In many cases, three-dimensional resistivity structures are often approximated by two-dimensional models without checking the dimensionality of the structure prior to perform modeling. However, such approximation can be misleading if the structure is purely 3-D where electromagnetic fields can not be separated into TE and TM modes. Then, a dimensionality analysis is important in order to get the general feature of the structure in particular in 3-D structure as expected in volcanic area. There are many methods to analyze dimensionality such as Groom-Bailey decompositions, which assume that the regional structure is two-dimensional, and Bahr's method. Here, we examine the dimensionality mainly by the phase tensor, which does not assume regional two-dimensional structure at all. The parameter “beta” is also used as an index for the three-dimensionality of the structure. On the other hand, the parameter “alpha” is the directional parameter. We also map the phase tensor diagrams (tan^{-1}(22) as a function of the coordinate angle) and the induction vectors. In this paper, we have also examined the effect of regional three-dimensional structure to the 2-D model. The synthetic and real Magnetotelluric data obtained from several volcanic zones were used in this study.