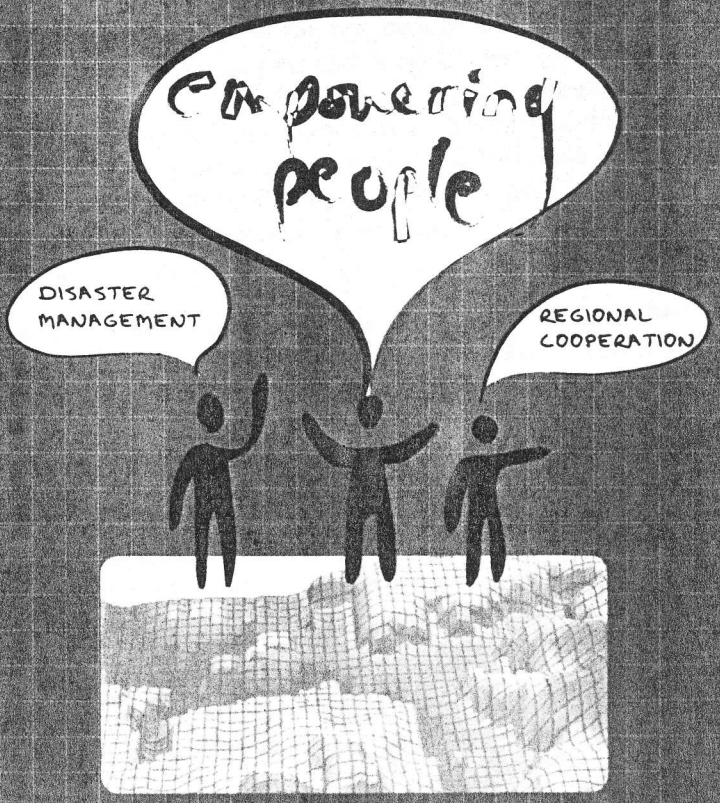
Map Asia 2005



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ABSTRACT VOLUME

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Using RS and GIS for Spatial Estimation of Evapotranspiration: A Case Study in Tang - e - Kenesht Catchment (West of Iran)

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Abstract

In general, remote sensing techniques can not measure evaporation or evapotranspiration directly. However, remote sensing data and images offer some methods of extending point measurements or empirical relationships to estimate evapotranspiration spatially. Developing these method can help to extend the estimation and empirical methods to much larger areas, including those areas where measured meteorological data may be sparse. Remotely sensed measurements may also be used to measure some other variables to calculate evapotranspiration by empirical methods such as energy balance and moisture balance models.

Landsat images (2001) were used to estimate some factors that are used with empirical methods in order of estimating actual evapotranspiration over a catchment. A catchment in Kermanshah -west of Iran- called Tang-e-Kenesht was selected for this study. A collection of other spatial data such as Digital Elevation Model, vegetation cover maps and meteorological data of the catchment were also used to calculate actual evapotranspiration.

Two theoretical and empirical methods (Energy balance and the Hargraves formula) were selected for this calculation. These models were used to calculate actual evapotranspiration for each individual pixel over the catchment (the total number of pixels is 159000).

The two models were used and by applying the crop coefficient, which was derived from the images, actual evapotranspiration were calculated for all the pixels over the catchment.

The results shows that there is a high correlation between energy balance and Hargraves model (R2=0.996) for actual evapotranspiration which spatially calculated for the catchment.

The point-measured data were also used to estimate evapotranspiration using the two methods and the results were compared with spatially distributed evapotranspiration over the catchment. These results can show the advantages of using spatially calculation in relation to point measurements.