

Thesis title:

Effect of Climatic Change on Water - Energy - Food Nexus in Mahaweli River Basin and a Prediction Model to Mitigate Negative Impacts

Abstract:

Eastern dry zone of Sri Lanka is a water-stressed area with seasonal water availability and vulnerable to both flood and draught disasters. During the rainy season, about 5800 MCM of water is released to the sea without use, while having a prolonged dry period in Eastern Dry Zone annually. Competition for water due to population growth and increasing frequency of draught will increase the water scarcity. Mahaweli river which flows through North-East dry zone supplies the water required for the area. Mahaweli river is the longest river in Sri Lanka which flows through all the climatological regions. About 70% of the hydropower plants are linked to Mahaweli basin and up to 900 MCM of water will be transferred annually from the Mahaweli River to the north and north-east regions. Since the North-East regions are more than 100 km away from the origin of the source and situated in a different climatic zone, climatic changes and water usage in the upstream basins affect the downstream basins' water nexus, and vice versa. Proper management of water that accumulate in wet zone of Mahaweli basin by storing and conveying to the draught prone areas in north east could address the issue to some extent. This study is focussed on developing a decision support system (DSS) by concentrating on the effect of climatic change on Water - Energy - Food Nexus in Mahaweli river basin.