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The Application of Climate Risk Informed Decision Analysis to the Ioland Water Treatment Plant in Lusaka, Zambia

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This presentation demonstrates the application of Climate Risk Informed Decision Analysis (CRIDA) at Zambia's principal water treatment facility, The Iolanda Water Treatment Plant. The water treatment plant is prone to unacceptable failures during periods of low hydropower production at the Kafue Gorge Dam Hydroelectric Power Plant. The case study explores approaches of increasing the water treatment plant's ability to deliver acceptable levels of service under the range of current and potential future climate states. The objective of the study is to investigate alternative investments to build system resilience that might have been informed by the CRIDA process, and to evaluate the extra resource requirements by a bilateral donor agency to implement the CRIDA process.

The case study begins with an assessment of the water treatment plant's vulnerability to climate change. It does so by following general principals described in "Confronting Climate Uncertainty in Water Resource Planning and Project Design: the Decision Tree Framework". By utilizing relatively simple bootstrapping methods a range of possible future climate states is generated while avoiding the use of more complex and costly downscaling methodologies; that are beyond the budget and technical capacity of many teams. The resulting climate vulnerabilities and uncertainty in the climate states that produce them are analyzed as part of a "Level of Concern" analysis. CRIDA principals are then applied to this Level of Concern analysis in order to arrive at a set of actionable water management decisions.

The principal goals of water resource management is to transform variable, uncertain hydrology into dependable services (e.g. water supply, flood risk reduction, ecosystem benefits, hydropower production, etc…). Traditional approaches to climate adaptation require the generation of predicted future climate states but do little guide decision makers how this information should impact decision making. In this context it is not surprising that the increased hydrologic variability and uncertainty produced by many climate risk analyses bedevil water resource decision making. The Climate Risk Informed Decision Analysis (CRIDA) approach builds on work found in "Confronting Climate Uncertainty in Water Resource Planning and Project Design: the Decision Tree Framework" which provide guidance of vulnerability assessments. It guides practitioners through a "Level of Concern" analysis where climate vulnerabilities are analyzed to produce actionable alternatives and decisions.