CHAPTER 3

SCOPE AND DESIGN OF THE STUDY

3.1 SCOPE OF THE STUDY

This research work is carried out on select tissues freshwater catfish, *C. gariepinus*. Biochemical and Biological aspects of gill, liver and kidney tissues on exposure to sub-lethal doses of Cadmium concentrations were analyzed.

Biochemical aspects involved induced MT Quantification, Localization and Expression, Confirmation, Isolation, Purification, Molecular Weight Calculation, obtain the peptide sequence and positively identify the MT protein, (using MALDI-TOF MS PMF) in this fish as it has not been reported before.

The biological aspects covered in the study involves estimation of quantification of accumulated Cd over specific durations of time, Micro-architectural alterations, Histomorphometrical and Stereological changes, DNA fragmentation, Caspases-3 activity and Apoptosis, Detoxification enzymes in this fish.

The work also involve correlating accumulation of Cadmium with MT induction.
3.2 Design of Study

Experimental animal: *Clarias gariepinus*

Treatment with Cadmium Chloride

**BIOLOGICAL STUDY**
- Cadmium Accumulation and Quantification
- Histological Alterations
- Histomorphometric and Stereological Analysis
- DNA Fragmentation
- Nuclear Morphology (DAPI)
- Apoptosis (Caspase-3)
- Detoxification Enzymes (GST, CAT and SOD)

**BIOCHEMICAL STUDY**
- MT Induction and Quantification
- MT Confirmation and Expression (WB)
- MT Localization (IHC)
- MT Isolation and Purification by Affinity Chromatography
- MT – Molecular Weight Analysis (MALDI-TOF MS)
- MT Identification and Amino Acid Sequence (MALDI-TOF PMF)