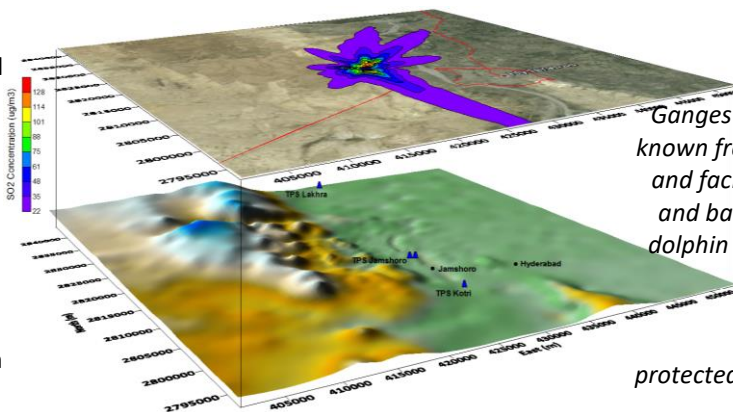




Environmental and Social Services

Compliance with today's environmental regulations and social policies are difficult, which can have significant impact on a company's image and competitive posture.

Details of major Environmental Protection and Land Act requirements, such as the Environmental Compliance Approval, Land Acquisition and Resettlement Policy are changing quite frequently. In this climate, even companies with large, dedicated environmental and social departments are finding it a challenge to keep up with the changing regulatory requirements and provide adequate staffing for short-term needs. GEEC's Environmental and Social Services Group (ESSG) works with clients in a team approach to help manage all types of issues cost-effectively.



Challenge

Ganges River Dolphin is one of the four known fresh water dolphins in the world and facing extinction. Dredging in river and barrages affect permanent loss of dolphin and fragment natural habitats.

GEEC Solution

Planned and designed 1,300 ha protected sanctuaries to offset losses to Ganges dolphin and prepare management plan for Indus Dolphin Game Reserve.

Challenge

Soil contamination by heavy fuel oil in the oil decanting area and wide spread disposal of asbestos material in power plants

GEEC Solution

Assess the extent of the soil contamination by sampling and testing to delineate the lateral and vertical extent of the contamination, and propose bioremediation. Asbestos management plan is prepared to contain the asbestos pollution.

Excellent Resources

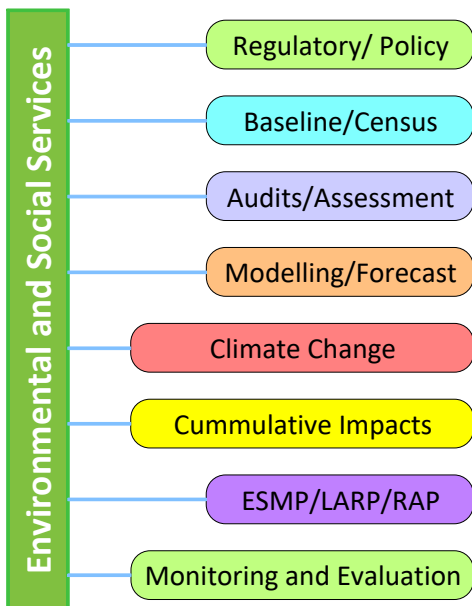
A broad range of scientific and engineering disciplines is necessary to handle complex Environmental and Social issues that may arise from regulatory analysis to control system design. Many of our professionals have advanced degrees, Doctoral in most cases and licensed professionals and are recognized in their fields. We utilize the latest regulatory models, statistical, emission and cost estimation references and softwares, and GIS & CAD packages. GEEC's ESSG drawn from a wider resource personnel in key technical disciplines including:

- ✓ Environmental Engineering and Science
- ✓ Sociology, Social science and anthropology
- ✓ Meteorology
- ✓ Biology

Typical Projects

Typical projects varies from thousands to a million dollar consultancy services.

- ✓ Environmental Compliance Audits and Approval, Airshed assessment using AERMOD and CALPUFF
- ✓ Cumulative Impact Assessments of barrages and power plants
- ✓ Land acquisition and resettlement, and social impacts
- ✓ ESIA for Coal fired Power Plants
- ✓ ESIA for Highways, Bridge (6.15km), railway line (600km), water supply system, and tunnels (1.8km)
- ✓ ESIA for hydropower (4,320 MW)
- ✓ ESIA for underground gas storage reservoir
- ✓ Noise modelling for road traffic, piling work, Gas RMS, power plants
- ✓ Thermal Plume Modeling
- ✓ Urban Air Quality Management
- ✓ National GHG Emission Inventories
- ✓ Capacity Building and Training in Air Quality, Environmental Management, Health, and Safety
- ✓ Biodiversity Monitoring and Management Plan
- ✓ Adaptation of Climate Change in Infrastructure Design



A Team Approach

GEEC's ESSG offers cost-effective, tailor made approach for addressing the complex regulatory, planning, scientific and engineering requirements of Environmental and Social compliance and due diligence.

Challenge

Hilsa is a migratory fish of huge economic value, piling works during a 6.15 km Bridge construction and barrages affect their annual migration

GEEC Solution

Identified the hilsa migration routes and their timing of migration and proposed construction window and fish ladders to avoid any impact on the migration

Challenge

Original 2 km alignment in Northern Railway Line (Phnom Penh to Poipet, 385km) in Poipet close to Thai border requires considerable resettlement.

GEEC Solution

Realignment along the median of existing NRS and reduced the resettlement of households and commercial centers from 1,517 to 335.

Challenge

Ispani mire is one of the two known percolation bogs of the world. Hydrological integrity of the mire is affected due to the construction of highway on its upstream side.

GEEC Solution

Recommended realignment and extensive structural solution to allow the natural hydrology of the mire

Full Range of Services

GEEC's ESSG offers a complete range of Environmental and Social consulting and engineering services, including the following:

REGULATORY

- ✓ Regulatory permitting (ECA, REA)
- ✓ Air emissions inventory & Abatement
- ✓ Assessment of BACT
- ✓ Social impact assessment

COMPLIANCE AUDITS/ASSESSMENT

- ✓ Environmental Compliance Audits
- ✓ Screening and Scoping Assessments
- ✓ Environmental and Social Impact Assessments
- ✓ Land acquisition and resettlement
- ✓ Resettlement action plan
- ✓ Cumulative Impact Assessments
- ✓ Noise Assessments (including underwater noise)
- ✓ Strategic Environmental Assessments

MODELLING

- ✓ Meteorological Data Processing
- ✓ Dispersion Modelling (AERMOD, CAL3QHC).
- ✓ Transport Sector Emission Modelling
- ✓ Noise and Vibration modeling (RAM Geo, TNM)
- ✓ Thermal Plume Modelling
- ✓ Urban and Regional Scale Modelling

SOCIAL AND RESETTLEMENT ASSESSMENT

- ✓ Social and poverty impacts
- ✓ Land acquisition and resettlement
- ✓ Livelihood assessment and restoration
- ✓ Gender & indigenous people impacts

SECTOR COVERAGE

- ✓ Highway and railway infrastructures
- ✓ Gas Transmission Pipelines
- ✓ Large Power Plants (Hydro, Solar, Thermal including coal)
- ✓ Water supply and sanitation
- ✓ Urban air quality management



Challenge

SO₂ emission in an existing powerplant is exceeding the national air quality standards

GEEC Solution

Emission offset is used by the introduction of state-of-the-start emission control technology to bring the plant in compliance with both national standard and IFC Emission Guidelines.



Challenge

DHP requires 5 million tons of fine sand extracted from river deposits, which will severely affect the Indus River ecology.

GEEC Solution

Manufactured sand is proposed from reservoir submergence areas to avoid impacts on aquatic ecology and avoiding additional land acquisition and environmental impacts.

GEEC Ltd.

GEEC Ltd. is a multidisciplinary consulting firm established in Toronto and maintains a Certificate of Authorization from Professional Engineers of Ontario. The key element of its strategy is the ability to combine the latest worldwide professional advances with a thorough knowledge of the local socio-economic conditions to reach solutions that are optimal, cost effective and reflects local needs.



GEEC LTD.



**Professional Engineers
Ontario**

CLIMATE CHANGE

- ✓ GHG emission Inventories & Mitigation Plans
- ✓ Climate Change Adaptation in Infrastructure
- ✓ Historical and Future Analyses and Trends
- ✓ Climate Resilient Design
- ✓ Institutional Strengthening

MONITORING AND EVALUATION

- ✓ Water and effluent sampling and analysis
- ✓ Air quality and noise level
- ✓ Sediment and sludge quality
- ✓ Biodiversity and fisheries
- ✓ Socioeconomic parameters

QUALITY ASSURANCE PROCEDURE

GEEC operates in accordance with its Total Quality Program (TQP). Our TQP constitutes (1) Client satisfaction, (2) Leadership, (3) Workplace environment, (4) Performance plan, and (5) Total participation.

Challenge

A major bridge, 100 years design life requires to adapt impact of future climate change.

GEEC Solution

Factored climate change (sea level rise, future temperature, wind speed, and salinity intrusion) resilience in engineering design.

AWARDS AND RECOGNITIONS

Environmental assessment documents prepared by GEEC received 'Best Safeguard System in Project Planning Award' from Asian Development Bank and selected as 'One of the Best Practice EIA' by the IAIA.



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