Summary and Conclusion:

1. Supplementation of market available conventional fish feed by 35% composite algal mixture, containing five microalgal genera viz. *Spirulina subsalsa*, *Phormidium valderianum*, *Navicula minima*, *Chlorococcum infusionum* and *Rhizoclonium riparium* (35:35:12:12:6) showed better growth performances, feed utilization and body composition of *Oreochromis niloticus* and *Oreochromis mossambicus*.

2. Cyanobacterial genera *Spirulina* and *Phormidium* were used as source of protein, amino acid and vitamins; green algal genera *Chlorococcum* and *Rhizoclonium* for carbohydrate and the diatom genus *Navicula* as source of lipid in fish diet formulation.

3. All the genera provided substantial amounts of carotenoids and vitamin C inducing disease resistance in the fishes.

4. *Spirulina subsalsa* showed better biomass growth in small tank cultures in outdoor conditions.

5. *Phormidium valderianum* showed best growth in outdoor condition especially in summer and was cultivated successfully in open raceway pond.

6. Both the species of *Oreochromis* fed with value added feed (VAF-35% replacement by mixed algal biomass) showed improved growth performance (p<0.05) in relation to feed conversion ratio (FCR), specific growth rate (SGR), protein efficiency ratio (PER), DP/DE ratio and weight gain percentage.

7. The carcass composition of VAF fed experimental fishes in relation to protein, carbohydrate, lipid, ash and moisture were also improved significantly.

8. The digestive enzyme activity of the gastrointestinal tract of the fishes was in accordance with the dietary protein, carbohydrate and lipid levels of the experimental feeds.
9. The survival rate of algae fed fishes were 97 % with no external clinical symptoms, therefore, the substantial carotenoid content of fish tissue validated the nutraceutical effects of algae in fish dietetics.

10. *Oreochromis niloticus* showed overall better result in the feeding trial than *Oreochromis mossambicus*, though both the fishes showed best results for algae based feed.