Traditional agroforestry systems and adaptation to climate change in the Okpara district, Benin

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Abstract

Benin's agriculture is facing growing challenges related to climate variability, including erratic rainfall, rising temperatures, and soil erosion. In this context, traditional agroforestry practices, which combine agricultural cultivation and forest management, emerge as a promising strategy to improve the resilience of local communities to these environmental challenges. This study seeks to enhance understanding climate change adaptation methods based on traditional agroforestry in the Okpara district. It aims to develop a typology of traditional agroforestry systems, assess plant agrobiodiversity, and analyse associated adaptation strategies within these agroforestry systems.

Fieldwork was carried out using eight transects and surveys of 111 farming households across four villages in the Okpara district. Study plots of 2500 m^2 were established to assess plant agrobiodiversity. This research identified four main categories of agroforestry systems: those derived from the management of spontaneous vegetation by farmers, wood-based plantation systems, systems integrated with livestock, and mixed systems. The floristic inventory revealed 22 spontaneous, para-cultivated, and cultivated woody species divided into 10 families and 18 genera. The dominant species were *Vitellaria paradoxa* (23 %) and *Anacardium occidentale* (24 %).

The primary adaptation strategies employed in traditional agroforestry systems include staggered seeding, the use of short-cycle species, crop rotation, co-cropping of legumes, early field preparation, ploughing perpendicular to the slope, and the installation of windbreaks. These practices are designed to maximise agricultural productivity, preserve soil fertility, and mitigate the impacts of climate change. The study recommends the integration of traditional knowledge into agricultural and environmental policies, while introducing modern approaches to sustainable land management.

Keywords: Agrobiodiversity, agroforestry, Benin, climate change adaptation, traditional knowledge

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