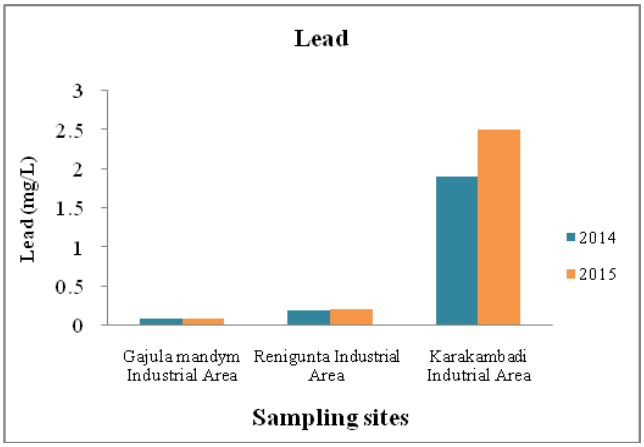

Figure 4: Average concentration of lead in three locations during 2014 and 2015

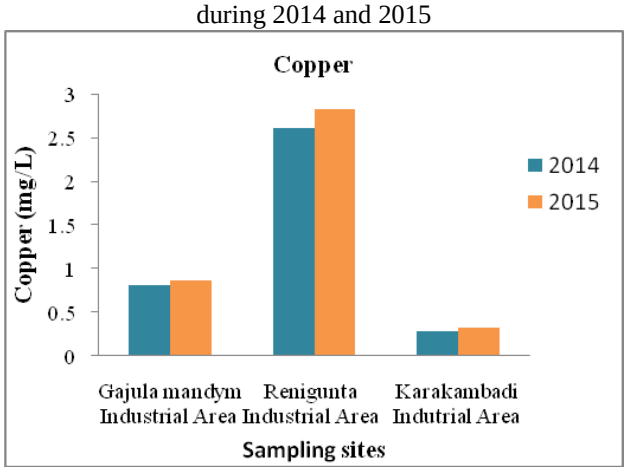

Figure 5: Average concentration of copper in three locations during 2014 and 2015

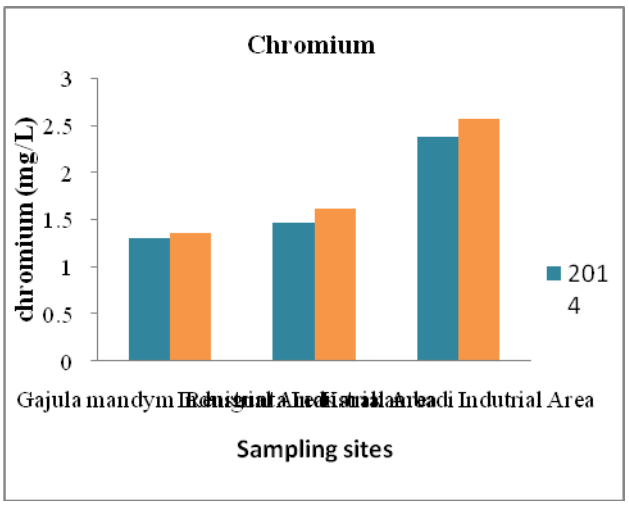

Figure 6: Average concentration of chromium in three locations during 2014 and 2015

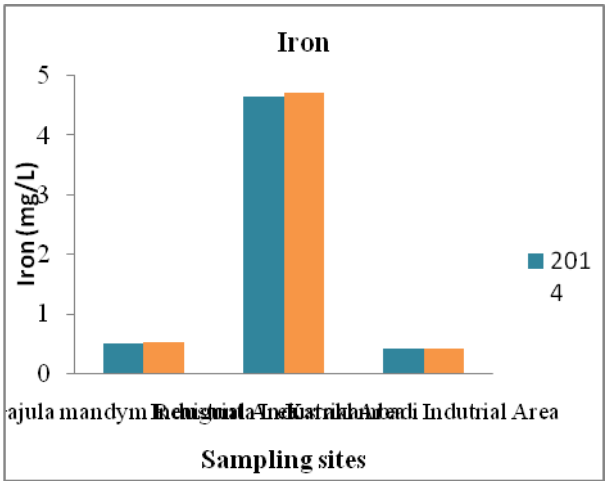

Figure 7: Iron levels from three locations of 2014 and 2015 in month by Month

4. Conclusion

The analysis of wastewater for heavy metal contamination is an important step in ensuring human and environmental health. Excess levels of heavy metals might cause several short term and long term health effects to the human beings. The present study is focused on determination of six heavy metals like Cadmium (Cd), Zinc (Zn) Lead (Pb), Copper (Cu), Chromium (Cr) and Iron (Fe) in Tirupati Industrial Region, Andhra Pradesh. In three study areas during the study period above all the heavy metals in above the permissible set by the Indian Standards. This study reveals that waste waters from industrial sites were highly polluted; there is urgent need to follow adequate effluent treatment methods before their discharge to surface water for reducing their potential environmental hazards. Strict environmental laws become imperative so as to control this stress.

References

[1] Aghor, Chemicals make Thane creek the worst polluted water body. Daily DNA. August 14, 2007. Mumbai, India
[2] D. Patil, 'A lot's fishy about our creek and lake fish'. Daily Times of India. March 22, 2009. Mumbai, India
[3] Kumar, A., 1996, Impact of industrial pollution on the popu-lation status of endangered Gangetic dolphin (Platanista gangetica) in the River Ganga in Bihar, India. *Pol. Arch. Hy-drobiol.*, 18(4), 469-476
[4] S. C. Barman, S.K. Sahu, S.K. Bhargava and C. Chatterjee, 2000. Bulletin of Environmental and Contamination Toxicology, vol. 64, pp. 489-496
[5] G.C. Kisku, S.C. Barman and S.K. Bhargava. 2000. Journal of Water, Air, and Soil Pollution, vol. 120, pp. 121-137.
[6] Ahluwalia, S. S. and Goyal, D. 2007. Microbial and plant derived biomass for removal of heavy metals from wastewater. Bioresource Technology, 98, 98-2243
[7] Nivruti T. Nirgude, Sanjay Shukla and A. Venkatachalam. 2013, physico- chemical analysis of some industrial effluents from vapi industrial area,

Gujarat, India, Vol. 6, No.1, ISSN: 0974-1496, Pp. 68-72.

[8] Priyanka Dhingra, Yashwant Singh, Manish Kumar, Hitesh Nagar, Karan Singh, Laxmi Narayan Meena. 2015. Study on Physico - Chemical Parameters of Waste Water Effluents from Industrial areas of Jaipur, Rajasthan, India. *International Journal of Innovative Science, Engineering & Technology*, Vol. 2 Issue 5, 2348 – 7968

[9] Siyanbola T O, Ajanaku K O, James O O, Olugbuyiro J A O, JAdekoya J O. 2011. Physico- Chemical Characteristics of Industrial Effluents in Lagos State,Nigeria. *G. J. P & A Sc and Tech*, 01: 49-54

[10] Morrison, G. Fatoki, O. Linder, S. Lundehn, C. 2004. Determination of heavy metal concentrations and metal fingerprints of sewage sludge from Eastern Cape Province South Africa by ICP-MS and LA-ICP-MS. Water Air Soil Poll., 152, 111–127

[11] Usha Damodhar and Vikram Reddy M, 2012. Assessment of trace metal pollution of water and sediment of river gadilam (cuddalore, south east coast of India) receiving sugar industry effluents .*Continental J. Environmental Sciences*.6 (3), 8-24

[12] Pawlowski, B. Krawczyk, J. Bala, P. 2013. The premature deterioration of Zinc-coated steel pipes in water distribution system. *Inter. J. Mater. Mech. Eng*, 2, 43–47.

[13] Children at the End of the Leaded Petrol Era.Abridged Report 2009. Available online:http://www.anglogold.com/subwebs/InformationForInvestors/Reports09/AnnualReport09/f/AGA_ABRIDGED09.pdf (accessed on 30 December 2013

[14] Romo-Kroger C.M, Morales J.R, Dinator M.I & Llona F, 1994. Heavy metals in the atmosphere coming from a copper smelter in Chile. *Atmos. Environ*., 28, 705-711

[15] Wu M.M, Chiou H.Y, Wang T.W, Hsueh Y.M, Wang I.H, Chen C.J & Lee T.C, 2001. Association of blood arsenic levels with increased reactive oxidants and decreased antioxidant capacity in human population of northeastern Taiwan. *Environ. Health Perspective*, 109, 1011-1017.

[16] Rafiquel Islam, Jannat Al Foisa, Hasanuzzaman, Musrat Rahman, Laisa Ahmed Lisa and Dipak Kumar Pau. 2016. Pollution assessment and heavy metal determination by AAS in waste water collected from Kushtia industrial zone in Bangladesh. *African Journal of Environmental Science and Technology*, Vol.10 (1), pp. 9-17

[17] O. Venkata Subba Raju, P.M.N. Prasad, V. Varalakshmi and Y.V.Rami Reddy.2014. Determination Of Heavy Metals In Ground Water By Icp-Oes In Selected Coastal Area Of Spsr Nellore District, Andhra Pradesh,India. *International Journal of Innovative Research in Science, Engineering and Technology*, Vol. 3, Issue 2, 2319-8753

[18] Chukwu, H.I. Mustapha, and H.B. Abdul Gafar. 2008. The effect of Minna Abattoir Waste on Surface Water Quality I. Environ

[19] Rajappa, B., Manjappa, S and Puttaiah, E.T. 2010. Monitoring of heavy metal concentration in groundwater of HakinakaTaluk, India. *Contemporary Engineering Sciences*, 3(4):183-190

[20] Bhaskar, C.V., Kumar, K & Nagendrappa, G. 2010. Assessment of heavy metals in water samples of certain locations situated around Tumkur, Karnataka