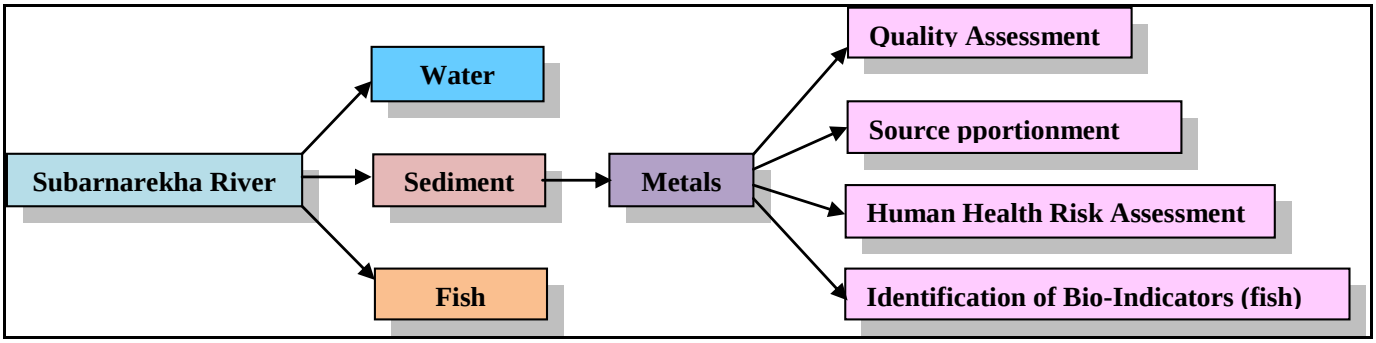
TITLE OF THE PROJECT: Impact Evaluation of Mining and Industrial Activities on the Surface Water Quality of Subarnarekha River: Using Fish as a Bio-indicator

PROJECT: NO. : GAP/EMG/DST/FTYS/90/2011-12

EXECUTIVE SUMMARY:

The Project was sponsored by Department of Science and Technology under the ***"Fast Track Young Scientist Scheme".*** The duration of the project was 3 years (11.10.2011 to 10.10.2014) with total cost of **₹ 21.5 lakhs.**

The main aim of the project was to assess the water, sediment and fish quality of the Subarnarekha River with special reference to the toxic metals. Human health risk assessment due to the consumption of the water and fish of the river was another goal for the project along with the statistical source evaluation of the metals. Identification of fish species which could act as bio-indicators was another objective. The study was carried out in the whole stretch of Subarnarekha River from the origin to the mouth of the river.



Salient research achievements and outcomes:

- The study confirmed the status of the water, sediment and fish quality of Subarnarekha River with reference to the toxic metals that would serve as a database for the future reference.
- Source apportionment studies indicated both innate and anthropogenic activities as contributing factors as source of metal profusion in Subarnarekha River
- The analysis of metals in the water and fish demonstrated marked seasonality and most of the metals exhibited higher levels in the pre-monsoon season.
- The largest contributors to chronic risks were As, V and Co for water, in all the seasons. The dermal risk indicated that the metals posed little hazards via dermal absorption indicating that the oral intake was the primary exposure pathway.
- The risk assessment studies of fish and shrimps suggest that that the concentration of metals in some species, especially shrimp, at some locations is alarming and do present an appreciable hazard risk on human health.
- The shrimps collected have been confirmed to be bio-accumulator of various metals
- The increased concentrations of metals in various components of the Subarnarekha River is considerably due to direct discharge of industrial, urban and mining wastes into the river
- **9 publications** have been made from the project in **International SCI journals** with cumulative **impact factor of 23.403**.