GIS as a Planning Tool

Demonstration of the Rapid Assessment Tool (RAT)

The RAT combines field surveys, data collection, mapping and limited direct measurements to provide a quick and cost-effective analysis of conditions of the water distribution network of irrigation districts. The main objective of the Water Supply (Head) Conditions component of RAT is designed to define the extent of the areas affected and seriousness of the problems contributing to poor conveyance efficiency and low on-farm water use efficiency.

Water Supply (Head) Condition Rating Criteria

A) Frequency of Head Problems
   1) Occasional during peak periods
   2) Often during peak periods
   3) Occasional during non-peak periods
   4) Often during non-peak periods
   5) Always during peak periods
   6) Never

B) Causes of Head Problems
   1) Heavy demand on the total irrigation district
   2) Heavy demand on a certain section or areas
   3) Engineering problem
      a) Structural problems
      b) Canal size or capacity
      c) Slope or elevation
      d) Fluctuating canal levels
   4) Other (i.e. farmer management problem)

C) Severity of Head Problem
   1) Minor
   2) Moderate
   3) Severe

Procedures:
District personnel (primarily the canal riders) and DMS Team rate the head conditions of each segment and pump station within the district. Segments are evaluated by the criteria. A copy of the rating form provided to district personnel is attached to this report.

The DMS Team instructs district personnel on how to complete the form and definition of terms. This includes traveling to the field and joint rating of segments.

The DMS Team compiles and analyzes all data and produces maps that interpret the data similar to those provided in this report.

Results

Head problems affect approximately 21,000 acres in the district.

Severity:
   - 6% minor
   - 59% moderate
   - 35% severe

Frequency during peak demand:
   - 7% occasional
   - 26% often
   - 67% always

Causes

Heavy demand in a certain area - poor head in 39% of area caused by mismanagement of the system by either the water supplier or the water users on the system

Engineering Problems (expansion) - poor head in 61% of the area is due to:
   - Expansion of irrigated areas (3% of problems)
   - Changes in crop mix in a larger portion of crops with higher water consumption, such as sugarcane (90% of the problem)