

East Meets West Foundation (EMWF)

Environmental Assessment For the Kon Ray Ethnic Minority Boarding School



Dak To Lung Commune, Kon Ray District, Kon Tum Province

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7.4. Summary Environmental Impacts, Mitigation and Monitoring Measures

The table below summarizes all anticipated environmental impacts, proposed mitigation measures, environmental monitoring activities, and responsibility for carrying out those responsibilities.

Summary of Impacts and Proposed Mitigation Measures (according to project phase)				
Impact Area	Potential Impact	Mitigating Action	Monitoring	Responsibility
Pre-Construction Phase				
Land use	Site currently used for low value agriculture. Upgrading will significantly increase value. Value of land bordering school property will increase because of potential for small retail use.	None required.	None required.	None required.
Surface water	Development of the property will result in increased runoff to adjacent surface water bodies.	A site drainage design will be provided by construction contractor with building plans. Design will include appropriate features to mitigate flood impacts. As the site is neither steeply sloped, heavily wooded, prone to flooding nor landslide, adverse impact will be small.	Design review & construction oversight.	EMW
Ground Water	As surface water and rainwater catchment will be water source, no impact is anticipated.	None required.	None required.	None required.
Rainwater	Utilizing rainwater as a supplemental water source will reduce surface water runoff and	None required.	None	None required.

Catchment	the consequent need for expanded drainage.		required.	
ADA Compliance	ADA compliance will facilitate access to the school and its facilities by disabled students, teachers and admin staff.	None required.	None required.	None required.
Construction Phase (See detailed mitigation measures in Section 9.1)				
Air Quality	Construction vehicle and equipment exhaust, and dust from vehicles and grading.	Spray water on material to be transported and covering truck beds to reduce dust. Require transport vehicles owners to only use properly registered vehicles with mufflers to mitigate noise and emissions.	Check trucks entering construction site to confirm licensing.	Construction Supervisor, USAID
Noise	Noise and vibration from transport vehicles, large / small equipment (e.g., generators, cement mixers).	Vehicle operators will be required to minimize use of horns on the site, and avoid using concrete mixers in proximity of religious sites. Workers at distances less than 5 m from construction equipment must wear ear protection to minimize noise impacts. Machinery and vehicles will be maintained in good working condition to minimize noise levels.	Visually inspect safety equipment use, observe vehicle noise levels.	Construction Supervisor
Soil	Erosion from site grading, change of use from agricultural to school.	Minimize grading, plant trees, bushes and grass to minimize runoff and channel rainwater runoff. Liquid and solid waste, fuel and chemicals will be properly stored above ground to avoid spills and leaks. Storage tanks	Periodic check for any uncontrolled	Construction Supervisor, USAID

		frequently inspected for leaks/damage.	drainage.	
Flora and Fauna	Negligible impact, as site use is currently for low value agriculture.	Additional trees and gardens will be planted on school grounds.	Confirm that landscape architecture conforms to plan.	Construction Supervisor
Increased Population	After construction there will be an additional 300 persons living on site. During construction there will be up to 100 workers.	Maximize the use of the local labor, in part to minimize the need for temporary camps, and also to ensure socioeconomic equity for the local population.	Confirm source(s) of construction labor.	EMW
Wastewater	Rainwater runoff will wash away residues, garbage, leaves, grease, thereby polluting nearby surface water.	Proper site grading, planting of trees, bushes, and gardens will reduce surface water runoff. A rainwater catchment system to supplement the water supply will further reduce runoff.	Periodic visual confirmation of run-off drainage sites.	EMW, USAID
Solid Waste	Construction materials (wood, steel bar, waste cement, etc.), paper, packing and domestic and human waste from workers	Paper, resin, iron and steel sold to other enterprises to recycle. Inorganic solid waste (concrete, bricks, etc.) will be disposed of properly. Unrecyclable domestic waste regularly collected/disposed in proper places.	Monitor waste stream to ensure maximum waste stream recycling.	Construction Supervisor, USAID
Human Waste	From construction workers and later students and staff	Temporary water supplies (trucked in) and portable toilets will be provided on-site during construction. Sanitary latrines and a septic system will be constructed for long term use of all students and school staff.	Ensure that workers utilize temporary latrines.	Construction Supervisor, USAID
Electrical	Low voltage power and suitable transformer are available within	Extension of low voltage electrical line to school will have	None	Construction

Power Supply	two hundred meters of the site.	negligible impact.	required.	Supervisor
Employment	About 100 skilled and unskilled laborers will be needed for site clearance and construction.	Use of local skilled and unskilled labor will be one of the important contractor proposal evaluation criteria.	Survey workers as to their origin.	EMW
Transport and Rural Road Improvement	Current road is in poor condition. Dirt road will be upgraded to tarmac or concrete road, and traffic to school and beyond will increase. Could cause erosion, provide access for illegal land clearing, logging or poaching.	Roads improvements and demand for retail support services for school will bring more traffic. Since site is relatively remote, it is unlikely to have significant impact. Construction trucks hauling equipment and materials will only operate during the day, and will be required to have fully licensed vehicles and operators. Follow guidance on design, construction, and operation and maintenance described in "Rural Roads" and resources listed there	Check licenses of vehicles and drivers regularly.	Construction Supervisor, EMW Project Manager, USAID
Local Labor Demand for Agriculture	Potential conflicting allocation of local labor required for planting and harvesting periods.	Planned construction period does not conflict with local manioc and cassava crop planting or harvesting period.	None required	None required
Social Evils	Construction crews seeking diversion may generate increased undesirable demand for prostitution, illegal drugs, gambling, etc.	Provide alternative diversions, e.g., provide football field, movie hall for showing DVDs (not uncommon in rural areas). Maximize use of local laborers who will live at home during construction.	None required	Construction Supervisor and EMW
HIV and other Infectious diseases	Irresponsible participation in social evils may well increase infection rate of sexually transmitted diseases.	Provision of public education materials, and behavioral change promotion programs	Periodical inspection	Local Authorities

Post-Construction Phase (See detailed mitigation measures in Section 9.2)				
Groundwater	Water system will use ground water spring as primary source.	As spring is currently unused, no other potential users are affected. Water is slow sand filtered, and chlorinated before use.	Periodic WQ tests will be carried out.	EMW, USAID
Fauna	Negligible, as site use is now currently low value agriculture.	None required.	None	None
Water Access	People near site use untreated water in deep dugwells. They could use school water system and improve community health.	Negotiate limited access of nearby houses to improved water system from school, possibly through public taps.	Confirm access to water system.	EMW, USAID
Water Supply & Wastewater Management	A treated (filtered, chlorinated), piped water system, possibly supplemented by rainwater catchment, will be built.	Wastewater (greywater) will be largely reused in gardens and watering landscape. Excess water (if any) from proposed rainwater catchment will be diverted to natural drainage.	Periodic visual confirmation of wastewater reuse.	EMW, USAID
Sanitation	People now defecate in fields or pits. Sanitary latrines with septic drainage field will be built.	Septic system will be periodically de-sludged and treated effluent will be properly dissipated to the environment through a septic field.	Periodic sniff and visually confirm septic system O&M.	EMW, USAID