**EXCUTIVE SUMMARY**

Understanding the dissemination intensity and population dynamics of invasive plant species is required for designing management strategies in Himalayan Forest ecosystems undergoing the rapid climate change. Although, there have been research on the presence of a few invasive species in Himalayan ecosystems, thorough information on their spread intensity and species association is still lacking. We desired to examine the intensity of dissemination and distribution pattern of *Ageratina adenophora*, one of India's high-concern invasive species (HiCIS) wreaking havoc in the Himalayas, over an elevational gradient, taking into account current data gaps.

Study on invasive effects of *Ageratina adenophora* (Spreng.) in Mussoorie Range exploring the Effects of Invasiveness on Ecosystems: Implications and Trends” was taken for the partial fulfillment of M.Sc. Dissertation.

The study attempted to achieve the following objectives:

• Identification of important invasive plant species (IPS) using artificial keys and morphological traits; community knowledge of and local control approaches for IPS.

• Mapping the global distribution of invasive plant species.

• Examining the Soil Organic Carbon, population status, and biomass of *A. adenophora*.

Field data were gathered from the study site *i.e.* Mussoorie (Garhwal Himalayas range) in the Indian state of Uttarakhand during the months of March-May in 2023. *A. adenophora* population status and species affiliation were studied throughout an elevational gradient ranging from 1200 m to 2,286 m above sea level. It was divided into five sites, and each gradient was randomly sampled to determine the phyto-sociological state of the region. Misra's (1968) methods were used to acquire the data. A pedestrian transect cutting settlements along altitudinal gradients and a home survey employing a questionnaire-based interview were used to determine the existence of IPSs. The household survey asked about IPS awareness or knowledge, sources of introduction, and consequences on the environment, infrastructure, crop yield, and local IPS control techniques. The Global Positioning System (GPS) was used to collect the IPS positions.

In all the study sites, 17species belonging to 8 family, 16 genus were found in conjunction with *A. adenophora*, including 6 herbs, 7 shrubs, and 1 climber, as well as 3 annual and perennial blooming plants. During the investigation, nationally recognised IPSs like *Ageratina adenophora, Chromolaena odorata, Parthenium hysterophorous, Boehmeria cylindrica, Urtica dioica,* and *Erigeron karvinskianus* were observed. The survey also observed some non-invasive species such as *Rumex acetosella, Berberis vulgaris, Rumex crispus, and Acrotriche cordata*, etc. as well as some agricultural weeds. An enumeration on species wise plant biomass (Shoot weight +Root weight) and site specific soil organic carbon were measured.

Geospatial analysis, such as, illustrating the areas prioritization, in addition to species prioritisation, may be necessary to accomplish successful IPS invasion prevention or control methods. For example, in Mussoorie, areas such as Landour, Hathipaon, Suwakholi, Jharipani, and Dhanaulti village have been identified to be prone to invasion because to high invasion richness. Furthermore, because these species were discovered to cover virtually all kinds of land use and land cover in the research regions, they will be prioritized for prevention in areas that have not yet been invaded and management in areas that have already been invaded.