**Technical considerations;**

The successful delivery of AI and sensor-based drought management systems is critical in terms of addressing climate change specifically droughts and water scarcity in South Africa. This system intends to provide accurate, timely, and actionable drought forecasting and modeling to enhance resource management in South Africa.

**Data Collection and Sources:**

* This system will rely on sensor-based technology and remote sensing data sources to gather important information on drought conditions and other environmental factors that are specific to South Africa in terms of climate
* Since obtaining data directly from sensors placed in the field is not feasible at this point and is not in the scope of this project. Given this in order to validate and test the system we will make use of South African drought data (existing datasets) or remote sensing data.

**Data Processing and Analysis:**

* Machine and deep learning models will be used to process and analyse the dataset enabling accurate detection of drought conditions as well as productivity which is affected by drought and water scarcity issues. By making use of these models we can provide precise insights in terms of aiding stakeholders in making informed decisions to optimise productivity. Not only will these models ensure accuracy and reliability but has the ability to provide actionable insights for stakeholders.

**Software Development and Delivery:**

* A user-friendly, web-based interface will be developed to provide stakeholders with access to drought forecasts, predictions, and relevant information.
* We will make use of Python and MATLAB during the duration of this project. By making use of these technologies we can develop advanced algorithms for the processing and analysing of the dataset to detect drought conditions and develop early warning systems as well predicting land fertility and productivity. Furthermore, these technologies can be used to create a user-friendly web-based interface with the relevant information as required.
* The software product will be deployed online via web servers, with mobile-based capabilities to ensure accessibility and usability for users in South Africa.

**Integration with Existing Systems:**

* The AI and sensor-based drought management system will be integrated with an existing dataset.
* Standard protocols and technologies will be employed for integration, ensuring compatibility and efficiency in sharing data and insights with relevant stakeholders.

**Infrastructure and Maintenance:**

* Infrastructure, including server hosting, data storage, and network connectivity, will be provisioned to support the operation and maintenance of the drought management system.
* Regular maintenance activities, such as software updates will be performed to ensure the reliability and effectiveness of the system.