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Modelling the biophysical and socio-economic potential of Sustainable Land Management (SLM) in the Cabo Verde drylands: The PESERA-DESMICE approach.

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Rainfall variability, the occurrence of extreme drought and historic land management practice have been recognised as contributing to serious environmental impact in Cabo Verde. Investment in conservation measures has become visible throughout the landscape. Despite this the biophysical and socioeconomic impacts of the conservation measures have been poorly assessed and documented. As such a concerted approach based on the DESIRE project continues to consult stackholders and carry out field trials for selected conservation technologies. Recent field trials have demonstrated the potential of conservation technologies but have also demonstrated that yield variability between sites and between years is significant. This variability appears to be driven by soil and rainfall characteristics

However, where detailed field studies have only run for a limited period they have not as yet encountered the full range of climatic variability; thus a modelling approach is considered to capture a greater range of climatic conditions. The PESERA-DESMICE model is adopted which considers the biophysical and social economic benefits of the conservation technologies against a local baseline condition. PESERA is adopted as climate is implicitly considered in the model and, where appropriate, in-situ conservation measures are considered as an annual input to the soil. The DESMICE component of the model considers the suitability of the conservation measures and their costs and benefits in terms of environmental conditions and market access.

Historic rainfall statistics are calculated from field measurements in the Ribeira Seca catchment. These statistics are used to generate a series of 50 year rainfall realisations to capture a fuller range of the climatic conditions. Each realisation provides a unique time-series of rainfall and through modelling can provide a simulated time-series of crop yield. Additional realisations and model simulations add to an envelope of the potential crop yield and cost-benefit relations. The development of such envelopes help express the agricultural risk associated with climate variability and the potential of the conservation measures to absorb the risk. Thus, highlighting the uncertainty of a given crop yield being achieved in any particular year. Such information that can directly inform or influence the adoption of conservation measures under the climatic variability of the Cabo Verde drylands.