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Crop water requirements and irrigation scheduling: Lower Uma Oya development area

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Water being a scarce resource and a commodity that has an exponential demand, it is important that the resource is used in the most efficient way. Uma Oya Multi-Purpose Development Project in which water is to be diverted from Uma Oya to Kirindi Oya while generating hydro-energy has been proposed to address this issue. As a part of the project, there is a proposal to enhance irrigation facilities in Kirindi Oya basin using the additional water received to the basin. This includes the construction of a new reservoir, raising an existing dam and the construction of many irrigation canals to provide water to existing as well as novel irrigation areas.

A study was carried out to propose an optimized cropping pattern for paddy cultivation, which minimizes crop water requirements within the proposed development area. This was done as such a crop water assessment has not been done in the area. To achieve this objective, the CROPWAT software, which is a computer model that estimates evapotranspiration, effective rainfall, crop water requirement and irrigation scheduling was used. Monthly meteorological data including maximum and minimum temperatures, rainfall, wind velocity, relative humidity and sunshine hours were collected during the period from 2000 - 2014 and were used as input data. Four scenarios were considered in the study; years with rainfalls of 20%, 50% and 80% probability of exceedance, representing a wet, normal and a dry year, respectively and an average year determined based on monthly values. The analysis was, initially carried out in the Yala season (March – May) and the Maha season (Sept –Jan). Then, the cropping calendar was shifted by two weeks forward and backward for the above scenarios and the results were calculated with the motive of identifying the cropping periods which give the minimum water requirements. The results indicated that the cropping calendar shifted forward in the Maha season and backward in the Yala season resulted in the minimum irrigation requirement. It also depicted that there was a 63% and a 26.5% difference in water requirements for the Yala and the Maha seasons, respectively, when the wet and dry years were compared for the selected cropping periods.