

## **Determination of best transformation method for local coordinate transformation from Kandawala to SLD 99**

In 1999 a new Geodetic Datum (SLD 99) was introduced to Sri Lanka with the introduction of the Geodetic Network 1999 (GN 99) which was established using Global Positioning System observations. Although the relation between old Geodetic Datum (Kandawala) and New Datum SLD 99 was established with seven Transformation Parameters, significant residuals exists depending on the location of control points.

It was necessary to establish a suitable method for transformations of Kandawala coordinates into SLD 99 in order to bring all the available coordinates in Kandawala system to SLD 99. Once transformed these coordinates should be compatible with the SLD 99. In order to achieve and maintain the accuracy of old coordinates local transformation has to be considered.

Kurunegala District was selected as the sample area and the behavior between the two coordinates systems was analyzed with the help of coordinates of the trigonometrical stations which have been observed with GPS (Global Positioning System). This was further enhanced with the addition of results of other old control stations observed with GPS.

Several methods were tried including, Seven Parameter Transformation, Orthogonal and General Affine transformations, polynomial transformations and rubber sheeting. Analysis of the results of above transformations provides the best possible methods for local coordinate transformations.