
Understanding the past for the future management: Effects of current and historic land Use on invasive plant diversity in Southeastern Togo, West Africa

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Abstract

Biological invasions and changes in land use are two components of global change affecting biodiversity worldwide. Both contemporary and historic land use may influence the spread of invasive plants by altering landscape patterns, soils, and biotic communities. Indeed, invasion within land uses is often associated with the historical legacy of changes in land use. Like in most West African regions, Togodo Protected Area (TPA) and its peripheries experienced notable land use change over the past few decades. These changes led to the spread of many invasive plants that threaten the biodiversity of the TPA and are chores for local farmers. However, despite the legacy of current and past land uses on plant invasion success, few studies have investigated the mechanisms triggering invasion credit and, in Togo, plant invasion ecology has not yet gained enough attention.

In this study, we investigated the influence of the current and historic land uses on the diversity of invasive plants in and around TPA. Firstly, we defined land use change trajectories using land use maps performed from Landsat images acquired in 1974, 1986, and 2003 and from Sentinel 2 image acquired in 2016. Secondly, we conducted botanic surveys in the different land use types and, 198 quadrats of 50 x 50 m were laid to make an inventory of all plant species.

In total, 483 plant species were recorded including 95 aliens, 1 uncertain, 71 invasive or potentially invasive. On average, old croplands are richer in invasive plant species than younger croplands and old vegetation. Croplands and fallows are the richest in invasive plant species. Overall, our results suggest that contemporary land use and past land use change trajectories influence invasion at the local scale. These results can offer insight into the invasion process and help identify areas of greatest risk for the protected areas.

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