Theory and Principle of Electrical Resistivity Method

The electrical resistivity method is an active geophysical method. It employs an artificial source which is introduced into the ground though a pair of electrodes. The procedure involves measurement of potential difference between other two electrodes in the vicinity of current flow. Apparent resistivity is calculated by using the potential difference for the interpretation. The electrodes by which current is introduced into the ground are called **Current electrodes** and electrodes between which the potential difference is measured are called **Potential electrodes**.

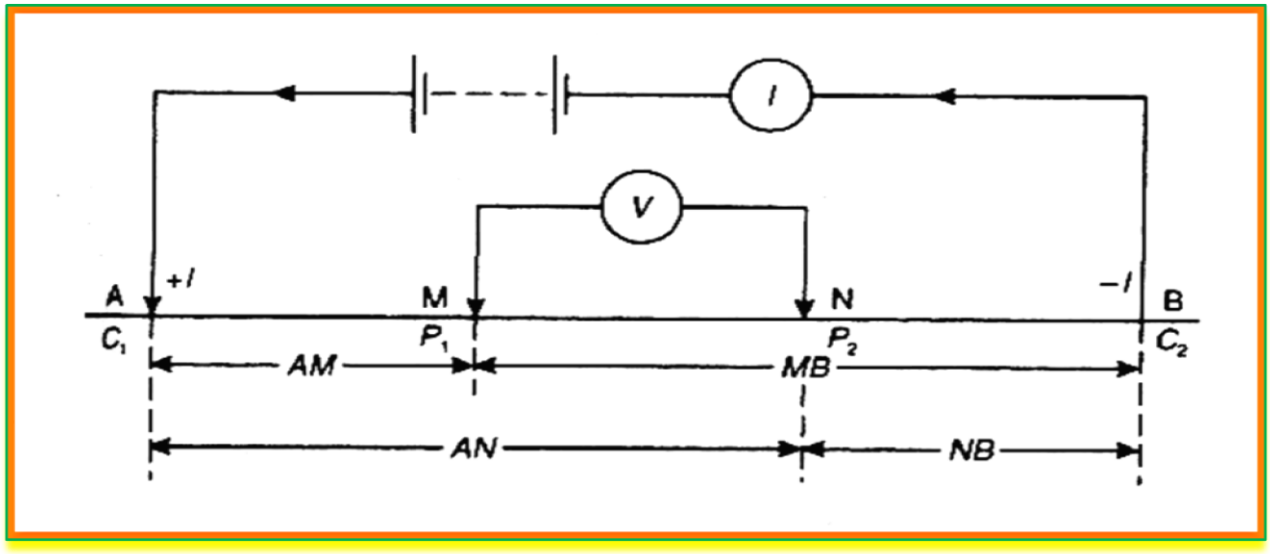


Fig 3: A, B are current electrodes and M, N are potential electrodes.

Potential at M,

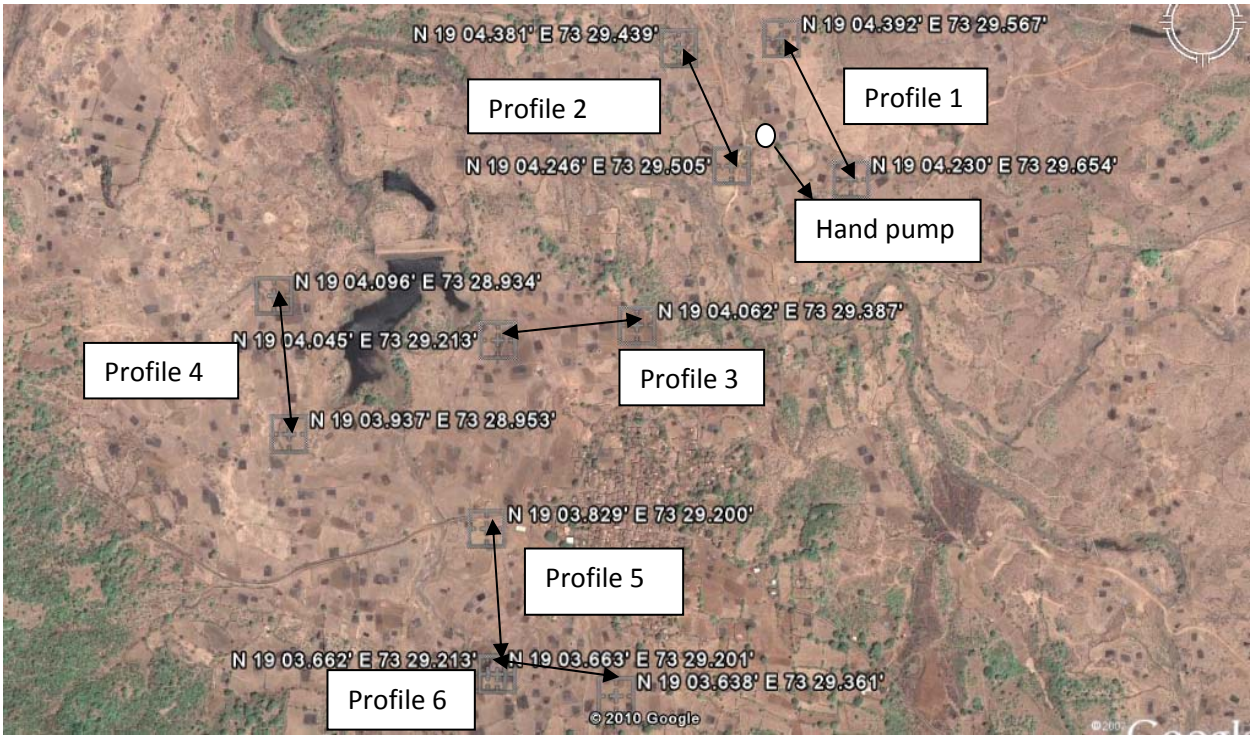
$$V_1 = \frac{\rho_a I}{2*\pi}\left(\frac{1}{AM} - \frac{1}{MB}\right)$$

Potential at N,

$$V_2 = \frac{\rho_a I}{2*\pi}\left(\frac{1}{AN} - \frac{1}{NB}\right)$$

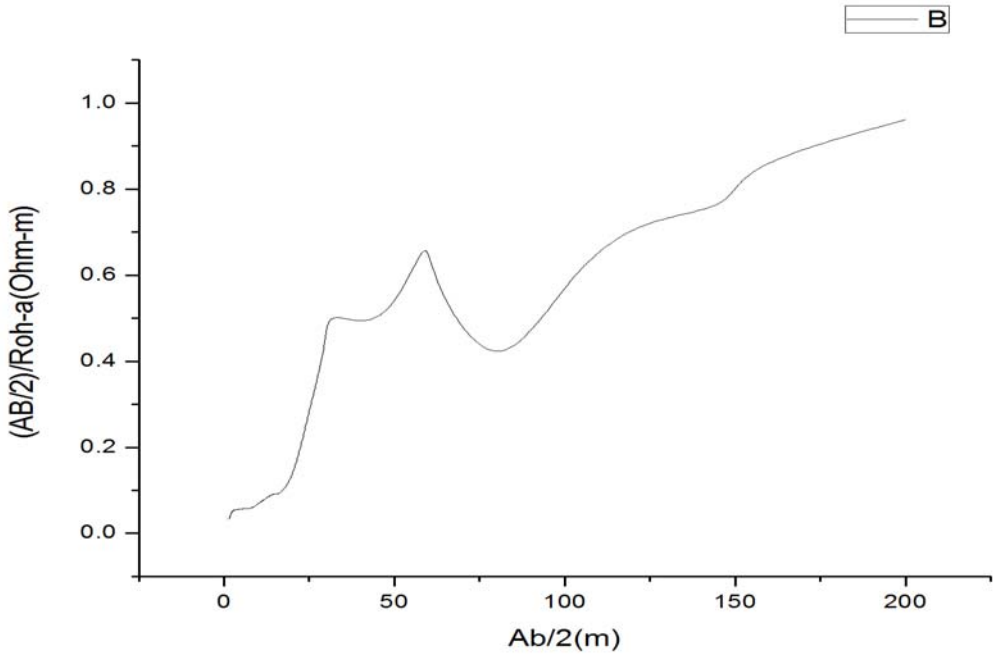
Potential difference between M and N,

$$\Delta V = \frac{\rho_a I}{2*\pi}\left\{\left(\frac{1}{AM} - \frac{1}{MB}\right) - \left(\frac{1}{AN} - \frac{1}{NB}\right)\right\}$$

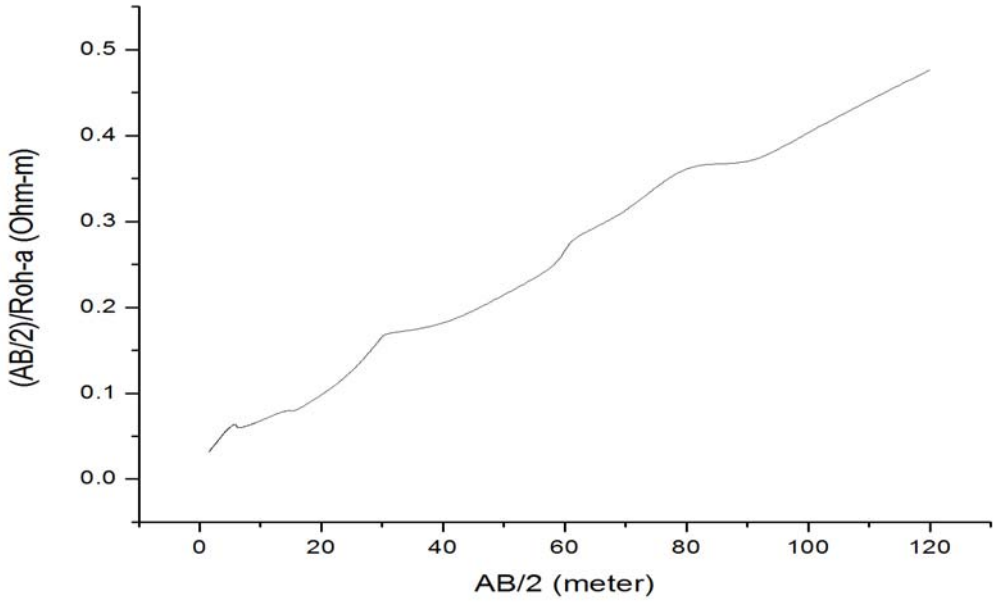


Photograph 1: All six profiles direction

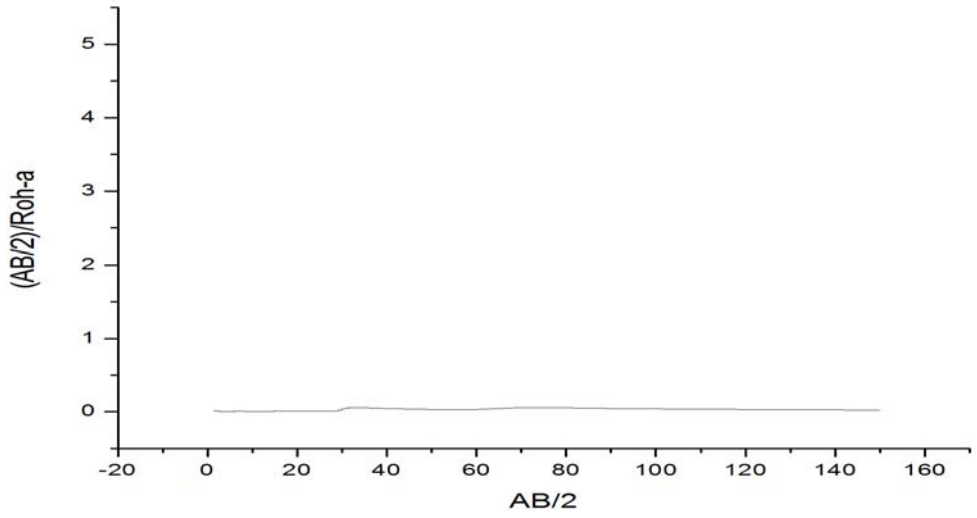
Profile 1:



Profile 2:



Profile 3:



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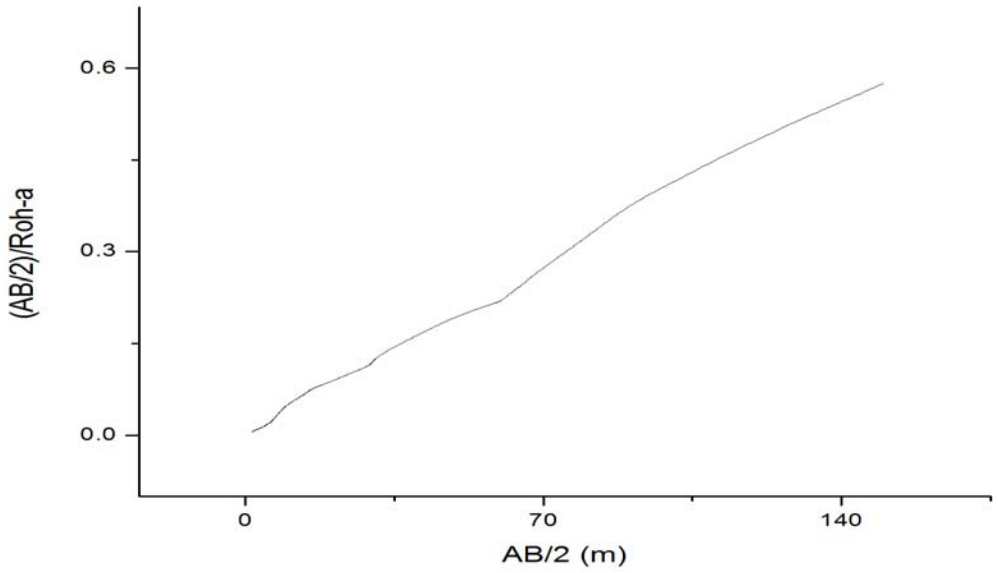

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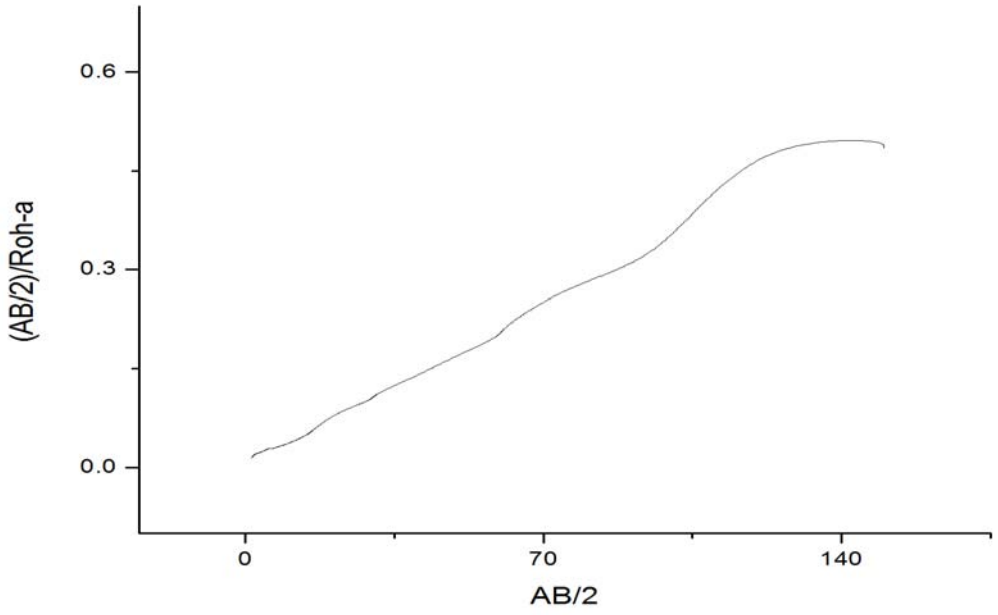

Profile 6: