Sewage and industrial wastewaters sometimes contain considerable amounts of salts which may serve as nutrients for plants. These waters can be utilized for irrigation purposes. On the other hand, soils also have great capacity for receiving and decomposing wastes and pollutants and the use of industrial effluents for irrigation as an alternative to other disposal methods could be attractive. The research work to lessen the deleterious effects of industrial effluents on life and surroundings to evaluate suitable treatments prior to its disposal is generally recommended. This will enable to recycle and reuse the valuable constituents of wastewater for productive purpose in agriculture.

The present study has revealed that the industrial effluents of the industries were highly acidic except Milk & Sugar factory. In the nine industries pH was not in accordance with the permissible limit. Conductivity is good and rapid measure of the total dissolve solids. High conductivity values were recorded throughout the investigation in industries effluent water. High levels of conductivity reflects on the pollution status. BOD was also found more than the permissible limits in all the industries. The chemical oxygen demand (COD), a measure of the oxygen equivalent to the organic matter content of water, that is
susceptible to oxidation by a strong chemical oxidant (APHA, 1985). It is reliable parameter for judging the extent of pollution in water. The present study revealed higher COD throughout the industries which is more than the permissible limit. Dissolved oxygen is essential to the metabolism of all aerobic aquatic organisms. Oxygen distribution is important for the direct needs of many organisms and affects the solubility and availability of many nutrients and therefore, the productivity of aquatic ecosystems. In the present investigation D.O. was found to be low in most of the industries except Milk Plant, Om Surgical and L.P.S. Industry. In the present investigation total alkalinity was found more than the permissible limit (180mg/l) in three industries only (Milk Plant, Sugar Plant and Om Surgical). Calcium, Magnesium & total suspended solids were found within the permissible limits except 1 or 2 cases. Sulphate were higher only in Hanumant Wire and Manish Steel Industries. Chloride values were higher in L.P.S., J.C. Fastners, R.B. Steel, Hanumant Wire & Manish Steel. The level of Iron was found higher in all the industries except Milk, Sugar & Om Surgical industries. The level of other metals Zinc, Copper Chromium, Cadmium, Lead & Phosphate were either not present in detectable amount or within the permissible limits except higher chromium level in L.P.S. & J.C. Fastners & Copper in Manu & Manish Steel Industries. There are number of reports available in connection with the toxic nature of

In the present study, the Milk Plant effluents contain high BOD and COD values suggest the presence of high amounts of putrescible organic matter in the effluent. The similar observation was observed from the study of other dairy plants effluent (Gautam et al; 1992). It is clear from the data that there was a variation in percentage of seed germination in different concentration. The percentage of germination was increased in 25% effluent treated seeds of Wheat, Jawar, Raddish but inhibitory effect has been observed in case of Bhindi. The promotary effect in 25% effluent may be due to presence of favourable levels of plant nutrients in it. The maximum germination percentage inhibition was observed in Bhindi at all the effluent concentration. The similar observations i.e. increased in root length, shoot length, fresh weight, dry weight and biomass have been depicted for all the crops. It might be due to the presence of mineral nutrients alongwith Calcium & Magnesium to favourable concentration in the effluent. The diluted form of the effluent showed more favourable results. It might be due to decreased concentration of total dissolved solids. Corresponding observation were also recorded by Gautam & Bishnoi (1992) when treated with dairy effluents.

Considering the effects of the effluent on soil at different concentration brought about spectacular changes in its chemical
composition. All the parameters except water holding capacity showed an upward trend from 25% to 100% effluent applied to the soil. The mineralisation of the organic matter, as well as the nutrients available in the effluent, might be responsible for these observation. More interesting data were obtained when the plants grown in the effluent added soil were analysed. Calcium and Magnesium uptake was more than control upto 50% effluent concentration in all the crops while potassium level was less than the control from 25% to 100% effluent treated plants. Level of Sodium, Iron, Phosphate, Zinc and Copper were higher almost in all the four crops in respect to control at all the concentration. The yield was reported to be higher at 25% effluent concentration. From these results it may be inferred that plants consumed water soluble salts and available nutrients. The similar observation were also reported on the Wheat, Barley, Kidney bean and Pearl millet by Ajmal et al; (1984) & Gautam et al; (1992).

A critical study of the above suggest that the fresh dairy effluent which is otherwise discharged as waste may be utilized as an additional potential source of liquid fertilizer in diluted form without recycling. The concentration should be reduced to beneficial level of nutrients by diluting with ordinary water. On the basis of present study, it can be concluded that dairy effluent which is discharges as waste can be used for irrigation after dilution. This will not only prevent the environment
pollution problem but also serve as an additional potential source of liquid fertilizer without any treatment.

It was noted from the study that the germination of Wheat, Raddish, Jawar & Ladyfinger was severely affected by the sugar factory effluent at higher concentration with the maximum effect seen with the undiluted waste. Where a maximum of germination was recorded in all the four crops at 25% effluent concentration. The earlier study made by different authors (Rathinasamy and Narshimhan 1998; Chandershekar et al 1989; Goel and Kulkarni 1994; Shinde et al 1988) have also revealed an adverse effect of sugar factory wastes on germination of different crops at the higher concentration above 25%. The mechanism involved in delayed germination might be associated with the reduced activity of several enzymes with growth parameters like root length, shoot length and total biomass increased up to 25% effluent concentration. And showed a better growth when compared with the control in all the four crops. These findings are concides with the earlier reports of (Goel & Kulkarni 1994) on gram seed. These findings are contrary to the findings observed by (Chandershekar et al 1989) where he observed better growth at 5% and 10% effluent concentration in Vigna mungo.

Several works have indicated the importance of certain enzyme at the time of germination. The activity of these enzyme can be influenced greatly by the pollutants present in the waste water. (Murumhar &
Chavan 1985) have analysed the activity of important enzymes in the germination stages of gram treated with waste water and found that rise in peroxidase activity is mainly contribute to growth suppression. The acid phosphate is also an important enzyme playing key role during germination. The enzyme helps in mobilizing the nutrients deserve and in most probably its suppression is a major factor in the reduction of germination and the length of the radicle which is dependent entirely on the reserve food. The favourable effect of the waste on the radicle or plumule length at lower concentration is mainly due to abundant nutrient supply from the ambient medium. The toxic effect of the waste is diluted at the lower concentration reflected its increase in percent germination, plumule length etc. Whereas the undiluted waste though have abundant nutrient is quite toxic for the seedling growth.

The effluent treatment caused considerable difference in the uptake of various nutrients by the seedlings in all the crops. The uptake of Calcium, Magnesium and Potassium was highest at 25% effluent concentration in all the crops. In Wheat the Calcium uptake was also higher at 50% effluent concentration in comparison to control. While in other crops at 50% effluent concentration the uptake of nutrients was equal to the control value. Magnesium and Potassium concentration was more than control value upto 75% concentration in most of the crops. Sodium uptake was found to be less than the control value at all the concentrations for all the crops. The uptake of Iron, Phosphate,
Zinc, Copper were found in increasing order and was highest at 100% effluent concentration. The reported increased value except Sodium may be due to the presence of soluble salts and organic matter which was found to be high in Sugar Mill effluent and the decrease in Sodium in Sugar Mill effluent and the decrease in Sodium uptake by the plant is may be due to the lower pH of the effluent. Our results are contrary to the result obtained by Kaushik et al (1996). Where the reported higher uptake of Sodium in the Sugar Mill effluent but similar to other parameter when the uptake of Calcium, Magnesium etc. increased in the Sugar Mill effluent. It has reveals that the plants have observed more Potassium and Magnesium failed to take up the required amount of the sodium and hence are deficienced Sodium content despite soil having adequate Sodium.

The soil used for experimentation showed a high concentration of Organic Carbon, Calcium, Magnesium, Potassium, Sodium, Phosphate, Iron, Zinc and Copper. The concentration of these macronutrients and micronutrients is found in increasing order of the effluent concentration and was highest at 100% effluent concentration. The pH and water holding capacity goes on decreasing as the effleunt concentration increases. The effluent used also had a higher concentration of Potassium than Sodium. Thus plants were exposed to high Potassium Stress. The reduced uptake of Sodium in comparison to Potassium seems to be due to comptitive inhibition of Sodium by high Potassium.
concentration in the medium. The Sugar factory effluent can be used for irrigating Wheat, Jawar, Raddish & Ladyfinger with proper dilution. The crop quality was not effected up to 25% effluent concentration and there was no adverse effect on the soil physical properties also. The similar observation has been made by Rathi Nahamy and Narashimham (1998) on the utility of Sugar Mill effluent on the vegetable Bhindi. From these studies the feasibility of using Sugar factory effluent for growing vegetable and crops with proper management is established.

The Om Surgical effluent sample was alkaline and contain considerable amount of Calcium, Magnesium and high COD and total suspended solids. The germination percentage of seeds of Wheat, Jawar, Raddish are similar with control at 25% effluent concentration but in case of Bhindi at 25% concentration it was less than the control. The germination percentage was found more than the control value at 25% effluent concentration in Wheat, Jawar and Raddish from 5th to 9th days of germination. But at higher concentration the germination percentage gradually decrease in all the crops. The root length, shoot length and biomass were increased up to 25% effluent concentration for all the crops. Root, shoot length and biomass decreased after 25% concentration may be due to higher concentration of toxic substance in the effluent. These effluent contain different organic and inorganic salts and toxic elements which enter the plant body and disturb the system (Chaudhary et al 1987). The high quantity of COD and suspended
solids seems to be responsible for germination inhibition and subsequent growth of seedling at higher concentration as they disturb the osmotic relation of seed and water, thus reducing the amount of absorbed water and retarding seed germination by enhancing salinity and conductivity of solutes being absorbed by the seeds prior to germination. The macronutrients uptake such as Calcium, Magnesium, Potassium, either increased up to 25% effluent concentration in comparison to control. Although the increased value showed marginal difference. At higher concentrations these values were in decreasing order for all the four crops. The uptake of Sodium was higher at 25% effluent concentration in comparison to control in Wheat and Jawar but in Raddish and Ladyfinger crops, at 25% concentration the value was slightly less than the control value. The uptake of phosphate was found in the decreasing order in all the four crops with the increasing of effluent concentration. The micronutrient Iron, Zinc and Copper uptake showed marginally increased value in the increasing order of the effluent concentration. The soil supports these plants revealed increasing the values of pH, organic carbon, E.C., Calcium, Magnesium and Phosphate with the increased effluent concentration. The micronutrient in the soil (Iron, Zinc, Copper) were slightly increased with increase in the effluent concentration. Presence of Potassium in the soil was found decreased in 25% effluent concentration in all the four crops while at higher concentration the values were either equal to control or
slightly increased. The water holding capacity of the soil was found to be decreased with the increase in effluent concentration. The slightly depletion of Potassium in the investigation at 25% effluent concentration may be due to higher percent of Sodium in the soil. The cation-anion exchange is found to be associated with the Sodium of the soil at alkaline pH. Water holding capacity is decreased in the effluent effected soil this may be due to the decrease in the porosity on account deflocculation of clay particles in the presence of high Sodium content (Tripathi et al 1990).

The L.P.S. and J.C. Fastner effluents sample were found to be acidic with high BOD, COD chlorides, iron and chromium values. The effluent LPS were also contain high amount of Zinc. The germination of all the four crops decrease with increase in the effluent concentration of these industries. The Lady finger was found to be more affected in J.C. Fastner effluent. Inhibition of germination and seedling growth in pure and higher concentration of effluent are due to excess quantity of micronutrients, heavy metals and toxic chemicals (Dolar et. al., 1972). The data on relative lengths of root, shoot and dry weight of seedlings showed an overall decrease after effluent treatment in both the industries. The inhibitory effect was more pronounced on the root growth compared with shoot. The similar observations were made by Khan and Jain (1995). The reduction in seedling growth and dry weight at higher concentrations of effluent treatment may be due to the
presence of excess amount of elements present in the effluent. The germinating seeds under high concentrations of the effluent treatment would get low amount of oxygen which restricts the energy supply and retarded the growth and development of seedlings. The net result would be restriction of growth of radicle and plumule. The higher concentrations of chromium ions in the effluent thus seems to inhibit the vegetative and reproductive growth in the crop treated with L.P.S. effluent. The toxic effect of metal at higher concentration might be due to the entering of metal into the protoplasm resulting in the loss of intermediatory metabolities which are essential for further growth and development (Subramani et al. 1997). The nutrient uptake was found effected equal by the L.P.S. and J.C. Fastners effluent treated crops. The calcium and magnesium uptake was found to be higher in 50 percent effluent concentration but lesser than that of control values. The potassium content increased upto 50% in all the crops treated with L.P.S. effluent. The micronutrients uptake by studied crops plant were revealed higher concentration treated with LPS effluent concentration in comparision to J.C. Fastner. The uptake of potassium was found to be less than the control value in both the industries effluent while the uptake of sodium has been increasing with concentration of industrial effluent. The reduction in the mineral contents may be due to the reduction in the pH. As the pH decreases, there is gradual reduction in the availability of phosphorus to the plants, phosphorus level affects
NO$_3^-$ absorption and vice-versa (Kumar & Babu, 1984). Arnon et al (1942) observed that roots were injured at pH 3.0 and there was no absorption of calcium & phosphors ions. He observed that Ca$^{++}$ uptake dimished at pH 4-5. It has revealed that the plants have observed more Na$^+$, failed to take up required amount of K$^+$. In this way our study were found to the study made by Hedge & Patil (1983).

The soil treated with the effluents of LPS & J.C. Fastner have been analysed after harvesting the crops. Most of the Macro and micronutrients showed higher concentration. However deposition of micronutrients such as Fe, Zn & copper takes place in lesser amount than macronutrients. pH in the soil decreased with increased of effluent concentration on the other hand E.C. in the soil treated with LPS effluent increasing significantly in comparison to control but in J.C. Fastner E.C. remains almost same or slightly higher than the control. Further, higher concentration of sodium is reported to upset the concentrations of other minerals in the soil and cause inhibition in growth. High concentration of salts in general and sodium in particular create quite unfavourable soil conditions unfavourable which cause inhibition in the growth of the plants. Adverse effect of sodium on growth and mineral composition of the various plants has been amply documented in a number of plants (Somashekar & Siddaramaiah, 1997) A similar response was observed in the present case with the LPS & J.C. Fastner effluents. Water holding capacity has found to be
decreased with the increased concentration of effluents in both the industries effluents due to accumulation of macro & micronutrients in excess in the soil pores. The presence of higher amount of Zinc and chromium also indicating an adverse effect on physiological and biochemical processes with obvious exteranl injury. Wain Wright & Woolhouse (1975) observed chloroses among plants exposed to zinc.

The effluent of six small scale steel industries (RR Steel, Amba steel, R.B. Steel, Manu Steel, Hanumant wire & Manish Steel) situated in Rohtak revealed high acidity, low pH, high E.C., high chlorides and iron and dissolved oxygen & BOD was either nil or low value with COD value more than permissible limit. Germination percentage of seeds decreased from 100% under control to 40% under pure effluents. The more inhibition in germination percentage was exhibited by *Ablemoschus esculantus* in comparision to other crops. The root length, shoot length, fresh weight, dry weight & biomass was also found drastically lower in all the treated effluents in comparision to control. Wheat revealed compartively better results in different effluent concentration in comparision to other crop plants. The inhibition of germination & seedling growth was maximum at 100% concentration of the effluent in comparision to control. Comparatively the inhibitory effect was more pronounced in root growth rather than shoot growth. Further the inhibtion of seedling was more in *Ablemoschus esculanths*. The gradual decrease in germination energy index might be due to high
osmotic pressure caused due to high salt concentration of effluent as observed by Gupta & Agarwal (1992). The mechanism involved in reduced germination, delayed germination and reduction in seedling growth as observed in the present study might be associated with the activity of several enzymes (Agarwal & Gupta, 1992).

The absorption of macronutrients (Ca, Mg, k, Na & PO$_4$) uptake in all the crop plants, is reduced under conditions of oxygen deficiency and other soluble salts. Reduction in growth may then be due to deficiency of potassium, for, under condition of potassium deficiency. The photosynthetic activity decline rapidly. The reduction in productivity at different effluent concentrations may then be attributed to the reduced biomass accumulation. In different steel industries it is point to note that the uptake of iron concentration increased while Zn & Cu concentration remains almost equal to the control except Amba Steel & RR Metal. In these industries Zn uptake was higher than the control. Copper uptake was exhibited higher in different plants in the effluents of Manish Steel & Manu Steel industries.

The effluent treated soils showed an increase in the Cu, Mg, K, Na, Fe & PO$_4$ concentration. But water holding capacity & pH was in the decreasing order according the increased in effluents concentration of these steel industries. The growth & yield of the crops plants in such soil was poor. This indicates that the available concentration of nutrients rather than the total nutrients status of the soil determines the
growth. The non-availability of nutrients is attributed to the hinderance of mineralisation processes and the formation of complex ions (Somashekhar et al; 1984). The inhibition of mineralisation may be due to the presence of Fe in all the effluents and Zn & copper in some effluents.

The effluent treatment altered the pH of soils. This property of effluents could be utilized to reclaim alkaline soils. It is concluded that the effluents of steel industries used in present study have an adverse effects on the soil property and growth of crop plants. To over come this difficulty it is suggested that effluents should be subjected to primary chemical treatment which brings down the concentration of toxic substances & hence treated effluents could be used after suitable dilution, depending on the concentration of mineral nutrients and other toxic substances.