FACULTY OF TECHNOLOGY SUB-PROGRAMME 3: WATER RESOURCES AND ENVIRONMENTAL ENGINEERING		
THEME: **Water Resources Engineering and Management Decision Support Systems**		
PROJECT TITLE: **A Framework for Development of Spatial Decision Support Systems for Water Resources Management in Uganda**		
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ABSTRACT

As recognized in the EU Water Framework Directive and other policy documents, a priority action towards ensuring the sustainable use of water resources is the development of Decision Support Systems (DSS). The aim of DSS is to bring decision makers to a good level of understanding of problem situations and their own subjective values, thereby facilitating choice amongst options and generating commitment to a specified course of action. However, it has been noted that although DSS offer many benefits to decision makers, they have not been widely taken up in practice. Secondly, there has been a shift in focus lately from DSS as technical artifacts to the entrenching of decision support within work systems, that is, the use of any plausible computerised or non-computerised means for improving decision making. Regardless of whether DSS capabilities emphasize better data availability, analysis, modelling, or communication and coordination, these capabilities have little or no impact until they are adopted and embedded into the prevailing work systems within organisations.

Thirdly, the classical decision making paradigm recognises three distinct stages of the decision making process: problem identification (Intelligence), development of alternative solutions (Design), and selection among alternatives (Choice). A lot of research has been done towards developing formal evaluation methodologies to support the choice phase, and a plethora of these exist. Likewise, a lot of models and modelling tools have been developed in support of the design phase. However, comparatively little research has been focused on problem identification, and yet it can be argued that facilitation of problem structuring is a key distinguishing factor between good and bad DSS. Fourthly, sustainable decisions require the active engagement of stakeholders. To persuade stakeholders to collectively arrive at a decision, especially when involving compromise, requires the decision making process to be transparent and fair, and to achieve this, the process must be as rigorous, logical and well documentable as possible. DSS have a crucial role to play in this regard: that of legitimizing choices by presenting logical support for decisions in front of authorities and public opinion, by means of the audit trail generated as the decision making process unfolds.

In this project, an Action Research (AR) approach is being used to develop and prototype a framework for Water Resources Management DSS development, tailored to the local context. AR is an inquiry process that involves partnership between researchers and practitioners, within the context of the practitioners' work setting, for the purpose of addressing an organizational issue while simultaneously generating scientific knowledge. For this project, emphasis is being placed, not on the creation of a technical DSS artifact, but rather on the institutionalisation of formal participatory decision making processes within an organisational work system, using real-life problem situations. Particular focus is being placed on the development of spatial, geo-visual tools to facilitate problem structuring, as well as clear justification and documentation of the basis of decisions taken. The use of an AR approach will ensure that the decision support tools and methodologies developed during the study stand a good chance of being adopted in real practice, thereby contributing towards bridging the gap between academic research and technological practice - a crucial undertaking if academic research is to play an effective role in the achievement of the country's development goals.