The study presented here in the form of doctoral thesis was taken up with a view to give comprehension to the understanding of biological condition of fishes. After an exhaustive survey of literature relevant to the subject matter and analysis of the merits and demerits of the various approaches to determination of condition coefficients, the problem was attacked from several different angles. Besides evaluating the somatic and organ condition gravimetrically (through weight changes) the quantitative alterations in biochemical constituents were also examined to present a more accurate and realistic account of the physiological status and living standard of fishes.

Specific aspects investigated and important findings are summarized here:

Chapter I focuses attention on the growth and condition of three species of major carps, *Catla catla*, *Labeo rohita* and *Cirrhina mrigala* obtained from cultured populations in a freshwater pond. Data pertaining to body weight/unit length, condition factor and relative condition factor were processed. Body weight was found to grow more than three times the total length in each species. It was higher in *Catla catla* followed by *Labeo rohita* and *Cirrhina mrigala*. Condition factor maintained a similar trend of progression in the three fishes.
Relative condition factor did not differ appreciably from 1 and substantiated the results obtained through length-weight exponent and condition factor. The importance of segregated niches, habitat partitioning and compatability of the carps in composite farming has been discussed.

Chapter II deals with scaling of heart, brain and liver in relation to growth in length and weight of catfish *Heteropneustes fossilis* and murrel *Channa punctatus*. Allometric relations of these internal organs with general growth of the fishes were established and the exponents used for throwing light on dynamics of change in weight of the organs as indicators of underlying biochemical phenomena.

Chapter III reports the nature of relation of specific gravity, protein, RNA and DNA with the condition index of *Heteropneustes fossilis*, besides the interrelation between these parameters. The use of biochemical constituents as sensitive indicators of biological condition was discussed in detail.

Data on monthly variations in concentrations of protein, RNA and DNA of *Catla catla*, *Labeo rohita* and *Cirrhina mrigala* have been embodied in Chapter IV. Seasonal profiles of these parameters were found related to intrinsic and extrinsic factors and these were interpreted in the background of
physiological response and adaptation of the fishes to changing phenomenon. While the response of variations were identical in all the carps, the interspecific differences existed in the magnitude of variations.

Attempt was made (Chapter V) to test the performance of diets supplemented with cost-effective homoeopathic extracts (Calcarea phosphorica, Natrum muriaticum and Lycopodium) on Heteropneustes fossilis. The nutritional efficacy of the formulated diets was worked out through change in appetite, food conversion efficiency, protein efficiency ratio and their effects on condition coefficient. All the additives increased food utilization and promoted growth. The resulting health status was assessed by the nucleic acid levels. RNA varied positively and DNA reciprocally with the nutritional level of fish. Calcarea phosphorica was most effective of the three feed mixes; next in order were Lycopodium and Natrum muriaticum.

A homoeopathically prepared glandular extract (Testes 3X) supplied with minced meat diet to Heteropneustes fossilis enhanced the appetite and food utilization marginally. Application of this preparation was considered more useful for long-term feeding. The results have been interpreted in Chapter VI.
Possible anabolic effects of the ovarian steroids of ripe specimens of *Heteropneustes fossilis* were tested on young individuals of the same species (Chapter VII). Increase in appetite, food conversion, body weight, ponderal index, liver-somatic index and gonado-somatic was noticed. The findings emphasized the utility of natural ovarian steroids in improving the yield of fish from culture ponds.

The response of liver condition and nucleic acid concentrations of this organ to steroidal preparations (Testoviron and Ovocyclin) was investigated (Chapter VIII). Liver-somatic index and RNA increased whereas DNA concentrations declined in treated fish. The growth-promoting effect of the exogenous hormone was discernible. The 'cause-and-effect' relation vis-à-vis nucleic acids have been explained.

Study was also designed to determine the effect of DDT contaminated environment on condition and concentrations of protein, RNA and DNA of the liver of carp *Puntius stigma* (Chapter IX). Exposure of the fish for 15 days resulted in decline of protein and DNA with a reciprocal increase in RNA. The data have been interpreted in the light of hypertrophication of hepatic cells and interrelations of chemical constituents of liver parenchyma.