

## **Agro-Forestry system in West Africa: integrating a green solution to cope with soil depletion towards agricultural sustainability**

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During the last decades, agriculture in West Africa has been marked by dramatic shifts with the coverage of single crops, increasing pressure over the available arable land. Yet, West African countries are still striving to achieve sustainable production at an increased scale for global market needs. Market-driven rapid intensification is often a major cause for cropland area expansion at the expense of deforestation and soil degradation, especially to export commodities in times of high prices. Cashew (*Anacardium occidentale* L.) is nowadays an important export-oriented crop, being produced under intensive cultivation regimes in several tropical regions. Particularly, among the main cashew production areas, West Africa is the most recent and dynamic in the world, accounting for 45% of the world cashew nuts production in 2015. Considering its global market values, several developing countries rely on cashew nuts as national economy revenues, namely in Guinea-Bissau. Considering the intensive regime of cashew production in Guinea-Bissau, and as widely recognized, intensive agriculture linked with extensification can negatively impact ecosystems, affecting natural resources availability, soil erosion and arability compromised by excessive salinity. Ultimately this will result in the disruption of carbon - nitrogen cycle, important to the agricultural ecosystem sustainability. As such, tree intercropped with legumes as cover crops, offers a sustainable management of the land area, thus creating substantial benefits both economically and environmentally, as it enhances diversification of products outputs and proving to be more sustainable than forestry and/or agricultural monocultures. Soil fertility improvement is a key entry point for achieving food security, and also increment agriculture commodities of the agro-system. Without using inorganic fertilizers, the green solution for improving soil management is to incorporate adapted multi-purpose legumes as cover crops, reducing soil erosion as well as insect pests and associated diseases, while improves the yield of the main crop. The integration of legume in agroforestry systems offers an alternative and resilient strategy to increase N availability without increasing mineral N additions. As such, we present a case study of a forest-based system under intensive agriculture regime and propose an alternative sustainable system - the agroforestry system - by intercropping legumes, thus ensuring the sustainability of a cash crop sector both in terms of food security and soil resources. Results obtained from this case-study will therefore be important to demonstrate the global importance of agroforestry systems as key strategy for land use planning, sustainability of the agricultural systems as well as the preserving the environment of smallholder farms in the sub-Saharan Africa.