

SPATIAL VARIATION OF CROPPING SYSTEMS AND WEED DIVERSITY ALONG TANK CASCADES: A CASE STUDY IN THIRAPPANE TANK CASCADE SYSTEM IN SRI LANKA

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The land use associated with tank cascades demonstrates a challenging environment, essentially transformed from a natural ecosystem into an agro-ecosystem, which leads to create diverse cropping systems and variation in weed diversity. There is no organized information or researches on variation of cropping systems and weed diversity of irrigated lowlands and uplands along the tank cascade systems. Present study aimed to identify the spatial variation of prominent cropping systems and weed diversity along the Thirappane tank cascade system in dry zone of Sri Lanka. A questionnaire survey was used to identify variation of cropping systems and field survey was used to determine variation of weed diversity. Quadrant method was used obtaining weed samples. A sample of 150 farmers and 24 farmer fields were selected from the cascade system representing its total population. Chi-square test and descriptive methods were used to analyze data. Weed diversity was analyzed using Simpson's Diversity Index and Shannon Wiener Index. Maize-sesame (36%) and sesame-long bean (30%) were identified as prominent cropping systems among the recorded six cropping systems. Maize-sesame (36%) was reported as the most prominent cropping system along the cascade. Both Simpson's Diversity Index and Shannon Wiener Index indicated relatively higher values (0.62 to 0.79 and 1.02 to 1.46 respectively) representing rich diversity of the weed population in rice fields. Chi-square test proved that weed diversity is significantly ($P < 0.001$) varied along the cascade system. Further, the results revealed that the most dominant weed species in the upper tank and lower tank area is *Welhiriya* (*Cyperus difformis*) while middle tank area is highly affected with *Batadella* (*Isachne globosa*). In conclusion, there is a significant variation of weed diversity while not having a significant variation of cropping system along the Thirappane tank cascade system in Sri Lanka. The generated information would be beneficial in fulfilling the existing research gap and further developing agricultural activities in the cascade.

Keywords: Cropping pattern, Diversity indices, Tank cascade system, Weed diversity