A- 19: Water related environmental factors and malaria transmission in Mahi Kadana, Gujarat, India: a case study of Geographic Information Systems

L P Mutuwatte, F Konradsen, D Renault
(International Irrigation Management Institute, Colombo)

In this study, an assessment is made of the spatial and temporal relationship between malaria incidence and selected water related environmental parameters within the Mahi Kadana Irrigation Scheme in the State of Gujarat, India. The analysis is based on the use of secondary information.

In this study 4 factors were selected to describe variation in water: rainfall, rice intensity, depth to ground water and irrigation intensity. Regression analysis was performed to examine what percentage of the variation of average parasite incidence (API) was explained by the above variables.

A Geographic Information System (GIS) was used to generate input into a statistical analysis and to map out the parameters for the visual analysis. The visual analysis indicated the correlation between API and rainfall. The study discusses the quality of the data used and describes the possibilities for using GIS in health related research. For the year 1981, rainfall explained 60% of the variation in malaria incidence among the primary healthcare centres located in the whole study area. Variation of rice intensity, depth to groundwater, and irrigation density did not contribute to explaining the variation. When the analysis was performed on an agriculture seasonal basis for one selected administrative unit, rainfall and rice intensity explained most of the variation in malaria. It was only for the selected administrative unit that the analysis showed that factors under irrigation management control were of importance in explaining the variation in malaria incidence. The analysis was weakened by the incomplete information obtained in relation to malaria cases. The GIS provided key inputs to the statistical analysis by generating average values for the parameters under study for the catchment area of the healthcare centres. The GIS was also useful for performing the interpolations of rainfall for the whole study area.