

Deforestation in Forest-Savannah Transition Zone of Ghana: Boabeng-Fiema Monkey Sanctuary

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Introduction

- The Boabeng-Fiema Monkey Sanctuary (BFMS) in the Bono East Region of Ghana is a unique ecotone rich in biodiversity, serving as a habitat for three primate species, including the critically endangered *Colobus vellerosus*.
- BFMS is not only a sanctuary for primates but also a sacred grove and ecotourism site, highlighting the role of traditional values in wildlife conservation in Ghana.
- The sanctuary has experienced deforestation due to anthropogenic activities, resulting in a decrease in closed forests. Additionally, previous research has largely focused on the primates. This study aims to fill the knowledge gap by analyzing the forest cover of BFMS and its changes from 1992 to 2018 using Remote Sensing (RS), GIS, and field data.

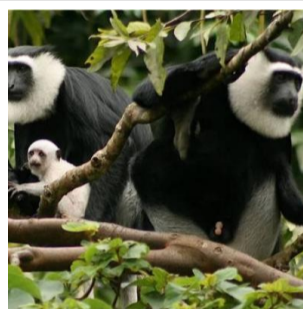


Fig. 1 *Colobus vellerosus*.

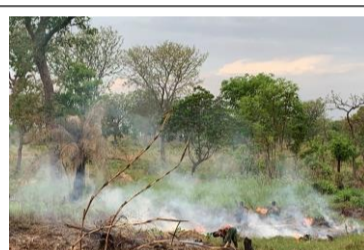
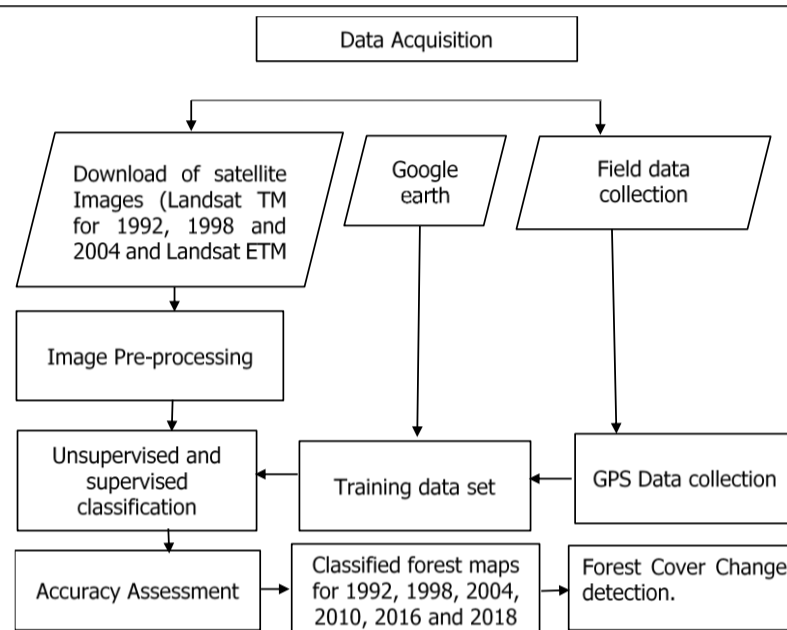


Fig. 2: Slash and burn agriculture.

Methodology



Results & Discussion

The closed forest cover is declining, whereas the open forest cover, built-up areas and farmland are increasing (Fig 3 and Table 1). A regression analysis showed a significant decrease in the closed forest and an increase in open forest cover, built-up areas and farmland.

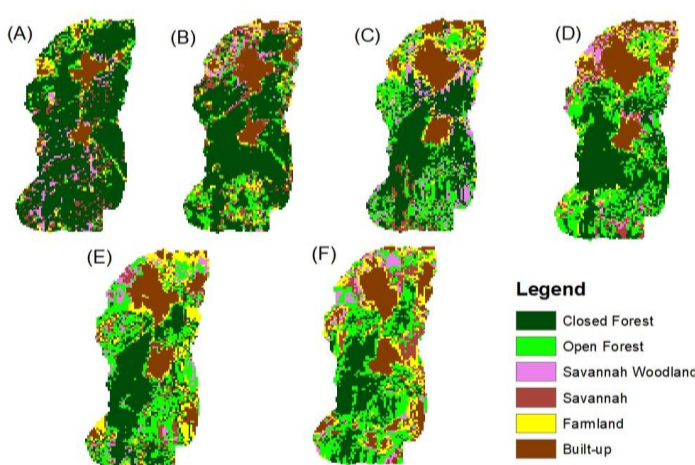


Fig. 3: Classified forest cover distribution in six different stages: (A) 1992 (B) 1998 (C) 2004 (D) 2010 (E) 2016 and (F) 2018.

Conclusion & Way forward

Population growth and activities like charcoal burning and farming have altered BFMS forest cover. To protect natural resources, sustainable forest management should be prioritized, with education on deforestation, promotion of alternative energy, and encouragement of agroforestry. Enhanced monitoring and high-resolution satellite imagery for forest classification are also recommended.

Results & Discussion

The decreasing closed forest and increasing open forest in BFMS (Fig. 4) cause structural and compositional changes, leading to a net loss of trees, biodiversity loss, reduction in carbon stock, release of carbon into the atmosphere and a threat to sustainable ecotourism in the area.

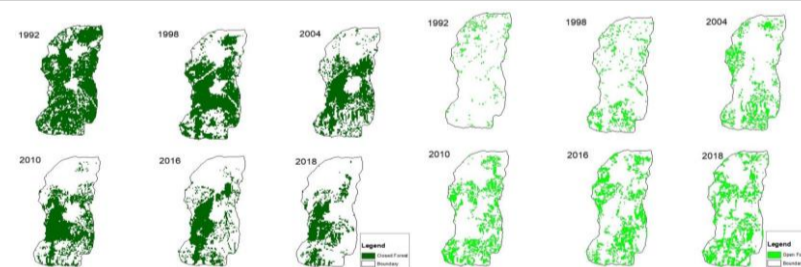


Fig. 4: Change map of Closed and Open Forest

Population growth in the study area has expanded farmlands and converted forests into physical structures (Fig. 5). Although this increases food production, slash-and-burn agriculture depletes soil and harms the environment. Horizontal housing and the cultivation of yam and groundnuts further contribute to land-use change.

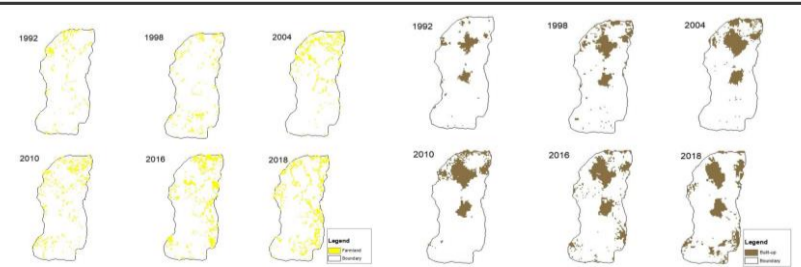


Fig. 5: Change map of Farmland and Built-up

Table 1: Spatial extent and changes in the different types of forest cover with respect to years in hectares (ha).

Given year	Closed Forest	Open Forest	Savannah Woodland	Savannah	Farmlands	Built-up
1992	369.72	30.78	26.19	40.50	28.17	40.32
1998	281.52	66.69	23.13	58.05	35.32	70.97
2004	225.63	104.68	50.13	21.69	46.90	87.48
2010	205.02	133.38	26.82	32.58	46.28	91.60
2016	162.99	142.65	30.15	35.91	64.98	99
2018	127.53	153.63	33.66	46.98	67.86	106.02
Change 1992-1998	-88.2	35.91	-3.06	17.55	7.15	30.65
Change 1998-2004	-55.89	37.99	27.18	-36.36	11.58	16.51
Change 2004-2010	-20.61	28.7	-23.49	10.89	-0.62	4.12
Change 2010-2016	-42.03	9.27	3.33	3.33	18.7	7.4
Change 2016-2018	-35.46	10.98	3.51	11.07	2.88	7.02
Change 1992-2018	-242.19	122.85	7.47	6.48	39.39	65.7