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Impact of different land uses on plant and water composition

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Abstract
Rapid industrialization affects the environment in different ways by discharging the large amount of effluent as waste water in the surrounding water bodies, causing the serious problems to environment. Water is the most precious and essential compound to sustain the life on the earth. Pure drinking water resources are dwindling due to over deforestation, mining and industrialization. Approximately 71% of the earth surface is covered with water, mainly in the form of oceans. Around 2% of the water is present in glacier and ice caps. The actual fresh water is available for human consumption is near about 1% of the total earth water. Ground and surface water are used by man are of different characteristics. Ground water contains dissolved minerals from the soil layers through which it passes.

Keywords: Electric conductivity, carbonate, calcium, sulphate

Introduction
Today the awareness of environment has reached the nook corners of the world and pollution has become a major threat to the very existence of mankind of this earth. It is now becoming an intellectually challenging problem of mankind. The pollution of various resources were gone to such an extent that human beings are unable to breath fresh air and can't take clean water. In general, major environmental pollution problems arise from houses and industrial activities particularly from distillery, paper mills, tannery, sugar factory, dairy, fertilizer unit, refineries, petrochemical industries etc. Ground water is used for domestic water supply and for irrigation and other purpose. Rapid withdrawal of ground water has seriously imparted the environment in many places. Soil contamination in agricultural land uses is associated with the use of fertilizers, pesticides, and herbicides by farmers to increase crop yields. In addition, the portion of solid waste (includes garbage, domestic refuse and discarded solid materials such as those from commercial, industrial and agricultural operations) that is hazardous such as oils, battery metals, heavy metals from smelting industries and organic solvents are the ones we have to pay particular attention to. These can in the long run, get deposited to the soils of the surrounding area and pollute them by altering their chemical and biological properties; these pollutants can move with irrigation or rain water to groundwater or can also be taken by the plants. They also contaminate drinking water aquifer sources. Although some trace elements are essential for plant nutrition, plants growing in the close vicinity of industrial areas display increased concentration of heavy metals, serving in many cases as biomonitors of pollution loads (Mingorance *et al.* 2007; Yang *et al.* 2005; Dankoub *et al.* 2012) [8, 3]. Since surface layers of soil, where pollutants can accumulate and reach relatively high concentrations, are the main rooting zone for vegetation and also the area with the greatest exposure to animal and human life.

Impact of different land uses on groundwater properties
Impact of land uses on pH
Kumar *et al.* (2017) [6] reported that pH was found to be in the range of 7.21 to 7.45 and 7.15 to 7.25 in surface and ground water, respectively which is low as compared to standard limit. Low pH of surface water of various rivers and other water sources may be due to dilution effect of rain water during rainy season, as reported by various workers. Rajappa *et al.* (2011) [9] the results indicate that the quality of water considerably varies from location to location. Though pH has no direct effect on the human health, all the biochemical reactions are sensitive to variation of pH.

Impact of land uses on EC

Kumar *et al.* (2017) [6] reported that EC was found in the range of 362.05 to 502.96 and 346.26 to 359.23 in surface and ground water, respectively which is high as compared to standard limit. It may be occurred due to pollution load by anthropogenic activity. Rajappa *et al.* (2011) [9] reported that in the present study the EC values were found higher at Ganganarasi village (3700 mmhos cm^{-1}) and very low conductivity was found at Dhoolhole (741mmhos cm^{-1}). EC values can be used to estimate the dissolved solids concentration which may affect the taste of water and suitability for various uses. Sharma (1998) [10] reported that electrical conductivity data indicated that 4.7, 6.8, and 4.4% of waters in the command area were having EC values less than 2.0, between 2 to 4 and more than 4.0 dS m^{-1}, respectively with SAR problems.

Impact of land uses on carbonate and bicarbonate

Kumar *et al.* (2017) [6] reported that Bicarbonate was found in between 154.45 to 172.62 mgl^{-1} and 147.44 to 159.61 mg l^{-1} in surface and ground water, respectively which is low as compared to standard limit. The primary source of carbonate and bicarbonate ions in surface water and ground water is dissolved carbon dioxide derived from the rain water

Impact of land uses on calcium and magnesium

Kumar *et al.* (2017) [6] reported that Ca was found to be in the range of 30.64 to 36.96 and 20.93 to 30.61 mg l^{-1} in surface and ground water, respectively which is low as compared to standard limit. Calcium (Ca) is fifth most abundant element in the earth crust and is very important for human cell physiology and bones. Mg was found in the range of 18.16 to 26.87 and 17.25 to 21.18 mg l^{-1} in surface and ground water, respectively which is low as compared to standard limit. The result obtained reveals that there is increase in contamination in the surface and ground water that could be accounted by urbanization, industrialization, anthropogenic activity and various other factors. Rajappa *et al.* (2011) [9] reported that in the total hardness exhibited the significant positive relation with the calcium and magnesium and calcium has showed the positive relation with the concentration of the magnesium. The strong correlation-ship between these parameters could be due to changes in land use namely deforestation etc. The water samples Ganganarasi village (710 mg l^{-1}) possess high calcium value and Chikkabidare village showed least calcium value (70 mg l^{-1})

Impact of land uses on sulphate

Yadav *et al.* (2015) [12] reported that in the month of March. The maximum value of sulphate was observed 68.4 mg l^{-1} in the month of Jun and the minimum value 30.6 mg l^{-1} were recorded in the month of Dec. higher value of sulphate responsible for corrosion.

Impact of land uses on chloride

Rajappa *et al.* (2011) [9] reported that the Chloride ion concentrations are very high in water sample of Hosahalli village (712 mg l^{-1}) and very low in water sample of Holesirigere. Yadav *et al.* (2015) [12] reported that the values of chlorides in different months were found to be various ranges from 242 mg l^{-1} to 642 mg l^{-1}. The chloride contents indicate industrial pollution. The maximum value of chloride was recorded in the month of June and minimum value in March.

Impact of land uses on heavy metal

Islama *et al.* (2015) reported the decreasing trend of metals in water as Cr > Cu >As >Ni > Pb > Cd. The level of studied metals exceeded the safe limits of drinking water, indicated that water from this river is not safe for drinking and/or cooking purposes. The investigated metals showed low mobility except for Cd and Pb which could pose a severe threat to the aquatic environment. Ladwani *et al.* (2012) [7] reported that heavy metal concentration was varied as Ni 0.136 to 0.303 mg l^{-1}, Cd 0.045 to 0.051 mg l^{-1}, Pb ND to 0.082 mg l^{-1}, Fe 2.70 to 21.9 mg l^{-1}, Mn 0.053 to 2.24 mg l^{-1}. The Fe values were found to be highest in the sample near second discharge point. Memet Varol and Bulent Şen (2011) [11] reported that all metal concentrations in water samples, except Cu, were lower than the maximum permitted concentration for the protection of aquatic life. Surface water samples from the upper Tigris River were determined to evaluate the level of contamination.

Impact of different land uses on plant composition

Impact of land uses on nitrogen

Islam *et al.* (2006) [4] observed that the content of N was found to decrease in the rice plants on the contaminated soils and the reduction were 28%.The contents of N in rice plants under contaminated soils decreased but S and Na contents increased during second harvesting and there was no remarkable change in the concentrations of the nutrients at third harvesting, except S and Na. The concentrations of the N in tissues of grass grown in both the soils were within the normal range. The contents of S and N were quite high in the plant tissues grown on contaminated soil.

Impact of land uses on phosphorus

Islam *et al.* (2006) [4] observed that the content of P was found to decrease in the rice plants on the contaminated soils and the reduction were 32% for P. The concentrations of the P in tissues of grass grown in both the soils were within the normal range. The contents of nutrients in rice and grass plants under contaminated soils were not influenced much, except S and Na, which suggests that the normal life cycle of the plants might be hampered by S and Na in the contaminated soil.

Impact of land uses on potassium

Islam *et al.* (2006) [4] observed that the content of K was found to decrease in the rice plants on the contaminated soils and the reduction were 65% for K. The contents of K in rice plants under contaminated soils decreased but S and Na contents increased. The concentrations of the K were very low in the grass tissues grown on contaminated soil. The contents of S and N were quite high in the plant tissues grown on contaminated soil.

Impact of land uses on sulphur

Islam *et al.* (2006) [4] the contents of N, P and K in the rice plants grown on the contaminated soil were decreased by 28, 32 and 65%, respectively . While increased (increase over normal agricultural soil, i.e. control: IOC) S and Na contents in rice by 55 and 10% but decreased the S and Na contents in grass by 200 and 114%, respectively. Available S content was obtained 3 to 5 times higher in contaminated soil at different time of sampling

Impact of land uses on heavy metal

Jasim Uddin Ahmad and Md. Abdul Goni (2010) [1] found that the concentration of heavy metals (mg kg^{-1} dry weight) ranged between 9.66 and 20.67 for Cu, 16.54-67.06 for Zn, 9.88-26.34 for Pb, 2.28-11.84 for Cr, 1.03-4.65 for Cd, 108.57-450.70 for Fe, and 3.05-26.63 for Ni. Arora *et al.* (2008) [2] reported that there were substantial build-up of heavy metals in vegetables irrigated with wastewater. The range of various metals in wastewater-irrigated plants was 116-378, 12-69, 5.2-16.8 and 22-46 mg kg^{-1} for iron (Fe), manganese (Mn), copper (Cu) and zinc (Zn), respectively. The highest mean levels of Fe and Mn were detected in mint and spinach, whereas the levels of Cu and Zn were highest in carrot.

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