

TABLE OF CONTENTS

ORIGINALITY STATEMENT FORM.....	i
ABSTRAK	ii
ABSTRACT.....	iii
PREFACE	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES	viii
LIST OF TABLES	ix
GLOSSARY OF TERMS	x
LIST OF ABBREVIATIONS AND SYMBOLS	xi
APPENDIX LIST	xii
I. CHAPTER I INTRODUCTION.....	1
I.1 Background	1
I.2 Problem Formulation.....	5
I.3 Research Purposes	5
I.4 Research Scope.....	5
I.5 Research Benefits	5
I.6 Writing System.....	6
II. CHAPTER II THEORETICAL BASIS.....	7
II.1 Rain Water Mechanism	7
II.2 Biopore Concept.....	9
II.3 Rainwater Harvesting Concept.....	10
II.4 Design for Assembly (DFA)	13
II.4.1 Manual Assembly	14
II.4.2 Determining Time and Assembly Efficiency.....	16
II.5 Water Filtration Technology	17
II.6 Related Research	18
III. CHAPTER III RESEARCH METHODS	21
III.1 Conceptual Model	21
III.2 Systematic Problem Solving	22
III.2.1 Initial Research Stage.....	24
III.2.2 Data Collection Stage.....	24
III.2.3 Data Processing Phase.....	25
III.2.4 Conclusions and Suggestions.....	27
IV. CHAPTER IV DATA COLLECTION AND PROCESSING	28

IV.1	Data Collection.....	28
IV.1.1	Rainwater Harvesting Existing System.....	28
IV.2	Existing Design of Rainwater Harvesting Tools	29
IV.2.1	Specification of Existing Rainwater Harvesting Tools.....	30
IV.3	Clarifying Objectives	30
IV.4	Establishing Needs and Characteristics.....	32
IV.5	Determination of Functions and Alternatives of Rainwater Harvesting Tools	32
IV.6	Alternative Selection	34
IV.7	Concept Combination.....	35
IV.8	Concept Screening.....	37
IV.9	Calculation of Rainwater Reservoir Capacity	39
IV.10	Design for Assembly (DFA).....	41
IV.10.1	Identification Part of Concept Design C of Rainwater Harvesting Tools	41
IV.10.2	Application of Design for Assembly on Concept Design C	50
IV.10.3	Proposal Design	66
IV.10.4	Application of Design for Assembly on Proposal Design	69
V.	CHAPTER V ANALYSIS	86
V.1	Analysis	86
V.1.1	The Concept Design C of Rainwater Harvesting Tool	86
V.1.2	Proposal Design of Rainwater Harvesting Tools	90
V.1.3	Comparison between Concept Design C and Proposal Design	93
VI.	CHAPTER VI CONCLUSION AND SUGGESTION.....	96
VI.1	Conclusion.....	96
VI.2	Suggestion	96
	REFERENCES.....	97