**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 aimed to achieve the following goals:

* Identification of key invasive plant species (IPS) using artificial keys and morphological characteristics; community awareness of and local management techniques for IPS.
* Mapping the geographical location of Invasive Plant Species.
* Analyzing 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. The population status and species affiliation of A. adenophora were investigated over an elevational gradient spanning from 1200 m to 2,286 m above sea level. It was separated into Five Sites, of which each gradient was further randomly sampled to find out the phyto-sociological status of the area. The data was collected by the methods as suggested by Misra, 1968. The presence of IPSs were detected utilizing a pedestrian transect cutting settlements along the altitudinal gradients and a household survey using a questionnaire-based interview. The household survey included questions about IPS awareness or knowledge, their sources of introduction, and their effects on the environment, infrastructure, crop yield, and local IPS management strategies. The IPS locations were collected using the Global Positioning System (GPS).

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. In addition, these species are found to cover practically all forms of land use and land cover in the study places they will be prioritized for the prevention in the areas that have not yet been invaded and management in areas that have already been invaded.