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# Impacts Assessment of Climate and Land Use Changes in Inland Valleys Agricultural Systems and Overview of Adaptation Strategies in Dano, West Africa

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**Abstract**

Agriculture in West Africa is facing enormous challenges due to climate and land use changes. These challenges are driven by a high variability of rainfalls impacting the agricultural systems which are mostly rainfed, by the increasing pressure on the natural resources due to a growing population that is largely rural and dependent on agriculture and by the depletion of soil fertility.

Water management through the development of irrigation systems is therefore a necessity to intensify and to secure the agricultural production systems. Inland valleys are foreseen as a promising opportunity for adaptation to climate and land use changes thanks to their high and untapped potential in water and fertile soils. Different adaptation options exist as regards to infrastructures like the construction of reservoirs, to crops like the selection of more adapted varieties to dry and flooded conditions, to the management of land and water through resource-conserving techniques and supplemental irrigation inter alia. But there's a need for assessment of the impacts of climate and land use changes on these inland valleys and on the capacity of resilience from the different adaptation options cited above that is barely covered by literature.

The research focuses on five inland valleys in the Dano region in Burkina Faso. In order to observe different settings and improve appropriately their adaptation potential, two sites with reservoirs, two with partially controlled irrigation infrastructures and one with conventional farming were selected and monitored in rainy and dry seasons over two years. The water balance of these inland valleys have been set and irrigation systems performance indicators such as adequacy, productivity, sustainability and impacts on downstream areas of the catchment, have been applied under current and projected climate scenarios. Based on an understanding of the functioning of the hydro-agro-eco systems at the different sites, their evolution can be predicted and effective and site-specific adaptation strategies can be derived.

**Keywords:** Agriculture, climate change, inland valleys, water management

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