

SOME ASPECTS OF THE BIOLOGY AND  
POPULATION DYNAMICS OF THE DOMINANT  
FISH SPECIES IN KEDUNGOMBO RESERVOIR,  
CENTRAL JAVA, INDONESIA

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By

**ENDI SETIADI KARTAMIHARDJA**

**Thesis Submitted in Fulfilment of the Requirements  
for the Degree of Master of Science in the  
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TABLE OF CONTENTS

	Page
III DESCRIPTION OF THE STUDY AREA .....	23
Introduction .....	23
Morphology and Hydrology .....	23
ACKNOWLEDGEMENTS .....	ii
LIST OF TABLES .....	vii
LIST OF FIGURES .....	ix
IV SOME ASPECTS OF THE BIOLOGY OF	
ABSTRACT .....	x
ABSTRAK .....	xiii
CHAPTER	
I INTRODUCTION .....	1
Background .....	1
Research Problems and Objectives .....	2
II LITERATURE REVIEW .....	4
Role of Reservoir for Fisheries .....	4
Some Aspects of Fish Biology .....	5
Taxonomy of Dominant Fish Species .....	5
Structure of Fish Community .....	9
Food and Feeding Habits .....	11
Reproductive Biology .....	14
Length-Weight Relationship and	
Condition Factor .....	17
Fish Population Dynamics .....	18
Growth Parameters .....	18
Mortality and Exploitation Rate .....	20
Fish Yield of Reservoirs .....	20
Estimation of Mortality .....	62
Exploitation Rate .....	63
Recruitment Pattern .....	63
Estimation of Fish Yield .....	64

	Page
III DESCRIPTION OF THE STUDY AREA .....	22
Introduction .....	22
Morphology and Hydrology .....	23
Physico-chemical Characteristics .....	23
Biological Characteristics .....	27
Plankton and Primary Productivity .....	27
Fish and Fisheries .....	28
IV SOME ASPECTS OF THE BIOLOGY OF THE DOMINANT FISH SPECIES .....	30
Introduction .....	30
Materials and Methods .....	31
Sampling Procedure .....	31
Structure of Fish Community .....	33
Food and Feeding Habits .....	34
Reproductive Biology .....	37
Length-Weight Relationship and Condition Factor .....	39
Results .....	39
Structure of Fish Community .....	39
Food and Feeding Habits .....	43
Reproductive Biology .....	47
Length-Weight Relationship and Condition Factor .....	51
Discussion .....	53
V THE POPULATION DYNAMICS OF THE DOMINANT FISH SPECIES .....	59
Introduction .....	59
Materials and Methods .....	61
Sampling Procedure .....	61
Estimation of Growth Parameters .....	61
Estimation of Mortality .....	62
Exploitation Rate .....	63
Recruitment Pattern .....	63
Estimation of Fish Yield .....	64



LIST OF TABLES

	Page
Results .....	65
Growth Parameters .....	65
Mortality .....	68
Exploitation Rate .....	71
Recruitment Pattern .....	71
Fish Yield .....	73
Discussion .....	76
VI SUMMARY AND CONCLUSION .....	81
Summary .....	81
Conclusion .....	86
BIBLIOGRAPHY .....	88
APPENDIX A .....	102
BIOGRAPHICAL SKETCH .....	108
Kedungombo Reservoir .....	42
Food Items and Their Index of Preponderance of the Five Dominant Fish Species in Kedungombo Reservoir.....	44
Niche Breadth and Niche Overlap of the Five Dominant Fish Species in Kedungombo Reservoir .....	45
Coefficient of Food Competition between the Five Dominant Fish Species in Kedungombo Reservoir.....	46
Sex Ratio of Mature Specimen of the Five Dominant Fish Species in Kedungombo Reservoir .....	47
Gonado-somatic Index and Fecundity of the Five Dominant Fish Species in Kedungombo Reservoir.....	49
The Relationship between Fecundity (F) and Total Length, Fecundity and Body Weight, and Fecundity and Gonad Weight of the Five Dominant Fish Species .....	51

## LIST OF TABLES

Table		Page
1.	Physico-chemical Characteristics of the Kedungombo Reservoir at Pre-inundation and at the Beginning of Impoundment .....	26
2.	Description of the Gillnets .....	32
3.	List of Fish Species Caught with Experimental Gillnets in the Kedungombo Reservoir .....	40
4.	Number of Fish Species Caught with Gillnets in Six Sub-fishing Areas Over Twelve Months Period .....	41
5.	Shannon Diversity Index (H') and Bray-Curtis Ordination of Dissimilarity Index (%) of Fish Community in Six Sub-fishing Areas of the Kedungombo Reservoir .....	42
6.	Food Items and Their Index of Preponderance of the Five Dominant Fish Species in Kedungombo Reservoir.....	44
7.	Niche Breadth and Niche Overlap of the Five Dominant Fish Species in Kedungombo Reservoir .....	46
8.	Coefficient of Food Competition between the Five Dominant Fish Species in Kedungombo Reservoir.....	46
9.	Sex Ratio of Mature Specimen of the Five Dominant Fish Species in Kedungombo Reservoir .....	47
10.	Gonado-somatic Index and Fecundity of the Five Dominant Fish Species in Kedungombo Reservoir.....	49
11.	The Relationship between Fecundity (F) and Total Length, Fecundity and Body Weight, and Fecundity and Gonad Weight of the Five Dominant Fish Species .....	51

	Page
12. Length-Weight Relationships of the Five Dominant Fish Species from Kedungombo Reservoir .....	52
13. Length-frequency Distribution of <i>Oreochromis mossambicus</i> Caught with Experimental Gillnets from Kedungombo Reservoir .....	103
14. Length-frequency Distribution of <i>Puntius gonionotus</i> Caught with Experimental Gillnets from Kedungombo Reservoir .....	104
15. Length-frequency Distribution of <i>Puntius bramoides</i> Caught with Experimental Gillnets from Kedungombo Reservoir .....	105
16. Length-frequency Distribution of <i>Mystacoleucus marginatus</i> Caught with Experimental Gillnets from Kedungombo Reservoir .....	106
17. Length-frequency Distribution of <i>Channa striatus</i> Caught with Long lines from Kedungombo Reservoir .....	107
18. The Estimates of Growth Parameters based on Wetherall Method and ELEFAN I Programme using Uncorrected and Corrected Data .....	68
19. The Estimates of Mortality and Exploitation Rate of the Five Dominant Fish Stocks in Kedungombo Reservoir .....	71
20. The Estimate Fish Yield of the Kedungombo Reservoir .....	75
21. Comparative Values of Overall Growth Performance ( $\phi'$ ) of Some Species of Family Cyprinidae .....	78

## LIST OF FIGURES

Figure	Page
1. Map of the Kedungombo Reservoir Showing Six Sub-fishing Areas (□) and Three Fish Landing Sites (●) .....	24
2. Water Level Fluctuation of the Kedungombo Reservoir from May 1991 to August 1992 .....	25
3. Changes in Gonado-somatic Index in Relation to Stages of Maturation in Female <i>Oreochromis mossambicus</i> (○), <i>Puntius gonionotus</i> (●), <i>Puntius bramoides</i> (⊙), <i>Mystacoleucus marginatus</i> (●) and <i>Channa striatus</i> (⊕) .....	48
4. Monthly Variation in Gonado-somatic Index of Female <i>Oreochromis mossambicus</i> (○), <i>Puntius gonionotus</i> (●), <i>Puntius bramoides</i> (⊙), <i>Mystacoleucus marginatus</i> (●), and <i>Channa striatus</i> (⊕) .....	50
5. The Modified Wetherall Plot for the Five Dominant Fish Species in Kedungombo Reservoir .....	66
6. The Resultant Curve of the Probability of Capture for the Five Dominant Fish Species .....	67
7. The Growth Curve of the Five Dominant Fish Species Superimposed to Structure of Length Frequency Data .....	69
8. Length Converted Catch Curve of the Five Dominant Fish Species .....	70
9. Recruitment Pattern of the Five Dominant Fish Species .....	72
10. Relative Yield and Biomass per Recruit in the Five Dominant Fish Stocks .....	74
11. Fish Yield and Water Level Fluctuation of the Kedungombo Reservoir .....	80

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By

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**JUNE 1993**

**Chairman : Assoc. Prof. Dr. Hj. Mohd. Zaki Mohd. Said**

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The study was aimed to investigate some aspects of the biology and population dynamics of dominant fish species, namely *Oreochromis mossambicus* (Peter), *Puntius gonionotus* (Bleeker), *Puntius bramoides* (Cuvier & Valenciennes), *Mystacoleucus marginatus* (Cuvier & Valenciennes), and *Channa striatus* Bloch in the Kedungombo Reservoir, Central Java, Indonesia.

Gillnet sampling in six sub-fishing areas of the reservoir once a month for a 12 month period and catch assessment survey (CAS) at three fish landing sites were carried out. Length-based methods for fish population study were adopted.

Results of the study showed that the dominant species were distributed all over the reservoir, except *C. striatus* which were distributed in a restricted area. The riverine species were concentrated in the upper portion of the reservoir. The species richness and diversity of the fish community were high in the upper portion of the reservoir. Based on the values of the index of preponderance, *O. mossambicus* and *M. marginatus* were classified as planktivores; *P. gonionotus* and *P. bramoides* as herbivores; and *C. striatus* as a carnivore. Food competition occurred between *O. mossambicus* and *M. marginatus*, and between *P. gonionotus* and *P. bramoides*. However, the food competition among other species was considered low.

*O. mossambicus* reproduced at intervals of about three months and their reproduction occurred extensively during high water level. Reproduction of *P. gonionotus*, *P. bramoides* and *M. marginatus* started from December until March when the water level of the reservoir began to rise. In *C. striatus* reproduction occurred during high water level. Fecundity of *O. mossambicus*, *P. gonionotus*, *P. bramoides*, *M. marginatus* and *C. striatus* were between 178-1,574; 25,980-86,916; 42,454-99,659; 4,702-15,681; and 2,585-12,880, respectively. The fecundity was highly correlated with total length, body weight, and gonad weight and it increased with the increase in total length, body weight and gonad weight.

Length-weight relationship of the species showed that *O. mossambicus*, *P. gonionotus* and *P. bramoides* grew isometrically and *M. marginatus* and *C. striatus* grew allometrically.

Von Bertalanffy growth parameters,  $L_{\infty}$  and  $K$  of *O. mossambicus*, *P. gonionotus*, *P. bramoides*, *M. marginatus* and *C. striatus* were 31.5 cm and  $0.57 \text{ yr}^{-1}$ ; 41.90 cm and  $0.54 \text{ yr}^{-1}$ ; 31.24 cm and  $0.86 \text{ yr}^{-1}$ ; 19.40 cm and  $1.21 \text{ yr}^{-1}$ ; and 66.93 cm and  $0.40 \text{ yr}^{-1}$ , respectively.

Recruitment patterns of the five dominant fish stocks showed two peaks of recruitment, particularly in *O. mossambicus*, *M. marginatus* and *C. striatus* stocks.

Exploitation rate of *O. mossambicus* and *C. striatus* stocks were at an optimum level and the other fish stocks were considered below optimum level. Relative yield per recruit of the stocks showed the maximum at 0.48 for *O. mossambicus*, 0.52 for *P. gonionotus*, 0.50 for *P. bramoides*, 0.55 for *M. marginatus* and 0.52 for *C. striatus*.

The fish yield of the reservoir was estimated to be 430.962 mt annually or 88 kg/ha/yr.