



Water management challenges at Mushandike irrigation scheme in Runde catchment, Zimbabwe

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Mushandike Irrigation Scheme, constructed in 1939, is located in Masvingo District and is one of the oldest irrigation schemes in Zimbabwe. Since 2002, the scheme has experienced severe water shortages resulting in poor crop yields. These low crop yields have led to dissatisfaction among farmers leading to water conflicts. This study sought to investigate the causes of water shortage and contribute towards the development of solutions to the water management challenges at Mushandike Irrigation Scheme. Hydro-climatic data was analysed to establish if there is enough water generated in the Mushandike system to satisfy the present demands at the scheme. Irrigation demands and efficiencies were compared against water availability and dam releases to establish the source of water shortages. The study observed that the yield of the dam is 9.2×10^6 m³/a and is adequate to irrigate a maximum area of 613 hectares using 15×10^3 m³/ha/a. The area has now expanded to approximately 997 hectares giving an annual irrigation water requirement of approximately 15×10^6 m³/which is beyond the yield of the dam. However, calculation of actual crop water requirements based on FAO guidelines suggest that there is enough water to accommodate the 997 hectares at a rate of 8×10^3 m³/ha/a. This means that there are much larger losses in secondary and tertiary canals, which are largely responsible for the water shortages. The Spearman's Rank Correlation test, established no significant long-term changes in rainfall patterns. However, evaporation and temperature have been increasing. The study concludes that annual irrigation water requirements exceed the water available in the Mushandike system and recommends interbasin water transfer of about 6×10^6 m³/a from the Tokwe system if the current water demands are to be satisfied based on the national water budget for irrigation schemes in Zimbabwe of 15×10^3 m³/ha/a, which is equivalent to 15×10^6 m³ of water per season for the 997 hectares of Mushandike Irrigation Scheme.