# Assessment of Spatio-Temporal Vegetation Cover Change and Its Implications in the Atiwa District of Southern Ghana

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## ABSTRACT

Deforestation has become a major environmental challenge facing the world since the 20th century. Ghana, like many other tropical countries particularly in Africa, Asia and South America, continues to lose her forest cover through unsustainable practices of forest use and destruction. Between 1900 and 1990 it was estimated that about 80% of Ghana's forest cover (8m ha – 1.6m ha) was lost.

In this study, a spatio-temporal assessment of the vegetation cover change (1990-2020) and its implication in the Atiwa District in the Eastern Region of Ghana was studied. Geographic Information System and Remote Sensing (GIS and RS) were used to assess the extent of vegetation cover change during the period of 1990 – 2010 and a projection for 2020 both in terms of space and time as well as possible drivers responsible for the changes. A social-economic survey involving the administration of questionnaires was also carried out which sought the opinion of the indigenous people on issues of deforestation and consequences on well-being and livelihood conditions in the study area. The results of the study indicated that there was an increase in the total area covered by the general vegetation classes by 0.23% (214.38 ha) between the period of 1990 to 2000, the total area covered by vegetative cover reduced by 4.11% (3812.69 ha) between 2000 and 2010 and further estimated to decrease by 1270.69 ha at an annual change of 0.143% during 2010 and 2020.

In terms of vegetation classes, the Closed Canopy Forest decreased by 48.4% while the Open Canopy Forest increased by 81.7% between 1990 and 2000. Between 2000 and 2010 the Grass Cover vegetation increased by 12071.84 ha (146.1%) compared to the reduction in the areas cover by both the Closed Canopy Forest and Open Canopy Forest by 82.6% and 57.3% respectively. The major drivers of deforestation identified in the study areas were agricultural activities and expansion of human settlements based on the GIS/RS analysis. However, other drivers responsible for the rapid rate of deforestation discovered in the Atiwa District included illegal logging, mining, fuelwood harvesting and charcoal burning as well as annual bush fires. In terms of impacts of deforestation, increasing loss of biodiversity, unfavourable

changes in climatic conditions (rainfall, temperature and winds), loss of revenue to the state through illegal resources exploitation were also noted. Based on the findings of the study, some recommendations were made. These include: regular assessment of the composition and spatial extent of the vegetation cover to keep track of changes through the application of GIS and RS; establish sustainable forestry management systems and policies in place to ensure sustainable utilization of forest resources; provision of alternative sources of livelihood for the indigenous people; and law enforcement and public education.

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