INTRODUCTION
Environmental pollution is a problem with both developing and developed countries and its potential to influence the health of human populations is great. Over the last three decades there has been increasing global concern over the public health impacts attributed to the environmental pollution particularly in a country like India which has to go for rapid industrialization in order to sustain overgrowing population. The growth of human population, unplanned urbanization, industrial and agricultural practices is the major causes of pollution (Eguabor, 1998). Industries, clustered in urban and semi-urban areas surrounded by densely populated, low-income localities, continue to pollute the environment indiscriminately. Excessive levels of pollution cause a lot of damage to human and animal health, plants and trees including tropical rainforests, as well as the wider environment.

Water pollution is generally induced by mankind becoming worse as a result of overcrowding in urban areas. Agricultural, domestic and industrial wastes are the major pollutants of habitats. Industrial effluent is the biggest pollutant of fresh water when discharged into them. The immediate consequence is a substantial and immediate drop in the amount of dissolved oxygen in the water. This happens because organic matter stimulates decomposers especially bacteria which break down
suspended solids. The decomposers use up dissolved oxygen and reduce the biological oxygen demand. The flora and fauna of the rivers experience change and reduction in number due to death by suffocation.

Of the various sources of pollutants industrial effluents containing heavy metals pose a threat to the ecosystem. In normal situation microbes degrade the organic pollutants and convert to usable form for aquatic life whereas inorganic pollutants particularly heavy metals bring in much hazards and are not degraded by microbes. Some of the heavy metal pollutants like lead (Pb), arsenic (As), mercury (Hg), chromium (Cr), nickel (Ni), barium (Ba), cadmium (Cd), cobalt (Co), selenium (Se), vanadium (V), oil, grease, pesticides etc are very harmful, toxic and poisonous even in ppb (parts per billion) range. There are some minerals which are useful for human and animal health in small doses beyond which these are toxic. Zinc (Zn), copper (Cu), iron (Fe), etc fall into this category. For agriculture, some elements like zinc, copper, manganese (Mn), sulphur (S), iron, boron (B), together with phosphates, nitrates, urea, potassium, etc are useful in prescribed quantities. There are some compounds like cyanides, thiocyanides, phenolic compounds, fluorides, radioactive substances etc which are harmful for human beings as well as animals. Environment pollution particularly from hazardous heavy metals and minerals are important societal problem. Many of these elements are stable bio-accumulative and deriving their safe limits is very difficult. Also toxicity of metals depends largely on its chemical form and oxidation state. Hence toxicity studies without taking the speciation may not reveal its actual hazard. Some elements like iron (Fe), zinc (Zn), copper (Cu), manganese (Mn) and nickel (Ni) are needed in small quantities for human metabolism, but may be toxic at higher levels. Others like lead, mercury, cadmium, and arsenic etc. have no beneficial role and are positively toxic. Industries such as tannery, steel, electroplating and textile dyeing are the huge sources of water pollution. Among industries, textile dyeing industry plays a key role in water pollution. Around 10,000 different textile dyes with an estimated annual production of 7.105 metric tonnes are commercially available worldwide; 30% of these dyes are used in excess of 1,000 tonnes per annum, and 90% of the textile products are used at the level of 100 tonnes per annum or less. (Baban et al., 2010, Robinson et al., 2001 and Soloman et al., 2009). 10-25% of textile dyes are lost during the dyeing process, and 2-20% is directly discharged as aqueous effluents in different environmental components.
Textile dyeing industry is one of the oldest and largest industries in India. Majority are located in the states of Tamil Nadu, Punjab and Gujarat. In Tamil Nadu, Coimbatore, Tiruppur, Karur and Chinnalapatti are the major centres for textile dyeing industries. Textile processing units in Tamil Nadu use a number of unclassified chemicals that are likely to be from the Red List Group which is said to be harmful and unhealthy (Ravikumar and Dutta, 1996).

Dyeing industry effluent is characterised by dark color, high EC, TDS, TSS, Total Hardness, BOD COD, low in suspended solids and nutrients such as nitrogen and phosphorus. Color varies in intensity and hue with blue and red dominant colors. Besides these, untreated dyeing effluent contains chemicals such as acetic acid, caustic soda, sodium hydrosulphate, mordants, reducing agents, soap and heavy metals such as copper, lead, nickel and cadmium. These heavy metals have a marked effect on aquatic flora and fauna through bio-magnification enter the food chain and ultimately affect human beings as well. Incidence of heavy metal accumulation in fish, oysters, sediments and other components of aquatic ecosystems has been reported globally (Singare et al., 2010). These toxic heavy metals entering in aquatic environment are adsorbed as particulate matter, although it can form free metal ions and soluble complexes that are available for uptake by biological organisms. The chemicals of dyeing effluent could be toxic, carcinogenic, or mutagenic to living organisms (Suzuki et al., 2001). Dyeing effluents cause coloration of surface and ground water when released untreated thereby making it unfit for irrigation, drinking and cause severe problems to aquatic life (Hai et al., 2007).

In Chinnalapatti, Tamil Nadu alone 98 dyeing industries are running. Dyeing industry uses more than 8000 chemicals in various processes of textile manufacture including dyeing and printing. Many of these chemicals are poisonous and damaging human health directly or indirectly. Large quantities of water are required for textile processing, dyeing and printing. The daily water consumption for dyeing varies from 30-50 litres per Kg of cloth depending upon the type of dye used. Dyeing section contributes to 15-20% of the total waste water flow. The World Bank estimates that 17-20 percent of industrial water pollution comes from textile dyeing industries. Out of the 72 toxic chemicals identified in dyeing industry effluent, 30 chemicals cannot be removed (Kant Rita, 2012).
The use of wastewaters from industries for irrigation has emerged as an important way of utilization of waste water because of the presence of considerable quantities of nitrogen and phosphorus along with some other micronutrients. The pollutants are partly taken up by the plants and partly transformed in the soil without causing any damage.

Utilization of industrial effluents for irrigating agricultural land has become a common practice in India. Because nutrient supply is the major constraint in the development of Indian agriculture and the cost of organic fertilizers is also increasing due to excess mining of the nutrients as well. It is well known fact that in the present context there is a limited availability of organic manure in agriculture due to population explosion, intensive agriculture, reduction in livestock population etc. Therefore, the judicious application of nutrients is essential to keep the soil fertile and to make the agriculture sustainable. This calls for the use of alternate sources of nutrients in agriculture. Irrigating industrial effluent provides farmers with a nutrient enriched water supply and society with a reliable and inexpensive system for wastewater treatment and disposal (Feigin et al., 1991). Effluent could be reused if concentration of all trace elements was found to be low and within the guidelines for irrigation of agricultural crops (Shatanawi and Fayyad, 1996). Continuous use of wastewater leads to the enrichment of soil with essential macro and micro-nutrients (Dass and Kaul, 1992 and Kanan et al., 2005). The wastewater may act as a resource that can be applied for productive uses. It contains nutrients that have potential value for its use in agriculture, aquaculture and other activities. (Hussain et al., 2001). As the micronutrient contents of the industrial effluent are higher than those of natural water, the effluent can supply greater input of minerals for the better growth of crop plants. In addition, the use of industrial effluent for agricultural irrigation purpose can reduce the water pollution and dependency on agricultural use of groundwater (Jolly et al., 2012). In addition to this nutritional factor for utilizing industrial effluent for irrigation purpose, it mitigates the wastewater disposal problem in urban and semi-urban areas as well. Hence applying these industrial effluents to agricultural field instead of disposing off in lakes and rivers can make better growth of crops due to presence of various nutrients like nitrogen, phosphorus, potassium, calcium, and magnesium, if used in permissible limits. Most crops give higher yield with waste water irrigation and reduce the need of chemical fertilizers, resulting in net cost savings to farmers. (Kannan and Upreti, 2008 and Vinod Kumar et al., 2010). Utilizing
industrial effluent for irrigation purpose plays an outstanding role to maintain the crop yield and also minimizes the water pollution.

The industrial effluent as an alternative means of irrigation can offer a number of advantages. It contains various trace elements which can satisfy the need of micronutrients of crop plants. The environment can be saved from its hazardous effects and utilizing the effluent can reduce the dependency on groundwater to a great extent. The use of the effluent after treatment not only solves the disposal problem but also serves as an additional source of fertilizer in liquid form.

Experiments have repeatedly demonstrated an increased productivity of crops or trees when irrigated with waste water as compared with clean water. These nutrients represent a resource of considerable value when compared with the equivalent cost of fertilizer. The application of waste water at rates which ensure a balance between nutrient input and plant uptake will promote optimal plant growth while limiting the risks of pollution. (CSIRO,1995). Another advantage of effluent irrigation is that because of rapid industrialization significant amounts of heavy metals as lead, nickel and cadmium remain in soil due to long biological life and thus influence plant growth (Zheng 2004 and Pethkar et al 2001).

Methodology of using dyeing industrial effluent residue for growing vegetable crop plants is not yet standardized. Although few works are available on the physico-chemical characteristics of dyeing industrial effluent and its impact on growth, biochemical characteristics and yield performance of agricultural crops, specific studies on the impact of dyeing industry effluent residue on growth, biochemical and yield performance of vegetable crops is totally wanting. It is in this context the present study has been undertaken.

The objectives of the present study are

1. To assess the physico-chemical parameters of dyeing industry effluent.
2. To evaluate the impact of different quantities of dyeing industry effluent residue on growth, biochemical characteristics and yield performance of Lady’s finger *Abelmoscus esculantus* (L.) Moench., Cluster bean *Cyamopsis tetragonoloba* (L.) Taub. and Brinjal *Solanum melongena* L.,
3. Comparative study on pot culture and field trial.