Heavy Metal Contamination in Aquatic Ecosystem and its Effect in South India – A Review

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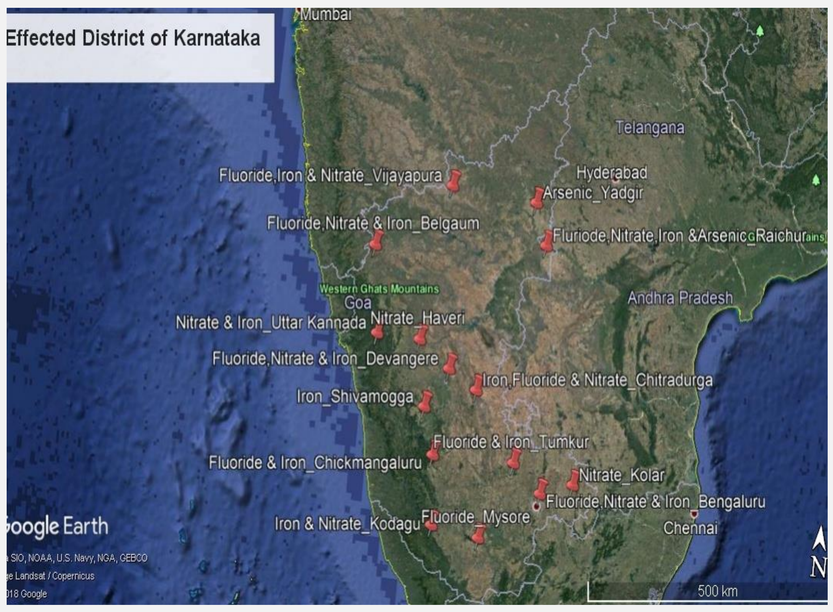
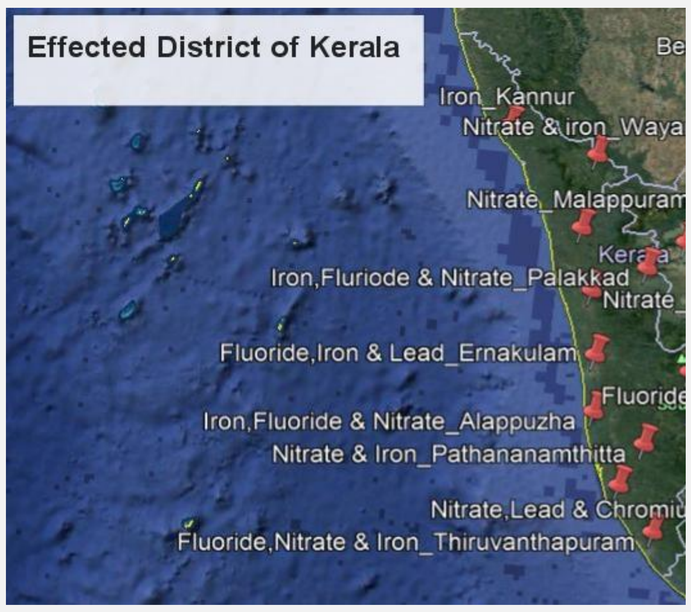
Introduction:

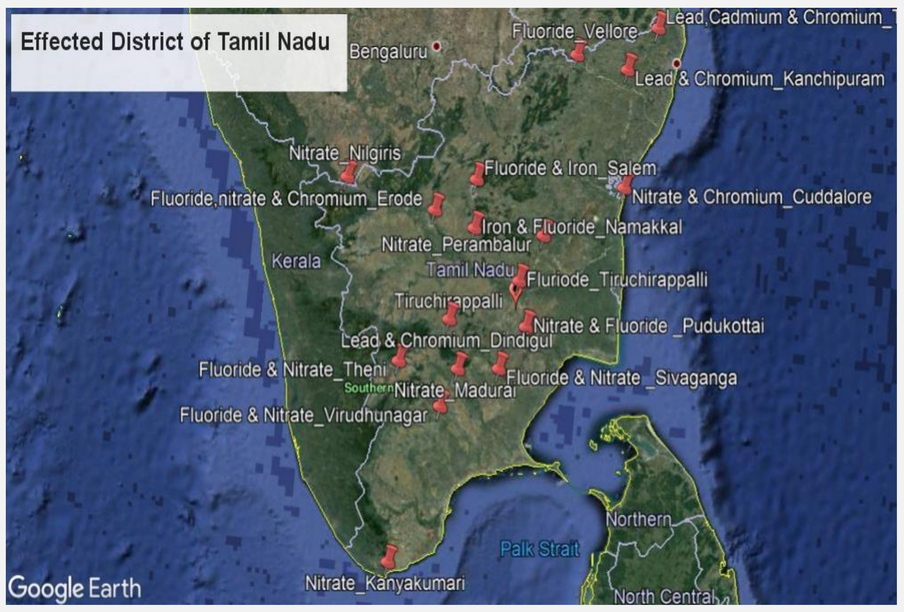
Environment get polluted due to anthropogenic disturbance. This pollutant are loaded into aquatic ecosystem which rises the levels of heavy metal and posses adverse effects the human health.

Standard limits of Chemicals as per Bureau of Indian Standard	
Fluoride	1.5 mg/l
Nitrate	45 mg/l
Arsenic	0.05 mg/l
Iron	1.00 mg/l
Heavy Metals :	
Lead , Cadmium & Chromium	0.01/mg/l ,0.003 mg/l & 0.05 mg/l

State wise affected Districts of Water Contamination by different Chemical constituents:







State	Fluoride (above 1.5mg/l)	Nitrate (above 45mg/l)	Iron (above 0.05 mg/l)	Arsenic (above 1.0 mg/l)	Cadmium, Lead ,Chromium (above(in mg/l): Cd-0.003,Pb-0.01,Cr-0.05)
Karnataka	Detected	Detected	Detected	Detected	Not Detected
Kerala	Detected	Detected	Detected	Not Detected	Detected(Pb,Cr)
Tamil Nadu	Detected	Detected	Not Detected	Not Detected	Detected(Pb,Cd,Cr)

Effect on Fish due to heavy metals:

Lead- Cause blood and nervous system changes.

Cadmium & Mercury-Impaired reproductivity capacity ,kidney tumours, hypertension and hepatic dysfunction.

Zn- Decreased the length of fish, affect the growth ,improvement and survival.

Chromium- damages the gills and results anemia, eosinophilia and lymphocytosis, bronchial and renal lesions etc.

Iron-Effects on brain and central nervous function

Effect on Humans due to fish intake:

Cadmium-Kidney damage,cancer and renal disorders.

Chromiun-Vomiting, Diarrhoe, nausea, cancer and headache.

Arsenic-Skin,lungs,kidney cancer as well as pigmentation changes of skin,nausea and muscular weakness.

Lead- Damage of kidney,nervous and circulatory system .

Iron-Brain damage and reduction of mental processes human.

Conclusion

Fish are susceptible to genotoxic effects caused by the pollutant. Economically it is also affected the country for less production. Fish can, in fact, be the sentinel organisms that can indicate the risk of human exposure to drinking water contaminated with genotoxicants. Conventional cytogenetics technique like chromosomal abberation and micronucleus test for the assessment of various of toxicants using fish as a model organism because it act as a bioindicator .To avoid contamination the practice should be enforced for i) safe disposalof industrial effluents and domestic sewage ii) the laws enacted to protect the environment.

References : i)Research Journal of Chemical and Environmental Sciences Volume 2 Issue 1 February 2014: 74-79.ii) African Journal of EnvironmentalSciene and Technology , Vol. 7(7),July 2013 iii) Fisheries & Aquaculture Journal 2016 vol 7:1 ,iv) GOI Ministriy of water Resources , River Development Ganga Rejuvenation. Pic collected from Internate.