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LiDAR DEM for Slope regulations of land development in Taiwan

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Slope gradient is a major parameter for regulating the development of slope-lands in Taiwan. According to official guidelines, only two methods can be adopted, namely the rectangular parcel method and the parcel contouring method. Both of them are manual methods using conventional analogue maps produced by photogrammetric method. As the trend of technology is in favor of adopting digital elevation models for automated production of slope maps and complete coverage of the territory of Taiwan with DEM in 40m, 5m and 1m grids have been mostly completed, it is needed to assess the difference of DEM approaches in comparison to the official approaches which is recognized as the only legal procedure until now. Thus, a 1/1000 contour map in the sloping land of suburban area of New Taipei City is selected for this study. Manual approaches are carried out using the contour lines with 2m intervals. DEM grids of 1m, 5m, and 10m are generated by LiDAR survey. It is shown that the slope maps generated by Eight Neighbors Unweighted method are comparable or even better than the conventional approaches. As the conventional approach is prone to error propagations and uncertainties, the new digital approach should be implemented and enforced in the due process of law.