CHAPTER 2
2. Scope and Objectives

The Gangetic alluvial plain is a highly productive zone and under intensive agriculture. The practised cropping intensity in the zone is more than three hundred percent, and such high intensity cropping results in the depletion of immense groundwater resources. The *boro* rice crop particularly consumes a huge amount (2000 – 2500 mm) of underground water. The arsenic contamination in the underground water resources has been reported in these areas. Though the farmers are getting satisfactory financial returns, the soil health is getting deteriorated due to arsenic contamination. There is a possibility of the arsenic getting accumulated in the soil environment, which acts as an excellent sink for this toxin, and as a result soil properties may also get affected in the process. Such excessive utilization of groundwater, as well as its overexploitation need to be checked. Thus, a study of the selected area under the given belt will help in establishing relationship between effective crop planning and soil health restoration.

The protection of the environment has to confront with the soil retention of heavy metals, pollution of groundwater and alternative land uses. The major kinds of land - use resources are: (1) Physical resources: climate, vegetation, water and hydrology, landform and soil; (2) Human Resources and (3) Capital Resources. The study of all these land - use resources will help to understand the extent of the problem of As contamination that would aid in developing alternative cropping patterns, consuming less As contaminated (irrigation) groundwater, but at the same time, affording the farmers with good economic returns. This is expected to lead to protection of the environment, particularly soil, from accumulation of the given toxin, which may enter the human food chain through the agricultural produce.
In the background of what is stated above, the present study was undertaken to address the following specific objectives:

i) To study the distribution pattern of arsenic in water and soils in selected area under observation, subjected to irrigation with arsenic contaminated groundwater.

ii) To study the effect of arsenic contaminated irrigation water on soil system, highlighting soil-arsenic interactions.

iii) To study the soil-site suitability for suggesting alternative cropping systems based on examination of the appropriate soil-plant system.