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Farmers’ and academia’s views”

## Assessing the opportunity cost of ecological restoration caused by land use/ land cover changes

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### Abstract

In the coastal landscapes of south-western Ghana, onshore infrastructural developments associated with the commercial quantities of oil discovery and rubber expansions on out-grower schemes have accelerated rapid land use/land cover changes with high consequences on the ecological integrity of the landscape. This calls for an understanding of alternative land use options for ecological restoration and adapted land use planning. This study aimed to identify and analyse synergies in locally-specific land use options for ecological restoration using local knowledge and expert opinions. First, the study reviewed land use activities that provide synergies in ecological restoration in tropical regions. Further, the study tested the acceptability and applicability of the reviewed land use activities with local stakeholders to identify locally applicable land use options. Expert opinions were gathered to test the scientific applicability of identified land use options. Local and expert knowledge was gathered using surveys and workshops. Next, the capacity of identified and accepted land use options to contribute to Ecosystem Services (ES) was assessed in a stakeholder-based modelling platform. The relationship between identified land use options and ES capacity was assessed and results were visualised in spatially explicit maps. Finally, the opportunity cost of ecological restoration against other land uses was assessed. The results showed synergies in identified land use options compared to trade-offs experienced in rubber out-grower schemes and onshore infrastructural development. The results addressed land use options that offer local farming needs and global ecological restoration concerns. The identified land use options are considerable land use options for policy recommendation.

**Keywords:** Coastal landscape of southwestern Ghana, ecological restoration, ecosystem service decline, land use synergies, socio-economic activities, stakeholder-based modelling