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## Modeling Land use Land Cover Dynamics using CA-Markov Chain Model and Geospatial Techniques: A Case of Belete Gera Regional forest Priority area, South Western Ethiopia

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**A**rrogant practices of land use including expansion of agricultural land and infrastructural development are resulting in deforestation that goes to climate change. [Cellular Automata](#) (CA)-Markov chain combines the advantages of cellular and Markov chain analysis to simulate and predict future land use/cover trends depending on the Land Use Land Cover (LULC) changes in the past. First, spatial distribution of LULC and area changed were calculated using IDRISI software and [GIS technology](#), and then the forest land cover conversion to other LULC was [evaluated to obtain rate of deforestation](#) during a period of 1980-2018. Second, using transition potential matrices of 1999-2018, CA-Markov chain was executed to simulate spatial distribution of land use/cover in 2018. Based on the simulated LULC map for 2018 and the actual LULC map of 2018 CA-Markov model was validated with a kappa index of 1. Finally, future land use/cover transformed during the periods of 2018-2037 and 2037-2056 were predicted using [CA-Markov](#) chain model. The results revealed that decreasing of forest land and increasing of agricultural land in the study period. Forest land was decreased by 52,156.71 hectares from 1980 to 2018, while agricultural land increased by 78,021.35 hectares during 1980-2018. Rate of deforestation between 1980 and 2018 was 1,372.54 hectares per year. Therefore, the predicted results of 2037 year suggests that forest cover would decrease by 30,204.65 hectares within 19 years and also agricultural land would be increased by 30,693.91 hectares between 2018 and 2037. It approved helping concerned bodies that work on the forest better understand and address a tough land use system, and develop.

### Biography

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