

DEVELOPMENT OF WATER ROLLER DRUM FOR FARM IRRIGATION

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**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS
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ACCEPTANCE SHEET

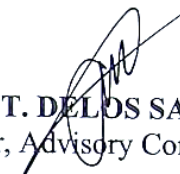
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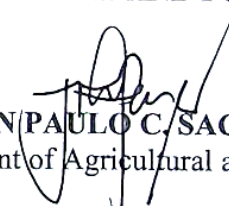

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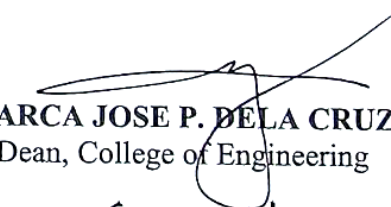

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TABLE OF CONTENTS

	PAGE
TITLE PAGE	i
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDIX TABLES	xi
LIST OF APPENDIX FIGURES	xii
ABSTRACT	xiii
INTRODUCTION	1
Background of the Study	1
Statement of the Problem	3
Objectives of the Study	5
Significant of the Study	5
Scope and Limitation of the Study	7
Time and Place of the Study	8
REVIEW OF RELATED LITERATURE	9
Water	9
Irrigation	15
Existing Water Roller Drum	16
Q-Drum	16
LOOP-Water Transport System	17
Hippo Roller Drum	18
Water Roller Drum Design Considerations	19
Drum Frame Design Considerations	19
Ideal Frame Design	20
Handle Design Considerations	20
Ideal Handle Considerations	21
Ease of Operations	22
Cost Analysis	22
Human Drudgery	23

Row Crops	24
Eggplant	24
Bitter gourd	25
Bottle gourd	26
METHODOLOGY	27
Conceptualization of the Study	27
Design Considerations	29
Methods on Machine Design	31
Handle	31
Drum Outer Shell	32
Drum Design Cover	34
Principle of Operation	35
Materials for Construction	36
Drum	37
Drum Frame	37
Drum Handle	37
Water Roller Drum Prototype Fabrication Process	38
Test Material Preparation	39
Preliminary Testing	39
Testing Instruments and Materials	41
Data Gathering	41
Determination of Performance Characteristics	42
Discharge Rate	43
Field Capacity	44
Operating Speed	44
Ease of Operation	45
Statistical Analysis	45
Cost Analysis	46
RESULTS AND DISCUSSION	52
Description of the Prototype of Water Roller Drum	52
Water Roller Drum Component and Specification	53
Performance Evaluation of the Water Roller Drum	54

Discharge Rate	54
Field Capacity	55
Operating Speed	55
Ease of Operation using Pulse Rate	56
Survey Summary of Water Roller Drum for Farm Irrigation	57
Cost Analysis	58
 SUMMARY, CONCLUSION, AND RECOMMENDATION	 61
Summary	61
Conclusion	64
Recommendation	66
 LITERATURE CITED	 67
 APPENDICES	 72
Appendix Tables	73
Appendix Figures	80
Appendix Mechanical Drawing	89

LIST OF TABLES

TABLE		PAGE
1	Problems and Proposed Solution	41
2	Instruments and materials to be used during the performance evaluation of the machine	41
3	The parameters and corresponding evaluation tests	43
4	Specification of water roller drum	53
5	Descriptive statistics of the parameter discharge rate, li/hr	55
6	Descriptive statistics of the parameter field capacity, ha/hr	55
7	Descriptive statistics of the operating speed, mins	56
8	Descriptive statistics of the parameter ease of operation using pulse rate, bpm	57
9	Survey for familiarity and marketability of the water roller drum.	57
10	Assumptions used on the cost analysis of the water roller drum	59

LIST OF FIGURES

FIGURE		PAGE
1	Q-Drum	16
2	Loop imagery shows how the system would be used in the field simulation	17
3	Loop system worn as a backpack	18
4	Hippo Roller Drum	19
5	Conceptual framework of the study	28
6	The isometric view of handle	32
7	The isometric view of frame	33
8	The isometric view of cover	35
9	Experimental layout of the study	46
10	Isometric view of the water roller drum	53
11	Cost curve	60

LIST OF APPENDIX TABLES

TABLE		PAGE
1	Bill of materials	73
2	Economic assumptions	74
3	Two independent sample t-tests for discharge rate, li/hr	74
4	Discharge rate for water roller drum.	75
5	Discharge rate for pail and dipper	76
6	Two independent sample t-tests for field capacity, ha/hr	77
7	Trial for field capacity	77
8	Two Independent Sample t-tests for operating time, mins	77
9	Trial for operating speed	78
10	Two independent sample t-tests for ease of operation using pulse rate	78
11	Pulse rate in the morning (bpm)	78
12	Pulse rate in the afternoon (bpm)	79

LIST OF APPENDIX FIGURES

FIGURE		PAGE
1	Buying of materials	80
2	Measuring the flat bar for the frame	80
3	Cutting the steel	81
4	Measured for check valve placement	81
5	Drill a hole in the drum	82
6	Attaching parts of the frame to the roller drum	82
7	Installing a check valve on the drum	83
8	Measuring the distance of flat bars for the frame of the drum	83
9	Learning how to bend flat bars to make a circle	84
10	Measuring the dimensions of the circle to ensure equal parts	84
11	Positioning the wheels on the drum before welding it	85
12	Roller drum catchment	85
13	Distance measurement of the experiment field from the filling point	86
14	Filling the drum with water and inspecting for leaks	86
15	Field testing of the roller drum	87
16	Conducting final tests on the roller drum	87
17	Watering using a bucket	88

ABSTRACT

BUNAO, MARY ANTOINETTE S., and MANANGUIT, PRINCESS C.
Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines. **JULY 2024.**
DEVELOPMENT OF WATER ROLLER DRUM FOR FARM IRRIGATION

Adviser: MARLON T. DELOS SANTOS, M.Sc.

The study developed a water roller drum for farm irrigation, aiming to improve efficiency for small-scale farmers. The prototype, tested against pail and dipper methods, showed lower discharge rate, higher field capacity, better ease of operation and faster operating speed.

The study found that despite a lower discharge rate of 394.79 liters per hour, the water roller drum had a higher field capacity of 0.0716 hectares per hour, faster operating speed of 88.68 minutes, and a lower operator pulse rate of 112.11 beats per minute, making it easier to operate. A survey with 30 respondents confirmed the marketability of the water roller drum, with a majority preferring it over traditional methods and willing to purchase within a specified price range. The estimated fabrication cost is Php 5,185.00, with labor cost being 40% of material cost. The machine has a break-even value of 2.54 ha/yr, earning profit when the area is at least 127 sqm and with two cropping seasons.

The study highlights the water roller drum's potential for improving irrigation efficiency, labor reduction, and crop productivity, with future improvements involving lighter materials, ergonomic features, and improved traction.

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