

*Chapter - IV*

**SCOPES AND OBJECTIVES OF THE  
STUDY**

#### 4. SCOPES AND OBJECTIVES OF THE STUDY

Human civilization is going under a serious crisis. This is originating from workload and social/professional pressure for a better lifestyle and more comfortable life leading (Ghosal, 2014). Which results in an undesired oxidative change in the body with the generation of free radicals in excess? The ultimate manifestation of this oxidative stress results in different metabolic disorders such as atherosclerosis, cataracts, cancer and osteoarthritis (Scott, 1995; Behl, 1999; Khan *et al.*, 2004; Ghosal, 2014). The free radicals are the main cause of oxidation of lipids, DNA and proteins. The early ageing is also a manifestation of the oxidative stress. There are many reports which state that intake of antioxidants might prevent the primary ageing processes, as well as many of the age-associated secondary pathological complications (Aruoma, 1993). It has been recorded that the consumption of sufficient amount of fruits and vegetables can reduce the risk of degenerative diseases like cancer as well as atherosclerosis and the dietary flavonoids can restore a range of oxidative radical damage sustained by DNA (Eastwood, 1999; Anderson *et al.*, 2000; Ghosal, 2014). It is also well understood by different experts that the antioxidants of Tea is one of the best alternative for reducing oxidative stress-related disorders. The antioxidant substances are mainly different phenolics which are present in leaves and during processing of tea the contents concentrations get enriched. The phenolics are produced in different biosynthetic path ways in the tea plant. We focused our attention on the study of the influence of certain factors from tea cultivation to the processing stages as well as the variation of regional climatic conditions.

A priori work suggests cultivation factors like soil type, compost, mulching and fertilization can affect the plant secondary metabolites and antioxidant activity (Prange, 1995; Strik, 2008; Ghosal, 2014). Several other factors including genotype, growing region, climate and cultural practices also affect the external and internal quality of the product (Mirdehgham and Rahemi 2007, Caleb *et al.*, 2012; Ghosal, 2014). Ozgen *et al.* (2008) reported that the variation of factors such as total soluble solids (TSS), pH etc. has also effect on the phenolic content in tea. It has been also noticed that a number of geographical and environmental factors influence the concentration of bioactive phytochemicals in the same plants collected from a different region (Houghton and

Raman, 1998; Marcus and Grollman, 2002). Potassium is a macronutrient which is most important nutrients in controlling yield and quality of plants (Cassman *et al.*, 1990; Cakmak, 2010; Ghosal, 2014).

We set our objective to examine the changes in contents of antioxidants and secondary (total flavonoids and total phenolics) metabolites with different soil profile search some relationship among the parameters within our Study areas.

In short following scheme has been constituted for determining the antioxidant activities of Tea in different agro-climatic regions:

- 1) Study of the variation of antioxidant properties of tea in
  - (i) different soil conditions
  - (ii) different climatic conditions
  - (iii) different geographical distributions
  - (iv) different plant varieties
  - (v) different processed grades
  - (vi) different physical conditions of processing.
- 2) Comparison of antioxidant properties in organically grown tea and non-organically grown tea.
- 3) Soil degradation pattern with the span of plantation ages and antioxidant properties of plants at different ages.
- 4) Study of phenolic contents in different tea.

The scope of this work is to understand the key factors to control the phenolic content of tea vis-a-vis search the control for augmenting health effect of tea.