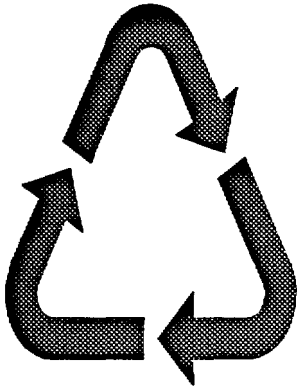


PN-ACF-613

102162



## Qualifications

for

Land, Water, and Air Pollution

due to

Industrial and Agricultural Activities

Submitted to:

USAID/India

New Delhi

Submitted by:

Sheladia Associates, Inc.

Rockville, Maryland, USA

In association with

International Foundation for

Sustainable Eco-Development

New Delhi, India

September 1995

**BEST AVAILABLE COPY**



# SHELADIA Associates, Inc.

15825 Shady Grove Road, Suite 100, Rockville, Maryland 20850 • Tel. (301) 590-3939 • Fax (301) 948-7174 • Telex: 887902/SHELADIA

September 1, 1995

Dr. David Hess  
Deputy Office Director  
Environment, Energy, and Enterprise  
USAID Office  
28B, Institutional Area  
Near Qutab Hotel  
New Delhi 110016  
India

Re: Land, Water, and Air Pollution due to  
Industrial and Agricultural Activities  
USAID/India

Dear Dr. Hess:

Sheladia Associates, Inc. (SHELADIA) of the U.S.A. and International Foundation for Sustainable Eco Development of India are pleased and honored to submit their qualifications for the referenced projects.

SHELADIA is a large Gray Amendment firm (about 200 employees) with a proven and successful record with USAID, UN agencies, the World Bank and the other multi-lateral development banks. SHELADIA has been both prime contractor and subcontractor on long-term project implementations as well as short-term assignments requiring quick fielding and the meeting of tight deadlines. SHELADIA has had over \$50 million in contracts with USAID in the last 10 years, including five IQC's. The firm has received letters of commendation for both implementation efforts and the excellent qualifications of short-term staff provided to support USAID's projects.

SHELADIA has worked extensively in Asia, including Bangladesh, India, Indonesia, Laos, Malaysia, Nepal, Pakistan, Philippines and Sri Lanka.

SHELADIA has undertaken numerous projects in pollution prevention and control. The firm's qualifications are presented on the following pages. Particularly relevant is our Trade in Environmental Services and Technologies Project with Sanders International and our work in the US with various clients



Dr. David Hess, USAID  
September 1, 1995  
Page 2

including the EPA. SHELADIA, in association with CH2MHill, was also recently short-listed on the Bangladesh Industrial Pollution Control Project funded by the ADB.

IFSED is an established Indian consulting firm with substantial local experience in the areas required for the successful implementation of the referenced projects. IFSED specializes in blending modern technology with local skills and materials to adapt the technology to suit the project environment.

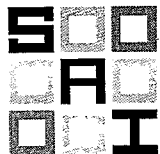
Additional materials are attached showing the breadth of our experience in the type of services required for the referenced projects. SHELADIA looks forward to a formal request to assist USAID for this vital and challenging project in this era of Indian development. I will be happy to answer any questions you may have or any request for additional information.

Sincerely Yours,

Gopal Pillai, P.E.  
Senior Vice President

GP/plf/Q341

enc SAI/IFSED



## **METALS REMOVAL AND RECOVERY TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES, INDIA**

### **CLIENT**

USAID/India &  
Sanders International

### **CONTRACT NUMBER**

386-0530-C-00-3219-00

### **CLIENT CONTACT**

Edward Sanders  
Sanders International

### **PROJECT DURATION**

3 weeks

### **COMPLETION DATE**

1994

### **CONTRACT AMOUNT**

\$92,288 (overall)

### **SERVICES**

Trade Promotion  
Business Linkages  
Technology Information  
Pollution Prevention  
Pollution Control  
Industrial Waste  
Management

The main purpose of this project is to assist private industries in India in adopting environmentally sound practices while promoting sustainable linkages between US and Indian firms. SHELADIA is assisting the prime contractor expedite Indo-US business ventures, organize trade and investment tours and strengthen Indo-US information networks on US environmental technologies for which there is a demand in India.

SHELADIA assessed the leading American technologies for dealing with metal removal and recovery and identified vendors of environmental services and technologies with an active interest in business linkages with India. The report responded to the study of the needs which revealed that:

- Removal of the metals would be required
- Recovery would be desirable, but only if it made economic sense
- The Indian clients were manufacturers who need flexible processes and equipment that can be configured to deal with different metals and various flows
- The electroplating industry was a key target
- The clients were particularly interested in package plants for treating industrial wastes
- Metals of interest included nickel, cadmium, copper, chromium and zinc, with gold and silver being of a lower priority
- Investigation of detoxification processes for cyanide was needed.



## SLUDGE DEWATERING TRADE IN ENVIRONMENTAL SERVICES AND TECHNOLOGIES, INDIA

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**CLIENT**

USAID/India &  
Sanders International

**CONTRACT NUMBER**

386-0530-C-00-3219-00

**CLIENT CONTACT**

Edward Sanders  
Sanders International

**PROJECT DURATION**

2 weeks

**COMPLETION DATE**

1994

**CONTRACT AMOUNT**

\$92,288 (overall)

**SERVICES**

Trade Promotion  
Business Linkages  
Technology Information  
Pollution Prevention  
Pollution Control  
Industrial Waste  
Management

SHELADIA assessed the leading American technologies for dealing with sludge dewatering and identified vendors of environmental services and technologies with an active interest in business linkages with India. Companies who are technological leaders in the particular application were contacted and interviewed as to their special comparative advantage (e.g., large versus small applications, or special applications versus low cost routine uses).

To meet conditions in India, it was determined that equipment should require relatively low amounts of chemical additives as these are costly and often a further source of pollution. Also, ideal equipment would have a lower power requirement, thereby lowering operating costs as well as reducing pollution.



# ENVIRONMENTAL PROTECTION & NATURAL RESOURCE MANAGEMENT INDONESIA

**CLIENT**  
UNDP/OPS

**CONTRACT NUMBER**  
INS/91/008

**CLIENT CONTACT**  
Gilman Rebello

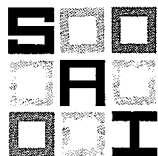
**PROJECT DURATION**  
3 months

**COMPLETION DATE**  
April 1992

**CONTRACT AMOUNT**  
\$40,000

**SERVICES**  
Policy Review  
Environmental Protection  
Sustainable Development  
Training Program  
NGO Involvement  
Human Resources  
Requirements

Sheladia reviewed the policies and strategies of the Government of Indonesia, as well as UNDP and other donor efforts for promoting environmental protection and sustainable development in preparing a program framework for the UNDP's Fourth Country Program. Through our collaboration with the Ministry of Population and Environmental (KLH) and their financial specialists, deficiencies were revealed in methods of financial and economic analysis for national development projects. These deficiencies result in inaccurate assessment of net benefits and, consequently, flawed feasibility studies as environmental degradation feed back. Through a series of discussion and seminars on sustainability issues and the valuation of environmental resources, the difficult job of conveying that environmental measures are pro-growth in the long-term was begun. Our efforts convinced KLH to endorse a major training program for its planning staff as part of the UNDP program in Indonesia.



# STRENGTHENING NATIONAL CAPACITY FOR ENVIRONMENTAL AFFAIRS, SYRIA

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**CLIENT**  
UNDP/OPS

**CONTRACT NUMBER**  
SYR/92/003

**CLIENT CONTACT**  
Myryam Torre

**PROJECT DURATION**  
1 month

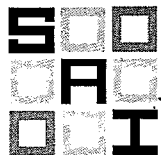
**COMPLETION DATE**  
September 1993

**CONTRACT AMOUNT**  
\$20,000

**SERVICES**  
Environmental Planning  
Environmental Protection  
National Planning  
Risk Assessment  
Remediation

Provision of environmental planning services to the Government of Syria to assist in the preparation of an environmental protection act in an attempt to attain natural resource sustainability:

- Determination of the status of government priorities emphasizing institutional and human resources affected by the act
- Definition and analysis of the major environmental issues facing the country and presentation of recommendations for effective courses of action to remedy said problems
- Integration of environmental issues in the national socio-economic development plan
- Identification of targeted beneficiaries and direct recipients with appropriate socio-economic data and analysis
- Risk assessment analysis of the project objectives



## ENVIRONMENTAL GUIDELINES EL SALVADOR

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**CLIENT**

American Institute for Free  
Labor Development/El Salvador

**CONTRACT NUMBER**

519-0368-A-00  
0243-00

**CLIENT CONTACT**

Delano Stewart

**PROJECT DURATION**

1 month

**COMPLETION DATE**

October 1991

**CONTRACT AMOUNT**

\$34,000

**SERVICES**

Environmental Assessment  
Institutional Development  
Training Needs Assessment  
Evaluation & Monitoring  
Policy Analysis

SHELADIA drafted environmental guidelines for an NGO's \$14 million Democratic Labor Development Project. Four areas were covered - water supply, sanitation, housing, and infrastructure which included roads, bridges and irrigation and drainage systems.

Environmental criteria for project selection were proposed and various mitigating measures identified as options for each project category. Companion activities to enhance positive environmental impacts of projects were also identified and described to permit project developers to improve benefit-cost ratios.

The Environmental Review Guidelines established a screening process whereby projects are categorized into those with significant and diverse impacts, those with specific impacts and those which would not require environmental review. Particular environmental impacts to be assessed covered:

- Soils and vegetation
- Water resources
- Ecological impacts
- Historical/cultural impacts
- Land use
- Socio-economic impacts
- Energy requirements
- Irreversible and irretrievable commitments of resources.





# PILOT PROJECT FOR PARTICIPATORY ENVIRONMENTAL REGENERATION AND SUSTAINABLE COMMUNITY-BASED DEVELOPMENT IN WADI ZABID, YEMEN

**CLIENT**  
UDNP/OPS

**CONTRACT NUMBER**  
YEM/90/009

**CLIENT CONTACT**  
Myryam Torre

**PROJECT DURATION**  
1 month

**COMPLETION DATE**  
April 1993

**CONTRACT AMOUNT**  
\$11,000

**SERVICES**

Erosion Protection  
Participatory Techniques  
Socio-economic Baseline  
Survey  
Institutional Strengthening  
Project Evaluation

Project to address the severe erosion of the Upland Watersheds and the abandonment and collapse of the upper terraces in two regions of Northern Region: development and evaluation of replicable participatory procedures and practical techniques for revegetating escarpments, reclaiming terraces, and establishing wadi's and gully water/soil control systems; strengthening of the development of an NGO, Yemen Al Kadhara; and establishing a socio-economic baseline survey to evaluate socio-economic costs and benefits derived from all project activities and from the various techniques tested. Services provided:

- Review of the Terms of Reference of contracted NGO
- Review of proposal formulated by Ministry of Planning for NGO participation:
  - Reduction of overall scale of the preparatory assistance phase
  - Identification of all consultants and field inputs executable by local expertise under locally managed contracts
  - Rephasing of community based field work
  - Review of equipment cost
  - Redrafting of the TOR of the Steering Committee.



## SELECTED POLLUTION PREVENTION AND CONTROL PROJECTS IN THE U.S.A.

- PROJECT:** Analysis of Air Quality Issues
- CLIENT:** US Environmental Protection Agency
- SCOPE:** SHELADIA analyzed performance standards such as the New Source Performance Standards (NSPS), Reasonably Available Control Technology (RACT), and National Emission Standards for Hazardous Air Pollutants (NESHAP). Environmental considerations and constraints were analyzed for a national energy policy. Also, EPA's strategy for the reduction of risks from hazardous air pollutants was reviewed and recommendations developed.
- PROJECT:** "2001" Facilities Planning Study
- CLIENT:** Anne Arundel County, Maryland
- SCOPE:** Preparation of a facilities planning study to assess the existing environmental, socio-economic and demographic conditions in the Broadwater Sewer District of Anne Arundel County. A complete environmental inventory was prepared and analyzed to assess the impact of projected future development and the facilities required to meet the needs of future development.
- PROJECT:** Groundwater Contamination Study, Phoenix Military Reservation
- CLIENT:** US Army Corps of Engineers, Baltimore District, Maryland
- SCOPE:** Study to assess alternatives for the removal of groundwater TCE contamination at the Phoenix Military Reservation and selection of the most feasible alternative that would least adversely affect the supply of potable water of nearby residents.



**PROJECT:** Brentwood Pollution Control--Dust Collection

**CLIENT:** U.S. Department of Interior

**SCOPE:** Various maintenance and rehabilitation projects including upgrade to existing carpentry and welding shops and design of new ventilation and dust collection systems.

**PROJECT:** National Airport Industrial Waste Treatment Study/Design

**CLIENT:** U.S. DOT/FAA and Burns & McDonnell

**SCOPE:** Process study involving sanitary engineering and mechanical and electrical services for design of industrial waste treatment and discharge system including oil/water separator, equalization basin and associated piping at Washington National Airport.

**PROJECT:** Wastewater Treatment Plant, Thurmont, Maryland

**CLIENT:** Town of Thurmont, Maryland

**SCOPE:** Engineering design and shop drawings review of various treatment facilities at the sewerage treatment plant, including the oxidation chamber, pumping stations, secondary clarifier, tertiary sand filter and other related facilities.

**PROJECT:** Industrial Waste Treatment Study and Design

**CLIENT:** Federal Aviation Administration

**SCOPE:** Process study of industrial waste treatment operations at Washington D.C.'s National Airport and design of additional treatment facilities, including an oil/water separator and all associated piping for treatment of industrial wastes.



**PROJECT:** Technical Support to Analyze Air Quality Issues and Analytic Support for Solid Wastes, Toxics and Contaminants Issues

**CLIENT:** ASFE/Office of Planning and Environment, US Department of Energy

**SCOPE:** Identify and examine environmental notices and rules-making actions pertaining to air quality, solid wastes, toxic substances and chemical contaminants associated with fossil energy exploration, production, processing and utilization. Attend and report on public hearings and advisory committee meetings. Provide technical analyses of proposed regulations pertaining to these areas, review specific legislative and policy initiatives, evaluate existing analytical and mathematical models, examine the applicability of electric utility research and perform technical analyses.

**PROJECT:** Analyze Solid Waste/Toxic Substances

**CLIENT:** U.S. Department of Energy

**SCOPE:** Technical and information services to identify, analyze and review legislative, regulatory and policy issues under RCRA, CWA, SMCRA, TSCA, CZMA and NEPA impacting air quality. Provide technical and information services to the Office of Planning and Environment (OPE) to identify and analyze proposed legislation, regulations, policies and programs for protection of the environment and human health. Specific support includes:

- Examining the Federal Register to identify environmental notices or rulemakings pertaining to solid waste, toxic substances and chemical contaminants regulations affecting the development or utilization of fossil fuels.
- Performing technical analyses of proposed legislation, regulations, policies and programs pertaining to solid wastes, toxic substances and chemical contaminants associated with fossil energy exploration, production, processing and utilization.



**PROJECT:** Liquefied Gaseous Fuels Spill Test Program

**CLIENT:** U.S. Department of Energy

**SCOPE:** The objective of the project was to develop safety and environmental control information to assure the public health and safety, as well as the environment from the potentially hazardous effects of liquefied gaseous fuels and other toxic fluids. The overall goal of the liquefied gaseous fuels spill test program was to develop safety and environmental control information needed by government regulatory agencies, industry and the general public to assure the protection of public health and safety, as well as the environment, from the potentially hazardous effects of liquefied gaseous fuels and other toxic liquids. The program objectives were to:

- Provide a firm technical foundation on liquefied gaseous fuels release behavior for development of industry standards and promulgation of regulations.
- Investigate, develop and validate methods for preventing accidental liquefied gaseous fuels spills and controlling the consequences of accidental liquefied gaseous fuels releases.

In support of this effort, SHELADIA provided technical, analytical and consultation support for policy and budgetary activities required during the construction of the experimental liquefied gaseous fuels spill test facility. SHELADIA was responsible for the examination of construction site information to confirm consistent application of all test facility requirements and to assure compliance of environmental standards.

Comparability to the proposed project includes technical and policy issues on transportation of toxic hazardous chemicals; risk assessment; and local and regional transport of contaminants and exposure pathways.



**PROJECT:** Building 196, Washington Navy Yard, OSHA Deficiencies

**CLIENT:** NAVFAC - Chesapeake Division

**SCOPE:** Removal of hazardous asbestos (approximately 9,000 s.f.) from steel structures in a four-story building housing a computer facility. Residual/remaining asbestos was encapsulated and enclosed. All non-hazardous fire proofing material was reapplied to restore the facility in accordance NFPA and OSHA requirements. Work included feasibility study, engineering design, preparation of contract documents and supervision of removal and restoration, design of fire dampers, fire doors; loading dock repair; replacement of existing stair treads; temporary ventilation exhaust system; installation of temporary shower facilities for construction workers.

**PROJECT:** Full A/E Services--Asbestos

**CLIENT:** GSA, Region III

**SCOPE:** Repairs, renovations, alterations and modernization of buildings or portions thereof, and surrounding grounds including feasibility studies; historical structure reports; CAD design; metric design; design development, construction documents, asbestos abatement and monitoring of construction as required.

Asbestos abatement issues included review of asbestos survey documents and construction documents; building inspection to identify homogenous materials; material sampling and testing; abatement prioritization; materials quantification and evaluation report.



**PROJECT:** IQC - Architect Engineering Contract

**CLIENT:** U.S. Army Corps of Engineers - Baltimore

**SCOPE:** Services to the Director of Engineering & Housing (DEH) at Fort George G. Meade include a variety of multi-disciplinary tasks involving architecture, civil and environmental engineering for requirements such as asbestos identification and remediation planning; building renovations; land-fill closure(s); design of minor construction projects and other consulting services.

**PROJECT:** Cleanup of Hazardous Waste Sites

**CLIENT:** U.S. Department of Energy

**SCOPE:** Technical Assistance and Support Services to the Defense Programs for cost analyses for CERCLA/RCRA projects. Collection and analyses of data related to cleanup of existing hazardous waste sites were also performed. These analyses established priorities for proposed PROJECTS and to support the hazardous waste remedial action program.

The objective of this project was to provide technical assistance and support services to the Assistant and support services to the Assistant Secretary of Defense programs for independent cost analyses (ICAs) of the cost estimate/budget requests for CERCLA/RCRA PROJECTS from the Program Outlay Offices. These ICAs will be used to establish priorities for proposed PROJECTS and to defend and support the hazardous waste remedial action program. Collection and analysis of data related to cleanup of existing hazardous waste sites are being performed. These analyzed data will be introduced to the FAST COST model to establish reference values of the costs of site cleanup.

Comparability to the proposed project includes data analysis, economic analysis, cost engineering and modeling.



**PROJECT:** Hazardous Waste Clean-Up

**CLIENT:** EBASCO/US Environmental Protection Agency

**SCOPE:** SHELADIA is currently under Contract with EBASCO, a leading Environmental Services Firm, to assist in the clean-up of 15 hazardous waste sites in New Jersey. These tasks, further identified as "Environmental Preliminary Assessments", are being conducted under US EPA Rules established for the "Environmental Priorities Initiative (EPI)" at sites that were previously investigated by US EPA or other Federal and State Agencies. These Preliminary Assessments, being conducted in accordance with US EPA **CERCLA(\*) Superfund Legislation** includes documentation research, and site reconnaissance and investigation. Field investigation includes taking soil, water and air samples; followed by laboratory analysis; and preparation of reports and recommendations for further corrective actions and remediation. {(\*) CERCLA = Comprehensive Environmental Response, Compensation and Liability Act}

**PROJECT:** Management of Underground Storage Tanks (MUST)

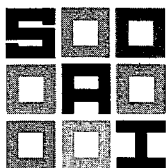
**CLIENT:** Naval District of Washington and E2SI

**SCOPE:** SHELADIA is assisting NDW in managing above- and below-ground storage of petroleum, chemicals, and other liquids, including potable water and sanitary wastewater. This includes:

- Overall Management Services
- Engineering Services for the Removal of Unserviceable Tanks
- Engineering Design for Replacement Tanks
- All related Geotechnical/Soils Engineering Services
- All related Environmental Engineering Services
- Tank Tightness Testing Services

Services offered are in full compliance with U.S. Environmental Protection Agency (EPA), Army Corps of Engineers, and local jurisdictional authority Regulations and Laws.





## IRRIGATION DEVELOPMENT HIMACHAL PRADESH, INDIA

**CLIENT**  
USAID/India

**CONTRACT NUMBER**  
386-0000-C-00-7265-00

**CLIENT CONTACT**  
Michael Snyder

**PROJECT DURATION**  
3 years

**COMPLETION DATE**  
1990

**CONTRACT AMOUNT**  
\$1,074,118

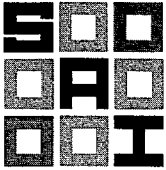
**SERVICES**

Institutional Development  
Design and Planning  
Construction Supervision  
Training  
Operations Planning  
Research  
Procurement  
Computer Modeling

The \$79 million Hill Areas Land and Water Development Project will improve the planning, design and construction of small (less than 500 hectares) irrigation schemes in the foothills of the Himalayas. The project emphasizes the development of state agencies and training institutes, and the integration of irrigation, forestry and soil conservation.

The SAI resident advisor will be assisted by short-term experts in irrigation, agriculture, forestry, horticulture, and rural development. The SAI team will review designs for cost-effectiveness and positive social and environmental effects; arrange in-country training for officials, technicians and farmers; organize overseas training for professionals associated with the project; identify any major problems and address them through special technical studies; and provide specialist input on topics such as community participation, watershed management and irrigation application techniques.

The project focuses on institutional development, through the training provided by the SAI team and through the development of linkages between the local project staff and national and overseas universities and other institutions.



## PROCUREMENT: IRRIGATION INDIA

**CLIENT**

Louis Berger  
International, Inc.

**CONTRACT NUMBER**

386-0480-C-00-5028-00

**CLIENT CONTACT**

Ashok K. Pali

**PROJECT DURATION**

5 years

**COMPLETION DATE**

1991

**PROCUREMENT COST**

\$1,503,121

**SERVICES**

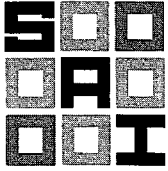
Needs Assessment  
Specifications Writing  
Bid Invitation  
Bid Evaluation  
Contract Award and  
Administration  
Inspection  
Shipping

USAID is assisting the Irrigation Research and Management Improvement Cell (IRMIC) of the Central Water Commission, Government of India, in the comprehensive Irrigation Management and Training project. SAI has been engaged by the prime contractor to procure the specialized technical equipment required for the project's successful execution. SAI is responsible for writing the specifications and managing the formal competitive bidding, and is also liaising with all the institutions concerned to ensure that the commodities are available when needed.

The equipment being procured to date includes:

- soil moisture monitoring equipment;
- microprocessor-controlled plant/soil water potential measuring instruments;
- portable infrared temperature recorder;
- physiological respiration/leaf photosynthesis determination systems;
- laser land-leveling system;
- electronic balance;
- irrigation canal water flow and volume measurement equipment and controls;
- portable and laboratory plant and soil analysis systems; and
- technical and professional publications.

An SAI procurement specialist traveled to India to make a comprehensive needs assessment in conjunction with the prime contractor, IRMIC and USAID. He also arranged with GOI departments for all required equipment certification, import licenses, and customs duty exemptions.



## MINOR IRRIGATION UPGRADING MAHARASHTRA, INDIA

**CLIENT**

USAID/India

**CONTRACT NUMBER**

386-0000-C-00-7265-00

**CLIENT CONTACT**

Michael Snyder

**PROJECT DURATION**

3 years

**COMPLETION DATE**

1990

**CONTRACT AMOUNT**

\$1,035,527

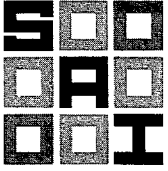
**SERVICES**

Design and Planning  
Construction Supervision  
Training  
Operations Planning  
Research  
Procurement  
Computer Modeling

The \$92-million Maharashtra Minor Irrigation Project will provide a model for improving the design and operation of small reservoir-fed irrigation systems (averaging 300 hectares). It involves the rehabilitation of existing schemes and construction of new ones (about 100 schemes covering a total of about 31,000 hectares); training of government technicians and farmers; strengthening the Departments of Irrigation and of Agriculture of the Government of Maharashtra; and implementing a variety of special studies, pilot activities, etc., to address particular problems in system design and management.

SAI is providing a resident advisor as the senior professional in a newly created project Liaison and Coordination Unit (LCU). He will advise and assist the state government departments in all aspects of project planning and execution. The resident adviser is supported by short-term SAI specialists in computer modeling, in-service training, and operations planning and research.

The primary objective of this technical assistance by SAI is to improve the effectiveness of the people, institutions and information systems involved in irrigation development and management in Maharashtra. By the end of the project, the state government will have its own capability to develop similar irrigation projects.



# IRRIGATION DRAINAGE STUDY

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## INDIA

**CLIENT**

Louis Berger International, Inc.

**CONTRACT NUMBER**

386-0484-C-00-5028-00

**CLIENT CONTACT**

Jan Stofkoper

**PROJECT DURATION**

1 1/2 years

**COMPLETION DATE**

1988

**CONTRACT AMOUNT**

\$70,000

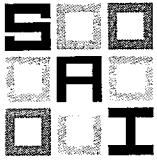
**SERVICES**

Drainage System Evaluation  
Drainage Planning  
Counterpart Training  
Training Manual  
Institution Building

The objective of the overall Irrigation Management and Training Project is to develop the capabilities of irrigation training institutes in several states in India. SAI is a subcontractor on this project to Louis Berger International, Inc. (LBII). As one of its major tasks executed to date, SAI was responsible for carrying out a drainage study and training local staff. SAI developed a detailed drainage design manual, and initiated the use of the improved design procedures through a training workshop.

The SAI drainage expert made a number of trips to the project areas. He conducted on-site reviews of the drainage needs and problems, both technical and institutional. He worked closely with specialists at the institutes and at irrigation projects who were already active in the field of drainage management. The result was a practical manual, addressing immediate needs in such a way that its procedures and recommendations could be directly and effectively implemented.

The manual is being prepared for publication, and wide distribution is expected.



### **CLIENT**

Sardar Sarovar Narmada Nigam Limited, Government of Gujarat

### **SYPHON AQUEDUCT ON THE UNCH RIVER**

SHELADIA provided consulting services to the Narmada Project Design Circle for the design of a cross-drainage structure to carry the Narmada Main Canal over the Unch River near the village of Sindholi. The Canal is a 443-km long, 71-m wide and 7.6-m deep concrete lined structure, a component of a multi-objective river valley development project in Western India. SHELADIA's engineers designed a 70-m long syphon aqueduct with nine 6.4 m by 5.75 m reinforced concrete barrels to carry the canal flow. The design also included river bed and bank protection works, and all ancillary civil works.

### **SARDAR SAROVAR DISTRIBUTION NETWORK SYSTEM**

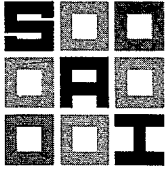
Detailed investigations and survey of distribution network, engineering design and preparation of cost estimates for canals, drains, and civil works, and preparation of reports for 764 structures on 4,500 acres. Project activities included canal and drain alignment, structures location, hydraulic and structural design, bench mark and bed grades determination, location and extent of falls, preparation of longitudinal and cross sections, preparation of land plans and schedules for public acquisition of the required land.

### **SARDAR SAROVAR BRANCH CANAL STRUCTURES**

Preparation of standard designs, drawings, and cost estimates for the branch canals of the Sardar Sarovar Narmada Project. The following standard designs were prepared: road bridge, cross regulator, canal syphon, cross regulator cum fall, head regulator, drainage culvert.

### **RIVER KARAD AQUEDUCT**

River Karad across the Narmada Main Canal. SHELADIA conducted detailed hydraulic studies and prepared preliminary structural design and drawings, including flood estimates, river training, and protection works.



# WATERSHED DEVELOPMENT CAPE VERDE ISLANDS

**CLIENT**

USAID/Cape Verde

The Watershed Management Project will protect and develop the soil and water resources in 17 designated watersheds in Cape Verde.

**CONTRACT NUMBER**

3-86-1-6028 (SBA)

Conservation measures include engineering structures and extensive reforestation to control erosion and help recharge groundwater resources by reducing runoff after rain. Various plants are used to control erosion and provide food, fodder and fuel.

**CLIENT CONTACT**

G. Cashion

The SAI long-term technical assistance team, comprised of specialists in watershed development, forestry, engineering and extension, is advising the government in:

**PROJECT DURATION**

3 years

**COMPLETION DATE**

1988

- water control structures;
- biological measures for soil and water conservation;
- the formation, training and strengthening of Community Based Work Forces (CBWF);
- the development of a comprehensive computerized geographical information system, including watershed modeling and hydrogeological monitoring;
- arranging training of technicians in US degree programs; and
- strengthening the institutions concerned with soil and water resources, including the rural extension service.

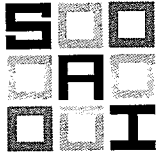
**CONTRACT AMOUNT**

\$2,297,874

The project, linked to a PL-480 Food for Development Project, provides employment for about 4,000 people. On completion, the government will have a well-tested and replicable model for sustainable watershed development, suited to the country's arid climate.

**SERVICES**

Watershed Development  
Planning  
Construction Supervision  
Institutional Development  
Soil/Water Conservation  
Rural Extension/Training  
Remote Sensing



# **THIRD ON-FARM WATER MANAGEMENT PROJECT**

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## **PAKISTAN**

### **CLIENT**

Ministry of Food, Agriculture  
and Cooperatives

### **CONTRACT NUMBER**

2245/LN 3327-PAK

### **CLIENT CONTACT**

Dr. Bza Mohamed Khan

### **PROJECT DURATION**

3 years

### **COMPLETION DATE**

August 1996

### **CONTRACT AMOUNT**

\$3,140,000

### **SERVICES**

Irrigation Management  
Training  
Water User Associations

The project seeks to build on the success of the two previous water management project. The specific objectives of the project are as follows:

- Increase agricultural production through effective use of water and strengthened irrigation agronomy program
- Strengthen the capabilities of the implementing agencies in four provinces and overall coordination
- Increase farmer participation in Water User Associations, strengthen these organizations, enhance their participation in the program, and encourage them to organize in federations within irrigation commands
- Reduce governmental financial obligations via an improved cost recovery program.

SHELADIA is providing the following services:

- Assistance to government agencies for implementation of the project by means of improvements in construction technologies and design standards; and introduction of new irrigation and water management technologies.
- Training of staff through improvement in curriculum, preparation of training materials, and training of trainers
- Assistance in training of farmers/farmers leaders by means of establishing training and demonstration centers, melas, peer training, and extension efforts
- Support in the establishment of water user associations and enhancement of their ability to attain sustainability
- Assistance to the Watercourse Monitoring and Evaluation Directorate in the monitoring and evaluation of the On Farm Water Management Program.



## NEPAL WATER SUPPLY AND SEWERAGE MANAGEMENT PROJECT

### CLIENT

Nepal Water Supply  
Corporation/UNDP

The objectives of the Water Supply and Sewerage Management Project are to improve the operational efficiency and financial soundness of the NWSC and to establish a new customer oriented and cost conscious corporate identity for the organization.

### PROJECT DURATION

48 months

In Joint Venture with South Staffordshire Water Company, Ltd. of the United Kingdom, SHELADIA is providing long term technical assistance to the NWSC. The joint venture is responsible for: institutional strengthening; improved operations and maintenance; improved financial management, cost accounting and revenue collection; design review; improved construction management and supervision, including contract administration, preparation of tender documents, specifications and cost estimates, and procurement; and manpower development.

### COMPLETION DATE

1997

Under a long term twinning relationship, staff from NWSC will be trained at South Staffordshires' facilities in the UK. Specialized in-service training programs will be developed and conducted in Nepal.

### FEE

\$2,600,000

### SERVICES

Design Review  
Construction Management  
and Supervision  
Operations and Maintenance  
Institutional Development  
Financial Management  
Manpower Development and  
Training  
Procurement





## ZAMBIA DISTRICT CENTRES WATER AND SEWERAGE REHABILITATION PROJECT

### CLIENT

Republic of Zambia/  
Ministry of Local Government  
and Housing

The objective of the District Centres Water and Sewerage Rehabilitation Project, one of the priority programmes of the Republic of Zambia, is to provide improved and sustainable water supply services in the district centres of Monze, Choma, Kalomo and Livingstone and improved sanitary services for Kafue Township and Livingstone, thereby decreasing public health hazards.

### PROJECT DURATION

38 months

As a member of a Joint Venture, SHELADIA will provide consulting services in conjunction with the rehabilitation of four water supply systems and two water borne sanitation systems; extension of one water supply system; and provision of essential operation and maintenance facilities for all systems. These services will involve:

### COMPLETION DATE

1995

### COST/FEE

\$1,600,000/600,000

- Rehabilitation and extension of water supply systems of Monze District Centre;
- Rehabilitation of water supply systems of Choma District Centre;
- Rehabilitation of water supply systems of Kalomo District Centre;
- Rehabilitation of water supply systems at Livingstone Municipality;
- Rehabilitation of wastewater systems of Kafue Township;
- Rehabilitation of wastewater systems of Livingstone Municipality;
- Provision of Institutional Support to the Executing Agency to monitor the implementation of the proposed project, strengthen organizational and financial management, provision of training for improved operations and maintenance, conducting a tariff study; and,
- Provision of engineering services for preparation of contract documents and supervision of works.

### SERVICES

Engineering Services  
Construction Supervision  
Procurement  
Institutional Development  
and Training  
Operations and Maintenance



# ON-FARM WATER MANAGEMENT PAKISTAN

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**CLIENT**

USAID/Pakistan

**CONTRACT NUMBER**

391-0413-C-00-4019-00

**CLIENT CONTACT**

John Anania

**PROJECT DURATION**

3 years

**COMPLETION DATE**

1987

**CONTRACT AMOUNT**

\$6,925,093

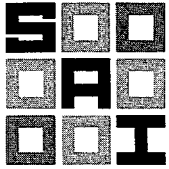
**SERVICES**

Institutional Development  
Design and Planning  
Construction Supervision  
Procurement  
Operation & Maintenance  
On-Farm Irrigation  
Feasibility Studies  
Counterpart Training

The On-Farm Water Management (OFWM) project substantially improved the capabilities of the national and provincial institutions responsible for the country-wide OFWM program, a key element in rehabilitating Pakistan's enormous irrigation network and increasing agricultural production.

SAI provided eight long-term resident specialists (in irrigation engineering, management and planning, agronomy, institutional development, training, and educational materials) supported by short-term technical advisors. They assisted the Government of Pakistan in:

- Improving and standardizing water management technologies, resulting in significantly improved design, construction and maintenance of water courses;
- Developing and strengthening two Training Institutes established during the Project and two existing ones, with development of a standardized curriculum and staff training;
- Establishing training and demonstration farms associated with the four Training Institutes;
- Designing and implementing a nationwide management information system (MIS);
- Procuring \$875,000-worth of irrigation, agronomic and computer equipment for the Training Institutes and the MIS;
- Introducing advanced irrigation systems; and
- Strengthening institutional relationships between the Department of Agriculture, the Department of Irrigation and the Water and Power Development Authority.



## ADB DRINKING WATER PROJECTS THE PHILIPPINES

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**CLIENT**

Asian Development Bank

**CONTRACT NUMBER**

—

**CLIENT CONTACT**

J. M. Gomez

**PROJECT DURATION**

3 weeks

**COMPLETION DATE**

October 1985

**CONTRACT AMOUNT**

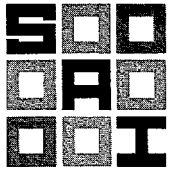
\$10,000

**SERVICES**

Preinvestment Review  
Hydrogeological Study

SAI was retained by the Asian Development Bank (ADB) to provide a technical adviser to review the Island Provinces Water Supply Sector Project. In the course of a three-week mission to the project headquarters and various field sites the adviser prepared a report which assessed the past achievements of the project; identified constraints to improving technical, institutional and financial performance; made recommendations on steps to be taken to meet planned targets; and determined future investment potential.

The SAI adviser was also retained by ADB to undertake a desk study of the groundwater supply problems in the water supply service area of Metropolitan Cebu, the second largest city in the country. His work included an assessment of the likelihood of salt water intrusion into municipal wells, and a general overview of hydrogeological conditions in the area.



## RURAL DEVELOPMENT NEPAL

**CLIENT**

USAID/Nepal

**CONTRACT NUMBER**

ANE-0249-C-00-6068

**CLIENT CONTACT**

Ben Stoner

**PROJECT DURATION**

5 weeks

**COMPLETION DATE**

1986

**CONTRACT AMOUNT**

\$69,606

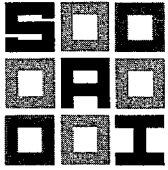
**SERVICES**

Technical Analysis  
Institutional Analysis  
Feasibility Evaluation  
Participant Survey

SAI provided a team of three specialists — in institutional and management issues; forestry and natural resources; and agricultural economics and planning — to assist the USAID Mission in preparing the technical and institutional analyses needed to develop a Project Identification Document (PID) for the second phase of the Rural Area Development (Rapti Zone) Project. Each of the three SAI specialists worked directly with a local counterpart technical specialist to produce joint reports outlining the various constraints and issues affecting implementation of the second phase of the project.

A survey of beneficiaries showed that the Phase I project had resulted in improvements in infrastructure and government services; however, the modest increases in agricultural production were probably inadequate to generate self-sustaining development or make significant improvements in the quality of life in the rural areas.

The SAI study therefore recommended a redirection of Phase II, so that it would focus on increases in production, both in agriculture and forestry. In particular, it would concentrate on developing the local institutional and technical capacity needed to meet this objective.



## WATER AND SANITATION LESOTHO

**CLIENT**

Morrison & Maierle, Inc.

**CONTRACT NUMBER**

AFR-0088-C-00-1025-00

**CLIENT CONTACT**

Willis Wetstein

**PROJECT DURATION**

7 years

**COMPLETION DATE**

1988

**CONTRACT AMOUNT**

\$1,756,433

**SERVICES**

Design

Commodity Procurement

Rural Health Education

Counterpart Training

Institution Building

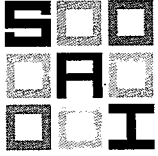
Operations & Maintenance

Morrison & Maierle, Inc. (MMI) of Helena, Montana, in collaboration with SAI, provided technical assistance to the Village Water Supply and Sanitation Service (VWSS) of the Government of Lesotho. A joint long-term resident team of seven experts, supported by several short-term specialists, advised on establishment of the VWSS, and trained Lesotho counterparts to manage the new governmental service.

SAI provided three long-term specialists who were responsible for the technical designs of the water systems; for rehabilitating existing schemes and developing better equipment maintenance procedures; and for all aspects of a multi-disciplinary health education program to ensure that the potential health benefits of the project were fully realized. In each case, the team members trained their VWSS counterparts, and ensured that the procedures developed through the project were institutionalized within VWSS.

SAI was also responsible for the procurement of much of the heavy equipment and material needed for implementation of the project, including drilling equipment, construction machinery, and water supply pipelines, to a total value of over \$1,500,000.

Upon project completion, the VWSS was fully staffed and managed by Basotho, capable of continuing planning, design and construction work with a minimum of external support.



# DESIGN CONSULTING SERVICES

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## RURAL ACCESS ROADS AND BRIDGES REHABILITATION PROGRAMME TRINIDAD & TOBAGO

### CLIENT

Ministry of Works  
and Transport

### CONTRACT NUMBER

700/OC-TT

### CLIENT CONTACT

James Howard

### PROJECT DURATION

1 year

### COMPLETION DATE

October 1994

### CONTRACT AMOUNT

\$1,277,000

### SERVICES

Road Design  
Bridge Design  
Economic Feasibility  
Environmental Impact  
Soils/Materials Studies  
CADD Training  
Agricultural Studies  
Socioeconomic Studies

The objectives of the project are the following:

- Rehabilitation of access roads in farming areas in order to boost the capacity for generating additional income for the nation's economy
- Reduction of transport costs for present and future users of the national highway system by reconstruction of bridges in advance state of disrepair.

In association with Kampsax International A/S and ASTA Engineers Ltd., Sheladia is providing the following services:

#### Access roads:

- Designs of the reconstruction/widening of existing embankments
- Engineering solutions and design for the repair, addition, and reconstruction of drainage works
- New pavements designs
- Designs of repair/reconstruction of road structures.

#### Bridges:

- Reconnaissance/surveys of bridge sites
- Analysis of deterioration of each structure
- Replacement or reconstruction options studies
- Determination of soil profiles and foundation systems
- Study to standardize bridge construction methods and materials
- Determination of construction costs estimates and economic internal rate of return for feasibility studies.



# CONSTRUCTION OF POLYPROPYLENE REFINERY MOSCOW, RUSSIAN FEDERATION

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**CLIENT**

TECHNIMONT, Spa.  
Roma, Italy

**CONTRACT NUMBER**

2545-PP

**CLIENT CONTACT**

Adriano Zasso  
39 2 63 331

**PROJECT DURATION**

18 months

**COMPLETION DATE**

1994

**CONTRACT AMOUNT**

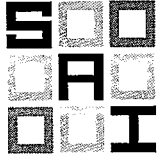
\$60,000

**SERVICES**

Construction Supervision  
Quantity Surveying

SHELADIA is providing a Scheduling and Cost Control Coordinator and a Senior Quantity Surveyor for the construction supervision of a refinery in Kapotnia, a suburb of Moscow. The refinery has a capacity of 100,000 tons/year of polypropylene (PP). This turn-key project involves design, procurement, construction supervision and commissioning of the refinery. The construction phase includes the following specialties: civil, mechanical, electrical, instrumentation, insulation, and painting. Scheduling and cost control coordination includes the following:

- Preparation of computerized site activities programmes and data collection from Field Superintendent, Supervisors and Engineering Manager
- Update of computerized programmes
- Cost/schedule monitoring, particularly for technical and quantity changes
- Analyses of budgeted and current costs and projections monitoring
- Identification of critical areas related to work progress and costs
- Preparation of periodic construction progress reports
- Assistance to the Construction manager for the development of remedial measures to minimize deviations from established programmes and estimated costs.



# TYPHOID CONTROL AND PREVENTION

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## JAMAICA

**CLIENT**  
UNDP/OPS

**CONTRACT NUMBER**  
JAM/91/004

**CLIENT CONTACT**  
P.M. Astolfi

**PROJECT DURATION**  
3 month

**COMPLETION DATE**  
February 1993

**CONTRACT AMOUNT**  
\$130,000

**SERVICES**

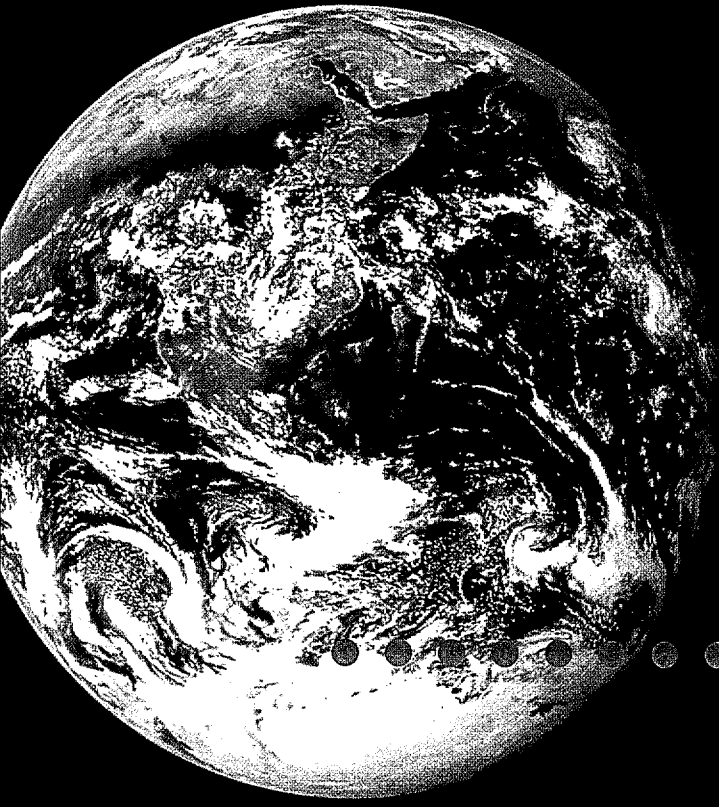
Water Supply & Sanitation  
Preparation of TOR  
Baseline Data Development  
Epidemiological Surveillance  
Institutional Assessment  
Community Level Hygiene

This project was designed to contribute to the control and eventual eradication of typhoid in the parish of Westmoreland through improvements in water supply and sewage disposal systems, increased epidemiological surveillance and treatment of carriers of typhoid, improved environmental planning, and increased health education. This strategy was adopted to ensure a longer term, sustainable solution to the recurring typhoid problem.

SHELADIA provided a resident Water Supply/Sanitation Engineer to supervise the overall investigation, make specific recommendations on water supply and sanitation, and develop terms of reference for additional short-term expertise. SHELADIA's responsibilities included:

- Developing baseline data for the project area
- Assessing the design and function of the water treatment, solid waste and sewage disposal systems and environmental health issues in the project area
- Developing epidemiological surveillance techniques and procedures
- Assessing the institutional capacities, responsibilities, and limitations of the involved public and private agencies in the target area
- Improving community level hygiene practices through a community health education program.






# *Our Fragile Planet*

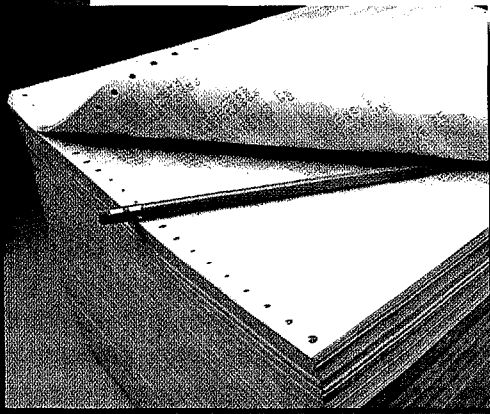
**S** **A** **I** SHELADIA Associates, Inc.  
Engineers, Architects, Planners  

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The Environmental Remediation Experts



# *In Environmental Remediation Professionals Make The Difference*



## **FROM THE COMMUNITY TO CONGRESS — CONCEPT TO CONCLUSION:**

Environmental remediation work is many things, but none looms larger than technical experts satisfying government regulators. And for 20 years SHELADIA Associates, Inc. has in its architectural and engineering work accomplished all of the elements of environmental remediation on behalf of a wide range of governmental agencies at all levels — local, state, and federal.

## **SHELADIA CUTS THROUGH THE CONFUSION TO APPROVAL:**

The road to government approval is complicated and full of detours. SHELADIA's team of 200 professionals is extremely cost effective in navigating just what needs to be done, getting it done, and then explaining it all to regulators. SHELADIA obtains and maintains the applicable environmental licenses/certificates and gains project approval on environmental conformance requirements.

## **SMALL DISADVANTAGED BUSINESS:**

Even with such an extensive staff, SHELADIA is classified as a *Small Disadvantaged Business*, thus satisfying a key requirement often demanded by governmental agencies of subcontractors on environmental remediation projects.

## **COMPANY PERSONNEL**

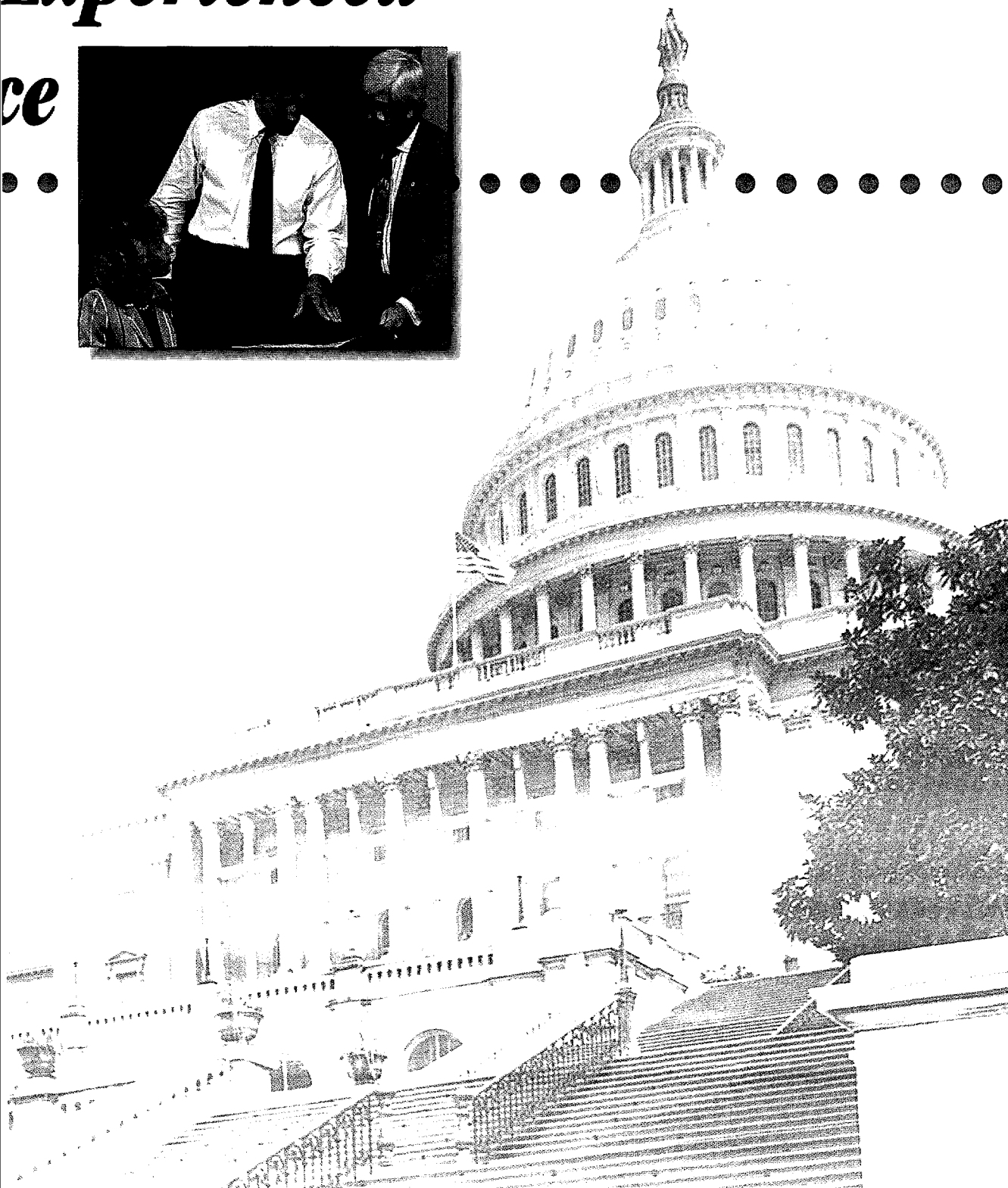
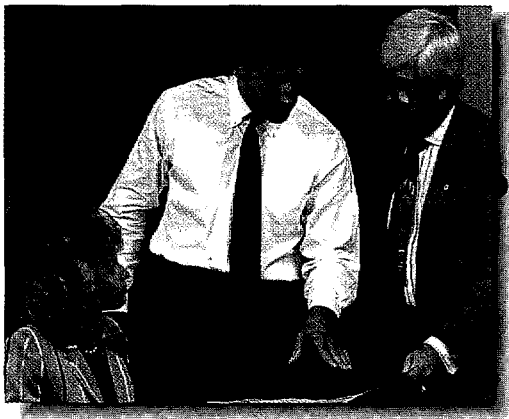
To accomplish these services, SHELADIA enjoys a variety of personnel resources which include:

- Architects and Engineers
- Biologists
- Chemical Engineers
- Civil Engineers
- Community Relations Specialists
- Computer Engineers
- Construction Managers
- Contract Administrators
- Draftsmen and CADD Technicians
- Ecologists
- Economists
- Electrical Engineers
- Energy System Engineers
- Environmental Engineers
- Geohydrologists
- Hydrologists
- Logisticians
- Management Information Specialists
- Mechanical Engineers
- Policy Analysts
- Program Managers
- Production Foremen
- Programmers
- Quality Assurance Managers
- Strategic Planners
- Structural Designers
- System Analysts
- Technical Writers
- Water Resources Engineers



*Experienced*

ce



# ***SHELADIA's Full Service Environmental Remediation:***



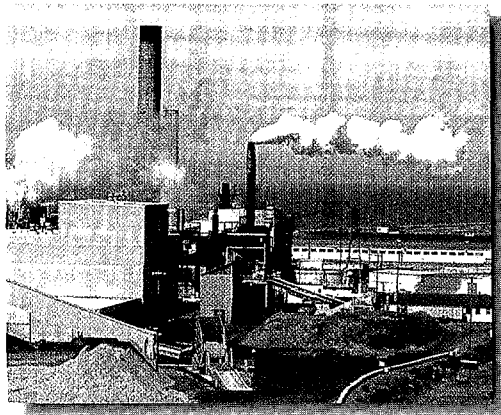
***SIMPLY PUT,  
IT'S QUITE  
COMPLICATED:***

The multiple-tasking demands of environmental remediation define SHELADIA's exceptional quality of work. With more than two decades of experience managing and

delivering engineering, design, procurement, and construction services, SHELADIA is soundly qualified to direct the entire remediation effort, including mobilizing and demobilizing personnel and equipment to mediate the site and restore it to specified conditions.

***SHELADIA KEEPS IT SIMPLE:***

For a wide range of clients, SHELADIA quickly translates the technical and tedious into real solutions. SHELADIA brings to all efforts its expertise in engineering, construction management, water resources, energy and transportation.



***WE PROVIDE PROJECT MANAGEMENT —  
scheduling, reporting of project activities, resources, and results.  
This includes:***

*Developing management plans and reports* including project schedules, work breakdown structures, and cost reports.

*Developing quality program plans* including health and safety plans, sampling and analysis plans, field sampling plans, quality assurance project plans, and construction quality plans.

*Developing technical plans* for community relations, site security, excavations, spill and discharge control, testing, demobilization and closures, asbestos abatement, air modeling and monitoring, surface water management, ground water management, erosion controls, emission controls, transportation, work plans, and site preparation.

***WE DIRECT THE REMEDIATION EFFORT —  
mobilizing and demobilizing personnel and equipment to reme-  
diate the site and restore it to specified conditions. This includes:***

*Sampling, testing, analysis, and monitoring.*

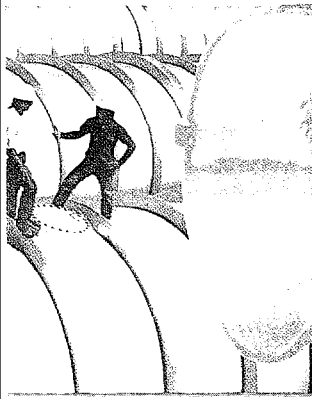
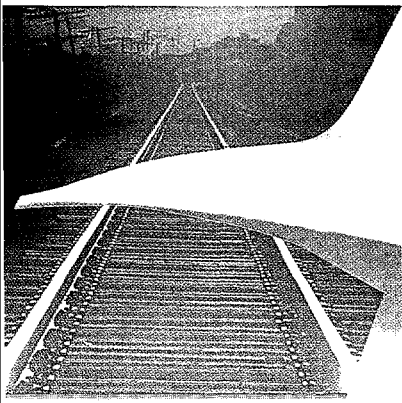
*Site preparation* including site clearance, ground preparation, site security, site remediation preparation, contaminated material facilities, and storm water control.

*Containment* including capping, stabilization and solidification, ground water extraction systems, and ground water containment systems.

*Removal* including transporting, excavation, ground water pumping, free product removal, soil vapor vacuum extraction, drum and tank removal, and asbestos removal.

*Treatment* including carbon adsorption, air stripping, biological treatment, and thermal treatment.

*Closure* including contamination removal, facility shut down, temporary facility removal, and site restoration.



# ***SHELADIA's History of Service***

## ***SHELADIA'S REPEAT BUSINESS — THE ULTIMATE ENDORSEMENT:***

You can tell a lot about a business by the company it keeps. Here is just a partial list of those who have repeatedly sought out SHELADIA's professional expertise:

- Environmental Protection Agency
- U.S. Department of Interior
- Naval Facilities Engineering Command
- U.S. Agency for International Development
- Army Corps of Engineers
- U.S. Department of Transportation
- U.S. Department of Energy
- Federal Aviation Administration

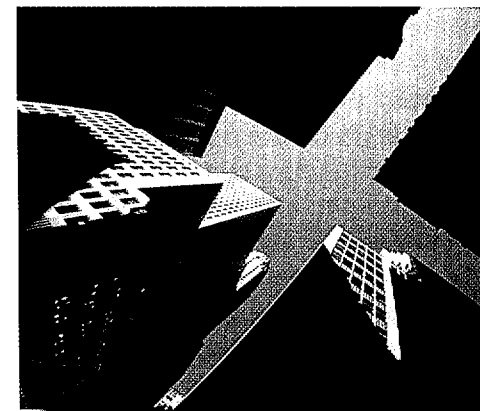
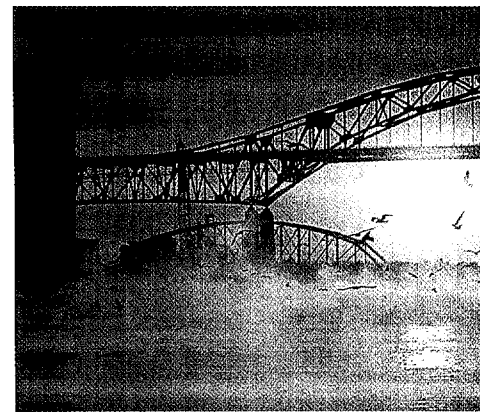
## ***HAVE SHELADIA HANDLE THE DETAILS OF YOUR ENVIRONMENTAL REMEDIATION NEEDS, WHILE YOU MOVE ON TO YOUR NEXT PROJECT:***

SHELADIA knows quality, so "no" becomes "yes," and negatives become positives. Even at the most remote job sites, governmental regulation knows no bounds. And SHELADIA has been there before. Enjoying good rapport with other work groups and with their customers from coast to coast, SHELADIA knows the environmental remediation laws — new & old — and quickly adapts to new situations and technology.

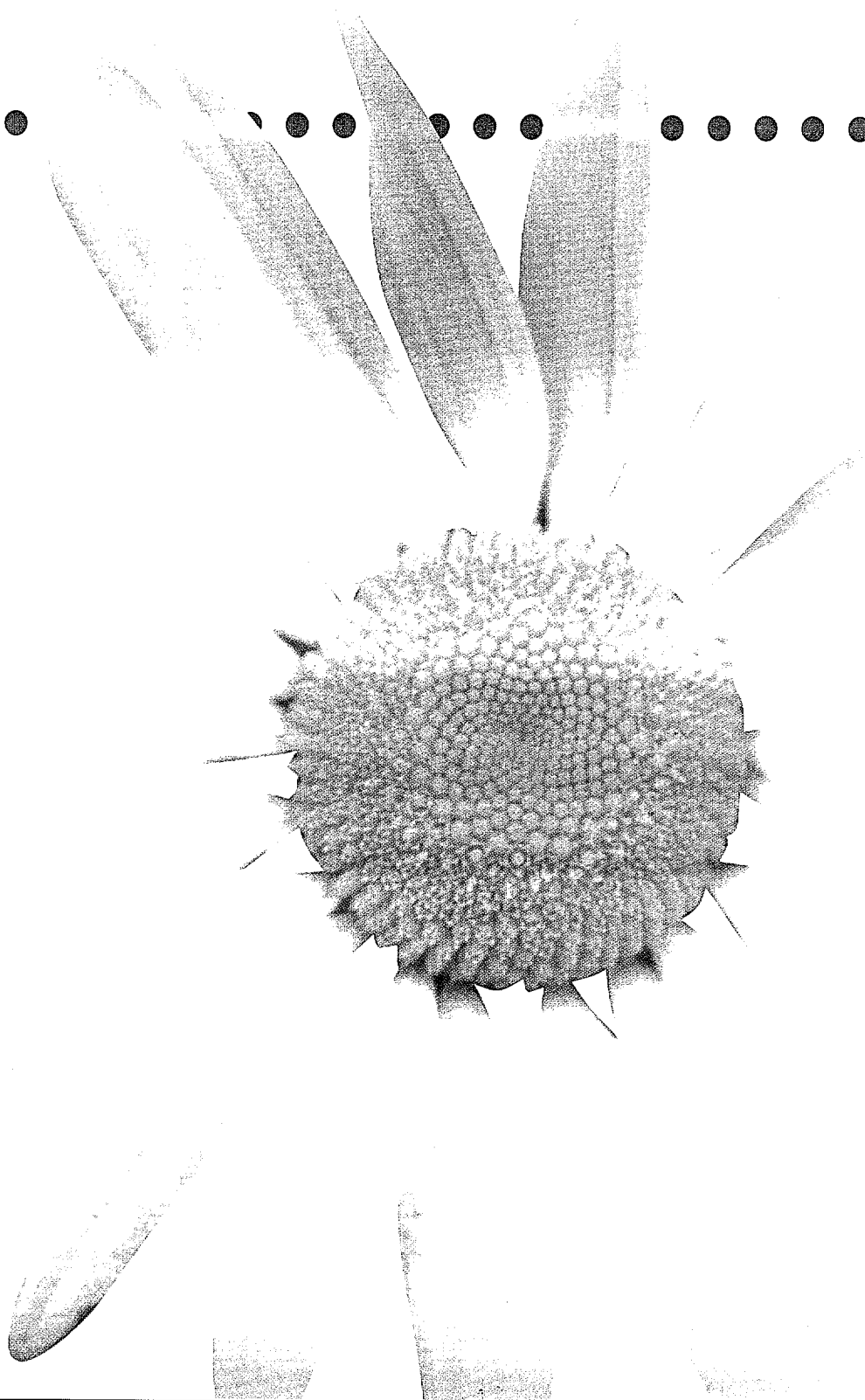
By tracking program status against established baselines, maintaining contract funding information, paying attention to subcontractors and the project's overall bottom line, SHELADIA frees up your time from managing the flow of your environmental remediation issues.

## ***THE SOLUTION IS SHELADIA:***

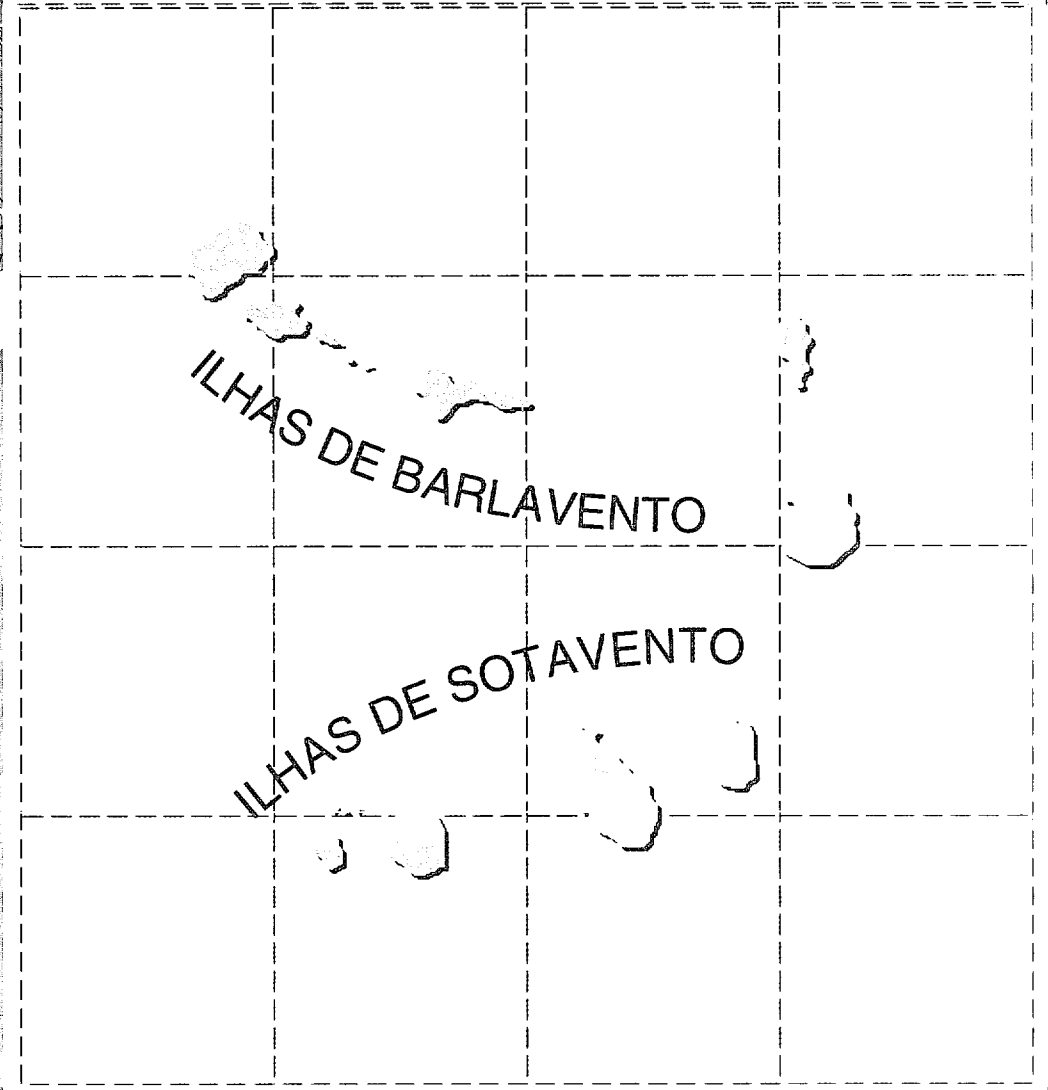
For environmental remediation concerns, SHELADIA delivers quality project completion. For additional information on SHELADIA and how we can work for you, please contact Jack Bertram at (800) 229-3690 for the answers you need.



**ess**



# Watershed Development Cape Verde Islands



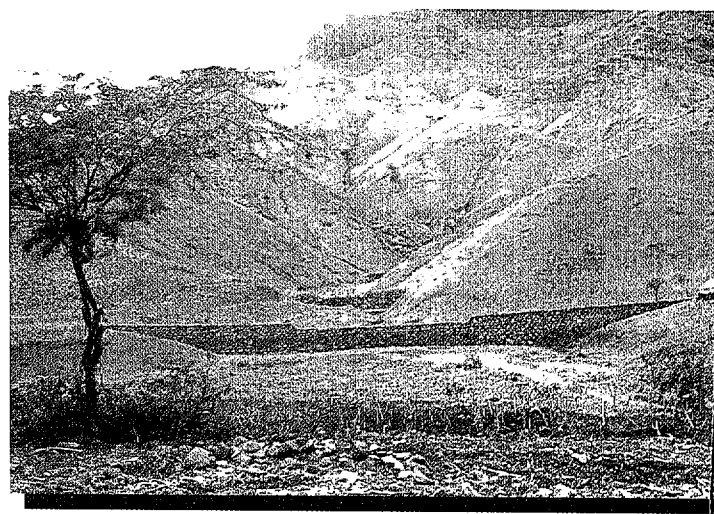
Watershed Development  
Planning  
Water Conservation  
Programs  
Water Control  
Structures  
Watershed Development  
Community Organization  
Local Extension/Training  
Water Modeling  
Software

Sheladia Associates, Inc.



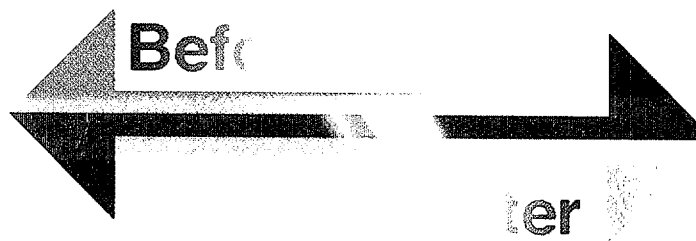
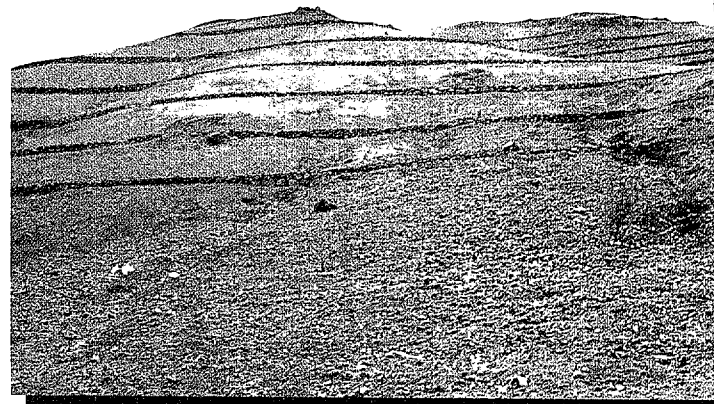
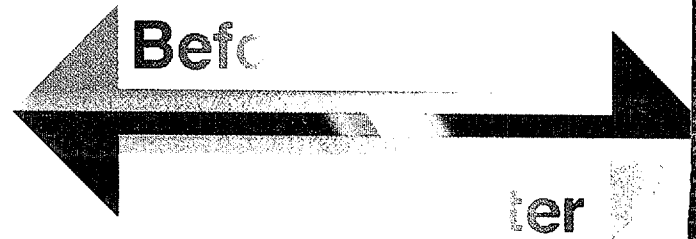
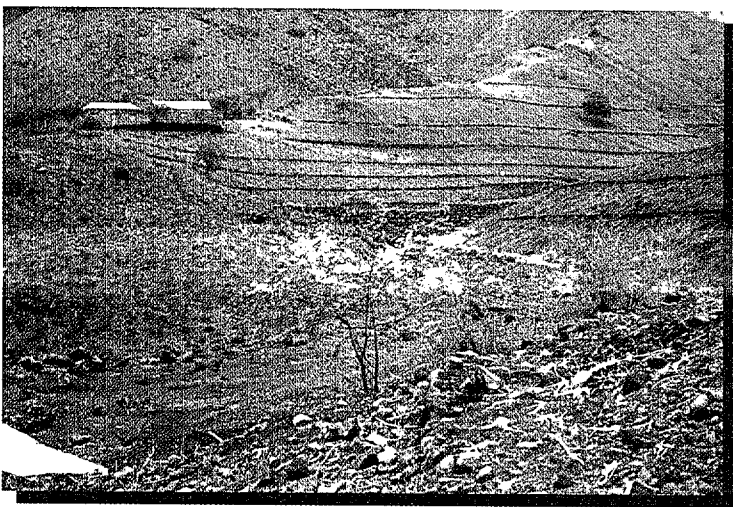
# Watershed Development Cape Verde Islands

The Watershed Development Project was designed to assist the Government of Cape Verde to protect and develop the soil and water resources in 17 designated watersheds in Cape Verde.

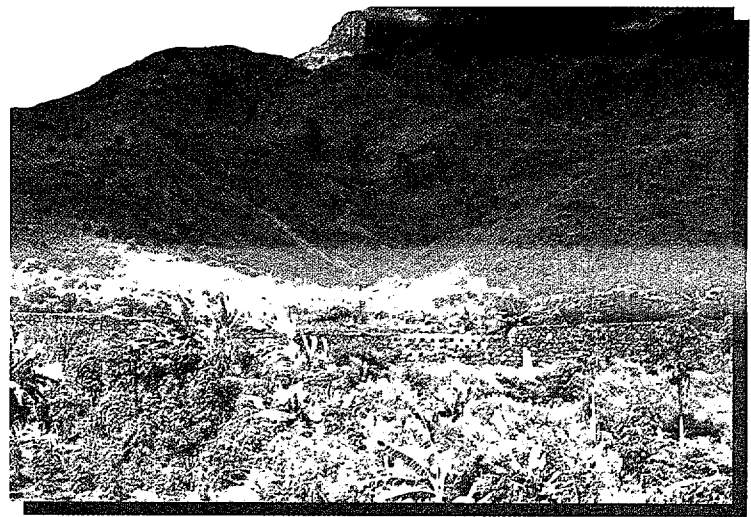
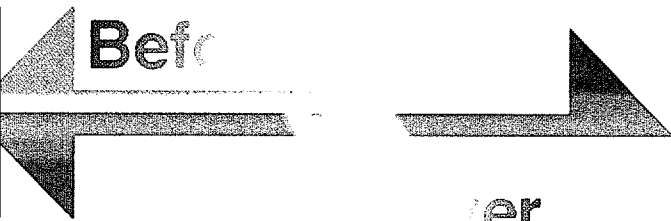


Conservation measures included engineering structures and extensive reforestation to control erosion and help recharge groundwater resources by reducing runoff after rain. Various species of trees and vegetative cover were introduced and used to control erosion and provide food, fodder and fuelwood.

The SAI long-term technical assistance team was comprised of specialists in watershed development, forestry, engineering, community

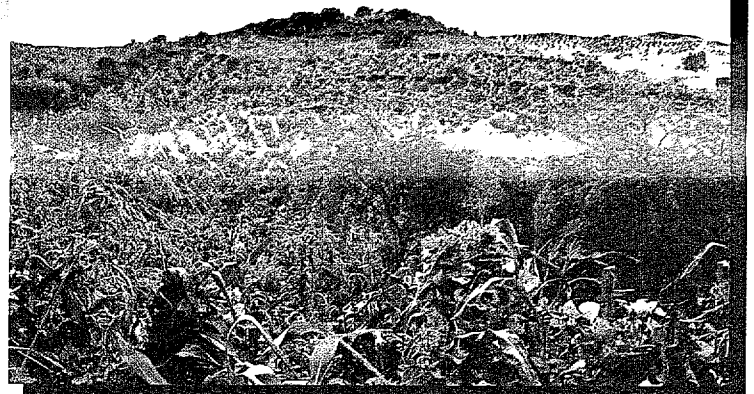
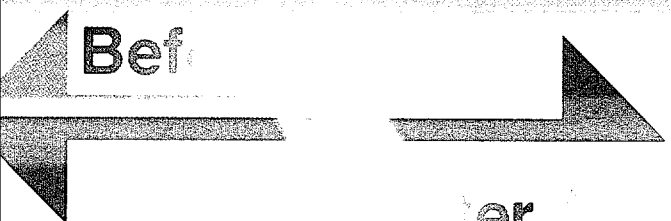


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development and extension. Sheladia provided advice in the following areas:

- Design and construction of water control structures;
- Biological measures for soil/water conservation;
- Formation, training and strengthening Community Based Work Forces (CBWF);
- Participation of women in construction of SWC structures and management of nurseries;
- Development of a comprehensive GIS, including watershed modeling and hydrogeological monitoring;



- Training of technicians through US degree programs;
- Strengthening of soil and water resource institutions, including the rural extension service.

The project, through the CBWFs, provided employment for about 4,000. On completion, the government had a well-tested and replicable model for sustainable watershed development in-place, suitable to the country's arid climate.





# Sheladia Associates, Inc.

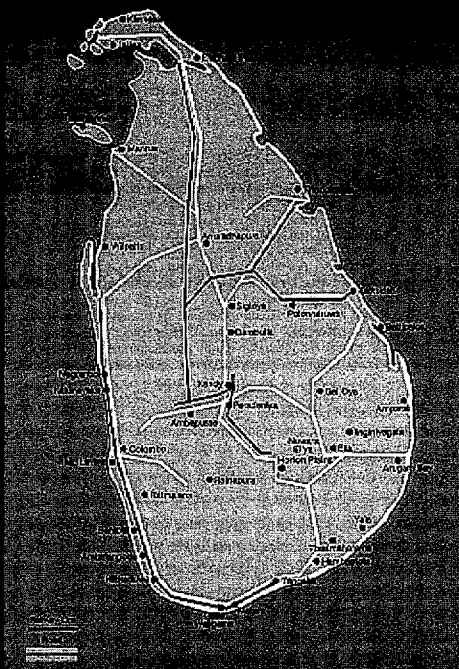
Fall 1992 Newsletter

## INTERNATIONAL PROJECTS

### SRI LANKA

SHELADIA has recently completed a landmark project in Sri Lanka. Since 1987, SHELADIA has been prime contractor for an USAID-funded Irrigation Systems Management Project in Sri Lanka. An important mandate of the project was to increase incomes and raise the standard of living in rural areas. The SHELADIA project team assisted the Sri Lankan government to improve the reliability and equity of water supply on existing irrigation systems; to successfully develop an approach to farmer organization that is unique for Asia; and expand irrigated non-traditional crop production.

The SHELADIA team worked closely with the Irrigation Management Division and Irrigation Department, at all levels, to strengthen their capabilities and to support their efforts to institutionalize an efficient irrigation management program. Areas of emphasis include design and implementation of essential structural improvements; introduction of modern O&M systems; better financial management; development of a monitoring, evaluation and feedback system; establishment of farmer organizations; improvement of agronomic practices; institutional development; and training.



Sri Lanka shimmers in the blue expanse of the Indian Ocean, sharing the same continental shelf as India. The tropical Island occupies a spot in the World's oceans, stretches roughly from 6 to 10 degrees North latitude, and from 80 to 82 degrees East longitude. It is 270 miles in length and 140 miles in width, with a total land area of 25,332 square miles. Sri Lanka has one of the world's oldest irrigation systems. Large-scale irrigation networks began crisscrossing the island as far back as early as the 1st Century A.D. Sri Lanka's farmers once possessed remarkable design capabilities that reflected sophisticated irrigation technology. Over the centuries, for a variety of reasons the system fell into disrepair. This affected not only the system but the people who depended on irrigation as a means of livelihood.

## Bangladesh - NRECA

SHELADIA's success in winning international contracts continues with the award of the Bangladesh Rural Electrification Technical Support Contract by the National Rural Electric Cooperative Association. SHELADIA is providing three technical personnel that comprise the "Engineering Advisory" Field Staff Component included within the Field Support Element stationed in Bangladesh. SHELADIA personnel will monitor and assist in the implementation of approved designs for Bangladesh rural electrification; and procure services for systems components in support of the ongoing Rural Electrification Program. The value of this four-year contract exceeds \$3.3 million.

## Technology Transfer - City of Tianjin

Paul Theuer, P.E., Senior Vice President, was a guest lecturer for the City of Tianjin, The People's Republic of China, International Symposium on "Reform, Open Policy and Economic Development of Tianjin" during the week of June 24, 1992. Mr. Theuer addressed the crowd of distinguished international participants on the importance of technology transfer in attaining Tianjin's economic goals. Topics included sources of technology, the innovation process, technology management and intelligence networking.

## NEW PROJECTS

### Department of Energy

Sheladia Associates, Inc. is a key subcontractor for a recently awarded technical support services contract for the Office of Business Operations, Office of Fossil Energy, U.S. Department of Energy. This 5-year multimillion dollar contract was awarded in April 1992. The contract will require the talents of more than 10 SHELADIA employees in the areas of economics, engineering, policy analysis, financial analysis, operations research, and publishing.

## Ft. Meade

In June (1992) SHELADIA was selected for award of a \$400,000 Indefinite Quantity Architect-Engineer Contract by the U.S. Army Engineer District, Baltimore. Services will be provided to the Director of Engineering & Housing (DEH) at Fort George G. Meade, Maryland. Tasks will include a variety of multidiscipline tasks involving architects, engineers, and environmental specialists, including requirements for 'asbestos identification and remediation planning'. Tasks already identified include evaluation of Ft. Meade's 42 mile-long natural gas line distribution system, building renovation, landfill closures, design of minor construction projects, and consulting services to the Director of Engineering & Housing (DEH) at Fort Meade.

## Naval District Washington

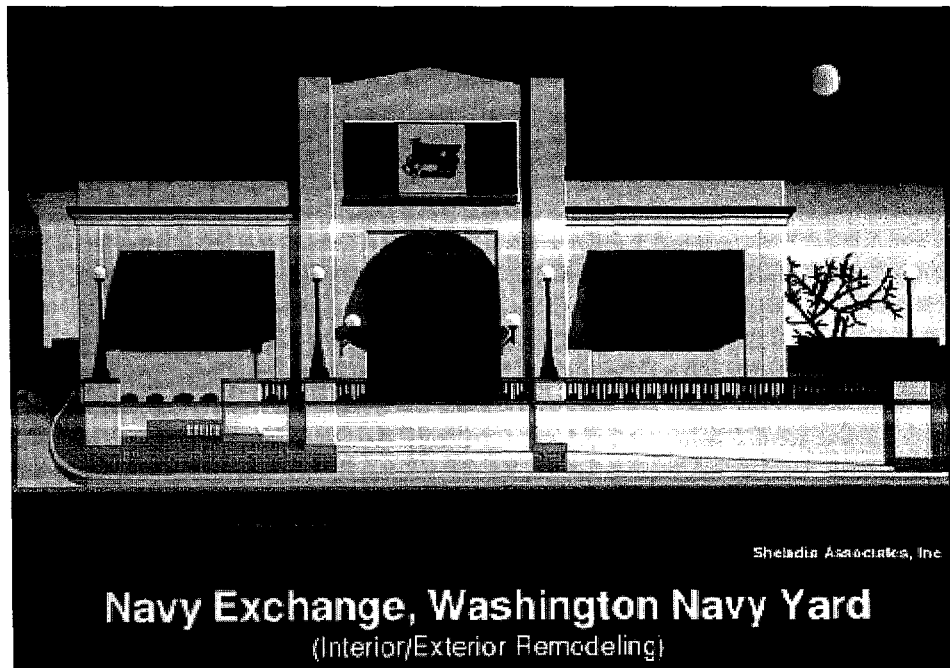
In January, the U.S. Naval District Washington (NDW) awarded SHELADIA an indefinite quantity contract for miscellaneous civil design and engineering services for various Washington, DC locations. To date, SHELADIA has received 5 task assignment. Assigned tasks include pavement repair, drainage correction, seawall design and restoration, and underground storage tank tightness testing and removal. SHELADIA looks

forward to continuing to provide quality engineering services to the NDW. This two-year contract award has a potential value of \$800,000.

## REGARDING: "Management of Underground Storage Tanks (MUST)" SERVICES

SHELADIA's Environmental Program received a BIG BOOST with the award of several major assignments by the U.S. Naval District Washington for the management of its 82+ underground storage tanks (UST). Tasks completed to date include the preparation of plans and specifications for the removal or closure of 25 USTs; tightness testing of an initial increment of 25 USTs at major Naval installations located in the Washington (D.C.) Metropolitan Area; and assistance to the NDW engineering staff for the management of their UST-Fleet.

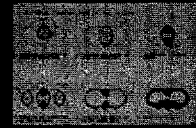
MUST is now a major professional services offering by SHELADIA for public and private sector clients, large and small. SHELADIA's staff is certified and "school-trained" in the latest design, tightness-testing, and UST Management techniques.



Sheladia Associates, Inc.

**Navy Exchange, Washington Navy Yard**  
(Interior/Exterior Remodeling)

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The **NEW AUSTRIAN TUNNEL METHOD (NATM)** is a new imaginative and highly successful vehicle by which soils surrounding a tunnel structure can be made to interact with the structure itself so that the soils participate

- Actively
- Positively
- Permanently

in the stability of the structure.

Sheladia Associates, Inc.  
 Washington Metropolitan Area Transit Authority

## AWARDS AND HONORS

### Awards for WMATA Project

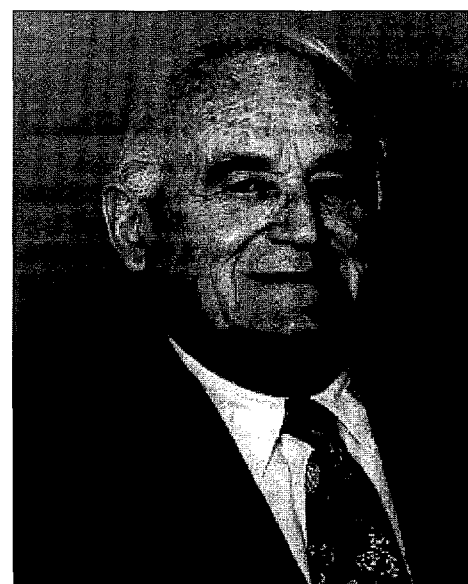
SHELADIA was presented two awards for the NATM construction of Washington's Fort Totten Station. On May 16, 1992, SHELADIA received the American Consulting Engineers Council Award which recognized SHELADIA's National Finalist Status in the Engineering Excellence Awards Competition. Paul J. Theuer, P.E., Senior Vice President and Charles Zollman, PE, Vice President accepted the award. On May 19, 1992, at the American Concrete Institutes' Annual Dinner, Pravin Sheladia, Chairman, accepted the National Capital Chapter of the American Concrete Institute 1992 Award of Excellence in recognition of SHELADIA's creative use of concrete in the Fort Totten Project.

Mr. Zollman served as Project Manger on the Fort Totten Station Project. Congratulations to all SHELADIA

employees and associates involved in this award winning project.

### Medal of Ghent

On June 3, 1991 Charles Zollman was awarded the prestigious Medal of the University of Ghent, Belgium at a banquet of the International Symposium



Charles C. Zollman

on Quality Control of Concrete Construction where he was one of the two keynote speakers.

During his acceptance speech, Mr. Zollman praised the University of Ghent's commitment to engineering research and development and education. Mr. Zollman presented a copy of his papers, "Reflections on the Beginnings of Prestressed Concrete in America" to the Dean of the School of Engineering, Dr. Ir. Jacques Willems and the Chairman of the Symposium, Dr. Ir. Emeritus H. Lambott. He also presented them with a copy of the PCI Journal which featured an article on the 100th birthday of the late Gustave Magnel, former Professor of Structures at of the University of Ghent and Mr. Zollman's mentor. Mr. Zollman, who has completed 53 years of excellence in engineering, has been a pioneer of prestressed concrete in the U.S.A. He is responsible for the design and construction of the first prestressed concrete bridge in the U.S.

## PENNSYLVANIA BRIDGE INSPECTION SERVICES COMPLETED

In May, SHELADIA completed a two-year program to provide bridge inspection services to the Pennsylvania Department of Transportation. SHELADIA, with Charles G. Babcock, P.E. as Project Manager and the subconsultant Wilbur Smith Associates, inspected nearly 1,000 state maintained bridges in Chester, Delaware, and Philadelphia Counties, PA as part of the National Bridge Inspection Program.

Teams of two to three engineers, supported by traffic control and rigging subcontractors and led by certified team leaders performed a "hands-on", detailed inspection of each bridge. All structures were inspected throughout for structural integrity as well as hydraulic adequacy, functional capacity, and traffic safety.

Bridge types included steel girders, beams and trusses; concrete beams, slabs, arches and boxes; prestressed concrete girders, box beams and slabs and brick and masonry arches, as well as fracture critical hanger-pin assemblies on 3 non-redundant bridges.

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# CONTINUING COMMITMENT TO TRAINING

## Noon News Club

The Noon News Club sponsors seminars at least once a month for SHELADIA employees on various topics. The Noon News Club began in May 1991 and has featured over 20 speakers on topics ranging from personal finances and safety to post-tensioned concrete tanks. The seminars serve to keep SHELADIA employees abreast of business and personal issues. For more information on these seminars, contact Gopal Shankar.

## Seminars and Courses Attended

Confined Space Entry Course by University of Maryland, Maryland Fire and Rescue Institute, completed by Francis Agyei and Jagdish Mandavia

How to Supervise People Seminar, Fred Pryor Seminars, completed by Jagdish Mandavia, Tung N'Vietson and Manish Kothari

Project Management Seminar, Fred Pryor Seminars, completed by Manish Kothari and Jagdish Mandavia

The Hazardous Materials Site Worker, HAZMAT Training, Information and Services, Inc. completed by Dr. Chandra Pathak

Petro-Tite® Basic Certification, awarded to Manish Kothari

OSHA Refresher Course, Dames & Moore, Manish Kothari

Bridge Backwater Program, National Highway Institute, completed by Kevin Chang

Stream Stability and Scour at Highway Bridges, National Highway Institute, completed by Kevin Chang

Federal Procurement of Architect and Engineer Services, George Washington University National Law Center, completed by Tawanna Chesley

Total Quality Management Seminar, Montgomery County Office of Economic Development, completed by Tawanna Chesley

Sheladia Associates, Inc.  
15825 Shady Grove Road  
Rockville, MD 20850  
Tel: (301) 258-7474  
Fax: (301) 948-7174

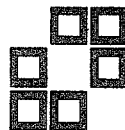
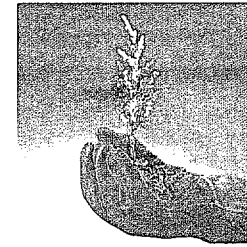
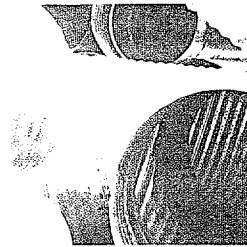
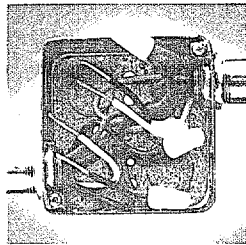
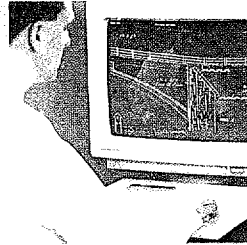
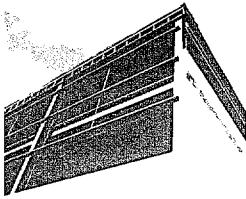
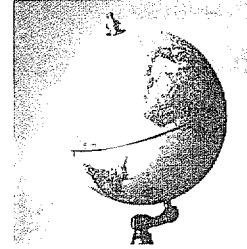
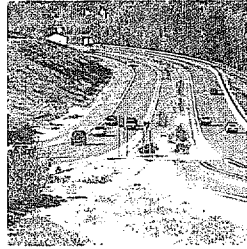
### Regional Offices:

Sheladia Associates, Inc.  
363 Seventh Avenue, #200  
New York, NY 10001  
Tel: (212) 947-4945  
Fax: (212) 947-5171

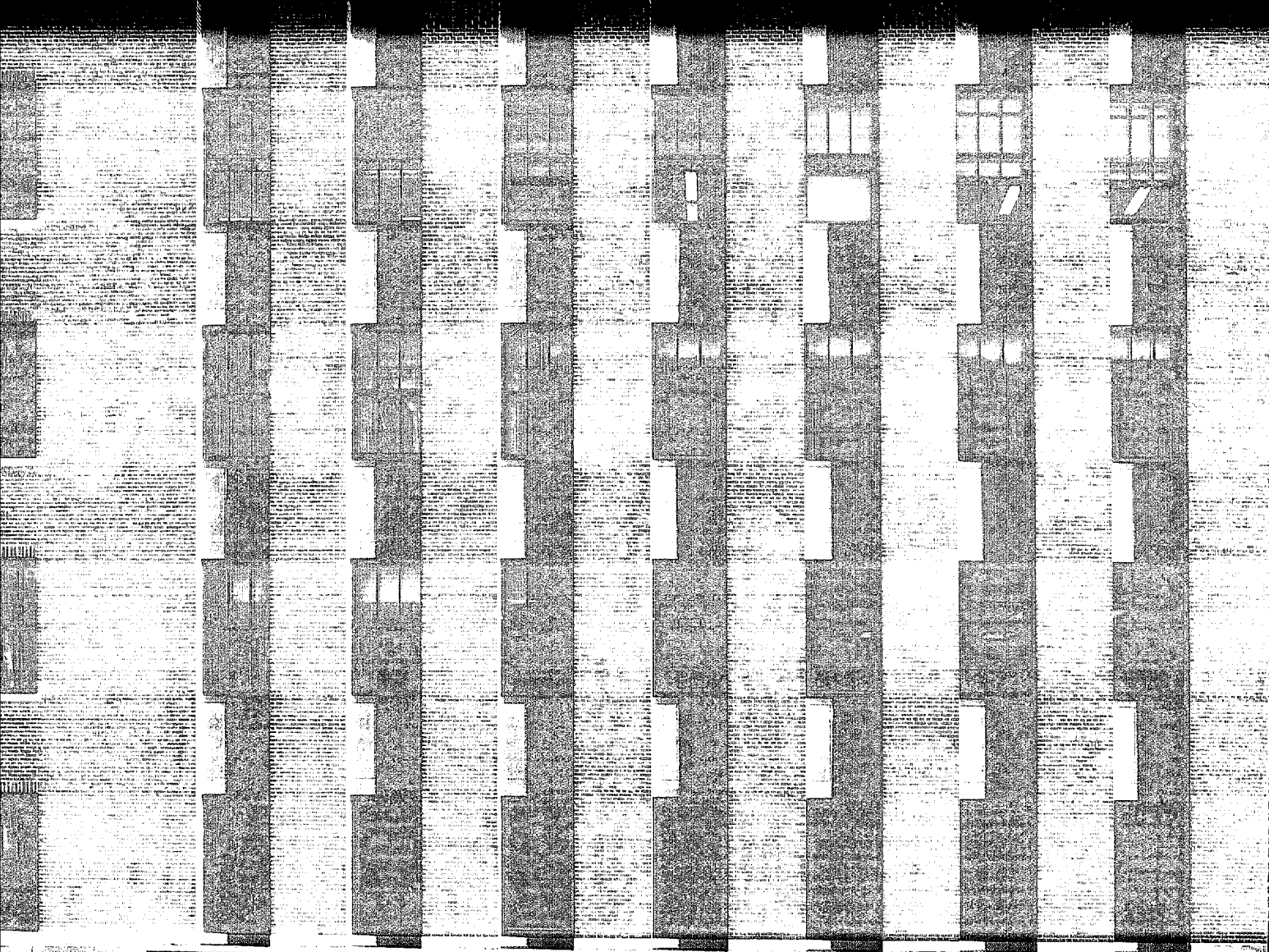
Sheladia Associates, Inc.  
5021 Louise Drive  
Mechanicsburg, PA 17055  
Tel: (717) 795-7925  
Fax: (717) 795-7934

### International Offices:

Colombo, Sri Lanka  
New Delhi, India  
Cairo, Egypt  
Lusaka, Zambia  
Freetown, Sierra Leone  
Dhaka, Bangladesh







UNITED STATES APPRAISERS STORES



BEST AVAILABLE COPY

# DEVELOPING PARTNERSHIPS WITH OUR CLIENTS

Since 1974, SHELADIA Associates, Inc. has successfully completed numerous domestic and international projects by developing solid partnerships with our clients. We consider each client to be unique with special needs. Our sensitivity to these requirements, personal involvement of our key principals on all projects regardless of size, our highly-qualified staff and strong management skills have provided personalized services specifically tailored to each assignment.

SHELADIA is a multi-discipline firm offering a diverse range of engineering, architectural, environmental, planning and construction services. Whether a major transportation project; an energy conservation study; a small building renovation; or technical assistance for developing countries, we focus the appropriate level of team effort on each project to provide efficient, cost-effective solutions.

Our staff strives to work closely with each client in order to fully understand their individual needs and to develop a true partnership of cooperation.



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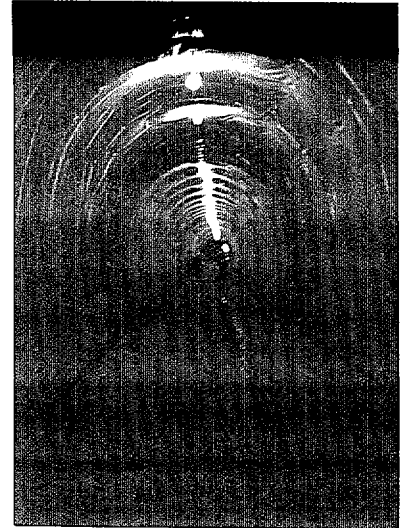


# SERVICES TO CLIENTS

SHELADIA offers complete, high quality engineering, architectural, environmental, planning and construction services to federal, state, local and international government as well as private industry and business. Our diversity in adapting to unique assignments keeps our firm at the forefront of applying innovative solutions to difficult problems. ■



Structural Renovation



New Austrian Tunneling Method (NATM)

2

## STRUCTURES

## ARCHITECTURE

## WATER RESOURCES

## LAND DEVELOPMENT

## ENERGY AND POWER

## CIVIL ENGINEERING

## COMPUTER AND CADD SERVICES

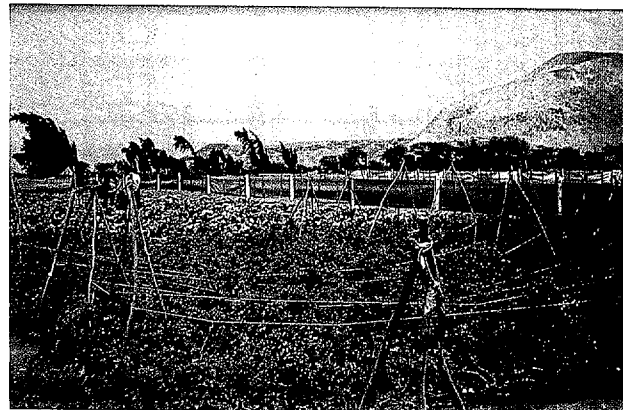
## ELECTRICAL/MECHANICAL ENGINEERING

## CONSTRUCTION MANAGEMENT & INSPECTION

## TRANSPORTATION ENGINEERING & PLANNING

## MANAGEMENT & TECHNICAL SUPPORT SERVICES

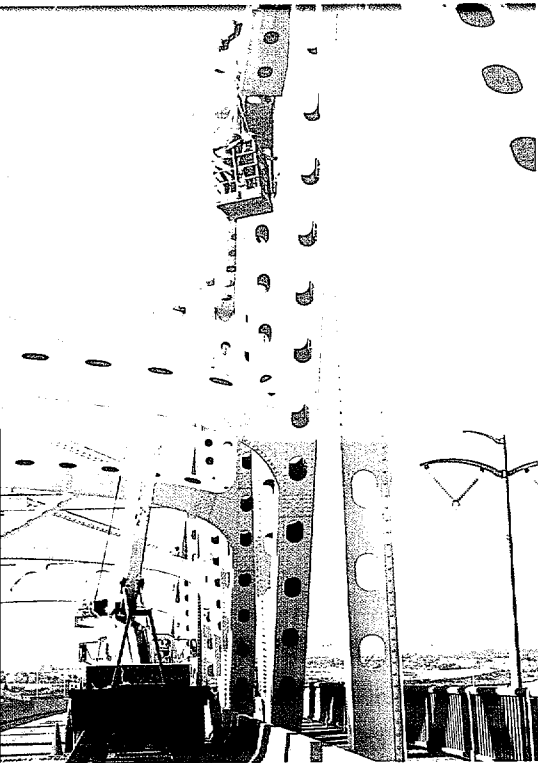
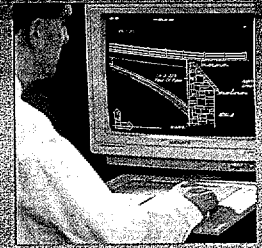
## ENVIRONMENTAL ASSESSMENT, MITIGATION & MANAGEMENT



Agricultural Development

# OUR PEOPLE

Our employees dedicate their efforts to excellence in contributing to the improvement of the world around us. The world's regions face difficult problems of restricted transportation, limited resources, environmental hazards, and economic instability. SHELADIA takes great care in selecting and developing our staff so that they can work closely with our clients to achieve project success. The depth of our professional staff provides many tangible benefits for our clients in terms of cost savings and application of advanced technology. ■



Bridge Inspection



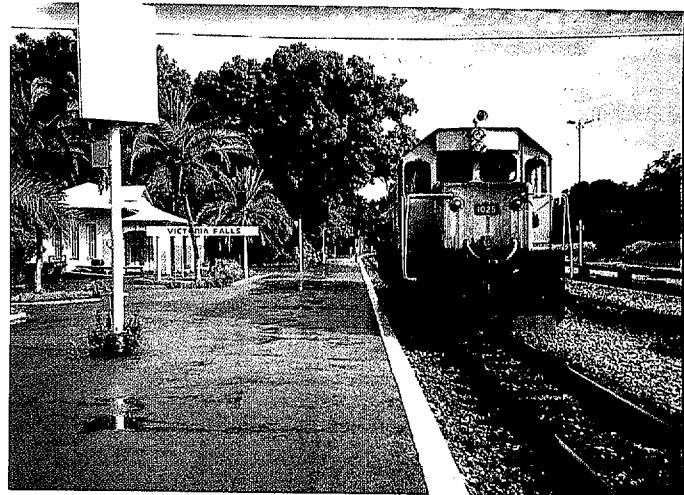
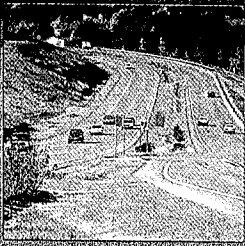
Construction Services

3

- PLANNERS
- ANALYSTS
- DESIGNERS
- SURVEYORS
- ENGINEERS
- ARCHITECTS
- SCIENTISTS
- TECHNICIANS
- CONSTRUCTION MANAGERS
- ENVIRONMENTAL PROFESSIONALS
- ADMINISTRATIVE SUPPORT STAFF

# TRANSPORTATION ENGINEERING

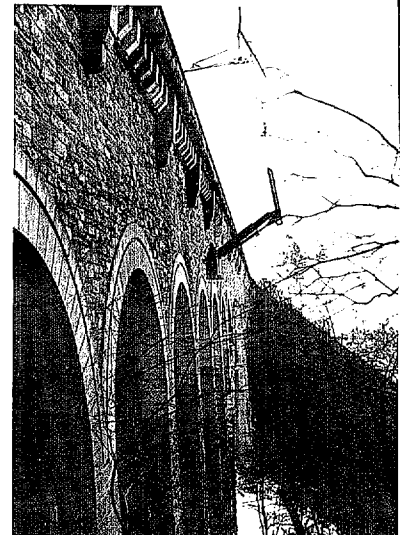
The movement of goods and people is vital to local, national and international economic well-being. At SHELADIA, we have developed a Transportation Division which addresses the full range of services needed for the design of new facilities, management and rehabilitation of existing systems, and integrating intermodal travel. Transportation no longer means just highways and bridges, but includes airports, mass transit, railroads, congestion management, air and noise quality improvement, and intelligent transportation systems. ■



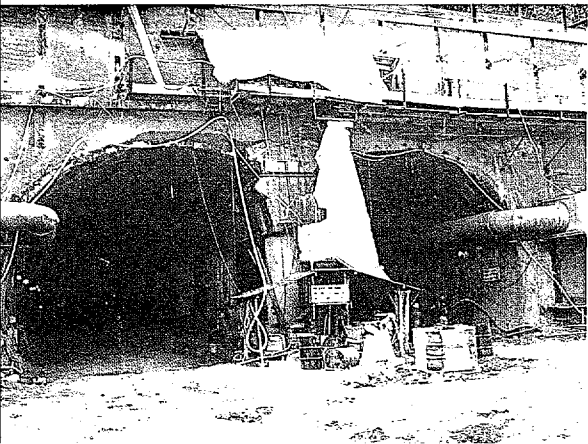
Railroad Improvements, Africa



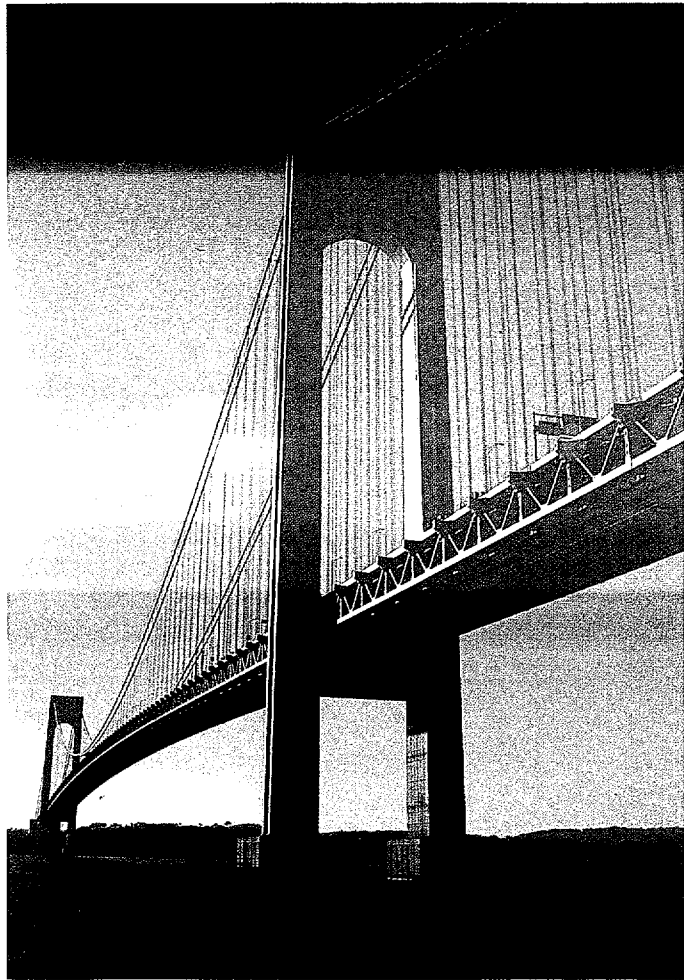
I-83 Widening & Reconstruction, Harrisburg, PA



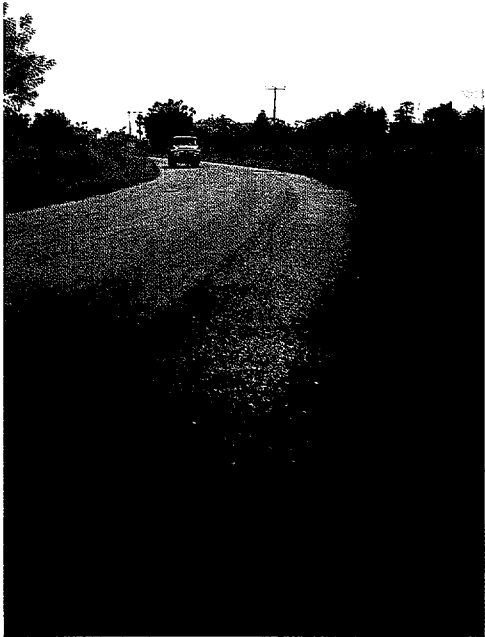
Bridge Re-inspection, Philadelphia, PA



Fort Totten Metro Station, Washington, DC



Verrazano Narrows Bridge Inspection, New York City



Road Reconstruction, Zambia

5

**MASS TRANSIT**

**RAIL FACILITIES**

**TRAFFIC STUDIES**

**LOCATION STUDIES**

**MASTER PLANNING**

**AIRPORT FACILITY DESIGN**

**BRIDGE & HIGHWAY DESIGN**

**SIGNALIZED INTERSECTIONS**

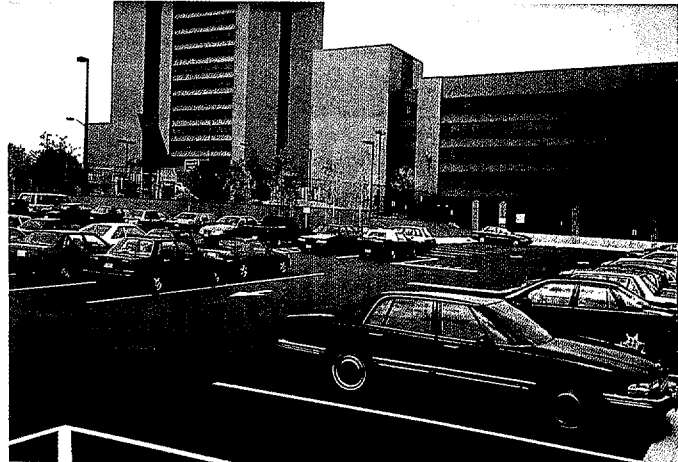
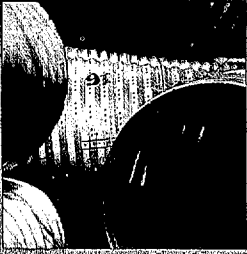
**PARKING STUDIES & DESIGN**

**BRIDGE INSPECTION & ANALYSIS**

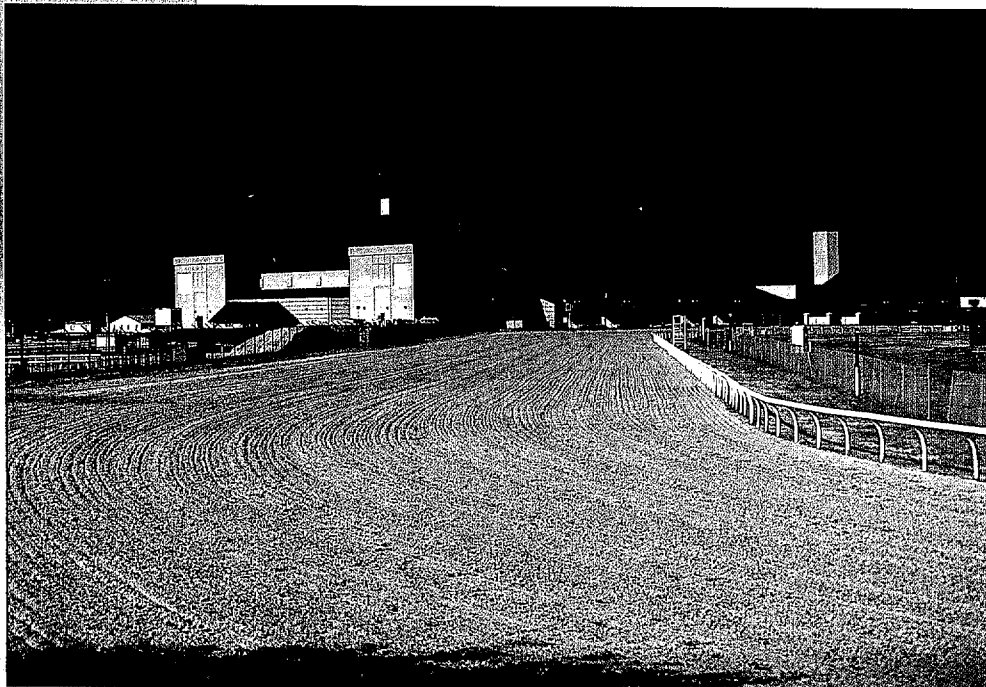
**ENVIRONMENTAL IMPACT ASSESSMENTS**

# CIVIL ENGINEERING/ WATER RESOURCES

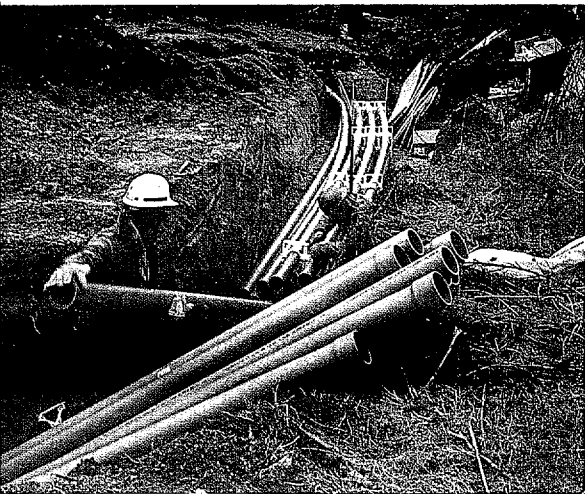
From land development and stormwater management to water supply and wastewater collection, SHELADIA implements the latest available technologies to meet individual project demands while blending these projects into the environment. Our professionals keep abreast of the ever-changing regulatory and permit requirements. On the international front, providing adequate water supplies, treating wastewater, and controlling erosion are high priorities. ■



Secure Parking Facility, Baltimore, MD



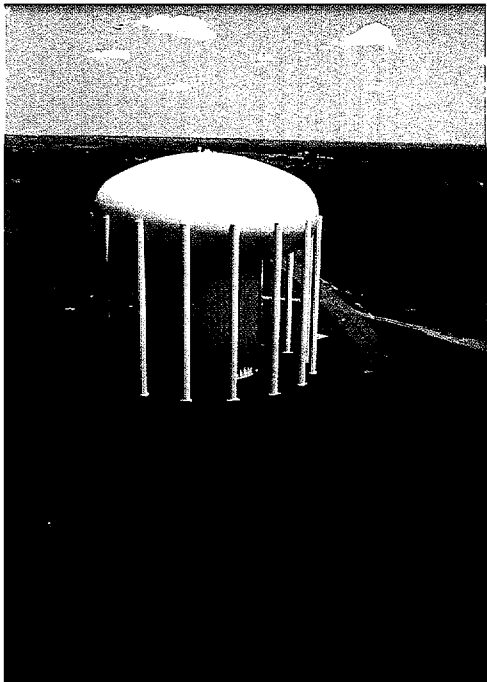
Equestrian Center, Upper Marlboro, MD



Utility Construction, Harrisburg, PA



Water Supply Reservoir, Haiti



Water Supply Storage Tank, MD



**PERMITTING**

**WATER SUPPLY**

**UTILITY DESIGN**

**SITE ASSESSMENTS**

**LAND DEVELOPMENT**

**STORMWATER MANAGEMENT**

**FLOODPLAIN MANAGEMENT**

**WASTEWATER MANAGEMENT**

**LANDSCAPE ARCHITECTURE**

**EROSION & SEDIMENTATION CONTROL**



# ENVIRONMENTAL SERVICES

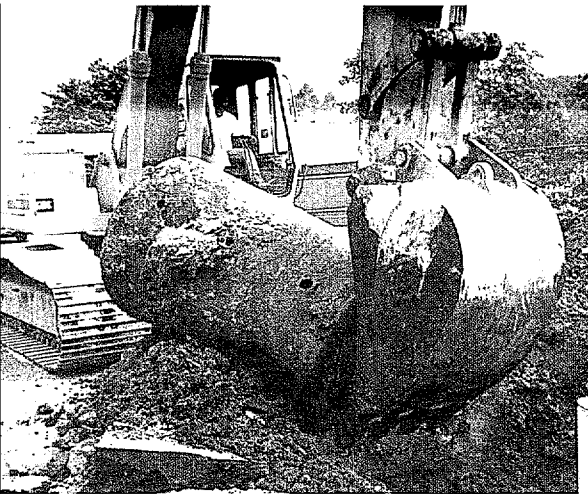
Protecting our environment has become a global concern. Domestically we deal with hazardous waste, water and air quality and protection of important natural resources as well as cultural resources. Pollution, erosion, deforestation, resource management and potable water lead the international focus. SHELADIA is at the cutting edge of applying sophisticated technology, methods and equipment to improve the quality of life worldwide. ■



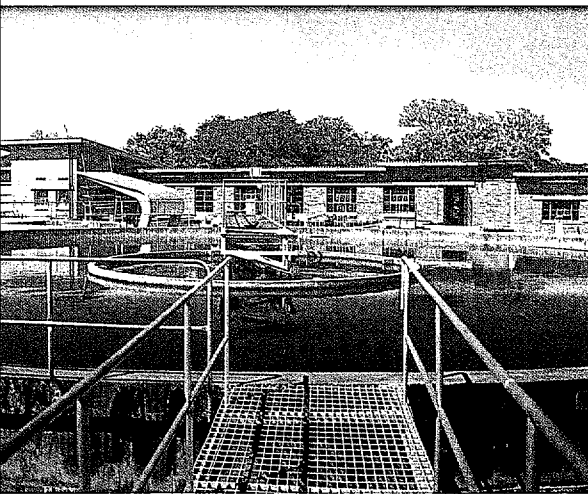
Hazardous Waste Investigation, SC



Wetland Identification & Delineation, Philadelphia, PA



UST Removal, MD



Water Treatment Facility, Zambia



Wetland Replacement Design, Landover, MD



**WETLANDS**

**HAZARDOUS WASTE**

**WATER TREATMENT**

**LANDFILL DESIGN**

**EROSION CONTROL**

**ASBESTOS ABATEMENT**

**RESOURCE MANAGEMENT**

**WASTEWATER TREATMENT**

**SOLID WASTE MANAGEMENT**

**IMPACT MITIGATION DESIGN**

**UNDERGROUND STORAGE TANKS**

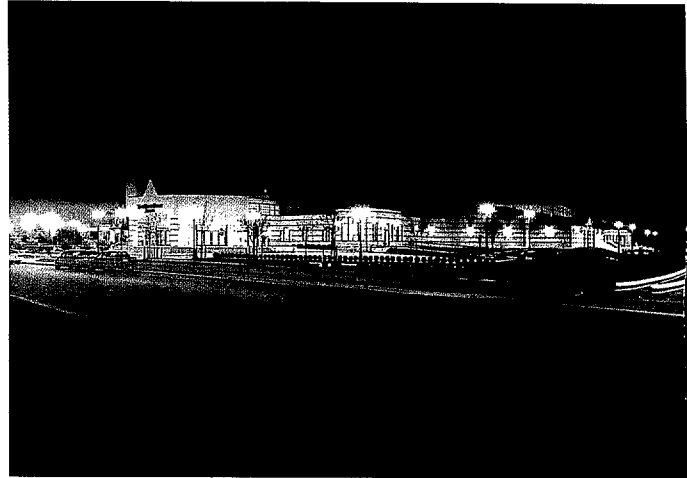
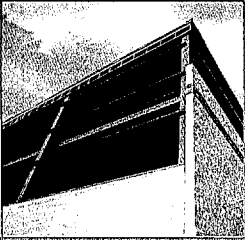
**ENDANGERED SPECIES STUDIES**

**AIR & NOISE QUALITY ANALYSIS**

**ENVIRONMENTAL IMPACT ASSESSMENTS**

# A RCHITECTURE/ STRUCTURAL ENGINEERING

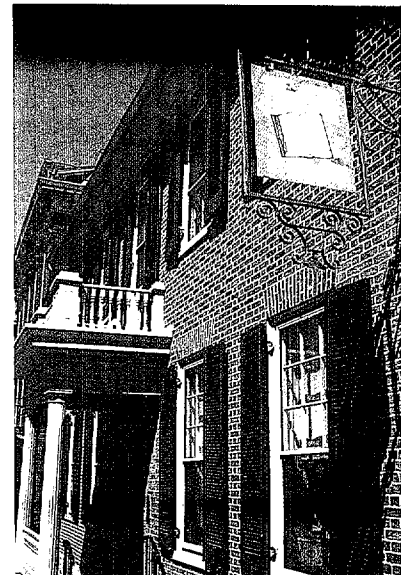
From initial feasibility studies to final construction documents, SHELADIA offers in-house capabilities for complete building and facility services. Each phase of these projects is given careful consideration regarding the client's needs while producing innovative, distinctive, efficient and cost-effective structures. Past projects have included governmental, educational, military, commercial, retail, correctional, industrial, residential, recreational, public-use and religious facilities.



Equestrian Center, Upper Marlboro, MD



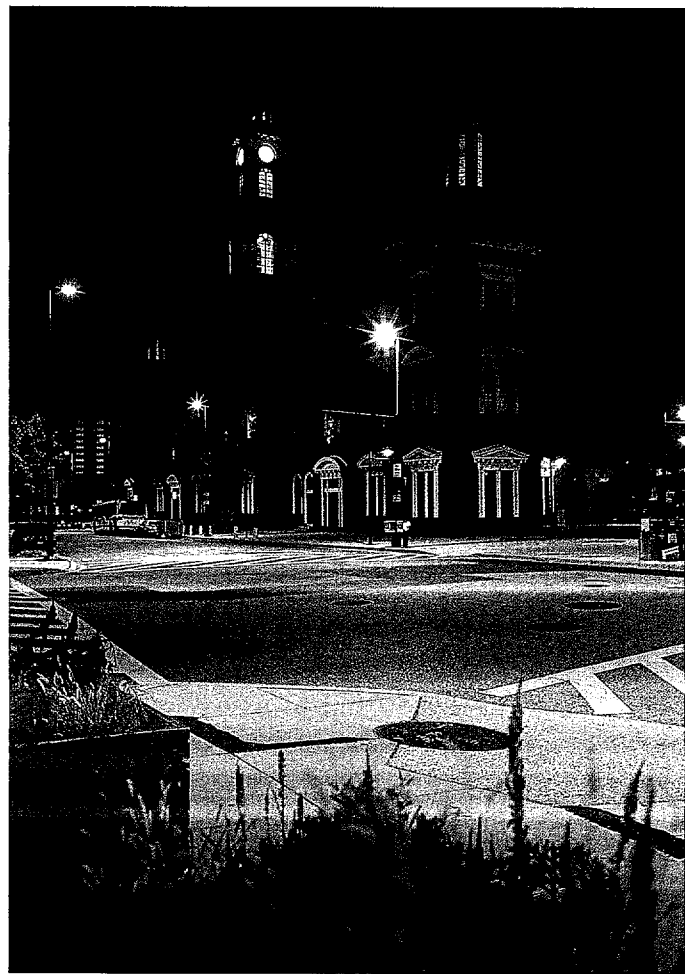
Feasibility Study for Restoration of Warehouse at Camden Yards, Baltimore, MD



Alexander Hamilton Library Addition, Wyndeboro, PA



Structural Design, Washington, DC



Feasibility Study for Restoration of Camden Station, Baltimore, MD



Pier D/Y Expansion, Baltimore Washington International Airport



**RENOVATION**

**SITE SELECTION**

**INTERIOR DESIGN**

**FIRE PROTECTION**

**SITE ENGINEERING**

**FACILITIES PLANNING**

**FEASIBILITY STUDIES**

**ARCHITECTURAL DESIGN**

**STRUCTURAL ENGINEERING**

**LANDSCAPE ARCHITECTURE**

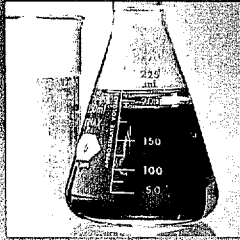
**ACCESSIBILITY IMPROVEMENTS**

**ENERGY CONSERVATION STUDIES**

**BUILDING CONDITION ASSESSMENT**

**ELECTRICAL/MECHANICAL ENGINEERING**

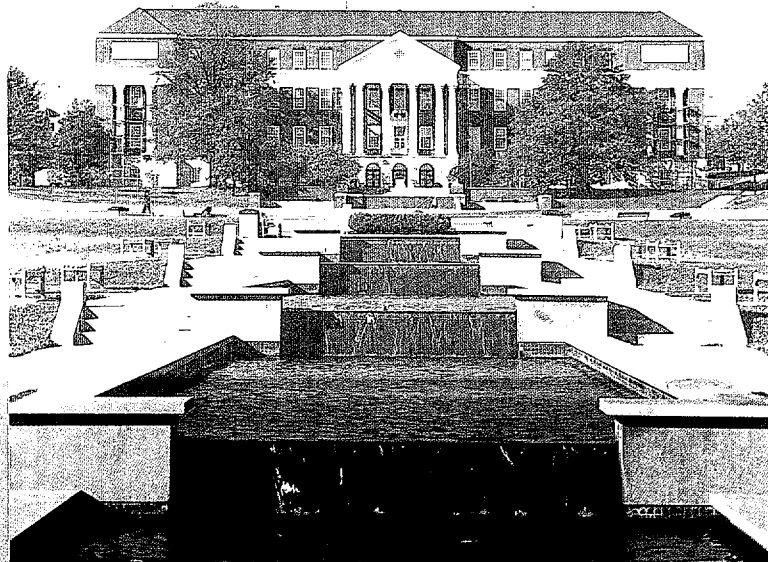
**HISTORIC RESTORATION & PRESERVATION**



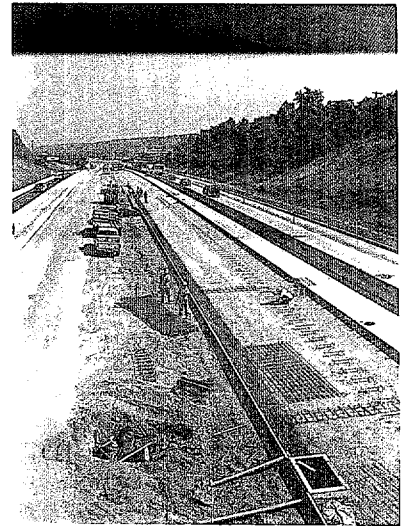
## FIELD SERVICES

SHELADIA Associates completes our diverse engineering and architectural capabilities with full field and construction phase services. Field surveying with total station equipment and CADD plan development, construction management, quality control, materials testing and procurement are typical of most projects. ■

12



Construction Management, McKeldin Library, University of Maryland, College Park, MD



Construction Inspection, US 302A, PA 20 Malvern, PA

### FIELD SURVEYS

### CPM SCHEDULING

### CONSTRUCTION STAKEOUT

### CONSTRUCTION MANAGEMENT

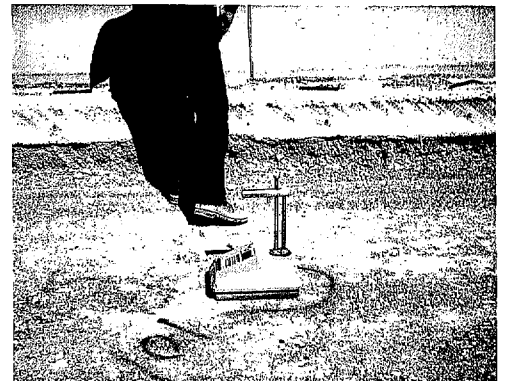
### CONTRACT ADMINISTRATION

### MATERIALS SAMPLING & TESTING

### CONSTRUCTION QUALITY CONTROL

### MATERIALS & EQUIPMENT PROCUREMENT

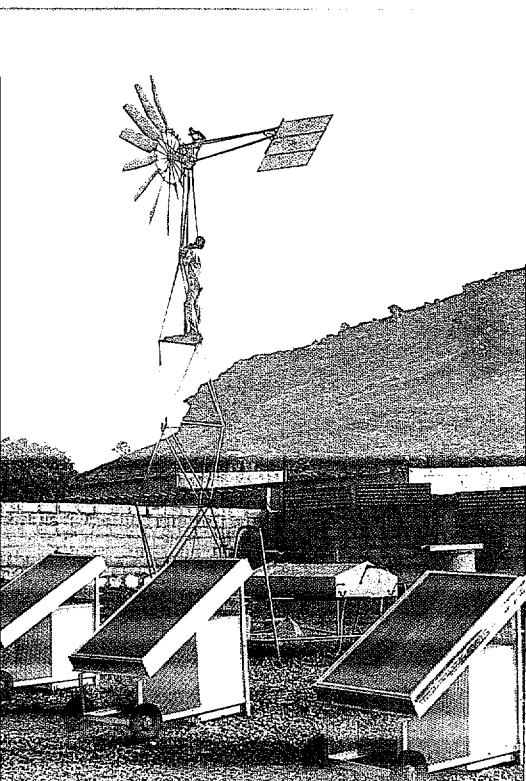
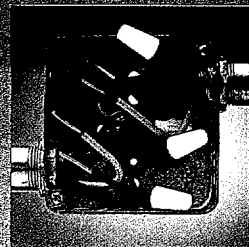
### RESIDENT ENGINEERING & REPRESENTATION



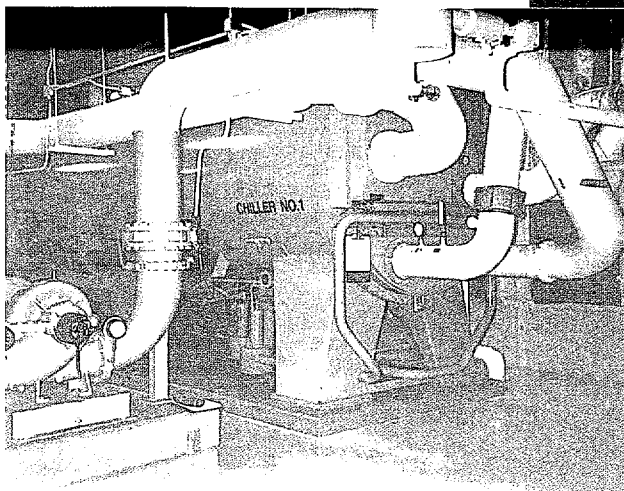
Materials Testing, Lancaster, PA

# LECTRICAL/MECHANICAL/ENERGY

Energy use and conservation continue to be a key element of nearly every building project. In addition, alternative and renewable energy sources are demanding consideration throughout the world. From energy use audits of existing facilities to power generation and distribution in developing countries, SHELADIA has proven our commitment to utilizing the latest technology to improve global conditions. ■



Wind and Solar Energy Research, Mali

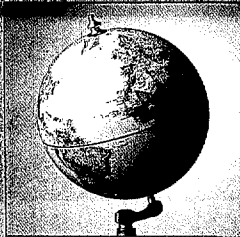


Refrigerant Energy (RVA) Engineering System  
Ellen Field Building, Baltimore, MD

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- HVAC SYSTEMS**
- ENERGY AUDITS**
- SYNTHETIC FUELS**
- POWER CONVERSION**
- LIGHTING SYSTEMS**
- HYDROELECTRIC POWER**
- CLEAN COAL TECHNOLOGY**
- COMPUTER FACILITY DESIGN**
- PLUMBING & PROCESS PIPING**
- OPERATIONAL CONTROL SYSTEMS**
- SOLAR, WIND & GEOTHERMAL ENERGY**
- ELECTRIC POWER GENERATION & DISTRIBUTION**

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## INTERNATIONAL SERVICES

SHELADIA Associates was founded by individuals with extensive experience in developing nations. Since many of our professional and technical staff also have professional experience in other countries, we are able to apply a unique first-hand personal perspective to development problems. Our focus has been on development in rural areas where transportation, energy, agriculture, water supply, public health, resource management, training and education are intensely important. With pride in our past overseas accomplishments, we continue our commitment to making contributions to the developing world. ■

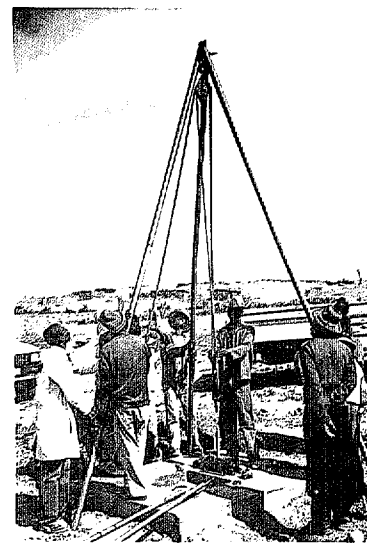
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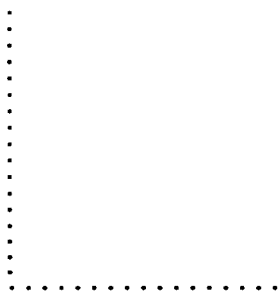
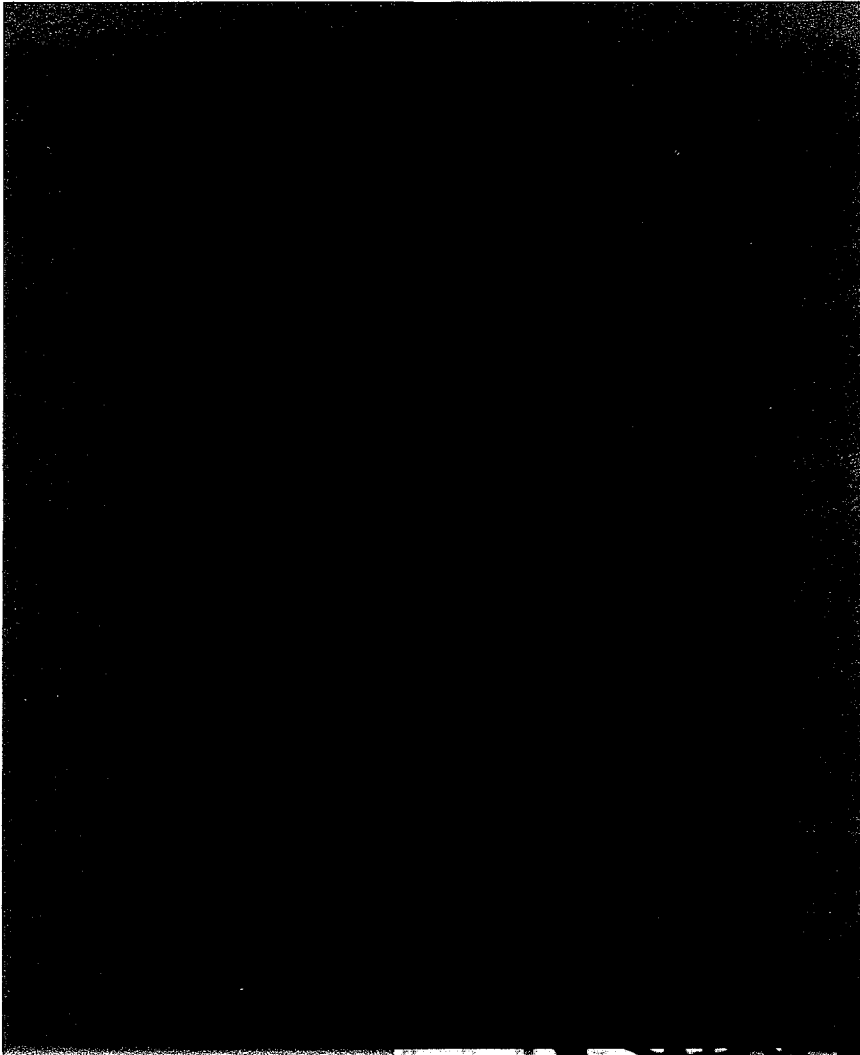
Technical Assistance and Training, E



Irrigation Improvements, Pakistan

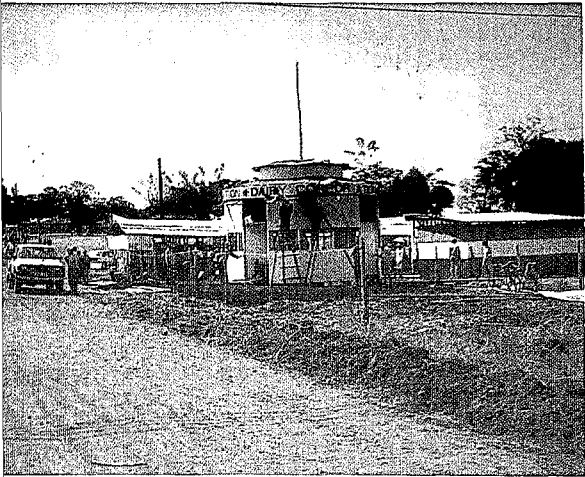


Rural Water Supply, E

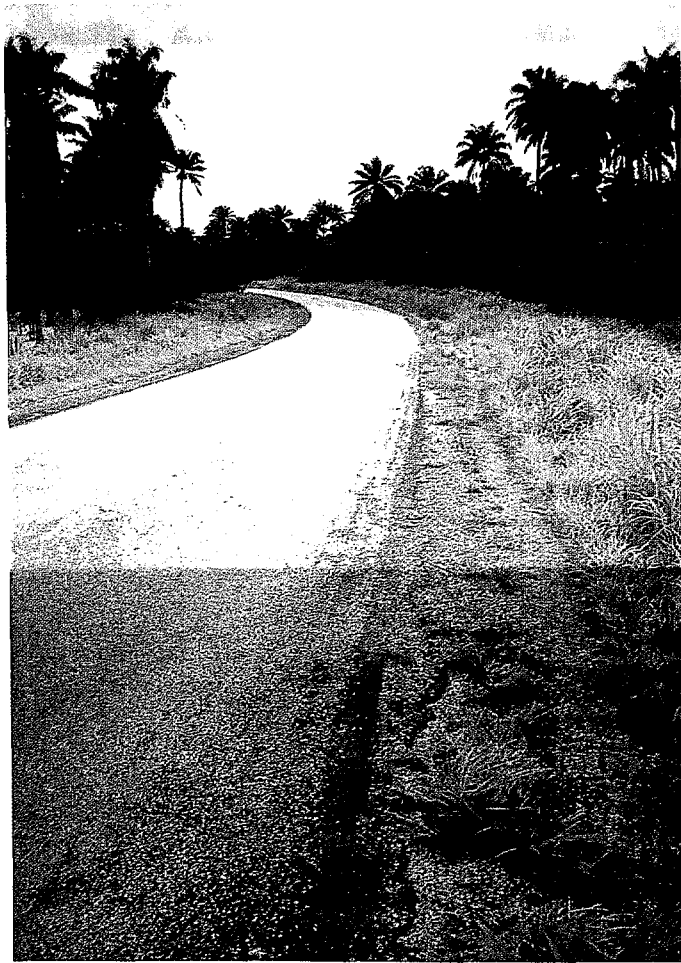


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Agricultural Market Development, Guinea



Rural Road Improvement Program, Sierra Leone

**DAMS & RESERVOIRS**

**HIGHWAYS & BRIDGES**

**RURAL & URBAN ROADS**

**RURAL ELECTRIFICATION**

**WASTEWATER MANAGEMENT**

**AGRICULTURAL MARKETING**

**AGRICULTURAL DEVELOPMENT**

**WATER SUPPLY & SANITATION**

**NATURAL RESOURCES MANAGEMENT**

**AGROFORESTRY & REFORESTATION**

**IRRIGATION & WATER RESOURCES**

**RENEWABLE & ALTERNATIVE ENERGY**

**AIRPORTS, RAILROADS & MASS TRANSIT**

**INSTITUTIONAL DEVELOPMENT & TRAINING**

**ENVIRONMENTAL ASSESSMENT & REMEDIATION**

**MANAGEMENT, FINANCIAL & INFORMATION SERVICES**



# OUR CLIENTS

## TRANSPORTATION AGENCIES

- Port Authority of NY/NJ
- Federal Rail Administration
- New Jersey Transit Bus, Inc.
- Federal Aviation Administration
- Federal Highway Administration
- New York City Transit Authority
- Pennsylvania Turnpike Commission
- Virginia Department of Transportation
- Maryland State Highway Administration
- New York Department of Transportation
- New Jersey Department of Transportation
- Connecticut Department of Transportation
- Pennsylvania Department of Transportation
- West Virginia Department of Transportation
- Washington Metropolitan Area Transit Authority
- District of Columbia Department of Public Works

## GOVERNMENTAL AGENCIES

- Berks County, PA
- Ocean County, NJ
- Dublin Borough, PA
- Howard County, MD
- National Park Service
- Baltimore County, MD
- City of Baltimore, MD
- District of Columbia
- City of Bethlehem, PA
- Middlesex County, NJ
- Montgomery County, MD
- U.S. Department of Energy
- Prince Georges County, MD
- Maryland Stadium Authority
- U.S. Department of Defense
- U.S. Army Corps of Engineers
- Harrisburg Redevelopment Authority
- U.S. Department of General Services
- Maryland Department of General Services
- Pennsylvania Department of General Services
- U.S. Department of Housing and Urban Development

## EDUCATION

- Howard University
- University of Maryland
- Salisbury State University
- Baltimore City Public Schools
- PA State System of Higher Education

## BUSINESS AND INDUSTRY

- IBM
- VESTA, Inc.
- United Airlines
- Rite Aid Corporation
- Gateway Construction
- Hershey Chocolate, USA
- First Industrial Realty Trust
- Argonne National Laboratory
- Martin Marietta Energy Systems

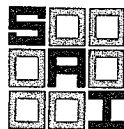
## UTILITIES

- Harrisburg Authority
- Metropolitan Edison Company
- Bell Atlantic Network Systems
- Potomac Electric Power Company
- Washington Suburban Sanitary Commission

## INTERNATIONAL

- World Bank
- Asian Development Bank
- African Development Bank
- United Nations Development Program
- U.S. Agency for International Development
- United Nations High Commission for Refugees
- International Federation for Agricultural Development

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**SHELADIA Associates, Inc.**

Engineers · Architects · Planners

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Project offices established as needed at project sites around the world.