

**STUDY THE POPULATION DYNAMICS AND STOCK ASSESSMENT
OF *Oreochromis niloticus* IN THE UNNICHCHAI IRRIGATION
RESERVOIR, BATTICALOA DISTRICT.**



By

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ABSTRACT

The purpose of this study was to determine the population dynamics and stock assessment of the Nile tilapia. In Unnichchai Reservoir, it is the predominant fish that is highly preferred by consumers. The length-frequency distribution, length-weight relationship, growth and mortality parameters, and recruitment of the Unnichchai reservoir were investigated using length–frequency data and respective weight. The length-frequency distribution and length-weight relationship were computed from linear regression analysis by using MICROSOFT EXCEL Professional plus 2019 and growth mortality parameters and recruitment analyzed ELEFAN method incorporated in FISAT software. 360 fish specimens sampled two times per month, from Gill net haul over a period of 6 months starting from June 2023 to November 2023. *Oreochromis niloticus* exhibited negative allometric growth ($b = 2.02 (\neq 3)$) and near to the strong positive correlation ($r^2=0.8615$). The von Bertalanffy growth constants for *Oreochromis niloticus* were $TL_{\infty} = 38.40$ cm, $K = 0.69 \text{ yr}^{-1}$, and with a derived growth performance index of $\phi = 3.00$. The instantaneous rates of total mortality (Z), natural mortality (M), and fishing mortality (F) were 1.45, 1.29, and 0.16 per year respectively. The rate of exploitation ($E = 0.11$) showed under-exploitation of this species. However, this reservoir be stocked annually that may be to balance the rate of exploitation of the Nile tilapia population. There might be a few possibilities for yearly stocking, which would suggest that the reservoir experiences predator attacks, heavy exploitation due to fishing, or inadequate natural recruitment. To solve that issue, implement a regular monitoring program to identify and record the *O. niloticus* population, improve natural recruitment, and increase public awareness of fisheries.

TABLE OF CONTENTS

ABSTRACT.....	i
ACKNOWLEDGEMENT.....	ii
DECLARATION.....	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	viii
LIST OF ABBREVIATIONS	ix
CHAPTER 1	1
1.0 INTRODUCTION.....	1
1.1 Freshwater fisheries in Sri Lanka.....	1
1.1.1 Freshwater fishes	3
1.2 Reservoir fishery in Sri Lanka	3
1.2.1 Selection of water bodies for fish stocking	4
1.2.2 Species selection for stocking.....	5
1.2.4 Exotic introductions in the Sri Lankan reservoir fishery.....	6
1.2.5 The stocking of Tilapia and Carp species in the dry zone reservoirs, Sri Lanka	6
1.3 Role of Inland Fisheries Reservoir in Sri Lanka	7
1.3.1 Consumption.....	7
1.3.2 Carrier opportunities.....	8
1.4 Freshwater fisheries governing bodies	9
1.5 Tilapia.....	10
1.6 Fish stock assessment.....	11
1.6.1 Significance of Length-based fish stock assessment model	12

1.6.2 Length weight relationship	12
1.7 Objectives	13
1.7.1 Main objective	13
1.7.2 Specific objectives	13
CHAPTER 2	15
2.0 MATERIALS AND METHODS	15
2.1 Study site	15
2.2 Sample collection	16
2.3 Species selection	17
2.4 Fish measurement techniques.....	18
2.5 Data analysis	19
2.5.1 Determination of length-weight relationships	19
2.5.2 Growth and population parameters estimation.....	20
2.5.3 Mortality parameters.....	20
2.5.4 Recruitment pattern	21
CHAPTER 3	22
3.0 RESULTS AND DISCUSSION	22
3.1 Length-frequency distribution.....	22
3.2 Length-weight relationship	24
3.3 Growth parameters and growth performance.....	27
3.4 Mortality rate.....	29
3.5 Recruitment pattern	32
CHAPTER 4	34
4.0 CONCLUSION	34

CHAPTER 5	35
5.0 FUTURE CONSIDERATIONS RECOMMENDATIONS	35
5.1 Future consideration	35
5.2 Recommendation	35
CHAPTER 6	38
6.0 REFERENCES	38
APPENDIX I	47
APPENDIX II	48
APPENDIX III	60