PREFACE
The widespread use of chemical pesticide during the last 30 years has played a major and tremendous role as an integral component of the "Green-Revolution", to alleviate the nutritional needs of the rapidly expanding population and to elevate the standards of living of the modern man. Therefore the public interest in environmental sciences especially in environmental pollution has become more intense in recent times and pollution is being examined sternly by the press and by the scientists of many disciplines. The use of chemical pesticide today is perhaps more than ever before, an indispensable and inevitable requirement for the control of insects, pests which destroy the economical crop plants. But, the indiscriminate, inadvertent and injudicious use of the pesticides paved the way for the environmental pollution and these toxic chemicals with their metabolites accumulated in the aquatic environment and finally led to the deleterious effects on their non-target organisms like fishes which represent the most typical the most massive, the most useful population of the aquatic environment.

The organophosphate pesticides are still increas­ingly used and replaced by organochlorides, by dint of
their biodegradable nature and less persistency in the environment. Phosphamidon, a member of the class of enolphosphates, is a versatile and systemic organophosphorus insecticide, is widely used to control crop pests, and in various agricultural operations.

Dougherti (1951) divided all substances causing 50 percent mortality among fishes in controlled experiments into 5 categories (1) extremely toxic (upto 1.0 mg/l), (2) Highly toxic (1 to 10 mg/l), (3) Moderately toxic (10 to 100 mg/l), (4) Mildly toxic (greater than 100 mg/l) and (5) poorly toxic (greater than 1000 mg/l).

The uptake of pesticides in fishes was reported to be usually through the gills (Holden, 1970) and the mechanisms for the detoxication of xenobiotics by fish are essential for their survival, since they do not readily excrete such substances through their gills (Adamson and Sieber, 1974). In such instance, there poisonous substances enter the blood and effect various tissues and organs and in turn various vital physiological processes in various degrees (Ashley, 1972; Basha Mohideen, 1983, 1984; Basha Mohideen and Sailabala, 1989; Zaccone et al., 1990; Shafiei and Costa, 1990). Amongst the most dramatic effects of water pollution are,
the many fish kills which are reported every year to the environmental protection agency (Southwick, 1976).

Both extensive and intensive studies have been carried out on the lethal effects of pesticides, but studies on sub-lethal effects of pesticides involving time course experiments which indicate the sequence of events in physiological and biochemical responses in the form of compensatory mechanisms leading towards the maintenance of homeostasis and extent of recovery during pesticide exposure are yet to be established. Studies of this nature involving energetics and energy relationships during pesticide exposure of a commercial fish are conspicuous by their absence. However there are some evidences that fish can adapt to pollutants for its survival.

Hence with a view to gain a knowledge of sub-lethal effects, of an organophosphorus pesticide involving long term exposure, phosphamidon was selected as the suitable systemic insecticide to investigate on the various energetics, in the energy relationships and energy budget of the commercial fish of economical value, the common carp *Cyprinus carpio*. This research scheme covers studies on the physiological and biochemical responses including energetics in the form of
compensatory mechanisms in this commercial fish, common carp during phosphamidon exposure of susceptibility, involving the level of toxicity, the degree of susceptibility, the resistant and recovery capacity, inter-tissue differences. The complete analysis of this investigation carried out basing on the size of the fish small and large.