

Socio- economic impacts of invasive alien plant species (IAPS) spread in irrigation systems in Sri Lanka

D. Abeysiriwardena

Department of Irrigation, Sri Lanka

Sri Lanka is a country where agricultural activities are done throughout the year mainly based on irrigation water. Total cultivation under major irrigation in the country is about 1,000,000 acres, of which 75% (756,000 acres) is irrigated and maintained by the Irrigation Department (ID). Invasive Alien Plant Species (IAPS) are rapidly spreading in the irrigation systems, including reservoirs and canals. Baseline surveys were conducted in five selected irrigation schemes (Parakrama Samudraya, Mahahalmilla Wewa, Neelabemma, Karawila Wewa, and Bentara Right Bank), to identify species, extent of spread, and their impact. A socio-economic survey was also conducted targeting field officers and beneficiaries of the schemes. Results showed that *Eichhornia crassipes* and *Salvinia molesta* are the most widely spread IAS in irrigation systems except Bentara RB, with high density (>40% of gross extent), while *Hydrilla verticillata* shows medium density (10% - 40%) of spread. *Dillenia suffruticosa*, and *Annona glabra* are major species spread with medium density in canal banks, wet lands and paddy fields in Bentara RB. *Typha angustifolia* spread is of medium density, and < 45% of extent of tanks and canal bunds are invaded by *Panicum maximum* at high density in all the schemes. The extent of the schemes invaded by IAPS are Parakrama Samudraya -14%, Halmillawewa - 52%, Neelabemma - 90%, Karawila Wewa - 29.4% and Bentara RB - 24.6% (including land area). The economic impact of IAPS in pilot schemes is significant. Due to heavy vegetation cover, cropping intensity is reduced by lack of water for cultivation, mostly in the Yala season. The vigorous growth and spread of *Panicum maximum* is said to reduce soil fertility and its structural qualities. The ID annually spends Rs.5.8 Mn for all the pilot schemes to control IAP and the frequency of farmer shramadana campaigns for maintenance of canals has increased up to 2-3 times per season. In Bentara RB 45% of the land is abandoned, and growth of *D. suffruticosa*, and *A. glabra* is said to be the third most important reason for it. Reduction in the number of fishing and bathing spots, and locations of recreational activities is also attributable to IAPS. Therefore IAPS has direct and indirect costs to ID, farmers, and other stakeholders. However, IAPS can also be used as green manure, firewood, fodder and timber. There is low awareness of IAPS and current control methods of mechanical and manual removal are ineffective. Sustainable management of IAPS recommended through activities such as raising the awareness of officials and the public, integrating current control practices with use of biocontrol agents, and finding uses for IAPS through scientific research.

Key words: Invasive alien plants, irrigation, agriculture, socio economic impacts