

Impact of *Parthenium* (*Parthenium hysterophorus*) on human health (a GIS based assessment)

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Parthenium weed (*Parthenium hysterophorus*) is an annual herb native to tropical and subtropical America. It is one of the most aggressive invasive weeds, threatening natural ecosystems and agro ecosystems. In Sri Lanka, the *Parthenium* weed entered in 1987. This invasive weed is known to cause many health hazards to humans and livestock. The objective of this study was to assess the potential health impacts of *Parthenium* to humans. It was reported that this weed first infested the Vavuniya district where it is found in different habitats. Hence, it was selected as the study area. *Parthenium* infested grids of 2 km x 2 km, mapped during Invasive Alien Species (IAS) distribution mapping, was used for this study. Based on the records available in the asthma and skin clinics of the General Hospital, Vavuniya, locations of patients visiting the hospital from January, 2015, to June, 2016, were pin-pointed in 'Google Earth Pro.' The patients' locations were overlaid and the relationship between disease distribution and *Parthenium* distribution was analyzed in Arc GIS. Disease hot spots were extracted using the 'Hot Spot Analysis' tool which was in Arcmap, and the analysis used Getis-Ord G_i^* statistics to identify the significant hot spots. These hot spots were compared with the *Parthenium* infested grids. The analysis revealed that 52 out of 103 Grama Niladari divisions in the Vavuniya District were infested by *Parthenium*. The level of infestation varied from 5% to 30 % in each grid. Out of 581 grids, 110 Grids, 19 % of the study area, were so infested. Further it revealed that the high infestation with *Parthenium* and high patient density were recorded within the urban council limits. According to the hot spot analysis, all the hot spots of asthma (100%) and 95.5 % of skin disease hot spots were in *Parthenium* infested areas. Based on the skin clinic and asthma clinic records, it was observed that 86 % of the asthma patients and 75 % of the skin disease patients, respectively, were from *Parthenium* infested areas. Further investigation on evaluating the health impact is essential, in order to take policy decisions to control this IAS weed.

Key words: GIS, Health hazards, human, invasive alien species, *Parthenium*.