead-based paints. No lead based paints will be used in construction activities under the project.	On site during construction and during site selection activities. In the bidding document specifications	Ensure proper supervision by experienced site engineers. Strict penalties for violators.	During construction activities.	Lead paints are toxic and have been known to cause brain damage to children	Included in construction contracts	NA	Contractors should follow instructions in the specifications and construction documents.	Supervision engineers

Phase	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/Type of monitoring equipment?	When is the parameter to be monitored-frequency of measurement or continuous?	Why is the parameter to be monitored (optional)?	cost		Responsibility	
						Install	Operate	Install	Operate
	<u>Removal of mature trees:</u> this is possible if the site is too small with mature trees in the way.	At existing school sites in need of expansion, or at new sites.	Site inspection and surveys of sites	Prior to the selection of a school site or commencement of works.	To ensure protection of mature trees that would take years to grow back. In extreme cases where trees must be removed, they should be replaced by a new planting.	Minor costs for a new planting	NA	MOE and District education office	NA
	<u>Proper execution of sanitary facilities:</u> To ensure proper installation of sanitary facilities and sewage system.	At existing school sites in need of rehabilitation-expansion, or at new sites.	Proper supervision works during construction	During construction, particularly the excavation stage of the works.	To ensure proper design engineering and installation to avoid spillage and water contamination	Included in construction contracts	None	MOE and District education office	NA
	Safe storage and disposal of chemical materials	Schools/laboratories	School inspections Teacher training Supervision of program activities (MOE/Project team)	Quarterly Annually Semi-annually	To ensure that people are educated and are applying safety measures				

3- INSTITUTIONAL STRENGTHENING

All the necessary precautions to avoid negative environmental impacts from the items identified are to be taken by the architects and engineers in charge of building design and specifications. Site engineers would be employed to supervise the execution of the works and ensure that they are in accordance with the designs developed and the specifications prescribed in the construction documents. These site engineers would also ensure that contractors observe safe and environmentally sound practices in their execution of the contract. Including appropriate disposal of debris. Execution would be the responsibility of the contractors, who would be governed by the Conditions of Contract (and the Building Code), which include many provisions dealing with safety and the environment. Therefore, no institutional capacity building or training for MOE staff would be needed. However, environmental sensitization, particularly in regard to health and hygiene, would be proposed whenever practical and feasible, through public awareness campaigns and training of teachers.

4- SCHEDULE

Construction activities would be defined annually through the Annual Work plans. The school mapping process would be used for selection schools in accordance with the agreed criteria. Specific site characteristics and environmental issues would be identified in the school-mapping database and by the architectural consultants during the design stages of each plan. Therefore, activities on mitigation and monitoring would be carried out throughout the project implementation period. Awareness raising would be undertaken by MOE staff that would be involved in community participation activities, and school administrators to ensure that waste generated in schools is properly controlled and disposed of in an environmentally acceptable manner.