

**Techno - Transfer through Intervention on
Biodegradable Waste Management
in Rural Settings**

By

SuranjanaAgamacharyya

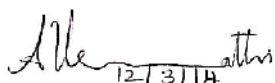
Thesis Submitted to
Avinashilingam Institute for Home Science and Higher Education
for Women, Coimbatore - 641043

In Partial Fulfilment of the Requirements for the Degree of
Doctor of Philosophy inResource Management

March 2014


CERTIFICATE

This is to certify that the dissertation entitled "**Techno-Transfer through Intervention on Biodegradable Waste Management in Rural Settings**" submitted to the Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore, in partial fulfillment of the requirements for the award of the Degree of **Doctor of Philosophy in Resource Management**, is a record of original research work done by **Suranjana Agamacharyya**, during the period of her study in the Department of Resource Management, Avinashilingam Institute for Home science and Higher Education for Women, Coimbatore, under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or similar title to any candidate of any other University and represents entirely an independent work on the part of the candidate.


12/3/14
Signature of the


Head of the Department


12.3.14
Signature of the Guide


12/3/14
Signature of the Dean

DECLARATION

I hereby declare that the dissertation entitled "**Techno-Transfer through Intervention on Biodegradable Waste Management in Rural Settings**" submitted to the Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore in partial fulfillment of the requirements for the award of the Degree of **Doctor of Philosophy in Resource Management**, is a record of original research work done by me under the supervision and guidance of **Dr. K. Manimozhi, M.Sc., B.Ed., M.Phil., Ph.D., Associate Professor**, the Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, and that it has not formed the basis for the award of any Degree/ Diploma / Associateship / Fellowship or similar title to any candidate of any other University and it represents entirely an independent work on the part of the candidate.


Signature of the Guide


Signature of the Candidate

ACKNOWLEDGEMENT

The investigator places her first and foremost prayers to 'GOD ALMIGHTY' for his uncountable blessings for the strength and perseverance bestowed upon her during the research leading her to realize her goal and to fulfill the task in a satisfactory manner.

*The investigator places her reverential gratitude, respect and admiration to the great architects of this temple of learning Padmabhusan **Dr.T.S.Avinashilingam**, the **Founder and First Chancellor** and Padmashri **Dr.Rajammal P. Devadas**, **Former Chancellor**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore for realizing their vision on Home Science education which has made learning in the portals of this institution possible.*

*The investigator expresses her sincere thanks to **Dr.T.S.K.Meenakshisundaram**, **M.A., M.Phil., Ph.D., Chancellor**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for all the amenities and infrastructure provided for the conduct of the study.*

*The investigator owes her sincere thanks to **Dr.(Mrs).SheelaRamachandran**, **M.Sc., P.G.Dip., Ph.D.(Avinashilingam), Vice Chancellor** of Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for providing all the facilities and support required for completion of the study.*

*The investigator also expresses her thanks to **Dr.(Mrs).GowriRamakrishnan**, **M.Sc.,(Madras), M.Phil., Ph.D. (Avinashilingam), Registrar**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for providing all the support in the smooth conduct of the study.*

*The investigator also expresses her thanks to **Dr.P.Santhanakrishnan**, **Director (Research and Consultancy)**, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for his timely suggestions and help rendered during the study period.*

*The investigator felt her deep sense of gratitude to **Dr.(Mrs.).U.K.Lakshmi**, **M.Sc., Dip.Ed., M.Phil., Ph.D.(Madras), Dean**, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her kind words of encouragement in completion of the study.*

*The investigator expresses her heartfelt gratitude to **Dr. (Tmt.) Satyavathi Muthu, M.Sc., M.Phil., Dip.Ed., Ph.D. (Madras), Former Professor and Head, Department of Resource Management, Former Dean, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her suggestions and consistent encouragement given throughout the study.***

*The investigator expresses her heartfelt thanks to **Dr. (Mrs). A. Venmathi., M.Sc., Dip.Ed., M.Phil, Ph.D., Professor and Head, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her concern and encouragement shown throughout the study period which has helped in the completion of the study.***

*The investigator deems it a privilege to have **Dr.(Mrs).K.Manimozhi, M.Sc.,B.Ed., M.Phil., Ph.D., (Avinashilingam), Associate Professor, Department of Resource Management, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, as a guide and expresses sincere gratitude for her keen interest, patient hearing, untiring effort, skillful instructions, esteemed guidance and suggestions instilled in me the spirit of confidence to successfully complete the task. The investigator thankher for the untiring encouragement and serving as a role model. The enthusiasm and scientific temperament she has for research and her caring ways were contagiously motivating even during tough times in every step of my work.***

*Sincere gratitude is expressed to **Dr. M.R. Thilagam, M.Sc., M.Phil., Ph.D., Professor, Resource Management for her spontaneous and timely help rendered for the completion of the study. The investigator expresses sincere thanks to each and every one of the Faculty members, Department of Resource Management for their kind support and good wishes.***

*The investigator is deeply obligated and grateful to **Mrs.S.Radha Devi, M.Sc., M.Phil., Associate Professor, Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, for her invaluable help and guidance rendered in the statistical analysis and valuable suggestions for the research work.***

The investigator feels indebted for the continuous support and co-operation extended by the homemakers and farmers in the selected village. The investigator expresses her sincere thanks to Environmental Science Department of Tamil Nadu Agricultural University, Coimbatore and Block Development Officers, Agriculture Officers and field officers of Thondamuthur block.

The investigator feels great and expresses her heartfelt thanks to all the friends and well-wishers who helped in many ways throughout the study period.

No words match to express my everlasting love and gratitude to my beloved parents Mr. Anjan Kumar Agamacharyya, ManjuAgamacharyyawho were not only the source of inspiration, courage and strength, but also the real architect of my career. I also thank my endearing loving brother SanjeebanAgamacharyyaand other my family members.

CONTENTS

CHAPTER No.	TITLE	PAGE No
	LIST OF TABLES	
	LIST OF FIGURES	
	LIST OF PLATES	
	LIST OF APPENDICES	
I	INTRODUCTION	1
II	REVIEW OF LITERATURE	13
	A. Concept and Classification of Waste	13
	B. Need for Biodegradable Waste Management	18
	C. Existing Biodegradable Waste Management Practices	24
	D. Functions of Various Agencies and Projects on Garbage Management	34
	E. Research Related to Waste Management Practices	40
	F. Importance of composting / Vermicomposting	47
III	METHODOLOGY	55
	Phase I -Household Survey	57
	PhaseII -Training on Biodegradable Waste Management	64
	PhaseIII-Evaluating the Impact of the Training programme conducted	84
IV	RESULTS AND DISCUSSION	87
	A. Household Survey	87
	B. Impact of the Training on Biodegradable Waste Management on the Women Leaders	107
	C. Impact of the Training on Biodegradable Waste Management on the community	116
V	SUMMARY AND CONCLUSION	138
	BIBLIOGRAPHY	148
	APPENDICES	168

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
I	PROFILE OF THONDAMUTHUR BLOCK	59
II	CONSOLIDATED PROFILE OF THE SELECTED VILLAGES	60
III	COURSE CONTENT AND PLAN OF WORK FOR THE TRAINING PROGRAMME	66
IV	THRUST AREAS COVERED	67
V	SOCIO-ECONOMIC PROFILE OF THE SELECTED HOUSEHOLDS	88
VI	AVERAGE QUANTITY OF KITCHEN WASTE AVAILABLE IN THE SELECTED HOUSEHOLDS.	91
VII	AVERAGE QUANTITY OF GENERAL WASTE AVAILABLE IN THE SELECTED HOUSEHOLDS	93
VIII	AVERAGE QUANTITY OF GARDEN WASTE AVAILABLE IN THE SELECTED HOUSEHOLDS	94
IX	AVERAGE QUANTITY OF BIODEGRADABLE WASTE AVAILABLE IN THE SELECTED HOUSEHOLDS	96
X	TYPE OF BINS USED FOR COLLECTING THE BIODEGRADABLE WASTE	96
XI	PERSONNEL IN-CHARGE OF DISPOSING THE WASTE	97
XII	BIODEGRADABLE WASTE DISPOSAL PRACTICES ADOPTED BY THE SELECTED HOUSEHOLDS	98
XIII	PROBLEMS FACED BY ACCUMULATION OF HOUSEHOLD WASTE	100
XIV	METHODS OF REUSING HOUSEHOLD WASTE BY THE SELECTED HOUSEHOLD	102
XV	EXISTING ENVIRONMENTAL CONDITIONS	103
XVI	REASONS FOR ENVIRONMENTAL DEGRADATION	105
XVII	DOMESTIC POLLUTANTS OF THE ENVIRONMENT	106
XVIII	NEED FOR CLEAN ENVIRONMENT	107

TABLE NO.	TITLE	PAGE NO.
XIX	KNOWLEDGE SCORE BEFORE TRAINING BY SOCIO-DEMOGRAPHIC VARIABLES	109
XX	KNOWLEDGE SCORES AFTER THE TRAINING BY SOCIO-DEMOGRAPHIC VARIABLES	110
XXI	KNOWLEDGE SCORES - BEFORE AND AFTER THE TRAINING	111
XXII	ATTITUDE SCORE BEFORE TRAINING BY SOCIO-DEMOGRAPHIC VARIABLES	113
XXIII	ATTITUDE SCORES AFTER THE TRAINING BY SOCIO-DEMOGRAPHIC VARIABLES	114
XXIV	ATTITUDE SCORES - BEFORE AND AFTER THE TRAINING	115
XXV	CORRELATION BETWEEN KNOWLEDGE AND ATTITUDE SCORES	116
XXVI	PARTICIPATION OF THE COMMUNITY IN THE TRAINING PROGRAMME	118
XXVII	FACTORS INFLUENCING THE ADOPTION OF BIODEGRADABLE WASTE MANAGEMENT PRACTICES	119
XXVIII	ADOPTION OF HOME COMPOSTING METHODS BEFORE AND AFTER THE CONDUCT OF TRAINING PROGRAMME	122
XXIX	COMPARISON OF NPK CONTENT OF TWO DIFFERENT COMPOSTS	125
XXX	OPINION REGARDING BIODEGRADABLE WASTE MANAGEMENT PRACTICES	126
XXXI	CHANGES IN THE BEHAVIOUR TOWARDS BIODEGRADABLE WASTE MANAGEMENT	128
XXXII	SOCIO-ECONOMIC PROFILE OF THE SELECTED HOUSEHOLDS	132
XXXIII	AVERAGE QUANTITY OF BIODEGRADABLE WASTE GENERATED BY THE SELECTED HOUSEHOLDS PER DAY	133
XXXIV	QUANTITY OF VERMICOMPOST GENERATED AND ITS MONEY VALUE	134

TABLE NO.	TITLE	PAGE NO.
XXXV	MONEY VALUE OF GREENS AND VEGETABLES PRODUCED BY THE SELECTED HOUSEHOLDS PER CROPPING	135
XXXVI	NET ECONOMIC BENEFITS ACCRUED THROUGH BIODEGRADABLE WASTE MANAGEMENT BY THE SELECTED HOUSEHOLDS	137

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO
1	SCHEMATIC REPRESENTATION OF THE RESEARCH DESIGN	56
2	LOCALE OF THE TRAINING PROGRAMME	58
3	BIODEGRADABLE WASTE DISPOSAL PRACTICES ADOPTED BY THE SELECTED HOUSEHOLDS	99
4	PROBLEMS FACED BY ACCUMULATION OF HOUSEHOLD WASTE	101
5.	EXISTING ENVIRONMENTAL CONDITIONS	104
6	DOMESTIC POLLUTANTS OF THE ENVIRONMENT	106
7	FACTORS INFLUENCING THE ADOPTION OF BIODEGRADABLE WASTE MANAGEMENT PRACTICES	120

LIST OF PLATES

PLATES NO	TITLE	PAGE NO
1	INTERACTION WITH HOMEMAKERS	63
2	HOME COMPOSTING- PORTABLE METHODS – MUD POT AND PLASTIC CONTAINER	70
3	FIELD COMPOSTING - PORTABLE METHODS – SILPAULIN VERMIBED	71
4	FIELD COMPOSTING - PERMANENT METHOD – COMPOST PIT	72
5	BIODEGRADABLE WASTE AS GROWTH BOOSTERS	73
6	BIODEGRADABLE WASTE AS PESTICIDES	74
7	BIODEGRADABLE WASTE AS FERTILIZERS	75
8	SPECIAL LECTURES	77
9	AUDIO- VISUAL AIDS USED	78
10	LECTURE CUM DEMONSTRATION	80
11	POSTERS USED DURING THE TRAINING PROGRAMME	81
12	CHARTS USED DURING THE TRAINING PROGRAMME	82
13	LEAFLET DISTRIBUTED DURING THE TRAINING PROGRAMME	83
14	QUANTITY OF KITCHEN WASTE AVAILABLE IN THE SELECTED HOUSEHOLDS	92
15	QUANTITY OF GARDEN WASTE GENERATED BY THE SELECTED HOUSEHOLDS	95
16	ADOPTION LEVEL OF BIODEGRADABLE WASTE MANAGEMENT PRACTICES	123
17	FIELD STUDY- VERMICOMPOSTING	130
18	FIELD STUDY- CULTIVATION OF VEGETABLES	131

LIST OF APPENDICES

APPENDIX NO.	TITLE	PAGE NO
I	INTERVIEW SCHEDULE TO ELICIT INFORMATION ON BIODEGRADABLE WASTE MANAGEMENT IN THE SELECTED HOUSEHOLDS	168
II	MONOGRAPH	174
III	BOOKLETS AND PAMPHLET	181
IV	KNOWLEDGE INVENTORY TO TEST THE KNOWLEDGE OF THE LEADERS BEFORE AND AFTER TRAINING PROGRAMME	192
V	ATTITUDE SCALE USED PRIOR TO AND AFTER THE TRAINING PROGRAMME	194
VI	STATISTICAL ANALYSIS OF KNOWLEDGE SCORES BEFORE AND AFTER THE TRAINING PROGRAMME	195
VII	STATISTICAL ANALYSIS OF KNOWLEDGE SCORES BEFORE AND AFTER THE TRAINING PROGRAMME	209
VIII	ANALYTICAL REPORT OF THE VERMICOMPOST	222
IX	DETAILS OF CASE STUDY CONDUCTED	223