

# **USAID's Water and Energy Nexus Project, Phase II Quarterly Report, June 2005**

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Prepared by: Barbara Britton, PA Government Services

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For more information, please contact:

Barbara Britton  
Chief of Party, WENEXA-II Project  
PA Government Services, Inc.  
D6/12 Vasant Vihar  
New Delhi 110057, India  
Email: [barbara.britton@paconsulting.com](mailto:barbara.britton@paconsulting.com)  
Tel: +91-11-2614-7648  
Fax: +91-11-2615-4732

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## 1. Background

USAID's Water and Energy Nexus (WENEXA) activity recognizes the dual impact of uncontrolled groundwater extraction on both energy and water sectors. Under the first phase of this program, WENEXA I, activities were implemented on a pilot basis in Maheshwaram watershed in Ranga Reddy district of Andhra Pradesh. Various activities were taken up, which included improving quality of power supply to farmers while simultaneously promoting demand side management at farm level. Energy interventions included improving distribution infrastructure through system upgrades, metering on a pilot basis. Water demand management interventions included potential crop shifts based on water balance studies, crop water budgeting, educating farmers on the changes in groundwater and methods to plan their crops depending on the availability of the groundwater, and introduced concepts of micro-irrigation.

Spurred by the clear need for intervention in this area and the success of the first phase, USAID has decided to scale up this initiative to cover more States, while consolidating the learning from Andhra Pradesh on policy issues. The second phase of USAID's Water and Energy Nexus Project (WENEXA II) is a technical assistance program designed to support the creation of effective models for management of nexus issues at the local, state and national levels. A technical assistance contract was awarded to PA Government Services in July 2004. The WENEXA II consortium led by PA consists of ten firms, each offering specialized technical resources in their fields and includes: PA Government Services Inc. (PA) as the prime contractor; International Water Management Institute (IWMI); Camp Dresser McKee (CDM); Global Energy Consulting Engineers (GECE) Development & Training Services, Inc. (DTS); Academy for Educational Development (AED); The Xavier Institute of Management Bhubaneswar (XIMB); International Institute for Energy Conservation (IIEC); Synapse; Institute of Resource Development and Social Management (IRDAS); and Tamil Nadu Agricultural University – Water Technology Centre (TNAU-WTC).

The WENEXA II Project falls under the Indo-US Bilateral Agreement entitled Energy Conservation and Commercialization between the Governments of India and the United States. The Ministry of Power is the authorized nodal agency representing the Government of India within the context of this agreement. The agreement finances various energy conservation initiatives and also includes the USAID Distribution Reform Upgrade Management (DRUM) program that comprises: 1) DRUM technical assistance and demonstration projects; 2) Training Initiative; 3) rural electrification technical assistance through an agreement with the US Dept of Agriculture's Rural Utility Service (RUS); and, 4) Water and Energy Nexus Program (WENEXA II). The two Governments have organized a DRUM Project Advisory Committee (PAC) to ensure joint coordination of this initiative.

The activities under this project support USAID's Strategic Objective (SO) 16. Improved Access to Clean Energy and Water in Selected States. Performance indicators associated with this SO include:

1. Number of men and women that have access to improved power supply.<sup>1</sup>
2. Number of men and women with access to sustainable water supply.
3. Number of tons of CO<sub>2</sub> avoided.<sup>2</sup>

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<sup>1</sup> Improved power supply is defined by the number of new connections and the increase in hours of electricity supply per day within a defined geographic area.

<sup>2</sup> Standard equations will be used to estimate the amount of CO<sub>2</sub> avoided through adoption of energy efficient technologies and practices.

WENEXA II responds to IR. 16.2

IR 16.2: Improved groundwater management in selected states:

Adoption of energy efficient pumps.<sup>3</sup>

Number of hectares of cropland under improved irrigation techniques.<sup>4</sup>

To address the water and energy nexus described above, USAID financed the Water Energy Nexus Activity (WENEXA) Project. WENEXA is designed to bridge the gap between the water and energy sectors at the policy level, support sector-specific reforms and introduce water–energy best practices and conservation to the farmers.

During the first phase of this program, the WENEXA I pilot project was conducted in Maheshwaram Watershed, Rangareddy District, Andhra Pradesh. Findings of this agricultural pilot intervention included:

- Surveys of local communities provided a quick entry into the local community where the project gained confidence and credibility.
- In conjunction with the International Water Management Institute and the National Geophysical Research Institute vast amounts of information on the status of groundwater was collected and analyzed and a water balance analysis carried out which documented declining water tables at the watershed level. This type of analysis can be critical to informed problem solving and decision-making.
- Utility financed HVDS upgrades are beneficial to farm incomes and utilities. Without any change in billings or collections, utilities recover investment cost within two years purely through reductions in technical losses.
- Farm budgets and creation of farm resource centers can play a valuable role in getting information to farmers on production methods that reduce water and energy consumption such as improved crop choice and adoption of irrigation technologies;
- Metered tariffs combined with HVDS upgrades and improved pump efficiency reduced power costs to farmers at a savings far below payments based on stab rate electricity tariffs.

Management of the water and energy management in India calls for a strategic approach that works at multiple levels of decision-making authority and employs a broad range of methods to address policy, institutional and technical issues. This phase of WENEXA seeks to build upon results of the WENEXA I by delving further into project implementation aspects that mobilize financing for farmers, utilities, and companies, to improve the adverse environmental consequences of water and energy use while increasing economic productivity. The WENEXA II works in three component areas that include tasks and activities that are inextricably linked.

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<sup>3</sup> Use of energy efficient pumps is a key measure for the adoption of technology for improved water-energy management.

<sup>4</sup> Adoption of improved irrigation techniques (such as drip or sprinkle) is a key measure for water end-use efficiency.

***Component A: Policy Dialogue***

- Task 1. Support Development of Energy and Water Co-Management Framework
- Task 2. Provision of Central and State Level Programmatic and Institutional Support
- Task 3. Support Institutional Arrangements and Capacity Building for Sustainable Water Resources Management in Target Areas

***Component B: Sector Reforms—Site Based Activities***

- Task 4. Provide Site Based Activities to Enhance Commercial Power Distribution and Sustainable Water Management in Agriculture
- Task 5. Support Basin Level Hydrological Information Collection and Analysis in Target Areas
- Task 6. Provide Site Based Support To Improve Urban Energy/Water Accessibility, delivery, efficient use, and waste management
- Task 7. Support to Improve Water Service Delivery, Reliability and Pollution Reduction in the Industrial Sector

***Component C: Customer Service and User Group Participation***

- Task 8. Develop and Implement a Communication Strategy with the Engagement of Civil Society/Industrial groups to extend and promote water energy concepts and technologies
- Task 9. Design of Participatory Models to Improve Local Ownership and Management of Rural Power Distribution
- Task 10. Promote Sustainable Water Resources Management Through Grass Roots Institutions

## **2. Activity Highlights**

### **2.1 Project Advisory Committee**

Under the direction of the Monitoring Committee of the Project Advisory Committee the Project's Management Information System was completed. This documents lays out the major tasks and subtask, schedules, and deliverables anticipated throughout the Project. This document will be submitted to the MOP Secretary and Chair of the Project Advisory Committee prior to every meeting.

The Monitoring Committee of the Project Advisory Committee convened on June 24,2005 to review all components of the DRUM project. The Committee overall seemed satisfied with WENEXA direction and progress.

### **2.2 Task-Specific Highlights**

#### **2.2.1 Task 1. Support Development of Energy and Water Co-Management Framework**

In June, WENEXA mobilized a financial expert to begin the financial modeling exercise to examine how financing could be arranged for farmers and utilities to improve pumping and irrigation efficiency. The consultant determined that there are financing programs available to support the range of WENEXA types of interventions. The major obstacle to financing the high rate of loan default in the Project site area, and the low collections rate for electricity service.

During the period and important relationship was developed with the National Bank for Agriculture and Rural Development (NABARD). Initial meetings were held with the Executive Director and General Management of NABARD in Delhi. This interaction occurred at a time when WENEXA had deployed a short-term consultant to examine investment-financing options for the Detailed Project Reports it is developing in association with the field implementation site in Karnataka. As a result of initial contacts made in Delhi, the regional NABARD office in Karnataka was briefed on the WENEXA program. Due to their interest in the WENEXA program, NABARD sent representation to participate in the June 3 WENEXA Technical Review meetings in Bangalore.

#### **2.2.2 Task 2. Provision of Central and State Level Programmatic and Institutional Support**

On May 1 the Project organized the first AP-WENEXA Project Steering Committee. The major outcomes of the meeting were:

1. A request for a rapid assessment of the groundwater management framework vis-à-vis international experience
2. Institutional assessment of AP Water Land and Trees Act
3. User friendly model for predicting groundwater trends associated with levels of groundwater pumping

Subsequent to the meeting, the Government decided an order was necessary for the creation of the Technical Coordination Working Group to address technical issues as they

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evolve during the course of Project implementation. The Government Order for this was issued on June 8, 2005.

With the assistance of Ministry of Power's Joint Secretary a meeting with Government Stakeholders was held in Bangalore on June 17, 2005. This meeting was widely attended by the most key Government Stakeholders. The major outcome of this meeting was the need to organize a three tier committee structure: 1) Steering Committee of high level stakeholders; 2) Resource Group of Technical Experts; and 3) a local level group of key stakeholders whose buy in will be required for project implementation at the field level.

Discussion from the meeting revealed that the Department of Mines and Geology announced that would soon release its reclassification of groundwater status throughout Karnataka. The representative mentioned that the entire Doddaballapur Taluk was to be reclassified as overexploited. This will mean that no new pumpset connections can be issued in this area until groundwater levels have recovered. This action will greatly enhance the importance of the WENEXA intervention and its scalability to other areas where overexploitation is an issue. The WENEXA team believes that the reclassification of Doddaballapur to overexploited is due in part, to the ongoing WENEXA field survey documenting the decline in groundwater tables in recent years. The data being developed clearly supports the reclassification. Owing to the fact that this classification will essentially ban new bore well development, there will not likely be an increase in overexploitation, resulting in considerably improvement in the public water supply that serves more than 300,000 people.

### **2.2.3 Task 3. Support Institutional Arrangements and Capacity Building for Sustainable Water Resources Management in Target Areas**

Nothing to report on this task.

### **2.2.4 Task 4. Provide Site Based Activities to Enhance Commercial Power Distribution and Sustainable Water Management in Agriculture**

The major focus of WENEXA activity during the quarter was on establishing the agricultural field implementation site in Karnataka. The field office was fully established during this period. A subcontract was issued to WENEXA Consortium member IIEC for to develop the pumpset efficiency Detailed Project Report. A subcontract was issued to University of Agricultural Sciences-Bangalore to develop the irrigation efficiency Detailed Project Report.

The team initiated technical review meetings that are quite productive and provide an entry for government stakeholders to participate. The regional offices of NABARD and REC have been invited to attend.

Institute for Youth and Development conducted eight focus group sessions during the period, some associated with the gender assessment conducted in the field from the period of May-June. In addition, IYD conducted primary data collection, surveying 30% of the total households served by feeder lines DF 12 and 13. Their report is due in July.

Technical Review meetings were held on May 2 and June 2. After the June 2 meeting it was clear that enough results of the WENEXA work in Doddaballapur were in to begin sharing them with the DRUM team. WENEXA organized a presentation of results focused particularly to share findings on pumpset efficiency and financing mechanisms on June 10.

### **2.2.5 Task 5. Support Basin Level Hydrological Information Collection and Analysis in Target Areas**

IWMI continue to discuss collaboration on development of water balance studies for both Karnataka and Andhra Pradesh. However, budgeting for this activity has not been clarified, and therefore, the activity is moving much slower than originally anticipated.

### **2.2.6 Task 6. Provide Site Based Support To Improve Urban Energy/Water Accessibility, delivery, efficient use, and waste management**

In May, WENEXA received approval for Nagpur as the site for the field implementation activity under this task. On May 23, 2005, the Nagpur Municipal Commissioner executed the Memorandum of Understanding. In June, a local consultant was engaged to begin the options study to determine the most viable uses of recycled water for the city.

### **2.2.7 Task 7. Support to Improve Water Service Delivery, Reliability and Pollution Reduction in the Industrial Sector**

In June, the Project continued to explore opportunities with the Managing Director of Hyderabad Metropolitan Water Supply and Sewerage Board. In May the team arranged a visit with him to finalize the concept. At that time, he was being transferred from HMWSSB to the Industrial Development Authority. He agreed to continue working with the Project in his new role and would work to promote a partnership arrangement between HMWSSB, the Industrial Development Authority and WENEXA. The concept for wastewater recycling and water reuse in the Industrial sector was further developed after this meeting. On June 30, the recommended approach was presented to the Project CTO. The next step is to obtain upper management approval of the concept. Once approval is received the Project will initiate activities.

### **2.2.8 Task 8. Develop and Implement a Communication Strategy with the Engagement of Civil Society/Industrial groups to extend and promote water energy concepts and technologies**

- Website update ongoing

### **2.2.9 Task 9. Design of Participatory Models to Improve Local Ownership and Management of Rural Power Distribution**

As a first step in designing participatory models that gain the participation of both men and women was a gender assessment of the agricultural field implementation site. Through May and early June the assessment was conducted through focus group discussions and a small sample survey. Initial findings of the assessment indicate that Self Help Groups have become both economically and politically viable organizations strongly related to livelihood growth in this particular rural area. Given the lack of other viable institutions to work with, it is likely that the Project will in the future, make use of these groups towards building local capacity to manage both energy and water resources.

### **2.2.10 Task 10. Promote Sustainable Water Resources Management Through Grass Roots Institutions**

The gender assessment mentioned above also serves to support future activities under this task.

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WENEXA staff attended a field trip to Vijawada in May. During the field visit, the team was introduced to field experiments for direct seeded rice experiments. The sponsor of this resource conservation technology, the Rice Wheat Consortium, was introduced to the University of Agricultural Sciences Bangalore to determine if some version of resource conservation technologies could be applied in the WENEXA field implementation site in Bangalore.

### **3. Program Plans for Upcoming Quarter**

- Finalization of User Survey
- Finalization of Pumpset Efficiency DPR
- Finalization of Irrigation Efficiency DPR
- Finalization of Options Study for Municipal Activity and Organization of Stakeholder Workshop
- Pilot Program for pumpset-irrigation efficiency at 13-15 farms in agricultural field implementation site
- Initiation of industrial field implementation activity

#### **4. Issues and Corrective Action**

The farmers in the field implementation site on feeder line DF12 are not investing in pumpset efficiency because they are not required to pay for electricity, and are not investing in irrigation efficiency because they spend large amounts for pump maintenance and repair. Farmers located in DF 13 have better power supply and are using branded pumpsets as a result, but have very little water availability. Because there is little pumpset replacement at the site due to lack of farmer incentive, the Project plans to initiate a small demonstration where pumpsets will be upgraded in exchange for farmer installation of drip or sprinkler irrigation systems. This program will demonstrate the benefits of simultaneous installation of efficient pumps and water saving irrigation systems in advance of the DPRs to facilitate adoption of the broader investment among farmers in this area.