

## RESULTS AND DISCUSSION

The findings of the study on “**Techno-Transfer through Intervention on Biodegradable Waste Management in Rural Settings**” are discussed and presented under the following headings:

- A. Household Survey
- B. Impact of the Training on Biodegradable Waste Management on the Women Leaders
- C. Impact of the Training on Biodegradable Waste Management on the Community

### A. HOUSEHOLD SURVEY

The findings of the household survey are discussed under the following headings:

1. Socio - Economic Profile of the Selected Households
2. Existing Biodegradable Waste Management Practices in the Selected Households
3. Prevailing Environmental Condition in the Selected Area

#### 1. Socio -Economic Profile of the Selected Households

The socio-economic profile reveals a clear picture on the age, type of family, family size, stages in the family life cycle, family income, type of house, type of land holding, educational and occupational status of the selected households.

Table V presents the data on the age, type of family, family size, stages in the family life cycle, income group, type of house and educational status of the selected households.

*“When the earth is sick and polluted, human health is impossible.....  
To heal ourselves we must heal our planet, and to heal our planet  
we must heal ourselves”*

*- Bobby McLeod*

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A maximum of 45 per cent of the homemakers of the selected villages belonged to the age group of 40 to 50 years.

Regarding type of family, a majority of about 64, 58, 60 and 70 per cent of the households from four villages namely Devarayapuram, Parameshwarapalayam, Selambanur and Viraliyur respectively belonged to nuclear family with an exemption of about 36 per cent of the homemakers from Pulahgoundanpudur village belonging to nuclear family. This shows the reducing trend of joint family system.

A maximum of 47 per cent of homemakers from these selected villages belonged to small family. Thirty four per cent of the homemakers belonged to medium family.

With regard to stages of families, a majority 70 per cent of the selected homemakers from the five selected villages belonged to expanding stage.

The standard of living of households is mostly based on its family income which would affect the economic status of the families. According to HUDCO (2009) classification, a majority 73 per cent of families from all the selected villages belonged to middle income group.

The household survey revealed that, out of 250 households in five selected villages, 90 per cent were residing in their own house while the rest were living in rented house.

Educational status of the women is an important variable. The perception of cleanliness, environmental management and garbage management are likely to be influenced by their educational status. Out of 250 homemakers, 37 per cent of homemakers were educated upto secondary education followed by 25 per cent of the homemakers holding higher secondary education. From the survey, it was also noted that, out of 250 homemakers, only four per cent were illiterate. It is encouraging to note that all the homemakers in Pulahgoundanpudur village were literates.

#### **b. Occupational Status**

Occupational status is always considered as the important index for determining social status. The occupation also determines the standard of living of the households.

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Regarding occupational status for cent per cent of the homemakers from the selected five villages, agriculture was the main occupation and they were also involved with its allied business.

### **c. Type of land holding**

Household survey revealed that the households possessed both dry and wet land. Eighty three per cent of households from the five selected villages possessed dry land while 62 per cent of the households possessed wetland.

## **2. Existing Biodegradable Waste Management Practices in the Selected Households**

Household waste is waste which is generated during day to day operations of a household. It can include everything from lawn clippings to burnt out light bulbs (<http://www.wisegeek.com>, 2014). Nearly 30- 50 per cent of waste materials generated at household were biodegradable.

The findings of the existing biodegradable waste management practices in the selected households are discussed under the following headings

- a. Quantum of kitchen waste available in the selected households
- b. Quantum of general waste available in the selected households
- c. Quantum of garden waste available in the selected households
- d. Total quantum of biodegradable waste available in the selected households
- e. Type of bin used for collecting the biodegradable waste
- f. Frequency of disposal of waste
- g. Personnel in-charge of disposing the waste
- h. Method of disposal of waste
- i. Problems faced due to accumulation of household waste and
- j. Methods of reusing household waste

### **a. Quantum of kitchen waste available in the selected households**

In order to calculate the quantity of waste generated by a family, the selected households were classified as small, medium and large because the amount of waste varies according to family size. Devipriya (2013) revealed that every household generates a considerable amount of waste which is generally organic (kitchen waste) and inorganic in nature.

From the above table it is evident that the average quantity of kitchen waste generated per day in the selected households were 0.144 kilogram of raw foods, 0.252 kilogram of vegetable peels, 0.080 kilogram of left-over food, 0.221 kilogram of fruit peelings, 0.042 kilogram of tea and coffee powder, 0.086 kilogram of egg and coconut shells and 0.044 kilogram of bone and meat waste.

#### **b. Quantum of General waste available in the selected households**

Waste emanating, typically, from homes and offices, although classified as general waste, this waste contains organic substances and small volumes of hazardous substances as well (Herselman and Moodley, 2008).

Table VII shows the quantity of general waste available in the selected households.

It is evident from the above table that the quantity of the general waste generated per day in the selected households were 0.150 kilogram of newspapers, 0.075 kilogram of tins/ bottle/ plastic container, 0.056 kilogram of magazines, 0.033 kilogram of packets/ paper bags/ polythene bags, and 0.016 kilograms of miscellaneous substances such as refill, match boxes, computer paper, tooth paste tube.

#### **c. Quantum of garden waste available in the selected households**

A home and garden waste containment system facilitates householders to divert organic kitchen and garden waste materials away from landfill. The resulting compost can be added to garden soil to complete the natural carbon cycle, thereby avoiding the generation of greenhouse gases in the collection, transportation, and anaerobic decomposition processes that would otherwise occur (<http://www.motherson.com> ; Zany muse, 2013).

Table VIII and Plate 15 shows the quantity of garden waste available in the selected households

The above table shows that, on an average, 1.160 kilograms of garden leaves, 10.8 kilograms of animal waste and 1.300 kilograms of miscellaneous waste such as stems of various plants, plant stems, unusable coconuts and unusable vegetables were generated by the selected households as garden waste per day.

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#### **d. Average quantity of biodegradable waste available in the selected households**

Table IX shows the average quantity of biodegradable waste available in the selected households

From the above table, it is clear that, on an average 13.384 kilograms of biodegradable wastes were generated by the selected households per day. This quantity of biodegradable waste generated every day makes the total average quantity to about 200.76 kilograms per month and 2409.15 kilogram per year. Chaudhari *et al.*, (2011), opined that solid waste generated in the residential complex is a good feedstock for vermiculture and can be treated through vermicomposting (eco-friendly method) and recycled as manure in agricultural farms.

#### **e. Type of bins used for collecting the biodegradable waste**

The below Table X shows that the type of bins used for collecting the biodegradable waste.

Majority (61 per cent) of the households were collecting the waste in the plastic bin which may be attributed to the reasons like easy availability, less cost, easy handling and maintenance. The study conducted by George (2013) also indicated that the respondents used containers like plastic containers, old buckets, polythene bags and dustbins to store solid waste.

#### **f. Frequency of disposal of waste**

The frequency of the waste disposal depends on quantum of waste generated. Cent per cent of the households were disposing kitchen waste every day and 66 per cent of the households were disposing garden waste on alternative days and 24 per cent disposing the same on weekly basis.

#### **g. Personnel in-charge of disposing the waste**

The table XI shows the personnel in-charge of disposing the waste

It is clear from the above table that, out of 250 households, 72 per cent of the homemakers were responsible for disposing the household waste. The result shows the significance of training of women on biodegradable waste management to safeguard the environment and households. Karout *et al.*, (2012) also stated that 72 per cent of the women were responsible for disposing the waste.

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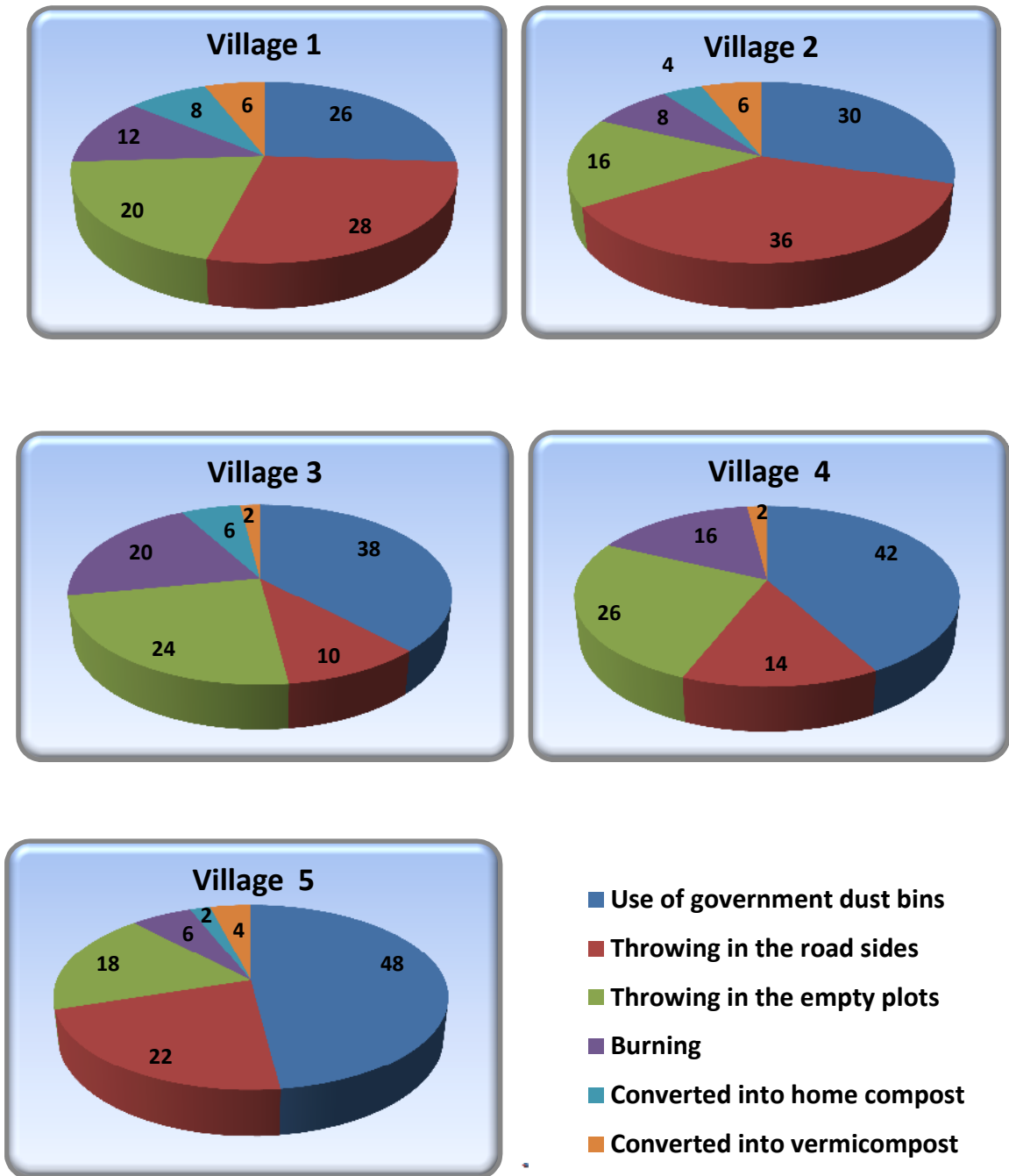
#### **h. Biodegradable waste disposal practices adopted by the selected households**

Table XII and Figure 3 shows the biodegradable waste disposal practices adopted by theselected households

**TABLE XII**  
**BIODEGRADABLEWASTE DISPOSAL RRACTICES ADOPTED BY**  
**THESELECTED HOUSEHOLDS**

Sl. No	Disposal practices	Percentage of households (N-250)					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Use of government dust bins	26	30	38	42	48	37
2.	Throwing in the road sides	28	36	10	14	22	22
3.	Throwing in the empty plots	20	16	24	26	18	21
4.	Burning	12	8	20	16	6	12
5.	Converted into home compost	8	4	6	-	2	4
6.	Converted into vermicompost	6	6	2	2	4	4
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Out of 250 households from the selected villages, about 37 per cent of homemakers were using government dust bins. The study revealed that, around 22 per cent and 21 per cent of homemakers used to throw the household wastes on the road side and on nearby empty plots respectively. This is the reason for the environment becoming unhygienic and causing many health problems. Burning of the waste near the houses were also still in practice by 12 per cent of the selected households that might increases the environmental pollution. Only four per cent each of selected households practice home composting and vermicomposting methods for disposing the biodegradable waste.



**FIGURE3**

**BIODEGRADABLEWASTE DISPOSAL RRACTICES ADOPTED BY THESELECTED HOUSEHOLDS**

## i. Problems faced by the households due to accumulation of household wastes

All over the world, every human being creates waste as a result of improved living standards. The amount of waste generation is increasing day by day and the accumulation of waste causes many problems (Rathi, 2007).

The few garbage containers (bins) placed by the municipality corporations at vantage point usually overflows and were the main cause for environmental pollution (Ameyewet *al.* 2010). The adoption of hygienic and smart methods for disposing the waste is of very serious concern.

Table XIII and Figure 4 shows the problems by the accumulation of household waste as mentioned by the homemakers

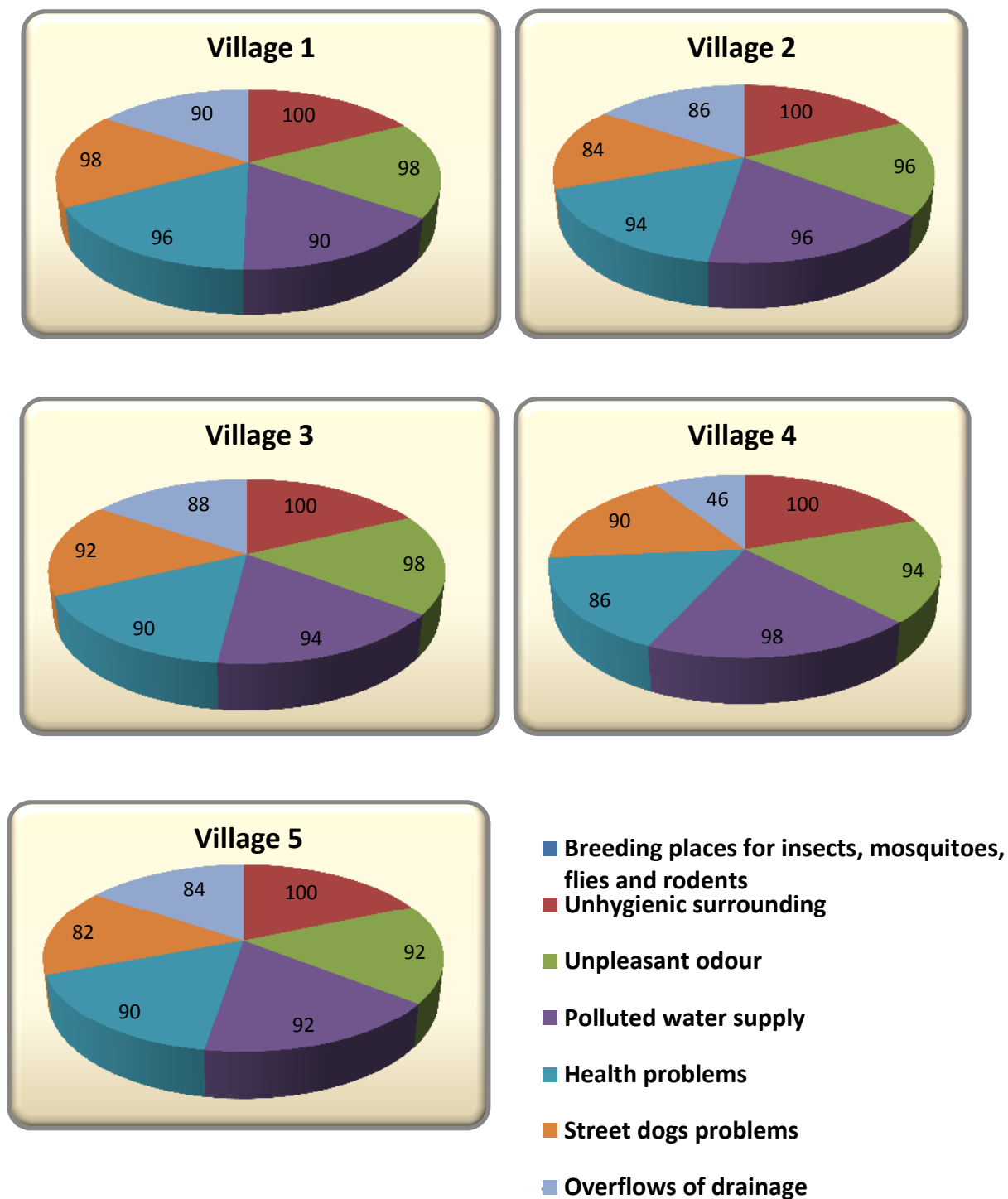
**TABLE XIII**  
**PROBLEMS FACED BY ACCUMULATION OF HOUSEHOLD WASTE**

(N-250)\*

S.No	Problems*	Percentage of homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
		%	%	%	%	%	%
1	Breeding place for insects, mosquitoes, flies and rodents	100	100	100	100	100	100
2	Unhygienic surrounding	100	100	100	100	100	100
3	Unpleasant odour	98	96	98	94	92	96
4	Polluted water supply	90	96	94	98	92	94
5	Health	96	94	90	86	90	92
6	Street dogs	98	84	92	90	82	89
7	Overflowing of drainage	90	86	88	46	84	87

### \*Multiple responses

Generally, homemakers face problems in disposing the waste. The data from the above table reveals that cent per cent of the homemakers from five selected villages faced problems like insects, mosquitoes, flies and breeding of rodents due to accumulation of wastes and unhygienic surroundings. About 96 and 94 per cent of the homemakers felt unpleasant odour and polluted water supply as the next major problems. Health problems, street dogs and overflowing of drainage were the other problems reported by the homemakers, due to accumulation of waste.



**FIGURE 4**  
**PROBLEMS FACED BY ACCUMULATION OF HOUSEHOLD WASTE**

## j) Methods of reusing household waste

The table XIV shows the methods of reusing the households waste

**TABLE XIV**  
**METHODS OF REUSING HOUSEHOLD WASTE BY THE**  
**SELECTED HOUSEHOLDS**

(N=250)

Sl. No	Method of reusing	Percentage of the households					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	<b>Kitchen waste</b>						
	Throwing	86	90	92	98	94	92
	Composting / Vermicomposting	14	10	8	2	6	8
2.	<b>Newspaper*</b>						
	Sold to vendor	100	100	100	100	100	100
	Wrapping articles	26	58	36	44	62	45
	Cleaning glass	4	-	12	8	14	8
3.	<b>Bottles*</b>						
	Sold to vendor	100	100	100	100	100	100
	Storing items	96	78	84	92	82	86
4.	<b>Plastic covers*</b>						
	Reused- carry bag, keeping vegetables	100	100	100	100	100	100
	Using as dustbin	100	100	100	100	100	100
	Sold to vendor	16	6	-	10	4	6

### \*Multiple Responses

The above table depicts that out of 250 households, only 8 per cent of the households were practicing composting/ vermicomposting methods and the rest 92 per cent homemakers mismanage the waste by throwing it in different places.

It could also be seen that cent per cent were selling the newspapers and bottles to the vendors. About 86 per cent of homemakers expressed that they use bottles for storing household items.

Cent per cent of the homemakers were reusing the plastic bags for various purposes like dustbins, storing vegetables and also used the bags to carry something.

### 3. Prevailing Environmental Conditions in the Selected Area

The prevailing environmental condition in the selected area is discussed under the following aspects:

- a) Existing environmental condition
- b) Reasons for environmental degradation
- c) Type of domestic pollutants
- d) Need for clean environment

#### a) Existing environmental condition

Table XV and Figure 5 shows the responses of the homemakers on the existing environmental conditions

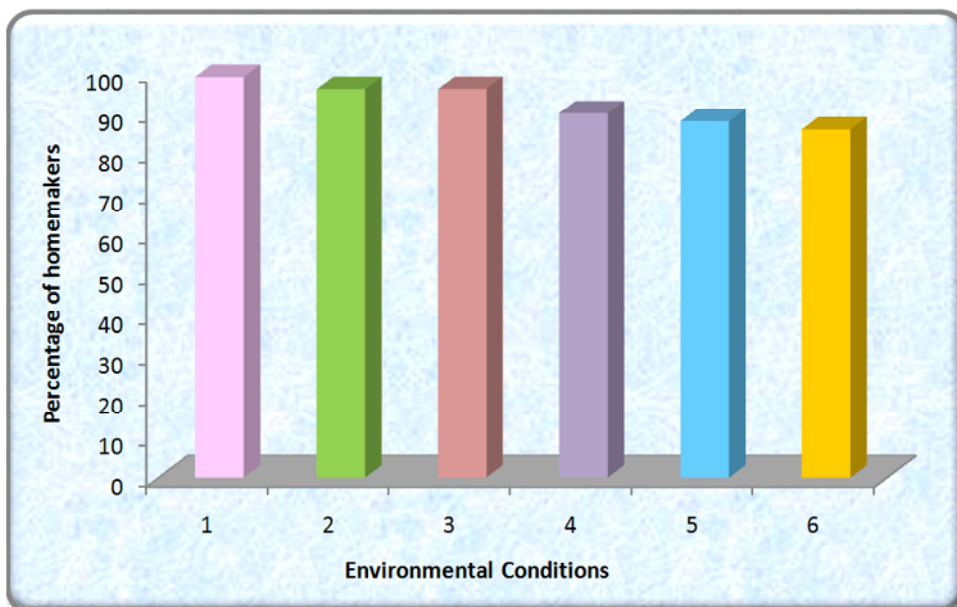
**TABLE XV**  
**EXISTING ENVIRONMENTAL CONDITIONS**

**(N=250)**

Sl. No	Conditions*	Percentage of homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Surface water contamination due to waste disposal in water bodies	100	96	100	98	100	99
2.	Increased atmospheric temperature	98	96	96	96	94	96
3.	Soil contamination and toxic effect of soil	96	94	94	96	98	96
4.	Loss of biodiversity	96	90	86	88	88	90
5.	Increased generation of Industrial, commercial waste	88	92	86	84	90	88
6.	Air pollution	86	88	88	84	86	86

#### \*Multiple Responses

The above table reveals that, out of 250 homemakers, a majority of homemakers (99 per cent) expressed that contamination of surfaced water is an hazard to the existing environment. Raised atmospheric temperature, loss of biodiversity, increased generation of industrial commercial waste and air pollution were the other responses expressed by homemakers on existing environmental hazards which causes environmental degradation.



**FIGURE 5**  
**EXISTING ENVIRONMENTAL CONDITIONS**

1. Surface water contamination due to waste disposal in water bodies
2. Increased atmospheric temperature
3. Soil contamination and toxic effect of soil
4. Loss of biodiversity
5. Increased generation of Industrial, commercial waste
6. Air pollution

## b) Reasons for environmental degradation

Man's activities disturb the co-balance by deteriorating the environmental conditions. Population explosion along with urbanization and industrialization have greatly increased the environmental pollution (Devi Priya, 2005).

The homemakers were asked to indicate the reasons for environmental degradation. The responses obtained are shown in Table XVI.

**TABLE XVI**  
**REASONS FOR ENVIRONMENTAL DEGRADATION**

(N=250)

Sl. No.	Reasons*	Percentage of homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Lack of knowledge on disposal of waste	98	96	100	98	94	97
2.	Indiscriminate throwing of waste	92	94	92	90	96	93
3.	Improper management of waste	96	98	84	92	90	92
4.	Lack of environmental awareness	98	94	90	86	92	92
5.	Improper collection of waste by Government Agency	96	84	94	86	96	91
6.	Mishandling of dustbins	86	90	96	88	92	90
7.	Laziness of managing waste in a proper manner	76	80	66	82	78	76
8.	Population explosion	32	46	36	40	50	40
9.	Lack of space and provision for disposal	50	24	42	30	38	37

### \*Multiple responses

The above table reveals that 97, 93 and 92 per cent stated that lack of knowledge on disposal of waste, indiscriminate throwing of waste and improper management of waste respectively as the major reason for environmental degradation.

*“Environmental problems are really social problems...they begin with people as the cause, and end with people as victims”*

**- Edmund Hillary**

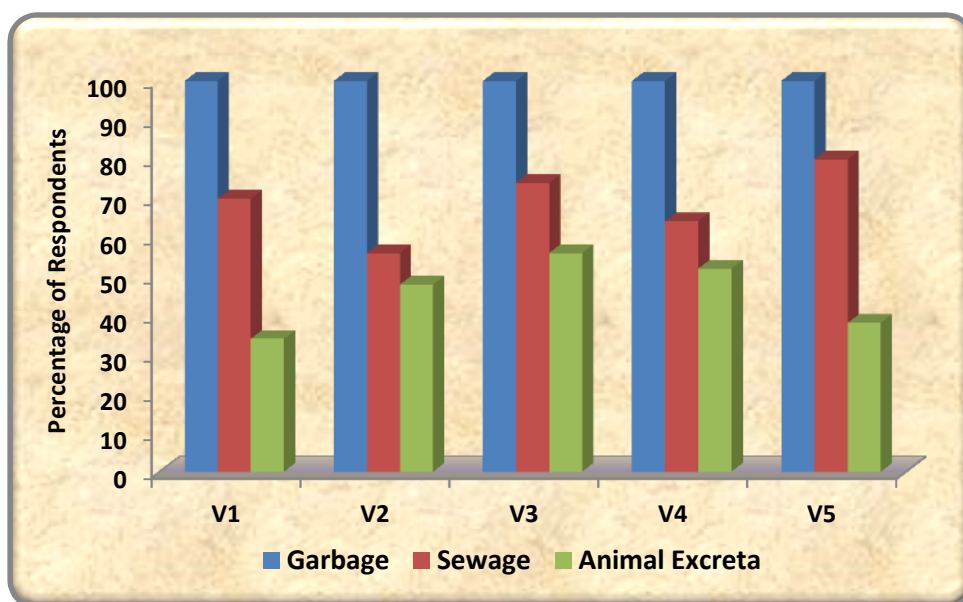
### c) Type of domestic pollutants

Various types of domestic pollutants affects the home environment. A pollutant thus may be any chemical substances or physical agent that is released intentionally or inadvertently by man into the environment in such a concentration that may have adverse or unpleasant effect (Adetolaet *al.*, 2009). Table XVII and Figure 6shows the type of pollutants that occur in the households.

**TABLE XVII**  
**DOMESTIC POLLUTANTS OF THE ENVIRONMENT**  
**(N=250)\***

Sl. No	Particulars*	Percentage of respondents					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Garbage	100	100	100	100	100	100
2.	Sewage	70	56	74	64	80	69
3.	Animal Excreta	34	48	56	52	38	46

#### \*Multiple responses



**FIGURE 6**  
**DOMESTIC POLLUTANTS OF THE ENVIRONMENT**

The above table clearly indicates that garbage was the major pollutant which causes environmental hazards as indicated by the homemakers.

**d) Need for clean environment**

"Culturally, legally, morally and existentially we need to move to a deeper understanding and recognition of the fact that human well-being and even economic growth are underpinned by a clean and healthy environment," (Ansari, 2013).

Table XVIII presents the data on the need for clean environment as expressed by the selected homemakers.

**TABLE XVIII  
NEED FOR CLEAN ENVIRONMENT**

**(N=250)**

Sl. No	Aspects*	Percentage of the homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Good health	100	100	100	100	100	100
2.	Clean atmosphere	98	96	98	90	94	95
3.	Tidy surrounding	98	100	94	96	98	95
4.	Mental satisfaction	92	84	86	92	88	88
5.	Life satisfaction	88	76	84	78	82	82

**\*Multiple responses**

It is clear from the table that cent per cent of the homemakers from the five selected villages felt the need for a clean environment to ensure good health. Clean atmosphere and tidy surroundings, mental relaxation and life satisfaction were the other opinions expressed by the homemakers.

**B. IMPACT OF TRAINING ON BIODEGRADABLE WASTE MANAGEMENT ON THE WOMEN LEADER**

The impact of the training programme on “Techno-Transfer through Intervention on Biodegradable Waste Management in Rural Settings” by the selected women leaders were assessed in terms of the following,

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**I. Knowledge gained by the women leaders**

- i. Knowledge gained by the women leaders before the training programme by socio - demographic variables
- ii. Knowledge gained by the women leaders after the training programme by socio - demographic variables
- iii. Knowledge score before and after the training programme

**II. Attitudes of the leaders towards training programme**

- i. Attitude score before training by socio - demographic variables
- ii. Attitude score after training by socio - demographic variables
- iii. Attitude Score Before and After training programme

**III. Effectiveness of teaching methods as expressed by the leaders**

**I. Knowledge gained by the women leaders**

- i. Knowledge gained by the women leaders before the training programme by socio - demographic variables**

Knowledge gained by the women leaders before the training programme by socio - demographic variables is presented in Table XIXI

**II. Attitudes of the leaders towards training programme**

- i. Attitude score before training by socio-demographic variables**

Table XXII presents the attitude score before training by socio-demographic variables.

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## **C. THE TRAINING ON BIODEGRADABLE WASTE MANAGEMENT ON THE COMMUNITY**

Impact of “Techno –Transfer through Intervention on Biodegradable Waste Management Practices in Rural Settings” on the community are discussed under the following heads

1. Participation of community in the training programme
2. Factors influencing the adoption of biodegradable waste management practices by the community
3. Adoption level of biodegradable waste management practices
4. Comparison of NPK content of two different composts
5. Opinion regarding biodegradable waste management practices
6. Changes in the behavior towards biodegradable waste management and
7. Economic benefits accrued through biodegradable waste management practices- A case study

A training programme was planned and systematically conducted using different methods of communication. With the help of the awareness programme, knowledge was instilled on the aspects of environmental sanitation, household biodegradable waste management practices and protection of environment, in the minds of the homemakers to make them aware of several issues namely, environmental problems, the need for clean environment, knowledge on household waste disposal, home composting and growing vegetables. The homemakers showed interest, initiative and willingness to acquire knowledge and communicate the same to other families.

### **1) Participation of the community in the training programme**

Table XXVI presents the participation of the community in the training programme.

**TABLE XXVI**

**PARTICIPATION OF THE COMMUNITY IN THE TRAINING PROGRAMME**

Sl. No	Method of communication	Number of Participant																							
		V1				V2				V3				V4				V5				Total			
		W	SC	Y	M	W	SC	Y	M	W	SC	Y	M	W	SC	Y	M	W	SC	Y	M	W	SC	Y	M
1.	Demonstration	12	6	3	2	13	3	1	1	12	1	1	1	10	3	2	3	11	4	2	1	58	17	9	8
2.	Meeting	20	4	-	3	22	5	2	2	24	4	2	3	20	7	1	2	21	8	3	1	107	28	8	11
3.	Exhibition	10	3	2	4	12	2	2	3	11	3	1	2	11	2	2	4	9	5	2	2	53	15	9	15
4.	Film and slide	20	7	2	3	15	4	4	3	19	2	2	3	18	5	4	2	15	6	4	2	87	22	16	13
5.	Field visit	6	2	1	2	10	3	3	1	14	2	-	1	7	3	1	1	10	5	3	-	47	15	8	5
<b>Total</b>		<b>68</b>	<b>22</b>	<b>8</b>	<b>14</b>	<b>72</b>	<b>17</b>	<b>12</b>	<b>10</b>	<b>80</b>	<b>12</b>	<b>6</b>	<b>10</b>	<b>66</b>	<b>20</b>	<b>10</b>	<b>12</b>	<b>62</b>	<b>28</b>	<b>14</b>	<b>6</b>	<b>352</b>	<b>97</b>	<b>50</b>	<b>52</b>

**W= Women, SC= School children, Y= Youth, M =Men**

The above table reveals that women participation was higher than men, youth and children in the training programme. The school children, the budding pillars of the nation, were enlightened about the hazards of environmental degradation and the need for the environmental management and protection. It is encouraging to see that the participation of school children was high compared to men. The younger generation with strong will power coupled with tremendous energy is expected to transform the present situation and solve the economic and environmental crisis in future.

Karout et al. (2012) also stated that women, as homemakers, play a pivotal role in waste in organizing waste collection campaigns and other activities related to waste and helping to motivate other household members towards spreading awareness of good waste management.

## 2) Factors influencing the adoption of biodegradable waste management practices

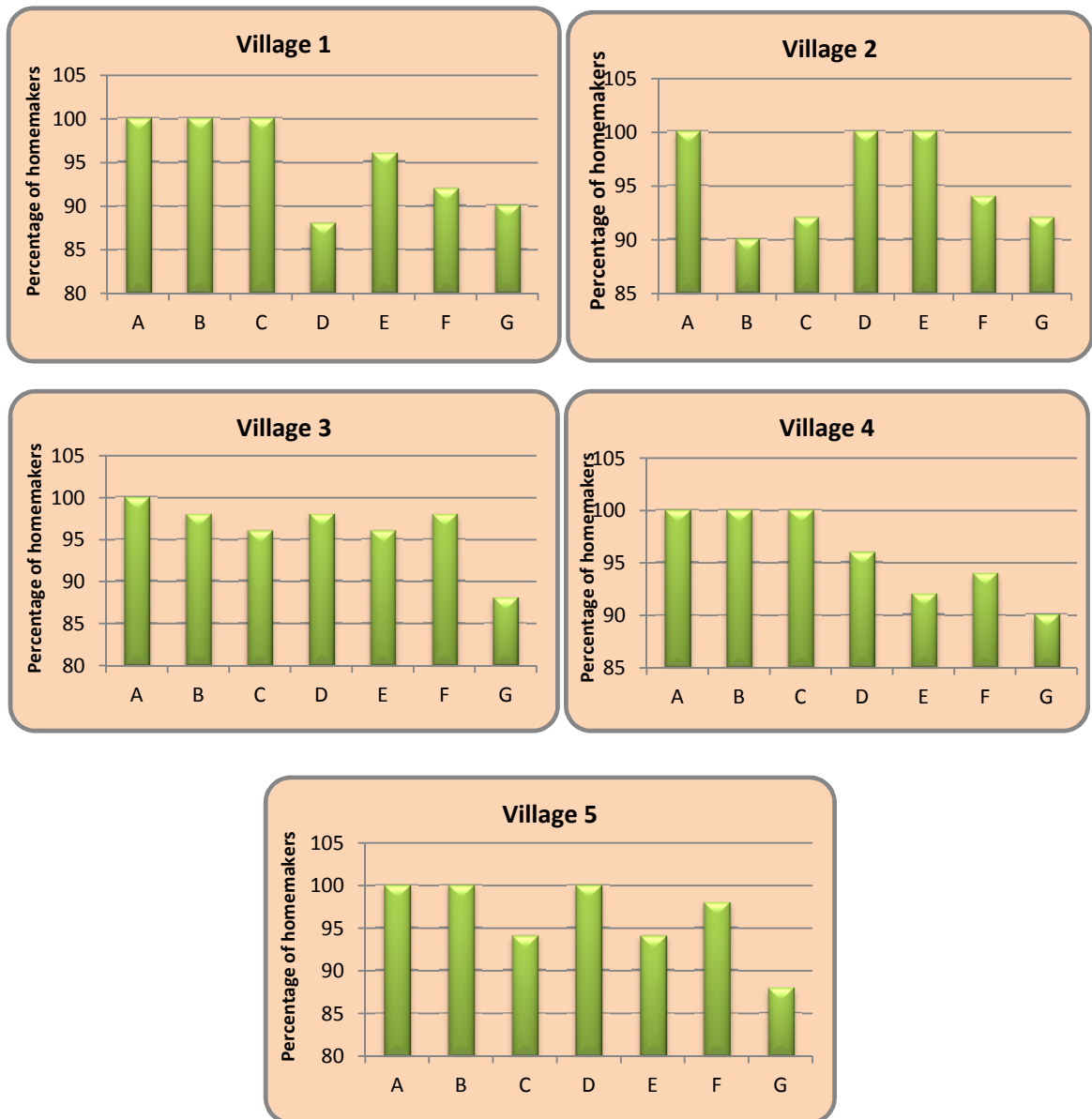
All the women who attended the training programme came forward to adopt home composting. The factors which motivated them to adopt biodegradable waste management practices are presented in Table XVII and Figure7.

**TABLE XXVII**  
**FACTORS INFLUNCING THE ADOPTION OF BIODEGRADABLE**  
**WASTE MANAGEMENT PRACTICES**

(N=250)

Sl. No	Factors*	Percentage of homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Easy to adopt	100	100	100	100	100	100
2.	Low cost and durable	100	90	98	100	100	98
3.	Self interest	100	92	96	100	94	96
4.	Gained knowledge and motivation	88	100	98	96	100	96
5.	Getting green manure for home garden	96	100	96	92	94	96
6.	Safeguarding the environment	92	94	98	94	98	95
7.	Creating eco-friendly environment	90	92	88	90	88	90

\*Multiple responses,



- A - Easy to adopt
- B - Low cost and durable
- C - Self interest
- D - Gained knowledge and motivation
- E - Getting green manure for home garden
- F - Safeguarding the environment
- G - Creating eco-friendly environment

**FIGURE 7**  
**FACTORS INFLUNCING THE ADOPTION OF BIODEGRADABLE WASTE MANAGEMENT PRACTICES**

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Cent per cent of homemakers in the selected five villages stated that the main factor influencing the adoption of home composting were its ease of adoption while 98 per cent felt that it is economical and durable. Self-interest, thirst knowledge and motivation, obtaining of green manure, to safeguard the environment and creating eco-friendly environment were the other opinions expressed by the homemakers as the factors influencing adoption of biodegradable waste management practices.

### **3) Adoption level of the home composting after the training programme**

After providing training on biodegradable waste management practices through home composting and vermicomposting methods, the homemakers were encouraged to adopt the biodegradable waste management practices effectively. The adoption level of home composting methods is given in Table XXVIII and Plate 16.

**TABLE XXVIII**  
**ADOPTION OF HOME COMPOSTING METHODS BEFORE AND AFTER THE**  
**CONDUCT OF TRAINING PROGRAMME**

**(N-250)\***

Sl. No	Composting through*	Adopted level in percentage																							
		Before the training programme												After the training programme											
		V1 (N=50)		V2 (N=50)		V3 (N=50)		V4 (N=50)		V5 (N=50)		Total (N=250)		V1 (N=50)		V2 (N=50)		V3 (N=50)		V4 (N=50)		V5 (N=50)		Total (N=250)	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1.	Mud pot	-	-	-	-	-	-	-	-	-	-	-	-	4	8	5	10	1	2	8	16	7	14	25	10
2.	Plastic container	5	10	2	4	9	18	4	8	7	14	27	10.8	46	92	45	90	49	98	42	84	43	86	225	90
3.	Silpaulinvermibed	2	4	1	2	-	-	3	6	-	-	6	2.4	29	58	25	50	27	54	30	60	31	62	142	57
4.	Compost pit	-	-	2	4	4	8	2	4	3	6	11	4.4	10	20	15	30	31	62	24	48	28	56	108	43

**\*Multiple Responses**

**N= Number, %= Percentage, V= Village**

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It could be revealed from the above table that with regard to the adoption level of home composting at household level, none of them were adopting mud pot before training, 10 per cent had started adopting the method of home composting after undergoing the training programme. Before the training programme, 11 per cent of homemakers were practicing home composting techniques by using plastic container and after the training programme, 90 per cent started adopting the same. The adoption level of home composting by using plastic container is higher than the mud pot due to reasons like low cost, easy handling, easily availability, portability, easy maintenance and durability. The price of a mud pot was ₹ 1500/- while the plastic container was ₹ 420/-. The cost of plastic bins was more economical which has also motivated the homemakers to use it for composting.

At the field level, maximum percentages of the households were adopting silpaulinvermibed. The silpaulinvermibed is more efficient only at the field level because it is a readily available readymade compost pit. One need to just fix it with six 4 ft. long bamboo stick and another major advantage is its portability. It is encouraging to note that 57 per cent and 43 per cent adopted silpaulinvermibed and compost pit respectively in the five selected villages after undergoing the training programme.

#### **4) Comparison of NPK content of two different composts**

From the household survey, the results revealed that all the selected households were not having garden waste (animal waste) for vermicomposting. Hence the investigator made an attempt to analyse the NPK content of the decomposed kitchen waste and kitchen waste with garden waste (animal waste). This helped to find out the difference in the NPK content of two different composts. Table XXIX presents a comparison of NPK content of two different compost samples. The Analytical report of the vermicompost is given in Appendix VIII.

**TABLE XXIX**  
**COMPARISON OF NPK CONTENT OF TWO DIFFERENT COMPOSTS**

<b>Parameters</b>	<b>Kitchen Waste</b>	<b>Kitchen waste with garden (animal) waste</b>
pH	6.68	6.83
EC (dSm <sup>-1</sup> )	0.86	0.70
Moisture (%)	45	38
Organic carbon (%)	20.28	21.40
Total Nitrogen (%)	0.55	0.65
Total Phosphorus (%)	0.42	0.68
Total Potassium (%)	0.76	0.88

The results revealed that the NPK content of compost made out of kitchen waste along with garden waste (animal waste) have an enhanced NPK value when compared to kitchen waste alone. However the NPK content of the compost prepared out of kitchen waste was good enough to help in the growth of the plants. Hence it could be concluded that we can use the compost prepared out of the kitchen waste alone which is almost equal to the animal waste. Wani (2002) also stated that vermiculture technology improves crop productivity by increasing soil fertility through ecological methods of farming. Similar study was done by Singh (2009) vermicompost processed by earthworms showed higher values of important plant nutrients for 'food & garden wastes'.

#### **5) Opinion regarding biodegradable waste management practices**

Table XXX explains the opinion regarding biodegradable waste management practices by the selected households.

**TABLE XXX**  
**OPINION REGARDING BIODEGRADABLE WASTE MANAGEMENT PRACTICES**

Sl. No	Opinion*	Percentage of homemakers					
		V1 (N-50)	V2 (N-50)	V3 (N-50)	V4 (N-50)	V5 (N-50)	Total (N-250)
1.	Availability of compost for kitchen garden	100	100	100	100	100	100
2.	Clean surroundings	100	100	100	100	100	100
3.	Creates eco-friendly environment	100	100	100	100	100	100
4.	Getting Fresh greens and vegetables	100	100	100	100	100	100
5.	Saves money	98	98	94	96	96	96
6.	Improve the health of the family members	92	94	92	92	94	93
7.	Self-satisfaction	86	88	90	92	90	89
8.	Prevents mosquito breeding	88	84	86	90	86	87
9.	Prevents health hazards	84	86	82	78	86	83
10	Reduces the environmental pollution	76	82	78	76	78	78
11	Leisure time activity	72	76	66	70	68	70

**\*Multiple responses**

Cent per cent of the homemakers from the selected villages opined that adoption of biodegradable waste management practices provides compost for their kitchen garden, maintains the surrounding clean, creates eco-friendly environment and provides fresh greens and vegetables devoid of chemical residues. Ninety six per cent of homemakers opined that through biodegradable waste management practices, they were able to save money while 93 per cent felt that it improves the health of the family members. Self-satisfaction by utilizing biodegradable waste as useful resource for cultivation of green and vegetable, prevention of mosquito breeding, health hazards, reducing environmental pollution and leisure time activity were the other opinions expressed by the homemakers on the biodegradable waste management practices. The

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study carried out by Karoutef *al.*(2012) also stated that the respondents opined that proper waste management prevents health hazards in the way that waste accumulation anywhere away from the house spreads disease and that collection of waste in closed container in the house prevents diseases.

## **6) Changes in the behavior towards biodegradable waste management**

Changes in the behavior of the homemakers towards biodegradable waste handling after attending the training programme were recorded. Table XXXI shows the impact of the awareness programme on the behavior towards biodegradable waste management.

TABLE XXXI

CHANGES IN THE BEHAVIOUR TOWARDS BIODEGRADABLE WASTE MANAGEMENT

(N-250)

SI No	OPINION*	CHANGES IN THE BEHAVIOUR LEVEL IN PERCENTAGE																									
		Before the training programme												After the training programme													
		V1 (N-50)		V2 (N-50)		V3 (N-50)		V4 (N-50)		V5 (N-50)		Total (N-250)		V1 (N-50)		V2 (N-50)		V3 (N-50)		V4 (N-50)		V5 (N-50)		Total (N-250)			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
1.	Collecting wastes in bins	15	30	10	20	12	24	9	18	11	22	57	22.8	50	100	50	100	50	100	50	100	50	100	50	100	250	100
2.	Proper disposal of biodegradable waste	6	12	10	20	7	14	9	18	9	18	41	16.4	50	100	50	100	50	100	50	100	50	100	50	100	250	100
3.	Segregating the waste	3	6	8	16	4	8	5	10	7	14	27	10.8	50	100	50	100	50	100	50	100	50	100	50	100	250	100
4.	Adopting home compost method	7	14	5	10	13	26	9	18	10	20	44	17.6	50	100	50	100	50	100	50	100	50	100	50	100	250	100
5.	Setting up kitchen garden	3	6	2	4	5	10	4	8	3	6	17	6.8	50	100	50	100	50	100	50	100	50	100	50	100	250	100
6.	Growing greens and vegetable by using compost manure	4	8	3	6	10	20	6	12	7	14	30	12	49	98	49	98	50	100	49	98	48	96	245	98		
7.	Using the waste water to garden	-	-	-	-	-	-	-	-	-	-	-	-	-	48	96	47	94	48	96	48	96	47	94	238	95.2	

\*Multiple responses

N= Number, %= Percentage

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Cent per cent of the homemakers expressed that after attending the training programme they were adopting biodegradable waste management practices such as proper disposal of biodegradable waste, segregation of waste, adoption of home composting methods and setting up kitchen garden and collecting wastes in bins . Ninety eight per cent were growing greens and vegetables by using compost manure and about 95 per cent were using the waste water for their garden. Abeyewickremeet *al.* (2012), also concluded in his study that community based waste management intervention was beneficial for the surrounding communities. Karoutet *al.* (2012) also reported the behaviour change towards waste management after the intervention programme.

### **7) Economic benefits accrued through biodegradable waste management practices – A case study**

Three households in each village belonging to the category–small (1-4 members), medium (4- 6 members) and large (above 6 members) size families from five selected villages constituting a total of fifteen households were selected for the case study. Willingness and co-operation of the homemakers also were taken into consideration. The study was conducted for a period of six months. Plate 17 and 18 shows the case study carryout in the field. The findings are discussed and presented under the following headings.

1. Socio-economic profile of the selected households
2. Average quantity of biodegradable waste generated by the selected households
3. Average quantity of vermicompost generated and its money value by the selected households
4. Money value of greens and vegetables produced by the selected households per cropping
5. Utilization of available biodegradable waste as growth boosters and botanical pesticides
6. Feasibility of waste management practices by the selected households
7. Economic benefits accrued through biodegradable waste management practices

## SUMMARY AND CONCLUSION

The study on “**Techno – Transfer through Intervention on Biodegradable Waste Management in Rural Settings**” was undertaken with the main objective of improving the knowledge and changing the attitudes of homemakers towards Biodegradable waste management to enhance the environmental conditions and economic status leading ultimately to healthy, happy and prosperous life.

Based on the biodegradable waste availability, five villages in Thondamuthur block of Coimbatore District was selected for this study which was conducted at three phases.

- A. Household Survey**
- B. Training on Biodegradable Waste Management Practices**
- C. Evaluation of the impact of the training programme**

### **A. Household Survey**

A Household survey was conducted in 250 households with equal representation from each of the five chosen villages using purposive sampling technique. An interview schedule was framed to elicit information on the quantity of household waste generated, methods of biodegradable waste disposal, problems faced and prevailing environmental conditions.

### **B. Training on Biodegradable Waste Management Practices**

Based on the problems faced and the areas of ignorance in management of household wastes, the training curriculum was framed and finalized to impart education on biodegradable waste management practices. In the first phase, a five day training on biodegradable waste management was given to 100 homemakers (trainees) who were willing to act as front line women leaders and deliver the messages learnt to their fellow members both men and women.

In the second phase, the training was given for a period of five days for the entire community. The communication methods used during the training

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programmewerelectures, participatory discussion, practical demonstration, slide shows, public meeting and field visits. The Audio- Visual aids used during the training programme were charts, posters, pamphlet, booklets, leaflet and monograph.

### **C. Evaluation of the impact of the training programme**

The impact of the training programme was evaluated in terms of knowledge gained, attitudes developed by the leaders and economic benefits accrued by adoption of biodegradable waste management practices by the selected households and the entire community.

#### ***The major findings are summarized below,***

- A maximum of 45 per cent of the homemakers of the selected villages belonged to the age group of 40 to 50 years.
- According to HUDCO (2009) classification, 73 per cent of families from all the selected villages belonged to middle income group.
- Out of 250 homemakers, 37 per cent of homemakers were educated upto secondary education followed by 25 per cent of the homemakers holding higher secondary education. It is encouraging to note that all the homemakers in Pulahgoundanpudurvillage were literates
- For cent per cent of the homemakers from the selected five villages, agriculture was the main occupation and they were also involved in its allied business.
- Household survey revealed that the households possessed both dry and wet land. Eighty three per cent of households from the five selected villages possessed dry land while 62 per cent of the households possessed wet land.
- The average quantity of kitchen waste generated per day in the selected households were 0.144 kilogram of raw foods, 0.252 kilogram of vegetable peels, 0.080 kilogram of used left-over food, 0.221 kilogram of fruit peelings, 0.042 kilogram of used tea and coffee powder, 0.086 kilogram of egg and coconut shells and 0.044 kilogram of bone and meat waste.

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- The quantity of the general waste generated per day in the selected households were 0.150 kilogram of newspapers, 0.075 kilogram of tins/ bottle/ plastic container, 0.056 kilogram of magazines, 0.033 kilogram of packets/ paper bags/ polythene bags, and 0.016 kilogram of miscellaneous substances such as refill, match boxes, usedtooth paste tube.
  - On an average, 1.160 kilograms of garden leaves, 10.8 kilograms of animal waste and 1.300 kilograms of miscellaneous waste such as stems of various plants, spoiled coconuts and vegetables were generated by the selected households as garden waste per day.
  - On an average 13.384 kilograms of biodegradable wastes were generated by the selected households per day. This quantity of biodegradable waste generated every day makes the total average quantity to about 200.76 kilograms per month and 2409.15 kilogram per year.
  - A Majority (61 per cent) of the households were collecting the waste in the plastic bin which may be attributed to the reasons like itseasy availability, less cost, easy handling and maintenance.
  - Seventy two per cent of the homemakers were responsible for disposing the household waste. The result shows the significance of training women on biodegradable waste management to safeguard the environment and households.
  - About 37 per cent of homemakers were using government dust bins. The study revealed that, around 22 per cent and 21 per cent of homemakers used to throw the household wastes on the road side and on nearby empty plots respectively. Burning of the waste near the houses were also still in practice by 12 per cent of the selected households that might increases the environmental pollution. Only four per cent of the selected households practice home composting and vermicomposting methods for disposing the biodegradable waste.
  - Cent per cent of the homemakers from five selected villages faced problems due to accumulation of wastes like breeding of insects, mosquitoes, flies and rodents that causes unhygienic surroundings. The next major problemswere

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unpleasant odour and polluted water supply as reported by 96 and 94 per cent of the homemakers respectively. Health problems, street dogs and overflowing of drainage were the other problems reported by the homemakers, due to accumulation of waste.

- Only eight per cent of the households were practicing composting/vermicomposting methods and the rest 92 per cent homemakers mismanage the waste by throwing it in different places. It could also be seen that cent per cent were selling the newspapers and bottles to the vendors. About 86 per cent of homemakers expressed that they use bottles for storing household items. Cent per cent of the homemakers were reusing the plastic bags for various purposes like dustbins, storing vegetables and also used as carry bags.
- A majority (99 per cent) of homemakers expressed that contamination of surface water is a hazard to the existing environment. Raised atmospheric temperature, loss of biodiversity, increased generation of industrial/ commercial waste and air pollution were the other responses expressed by homemakers.
- Ninety Seven, 93 and 92 per cent stated that lack of knowledge on disposal of waste, indiscriminate throwing of waste and improper management of waste respectively as the major reason for environmental degradation.
- Garbage was the major pollutant which causes environmental hazards as indicated by the homemakers.
- Cent per cent of the homemakers from the five selected villages felt the need for a clean environment to ensure good health. Clean atmosphere and tidy surroundings, mental relaxation and life satisfaction were the other opinions expressed by the homemakers.

## **IMPACT OF THE TRAINING PROGRAMME**

- Before the training programme there is no significant difference in the knowledge score by socio-demographic variables such as age, type of family, size of family, stages in family life cycle, monthly income and educational status.
- It is inferred that except in the case of variable – stages in family life cycle (knowledge score difference was significant at one per cent level), all the other

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variables such as age, type of family, size of family, monthly income and educational status does not show any significant difference in knowledge score after the training programme.

- Before training, the mean score for knowledge was found to be 6.94 for the selected trainees. After training the same has increased to 33.87. The calculated t-value 102.716 is higher than the table value of 2.627 at 1% level of significance. Since the calculated value is higher than the table value it is inferred that the mean of knowledge scores differ significantly before and after the training and thus it proves the fruitful outcomes of the training programme on biodegradable waste management and also the interest of the women leaders to learn and adopt new concepts and technology which paves the way for changing the knowledge of the women leaders.
- The attitude score before the training programme does not vary by variables such as type of family, monthly income and educational status. Five per cent level of significance was observed in the attitude score before training in the variable – stages of family life cycle and one per cent level of significant difference in the attitude score was observed before training in the variables such as age and size of the family.
- It is revealed that the attitude scores by socio-demographic variables such as age, type of family, size of family, stages in family life cycle, monthly income and educational status does not vary significantly after the training programme.
- Before training, the mean score for attitude was found to be 34.95 for the selected trainees. After training the same has increased to 95.90. The paired t-test was applied to find out whether the mean of attitude scores differ significantly between before and after training. The calculated t-value is 66.943 which was higher than the table value of 2.627 at 1% level of significance. Since the calculated value is higher than the table value it is inferred that the mean of attitude scores differ significantly between before and after the training programme which emphasize that the training programme has a positive impact on the change of attitude of leaders in the adoption of biodegradable

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waste management to protect environment for the betterment of the human living.

- Correlation – The correlation between knowledge and attitude score was found out to be ( $r = -0.118$ ). This shows that there is a negative correlation between knowledge and attitude scores. However the  $r$  value shows that there is less correlation between knowledge and attitude which is found to be not significant at 5% level.
- The participation of women in the training programme was higher than men, youth and children.
- Cent per cent of homemakers in the selected five villages stated that the main factor influencing the adoption of home composting were its ease of adoption while 98 per cent felt that it is economical and durable. Self-interest, thirst for knowledge and motivation, availability of green manure, to safeguard the environment and creating eco-friendly environment were the other opinions expressed by the homemakers as the factors influencing adoption of biodegradable waste management practices.
- None of them were adopting mud pot before training, 10 per cent had started adopting the method of home composting after undergoing the training programme. Before the training programme, 11 per cent of homemakers were practicing home composting techniques by using plastic container and after the training programme, 90 per cent started adopting the same.
- It is encouraging to note that 57 per cent and 43 per cent adopted silpaulin vermibed and compost pit respectively in the selected villages after undergoing the training programme.
- NPK content of compost made out of kitchen waste along with garden waste (animal waste) have an enhanced NPK value when compared to kitchen waste alone. However the NPK content of the compost prepared out of kitchen waste was good enough to help in the growth of the plants. Hence it could be concluded that we can use the compost prepared out of the kitchen waste alone which is almost equal to the animal waste.

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- Cent per cent of the homemakers expressed that after attending the training programme they were adopting biodegradable waste management practices such as proper disposal of biodegradable waste, segregation of waste, adoption of home composting methods and setting up kitchen garden and collecting wastes in bins . Ninety eight per cent were growing greens and vegetables by using compost manure and about 95 per cent were using the waste water for their garden.
  - Cent per cent of the homemakers from the selected villages opined that- adoption of biodegradable waste management practices provides compost for their kitchen garden, maintains the surrounding clean, creates eco-friendly environments and provides fresh greens and vegetables devoid of chemical residues.

## **CASE STUDY**

Three household from each village belonging to small (1- 4 members), medium (4- 6 members) and large (above 6 members) families from five selected villages constituting fifteen households were selected for the case study. Willingness and co-operation of the homemakers were also taken into consideration. The study was conducted for a period of six months.

### ***The major findings of the Case Study is as follows,***

- The results revealed that majority (87 per cent) of the households were in the expanding stage of family life cycle. Sixty seven per cent of them come under the high income category as per the HUDCO (2009) classification
- Per day on an average the small, medium and large families generate 10.456, 14.462 and 21.096 kilograms of biodegradable wastes respectively. The monthly generation of biodegradable waste was found to be 314.48, 433.86 and 632.88 kilograms by small, medium and large families respectively.
- On an average, small, medium and large families produced 399, 594 and 966 kilograms of vermicompost respectively within a period of three months. The money equivalent being ₹ 3,990/-, ₹ 5,940/- and ₹ 9,666/- generated by small, medium and large families respectively.

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- The selected households were utilizing the available biodegradable waste such as cow dung, cow urine, fall-over neem leaves that enhanced the growth of the plants and vegetables. Neem leaf and neem kernel extract were used as insecticides that protected the plants. This helped the households to produce good quality vegetables and greens. This may help the family members of the selected households to lead a healthy and contented life.
  - The feasibility in terms of work involved and cost, irrespective of the size of the family, all of them were highly satisfied with home composting. With regard to time involved in management of biodegradable waste all of them expressed only their satisfaction. They felt, the preparation of compost required more of their effective time.
  - Biodegradable waste management practice - raising a kitchen garden derived economic benefits in the form of mean income generation once in three months of about ₹247/-, ₹945/- and ₹1527/- by the selected small, medium and large families, by producing vegetables such as brinjal, tomato, bitter gourd, bottle gourd and ladies finger they could earn this amount. By growing greens, mint, coriander and fenugreek, small, medium and large families could gain ₹276/-, ₹834/- and ₹1278/- respectively. In addition to the economic benefits gained, one should also consider the reduction in expenditure on vegetables and chemical fertilizers/ pesticides.
  - On an average a large family might earn a maximum of ₹12,465/- in a period of three months through compost (₹9,660/-) and greens (₹1,278/-) and vegetables (₹1,527/-). However, on the whole a medium and small size family might also earn ₹7719/- and ₹4513/- respectively. Besides one also has to consider the amount they would have spent for pesticides/ growth boosters if they were growing in the usual way which will be about ₹ 1500/-, ₹ 2000/- and ₹ 3000/- by small, medium and large families respectively.

Hence it is proved that management of biodegradable waste will enhance their family income and improve the family health. This practice should be adopted and followed by the households at all levels to improve the family and protect the environment on the whole.

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***A journey of thousand miles will start from single step. Let us start this journey from this small step.***

## **CONCLUSION**

From the present study, it could be concluded that the village wide programme launched to educate, motivate and persuade the homemakers to adopt Biodegradable waste management practices was successful with a majority of home makers following the simple techniques with sound understanding which resulted not only in preventing environmental degradation but also provided subsidiary income and maintained the human health.

Since 1980s, agricultural scientists in the world have been realizing the limitations and problems of chemical fertilizers used for soil fertility management. While on one hand research is being initiated to improve the use efficiency of chemical fertilizers, on other hand alternative inputs are being considered. Recycling of Organic matter has been in use in India for centuries. Vermicomposting also is regaining strong foothold among the farmers due to its multifunctional roles and benefits in agriculture. Rising levels of gases in the Earth's atmosphere have the potential to cause changes in our climate. Some of these emission increases can be traced directly to solid waste that affect the Earth's climate.

Thus, at the household-level proper segregation of waste has to be done and it should be ensured that all organic matter is kept aside for composting, which is undoubtedly the best alternative method to overcome all environmental and health issues and narrow down economic burden.

### ***Recommendations emerged out of the present study:***

1. There is a need for conducting need based and well tailored training programme related to environmental safety and vermicomposting for the rural households
2. Strengthen and revitalize the practices and bring into practice the indigenous sciences through research and community based activities such as NSS and CSS

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3. The government should promote research on vermicomposting through various institutions
  4. Subsidizing the cost towards capital in the initial years (the catch up years) to practice vermicomposting
  5. Government can alleviate poverty, unemployment and under employment by establishing industries to process recyclable waste and manufacture vermicompost through engaging unemployed downtrodden people.
  6. Bankers can provide more financial assistance to the farmers at low interest rates to initiate composting of biodegradable waste at large scale.
  7. NGO's can encourage homemakers to form groups, collect kitchen waste from their street, produce compost and set up a garden that will fulfill their everyday vegetable needs thereby reducing their economic burden as well.
  8. Youth clubs can be formed that can work on segregating and collecting recyclable waste and producing compost and supply them to the marginal farmers such that it fetches economic benefits either side.
  9. Through practical demonstration of waste segregation, compost preparation and setting up of kitchen garden, interest could be initiated among students at schools and college level.
  10. Popularize biodegradable waste management practices through print media, All India Radio, television and street plays.

*"Recycling is a good thing to do. It makes people feel good to do it. The thing I want to emphasize is the vast difference between recycling for the purpose of feeling good and recycling for the purpose of solving the trash problem."*

**~Barry Commoner**



## BIBLIOGRAPHY

- Abeyewickreme, W., Wickremasinghe, A R., Karunatilake, K., Sommerfeld, J. and Kroeger Axel' (2012), "Community mobilization and household level waste management for dengue vector control in Gampaha district of Sri Lanka; an intervention study", A Journal of PATHOGENS AND GLOBAL HEALTH, Published by Pathog Glob Health. Vol. 106(8), Pp. 79–487. [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)
- Adetola, F., Edward C. and Orji Sanusi, J. (2009), "Land and Water Pollution", Journal of Work and Learn, Published by National Open University of Nigeria, ISBN: 978-058-775-6, Pp. 2-6.
- Agamacharyya, A.K. (2013), "Rays of Hope", September 13, Friday, Published by The Assam Tribune-Horizon, Dibrugarh, Pp 2.
- Aira, M., Monroy, F. and Domínguez, J. (2007), "Microbial Biomass Governs Enzyme Activity Decay during Aging of Worm-Worked Substrates through Vermicomposting", Journal of Environmental Quality, Published by Alliance of Crop, Soil and Environmental Science Societies (ACSESS), Vol. 36(2), Pp. 448-452.
- Alam (2006), cited by RoshanLal and Ashok Khurana, "Gender Issues: The Role of Women In Agriculture Sector", ZENITH International Journal of Business Economics & Management Research, Publisher: Zenith International Research & Academic Foundation, Vol. 1(1), Pp. 31.
- Alam S (2006), "Use of biomass fuels in the brick-making industries of Sudan: Implications for deforestation and greenhouse gas emission", Thesis submitted to Department of Forest Ecology, University of Helsinki, Finland, Helsinki, Pp. 8-48
- Alam, M.N., Jahan, M.S., Ali, M.K., Ashraf, M.A. and Islam, M.K. (2007); Effect of Vermicompost and Chemical Fertilizers on Growth, Yield and Yield Components of Potato in Barind Soils of Bangladesh, Journal of Applied Sciences Research, 3(12): 1879-1888.

- 
- Alsaghir L, (2011), "Exploring HR Policies and HR Specialists' Role in the Context of Innovation – The Case of BPR in Two Large Lebanese Banks" <https://theses.ncl.ac.uk/dspace/bitstream/10443/.../1/Alsaghir%2011.pdf>,
- Ameyaw, Y., Tachie T. Y. and Raheem K. (2010), "Environmental Pollution in the Winneba Municipality of the Central Region, Ghana", Research Journal of "Pharmaceutical, Biological and Chemical Sciences", *Publisher: RJPBCS. Journals*.Pp. 219-229
- Andrew Leu, President of UN's IFOAM, Business Line, 16/2/2012.
- Anjaneyula Y. (2005), "Introduction to Environmental Science", Environmental Science - Taught Programme, B.S. publication, Pp. 1
- Ansari H. (2013), "Clean, healthy environment basic need for human well-being" Published in Express India, Monday Oct 29, 2012 at 1652 hrs. New Delhi, [http://expressindia.indianexpress.com/story\\_print.php?storyId=1023540](http://expressindia.indianexpress.com/story_print.php?storyId=1023540)
- Ansari, A.A, (2006), "Indigenous Approach in Organic Solid Waste Management in Guyana (South America) Department of Biology", Faculty of Natural Sciences, University of Guyana.[http://idosi.org/gjer/gjer3\(1\)09/5.pdf](http://idosi.org/gjer/gjer3(1)09/5.pdf).
- Anwar, M., Patra, D.D., Chand, S., Alpesh, K., Naqvi, A. A. and Khanuja, S.P.S. (2005). Effect of Organic Manures and Inorganic Fertilizer on Growth, Herb and Oil Yield, Nutrient Accumulation, and Oil Quality of French Basil. *Communications in Soil Science and Plant Analysis*, Vol. 36(13), Pp. 1737-1746.
- Arcadis/Eunomia Report (2009), Data based on data on municipal waste from, EUROSTAT source :[http://www.environ.ie/en/Publications/Environment/Waste/Waste Management/FileDownload,28637,en.pdf](http://www.environ.ie/en/Publications/Environment/Waste/Waste%20Management/FileDownload,28637,en.pdf)
- Arouiee, H., Dehdashtizade, B., Azizi, M. and Davarinejad, G.H. (2009), Influence of Vermicompost on the Growth of Tomato Transplants. *Journal of Acta Hort. (ISHS)* Vol. 809, Pp. 147-154, Retrieved 24th December 2009, from [http://www.actahort.org/books/809/809\\_12.htm](http://www.actahort.org/books/809/809_12.htm)
- Arzumanyan, G., Karlsson, M. and Rossem, C.V. (2004), "Municipal Solid Waste Management in Armenia, Current Trends and Steps Forward", IIIIEE Master's Thesis, The International Institute for Industrial Environmental Economics, <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=1329229&fileId=1329230>

- 
- Azarmi, R., Ziveh P.S. and Satari, M.R. (2008), Effect of vermicompost on growth, yield and nutrition status of tomato (*Lycopersicon esculentum*). Pak. J. Biol. Sci., 11: 1797-1802. Retrieved 28th December, [www.ncbi.nlm.nih.gov/pubmed/18817219](http://www.ncbi.nlm.nih.gov/pubmed/18817219)
- Baby, K. and Govindarajulu, K. (2012), "Solid Waste Management – A Case Study of Palakkad Municipality in Kerala, Yojana", Journal of Environmental Economics an Introduction Singapore, Published by McGraw Hill International Editions, Vol.50(20), Pp.52-54.
- Bala, (2010) "Selection discrimination against women in Indian agriculture- a Review", Agricultural Review., 31 (3), Pp 227-228.
- Barik, T., Gulati, J.M.L., Garnayak, L. M. and Bastia, D. K. (2011), "Production of Vermicompost from Agricultural Wastes - A Review", Journal of Agricultural Reviews., 31(3), Pp. 172-183.
- Berg, B. (2013), "Laying Waste: A Guide to Critical Combat [Pathfinder RPG]", A project in Grundy Center, Published by Kickstarter, Inc./ Adam Clark, <https://www.kickstarter.com/projects/brianberg/laying-waste-a-guide-to-critical-combat-pathfinder>
- Berg, P.E.O., (1993). *Källsortering. Teori, metod och implementering/ source sorting. Theory, method and implementation. Doctoral thesis Institutionen för Vatten- och Avloppsteknik, Chalmers University of Technology, Gothenburg, Sweden.*
- Bernd, B. *et al*, (2010) Georg Härdtle, Klaus Marek, [books.google.co.in/ books? isbn=3540592105](http://books.google.co.in/books?isbn=3540592105), - 2010
- Bersani *et al*. (2008), "Life-cycle assessment (LCA) - European Environment Agency" [www.eea.europa.eu/publications/GH-07-97...C/Issue-report-No-6.pdf](http://www.eea.europa.eu/publications/GH-07-97...C/Issue-report-No-6.pdf)
- Bersani, R., Pennington, P. R. and David, W. (2008), "Analysis of existing studies that use a life cycle approach to assess the environmental performance of different options for the management of the organic fraction of municipal solid waste", <http://bookshop.europa.eu/en/inventory-of-existing-studies-applying-life-cycle-thinking-to-biowaste-management-pbLBNA23497/>

- 
- Bertoldi, M., *et al.* (1984), "In: Composting of Agricultural Waste Gasser", J.K.R. (Ed) Elsavier, London, Pp. 27-40
- Beukering, (1994), "An Economic Analysis of Different types of Formal and Informal Entrepreneurs", *Recovering Urban Solid Waste in Bangalore(India)*, Vol.12, Pp.229-252.
- Bhandari, G. (2006), "Biogas and its Socio-Economic and Environmental Impact", *Kurukshetra- A Journal on Rural Development*, Vol. 54(7), Pp.29-33.
- Bhandyapadhyay, R.K. (2011), *Information Technology and Development*, Yojana, Vol.43, No.1, Pp.73-76
- Bhattacharjee, S.and Gupta, S. (2011), "A Study on waste picker and waste traders of Silchar, Assam, North East India", *International Journal. of Ecology Environment and Conservation*, 17 (4), Pp. 755-760.
- Bhattacharyya, J.K., Kumar, S. and Devotta, S. (2008), "Studies on acidification in two phase biomethanation process of municipal solid waste", *Journal of Waste Management*, Vol. 28(1), Pp. 164–169,
- Bodkhe, V.A. and Mahorkar, V.K. (2010), "Effect of various manures on growth, yield and quality of radish", *International Journal of Agricultural Sciences*, Bioinfo Publications, Vol. 6, Pp. 72-73.
- Brog, W.R. and Gall, H.D. (1993), "Educational research – An introduction", Loggman Publication, New York, Pp. 488-490.
- Carey, C., Phelan W. and BolandC. (2008), "Organic Waste Management in Apartments", Environmental Protection Agency, [http://www.epa.ie/downloads/pubs/research/waste/ertdi%20no71\\_web%20final-with-cover.pdf](http://www.epa.ie/downloads/pubs/research/waste/ertdi%20no71_web%20final-with-cover.pdf)
- Chakraborty, M. (2010), "Waste management in India – the need for a comprehensive and sensible policy", <http://beta.bodhicommons.org/article/waste-management-in-india>
- Chaudhari, R.D., Datar, M.T. and Babookani, R. (2011), "Municipal solid waste management through vermicomposting employing exotic species of earthworm *eudriluseugeniae*" *Journal of environmental Science and Engineering*, Published by, Europe PubMed Central International archiveCorporation, New Delhi. Vol. 53(1), Pp. 129-134.

- 
- Da Zhu, Asnani, P. U., Zurbrügg, C., Anapolsky, S. and Shyamala Mani (2007) "Improving Municipal Solid Waste Management in India, A Sourcebook for Policy Makers and Practitioners", PUBLISHED BY The World Bank group, Washington, Pp. 1-8, [http://www.tn.gov.in/cma/swm\\_in\\_india.pdf](http://www.tn.gov.in/cma/swm_in_india.pdf)
- Dahle´n, L., Vukicevic, S., Meijer, J.-E., Lagerkvist, A., 2007. "Comparison of different collection systems for sorted household waste in Sweden". *Journal of Waste Management*, 27 (10), Pp. 1298–1305.
- Das, D. (2007), "Willingness to Pay for Solid Waste Management-A Casestudy of Guwahati ICFAI *Journal of Urban Policy*", Vol. 2(1), Pp.30.
- DDWS-UNICEF (2008), [www.unicef.org/india/IYS\\_India\\_Information\\_updated\\_doc.doc](http://www.unicef.org/india/IYS_India_Information_updated_doc.doc)
- Dean, B. C. (2008), "Algorithms for Minimum – Cost Paths in Time", - *Dependent Networks with Waiting Policies*. Pp- 85-86
- Devadas, P. D. (1989), "A Handbook of Methodology of Research", Published by Sri Ramakrishna Mission Vidhyalaya College of Education, Pp. 125 -148
- Devi Priya (2005), "Pollution Control", *A Journal of agriculture and rural Development "Kisan World"*, Published by, Sakthi Sugar Ltd., Printed by Nandan Offset, Sept, Vol. 32 (9); Pp. 37.
- Devipriya R. Majumder (2013), "Waste to Health: Biobleaching of Nanoparticles from E-waste and their Medical Applications", Published By *Indian Journal of Applied Research*, Vol. 3(2), Pp. 277-282.
- Dhanuja, U. (2006), "Sustainable Solid Waste Management", Published by Academic Foundation, New Delhi, P.23.
- Dharwad, (7/1/2011), farm varsity, rural bank to promote organic farming, *Business Line*,
- Diaz, L.F., *et al.* (2006), "Managing the Organic Fraction of Municipal Waste", *Biocycle*, Vol.47, Pp.50-53
- Directive, 1999/31/EC (2003), "Landfill of waste, A consultation paper on limiting landfill to meet the EC Landfill Directive's targets for reducing the landfill of biodegradable municipal waste", Report of Environmental Policy Division, Department of the Environment, Pp. 4-10.

- 
- Doyle and Kelleher (2009), "Re-Discovering Horticulture: An Exploration from Plant Production to Social Capital", *Journal of ActaHort*, Vol. 817, Pp. 209 -215
- Dulac, N. (2001), "The Organic Waste Flow in Integrated Sustainable Waste Management. Tools for Decision-makers. Gouda, the Netherlands: WASTE", Book of "Integrated sustainable waste management". The Netherlands Agency for International Cooperation (DGIS) Publication, Ministry of Foreign Affairs. Pp. 1-17
- Edmund Hillary, Cited by Chatterjee, B., (2007), "Environmental Laws: Implementation Problems and Perspectives", Printed in India at New Elegant Printers, Published by Deep & Deep Publications PVT.LTD. Pp. 221
- Edward, C.A. (1998). In: *Earthworm Ecology*, Ed. C.A. CRC Press, Boca Raton, FL, 327-354.
- Edwards, C.A., Lal, R., Madden, P., Miller, R.M. and House, G. Harwood, R.R. (1999) "A history of sustainable agriculture", Published by water and soil conservation society, Ankery, Pp. 3-19.
- Elhance, D.N. (2000), 51<sup>st</sup> edition, *Foundation of statistics*, Published by KitibMahal, Patna. Pp 2.2- 2.3
- Franckx, L. et al. (Arcadis/Eunomia) (2009). "Assessment of the options to improve the management of bio-waste in the European Union". Study performed for the European Commission, DG Environment.
- Garibay, S. V. and Jyothi, K. (2003), *Market Opportunities and Challenges for Indian Organic products*. Research Institute for Organic Agriculture and AC Nielson ORG-MARG.
- George F. (2013), "Problems of Solid Waste Management in Nima Accra". University of Ghana, Legon, Published by the Undergraduate Research Community, <http://www.kon.org/urc/v6/george.html>
- Gilbert (2008), *Researching Social Life*, Published By London, Sage, Pp. 132-135.
- Gitanjali, G. (2007). *Agricultural Science.Sci. Digest*, Vol. 27, Pp. 270-271
- Grinnel, (2011), *Journal of Agricultural Reviews*, Vol. 31 (3), Pp. 172-183

- 
- Grinnel, Richard, Jr. (2013), "Social Work Research and Evaluation", Published by, Itasca, IL.FE. Peacock, Pp. 120-122.
- Gupta, P.K. (2005), Vermicomposting for Sustainable Development, Agrobios (India), Jodhpur, Vol.2 (9), Pp. 609-612
- Gupta, S.B. (2005) Research methodology and statistical techniques, Deep and Deep Publications, New Delhi, Pp. 76-85.
- Gupta, S.B. (2009) Research Methodology and Statistical Techniques, Deep and Deep Publications, New Delhi, Pp. 104-111.
- Hammer, R. (2012), "New Role are Needed to Protect our Environment", Pp. 20-30, [www.nrdc.org/energy/files/fracking-wastewater-fullreport.pdf](http://www.nrdc.org/energy/files/fracking-wastewater-fullreport.pdf)
- Hammett, W. (1996), Disposal of Hazardous Household Wastes, [http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he368\\_3.html](http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/he368_3.html)
- Haralambos and Holborn, (2012), *Sociology: Themes and Perspectives*. Hammersmith, London: HarperCollins Publishers., Pp.900, <http://www.aqr.org.uk/glossary/term-pilot-study>
- Herselman, J.E. and Moodley, P. (2008), "Guidelines for the Utilization and Disposal of Wastewater Sludge", WRC Report No. TT 350/08, Requirements for the beneficial use of sludge at high loading rates, Published By, The water research commission, Printed in the Republic of South Africa, Vol. 4, Pp.78
- Hoornwegd, (2012), "What a waste in a changing climate" <http://blogs.worldbank.org/climatechange/what-waste-changing-climate>
- Howard, A.(1940), "An Agricultural Testament", [Journeytoforever.org/farm\\_library/howardAT/ATpref.html](http://Journeytoforever.org/farm_library/howardAT/ATpref.html)
- Idris, A., Inane, B., Hassan, M.N.,(2007), "Overview of waste disposal and landfills/dumps in Asian countries". Material Cycles and Waste Management, Vol. 16, Pp. 104–110.
- Ittiravivongs A, 2012, "Household Waste Recycling Behavior in Thailand: The Role of Responsibility", *International Proceedings of Chemical, Biological and Environmental Engineering (IPCBE)* Vol.28, Published by IACSIT Press. Pp.21-24, <http://www.ipcbee.com/vol28/5-ICFEE2012-F011.pdf>

- 
- Jamshidi. A., Taghizadeh, F. and Delnaz A. (2011), Sustainable municipal Solid waste management (case study: sarab county, Iran), *Journal of Environmental Science* /, Vol. 5, Pp. 55-59, <http://iris.lib.neu.edu/cgi/viewcontent.cgi>.
- Kale, R.D. (2009), "Regeneration, Predation and parasites of Earthworm Resources and Vermiculture", *Green farming* Vol. 2 (10), 696-698.
- Kannaiyan, S. and Lilly, S.S. (1999), *Bio Resources Technology for Sustainable Agriculture*, Associated Publishing Company, New Delhi. Pp 355-357.
- Karout, N. and Altuwajiri S. (2012) "Impact of Health Education on Community Knowledge, Attitudes and Behaviour Towards Solid Waste Management in Al Ghobeiry, Beirut", *Eastern Mediterranean Health Journal*, Vol. 18, Pp. 7.
- Khadilkar, S.S. (2011), Analysis of Participatory Approach in Solid Waste Management (SWM): A Case Study of Navi Mumbai City, *Southern Economist*, Feb, Vol.49, No: 19, P.35.
- Kothari (2004), 'Difference Between Survey and Experiment, *Research Methodology*, May, Gupta Publishers, Pp. 56-58.
- Kothari (2007), 'Difference Between Survey and Experiment, *Research Methodology*, May, Gupta Publishers, Pp. 87
- Kothari (2012), 'Difference Between Survey and Experiment, *Research Methodology*, May, Gupta Publishers, Pp. 71-78
- Kothari, C.R. (1997), *Research Methodology Methods and Techniques*, New Delhi, WiswaPrakashan, Pp. 15-30.
- Krutwagen, B., Kortman, J. and Verbist, K. (2008), "Inventory of Existing Studies Applying Life Cycle Thinking to Biowaste Management" EUR 23497 EN –IVAM Research and Consultancy on Sustainability, The Netherlands, <http://lct.jrc.ec.europa.eu/pdf-directory/Inventory-of-existing-studies-applying-life-cycle-thinking-to-biowaste-management.pdf>
- Krutwagen, B., Kortman, J. and Verbist, K., (2008), "Inventory of Existing Studies Applying Life Cycle Thinking to Biowaste Management, Analysis of Existing Studies that Use a Life Cycle Approach to Assess the Environmental

---

Performance of Different Options for the Management of the Organic Fraction of Municipal Solid Waste”, <http://lct.jrc.ec.europa.eu/pdf-directory/Inventory-of-existing-studies-applying-life-cycle-thinking-to-biowaste-management.pdf>

Kumar, A. (2002), “Environmental Pollution and Agriculture”, Published by, KulBhushanNangia, A.P.H. Publishing Corporation, Pp 1-15.

Kumar, P. S. and Kumar, K. (2009), “Bio- management of sugar mill using an exotic earthworm *Eiseniafoetida*”, Journal of Green Farming, Vol.2 (10), Pp. 696-698

Kumar, R. (2012), Research Methodology- a step guide for beginners, 4<sup>th</sup> edition, published by vivekmehra, Pp. 121-126, 65-68

Kumar, S., Bhattacharyya, J.K., Vaidya, A.N., Chakrabarti,T., Devotta,S. and Akolkar, A.B. (2009), “Assessment of the status of municipal solid waste management in metro cities, state capitals, class I cities, and class II towns in India: An insight, Waste Management”, Universal Journal of Environmental Research and Technology, All Rights Reserved Euresian Publication Vol-29, Pp.883–895

Lakshminarayanan, M.R. (2011), “Environmental Hazards”, A Journal of Agriculture and Rural DevalopmentKisan World, Published by Sakthi Sugars Ltd. Printed By Nandan Offset, Vol.38(12), Pp.33.

Lutz and Caldecott (2004), Cited by, Kenton, R.M. and Boness, M., “Securing Protected Areas in the Face of Global Change, Issue and Strategies”, Produced by, IUCN Publications Services Unit, Pp. 56

Mahajan, A., Chaudhary, A. K., Jaggi, R.C. and Dogra, R.K. (2011), “Importance of Biofertilizers in Sustainable Agriculture, Farmers Forum”, Research Journal of Agricultural Sciences, 2(3): Pp. 497-501.

Mandal, S., Makhal, S. and Kanawjia, S.K. (2010), “Organic Milk in India: A Somnambulism or a New Pragmatic Vision” *Indian Food Industry*, Journal of Eco-friendly Agriculture 5(2): Pp. 133-138.

Mane, T.T. and Hemalata, H. N. (2012), “Existing Situation of Solid Waste Management in Pune City, India”, Research Journal of Recent Sciences, Vol. 1, Pp. 348-351, <http://www.isca.in/rjrs/archive/iscsi/59.ISCA-ISC-2011-8EnvS-45.pdf>

- 
- Manfredi, S. and Pant, R. (2011), "Supporting Environmentally Sound Decisions for Bio-waste Management", A practical guide to LCT and LCA, Published by European Union, Pg. 1-84, <http://lct.jrc.ec.europa.eu/pdf-directory/D4A-Guidance-on-LCT-LCA-applied-to-BIO-WASTE-Management-Final-ONLINE.pdf>
- Marcus, P. 2012, "Home Waste Management", <http://www.homeadvisor.com/article.show.Home-Waste-Management.15240.html>
- Medina, M. (2011), "Informal Recycling around the World: Waste Collectors", Source: WIEGO, Published in Major Occupational Groups: Waste Collectors, [www.trunity.net/medina2/edit/article/51cbf0d57896bb431f6a33c6/](http://www.trunity.net/medina2/edit/article/51cbf0d57896bb431f6a33c6/)
- Mitchell and Overend, (2005), [http://shodhganga.inflibnet.ac.in/bitstream/10603/13293/5/05\\_chapter%201.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/13293/5/05_chapter%201.pdf)
- Montserrat, S., Bernat, C., Emilio G., Martínez, X., Pujol, M., Abate J. and Valero, J. (2004), "Organic Waste Management in Education and Research in agricultural engineering schools", 11th International Conference of the FAO ESCORENA Network on Recycling of Agricultural, Municipal and Industrial Residues in Agriculture. Murcia, Pp.43-51
- National Institute of Environmental Health Sciences: Reduce, Reuse and Recycle, [http://www.livestrong.com/article/187361-household-waste-recycling/\(5<sup>th</sup>\\_pl5.2\\_martin\\_medina\\_martinez\\_paper.pdf\)](http://www.livestrong.com/article/187361-household-waste-recycling/(5th_pl5.2_martin_medina_martinez_paper.pdf))
- Naveen, D.V., Manuja, C.V.*et. al.*, (2011) "Recycling of Bio-waste in Agriculture", *Kisan World, A Journal of Agriculture and Rural Development*, February, Vol. 38(2), Pp. 53.
- Nelson Mandela*, source by Bushell, R. (2007) [bookshop.cabi.org/Uploads/Books/PDF/.../9780851990224.pdf](http://bookshop.cabi.org/Uploads/Books/PDF/.../9780851990224.pdf),
- Nunan, F. (2000), "Urban organic waste markets: responding to change in Hubli-Dharwad", *Journal of India Habitat International*, Vol. 24(3), Pp. 347-360.
- Pande, R., Firake, D. M. and Yadav, S. (2008), "Study on Neem Seed Kernel Extract with Different Additives, Synthetic and Biopesticides Against Soybean White Fly", *Journal of Eco-friendly Agriculture*, Vol. 3(2), Pp. 168-170.
- Pandey, A. (2010), "Organic Foods: Benefits over their Conventional Counterparts", *Journal of Eco-friendly Agriculture*, Vol. 5(2), Pp. 133-138.

- 
- Paul, T. Williams (2013), [books.google.co.in/books?isbn=111868737X](https://books.google.co.in/books?isbn=111868737X), -
- Pollution Control Department (PCD), Ministry of Natural Resources and Environment. Thailand State of Pollution Report 1993-2009. Rungsilp printing: Bangkok. <http://www.ipcbee.com/vol28/5-ICFEE2012-F011.pdf>
- Prema, C. (2009), "Conservation of Environment is the Joint Responsibility of Men and Women", *Journal of Social Welfare*, Vol-56(3). Pp. 2-3.
- Radwan, H. (2009), <https://repository.cardiffmet.ac.uk>
- Ramunajam, *et al.*, (2004), "Foundation Course- B environmental studies", Published by Bharathiar University, Pp. 95-98.
- Rathi, S. (2007), "Optimization model for integrated municipal solid waste management in Mumbai, India", *Journal of "Environment and Development Economics"*, Published by Cambridge University Press, Printed in the United Kingdom, Vol. 12, Pp.105–121.
- Ravi, J. (2010), "Indian Fertilizer Marketing", *Kisan World, A Journal of Agricultural and Research Development*, Feb- 2010, Vol.-37, No-2.
- Rawals, W.J., Pachepsky, Y.A. *et.al.*, (2009), "Crop Management Factors Influencing Yield and Quality of Crop Residues, Field Crop Research, *Indian Journal of Agricultural Sciences*, Vol. 79 (3), Pp. 174-177.
- Rawat, Business line- 6/9/2011.
- Ray, P.C. (2009), "Environmental Science Health", *Journal of Environmental Carcinogen and Ecotoxicology Review*. Vol. 27(1), Pp. 1–35.
- Roberts, F, Jim. (2011), "The Need For Effective Waste Management Pick Up", <https://www.facebook.com/.../the-need-for-effective-waste-management-pick-up/10150458771403523>, Article source: <http://EzineArticles.com /3956984>
- Rules, (1998) <http://www.cpreec.org/pubbook-biomedical.htm>
- Saintmard, C. (2005), "Managing Biodegradable Household Waste: What prospects for European Local Authorities? ARC + Brussels (BE).
- Sally Morgan (2009), [books.google.co.in/books?isbn=0237539179](https://books.google.co.in/books?isbn=0237539179)

- 
- Sankar, V., Veragavathatham, D. and Kannan M. (2009), Journal of Eco-friendly Agriculture, Vol. 4(1), Pp. 17-21.
- Sarah Zhang, (2012), "Charts: What Your Trash Reveals About the World Economy", Published by Mother Jones and the Foundation for National Progress. <http://www.motherjones.com/environment/2012/07/trash-charts-world-bank-report-economy>
- Saravanavel (2010), Research methodology, Published by kitabMaheil Agencies, Pp. 177-178.
- Saravanavel (2010), Research methodology, Published by kitabMaheil Agencies, Pp. 65-68.
- Saravanavel (2012) Research Methodology, Published by KitabMaheil Agencies, Pp. 95-99.
- Saravanavel (2012), Research Methodology, Published by KitabMaheil Agencies, Pp. 110-115.
- Saravanavel (2012), Research methodology, Published by kitabMaheil Agencies, Pp. 177-178.
- Selvam, (1996), [ftp://ftp.fao.org/docrep/fao/010/ag124e/ag124e\\_full.pdf](ftp://ftp.fao.org/docrep/fao/010/ag124e/ag124e_full.pdf)
- Sharma, S. and Vasudevan, P. (1999), In: proceeding of the R'99 Congress (Recovery, Recycling, Re-integration).
- Singh, K.I., Devi, T.S., Gupta, M.K. and Singh, M.P. (2009), "Field Efficacy of Cow-Urine Indigenous Plant Extracts on the Incidence of Major Insect Pests of Cabbage in Manipur"., Journal of Eco-Friendly Agruiculture, Vol. 4(2) Pp. 149-154.
- Singh, K.(2009). Microbial and Nutritional Analysis of Vermicompost, Aerobic and Anaerobic Compost. 40 CP Honours Project for Master in Environmental Engineering; Griffith University, Brisbane, Australia; (Supervisors: Dr. Rajiv K. Sinha& Dr. Sunil Heart).
- Singh, S. (2008), "Vermicomposting of domestic waste by using two epigeic earthworms (Perionyxexcavatus and Perionyxsansibaricus)".International Journal of Environmental Science Techchnology., Vol. 5 (1), Pp. 99-106, <http://www.st08012.pdf>.

- 
- Sivasankaraiah, M., Naik, K.T. and Dasaratharamaiah, K. (2008), Environmental Pollution: Effects, Causes and Concerns, Southern Economist, Vol.47(3), Pp.13.
- Smith, A., Brown, K., Ogilvie, S., Rushton, K. and Bates, J. (2001), "Waste management options and Climate Change", Study Performed for European Commission, DG Environment.
- Snowleopard*, (2010), "Home Waste Composting", <http://unpredictableblog.wordpress.com/2010/10/04/home-waste-composting/>
- Solomon, U. A. (2010), "Environmental Ethics, Law and Education to Determine which Plays the Most Critical Role in Environmental Enhancement and Protection". Journal of Environment Development and Sustainability, Vol. 12(6), Pp. 1069-1080. [http://en.wikipedia.org/wiki/Environmental\\_protection#cite\\_note-1](http://en.wikipedia.org/wiki/Environmental_protection#cite_note-1)
- Stockholm, (1972), "Declaration of the United Nations Conference on the Human Environment"<http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503>
- Subramani, M.R.* (August 30, 2012), "A Virgin's Guide to the Commodities" *The Hindu Business Line* <http://www.thehindubusinessline.com/features/weekend-life/know-your-commodity/article3836406.ece>
- Sukumaran, M. Amsath, A. and Muthukumaravel, K. (2008), "Vermicomposting of Vegetable Wastes Using Cow Dung", Thesis submitted to P. G. and Research Department of Zoology, Published by KhadirMohideen College, India. <http://www.e-journals.in/PDF/V5N4/810-813.pdf>
- Sundari, and Mathew, J. (2010) "Utilization and Recycling of Farm, Industrial and Urban Solid Wastes as Eco-Friendly Approach for Augmenting Yield Maximization in Rice", Green Farming, Vol. 3 (1), Pp. 43-44
- Sunil Kumar, J.K. Bhattacharyya et al., (2009) "Assessment of the status of municipal solid waste management in metro cities, state capitals, class I cities, and class II towns in India: An insight", Journal of Waste Management, Published by Elsevier Ltd., Vol. 29, Pp. 883–895.
- Susan A. Thorneloe and Keith A. Weitz (2012), "Sustainability and Waste Management, Center for Environmental Analysis", RTI International (RTI), 3040 Cornwallis

---

Road, Research Triangle Park, USA.<http://www.swana-wi.org/Sustainability-Thorneloe-Final.pdf>

SutharSurindra (2009), "Vermicomposting of vegetable-market solid waste using Eiseniafetida: Impact of bulking material on earthworm growth and decomposition rate Ecological Engineering,35(5),pp.914-920.

Sambyal, S. S. (2013),<http://cseindia.org/node/4584>

Tchobanaglouset *al.* (1997), cited by "Environmental Audit of Municipal Solid Waste Management",[wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces\\_tr/TR118.../Index.htm](http://wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces_tr/TR118.../Index.htm)

Texas Municipal Solid Waste Policy (2012)

Thia-Eng, Chua (2008), Cited by, Memedovic O., "Public goods for economic development", Published by, United Nations Industrial Development Organization, Pp. 18-20.

Tolanur, S.I. (2009), Agriculture Research Communication centre, Agricultural Science. Digesi, Vol. 29 (1), Pp. 60-62,

UNDP/WB (1991) Sanitation Group for South Asia,. Indian experience on composting as means of resource recovery, in: Proceedings of the Water Supply and Sanitation Program Workshop on Waste Management Policies, Singapore 1–5

UNICEF, (2012), "Solid and Liquid Waste Management in Rural Areas, a technical note", Published by Government of India, Ministry of Rural Development, Pg. No. 1-7, [http://www.hptsc.nic.in/SLWM/SLWM\\_2.pdf](http://www.hptsc.nic.in/SLWM/SLWM_2.pdf)

UNSD (2013), *The United Nations Statistics Division*, <http://www.grida.no/publications/vg/waste/page/2853.aspx>

US Environmental Protection Agency, 2012, Topic-Nonhazardous waste. [http://en.wikipedia.org/wiki/Solid\\_waste\\_policy\\_in\\_the\\_United\\_States#cite\\_note-michigan-1](http://en.wikipedia.org/wiki/Solid_waste_policy_in_the_United_States#cite_note-michigan-1)

Vanitha, B. (2009), Determinants of Willingness to Pay for Household Solid Waste Management, Southern Economist, Vol.47(23,24), Pp.5-6.

Venkatesan (2005), "Programme to Train SHG members, youth is Solid Waste Management", The Hindu, 23<sup>rd</sup> September.

---

Vikram, (2011), Advantages of Vermicomposting, [www.GardenWorms.com/Advantages-and-benefits-of-Vermicomposting.htm](http://www.GardenWorms.com/Advantages-and-benefits-of-Vermicomposting.htm)

Waller, R.M. (2013), [pubs.usgs.gov/gip/gw\\_ruralhomeowner/gw\\_ruralhomeowner\\_new.htm](http://pubs.usgs.gov/gip/gw_ruralhomeowner/gw_ruralhomeowner_new.htm)

Wani SP. (2002). "Improving the Livelihoods: New Partnership for Win-win Solution for Natural Resource Management". Paper submitted in the 2<sup>nd</sup> International Agronomy Congress held at New Delhi, India, An Open Access Journal published by International Crop Research Institute for the Semi-Arid Topics (ICRISAT), Pp.1-4, [wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces\\_tr/TR118.../Index.htm](http://wgbis.ces.iisc.ernet.in/biodiversity/pubs/ces_tr/TR118.../Index.htm).

Wossink, A. and Boonsaeng, T. (2011), "Animal waste management technologies: an explorative study of farmers' knowledge and perceptions", North Carolina State University, Dept. Agricultural and Resource Economics, Pp- 35-40

Yadav A. (2011), Minister of state for agriculture Said in a written reply to loksabha, Vegetable output increase 6%: Govt, Financial Express, New Delhi, March 15,(PTI).

Yadav, B.S., Yadav, R.B. and Debnath,C. (2010). "Organic food: Production and certification", *Indian Food Industry*, Journal of Eco-friendly Agriculture Vol. 5(2): 133-138

Zurbrugg, C. (2003), "Urban Solid Waste Management in Low-Income Countries of Asia-How to Cope with the Garbage Crisis", Presented for, Scientific Committee on Problems of the Environment (SCOPE), Published by, Urban Solid Waste Management Review Session, Pp. 1-4

Zurbrugg, C., Drescher, S., Patel, A and Sharatchandra, H. C. (2004). "Decentralised Composting of Urban Waste – An Overview of Community and Private Initiatives in Indian Cities", *Journal of Waste Management*, Vol. 24(7), Pp. 655-662.

## WEBLIOGRAPHY

WTO, (1948), [www.medicalnewstoday.com/articles/150999.php](http://www.medicalnewstoday.com/articles/150999.php)

[www.2273.pdf](#)

---

[www.aaqua.persistent.co.in](http://www.aaqua.persistent.co.in)

[www.aggie-horticulture.tamu.edu](http://www.aggie-horticulture.tamu.edu), 2009

[www.agropedialabs.iitk.ac.in](http://www.agropedialabs.iitk.ac.in)

[www.answers.yahoo.com](http://www.answers.yahoo.com), 2007

[www.Composting-vs-vermicomposting-Dirt-Maker-Article.html](http://www.Composting-vs-vermicomposting-Dirt-Maker-Article.html)

[www.compostteasystems.com](http://www.compostteasystems.com)

[www.edenfoods.com](http://www.edenfoods.com), 2001. Organic Food: Superior in Every Way as on 19 September 2001. "Nutritional Quality of Organic Versus Conventional fruits, Vegetables and Grains," *Journal of Alternative and Complementary Therapies*, 7: 161-173.

[www.erfindia.org](http://www.erfindia.org)

[www.flexiguru.com/expert/what-do-you-think-biodegradablemeans-6489](http://www.flexiguru.com/expert/what-do-you-think-biodegradablemeans-6489), 2013

[www.indg.in](http://www.indg.in)

[www.innovateus.net](http://www.innovateus.net)

[www.issuu.com/giorgioghiringhelli/docs/giavini\\_michele\\_capture\\_rates\\_of\\_so](http://www.issuu.com/giorgioghiringhelli/docs/giavini_michele_capture_rates_of_so)

[www.journeytoforever.org](http://www.journeytoforever.org)

[www.niteshcapecod.co.in](http://www.niteshcapecod.co.in)

[www.niteshcapecod.in/Apartments](http://www.niteshcapecod.in/Apartments)

[www.nswai.com](http://www.nswai.com)

[www.organicdisposal.net/Pages/organicwaste.aspx](http://www.organicdisposal.net/Pages/organicwaste.aspx), May 26, 2009

[www.satavic.org](http://www.satavic.org)

[www.sepa.org.uk/guidance/waste/hazardous/index.htm](http://www.sepa.org.uk/guidance/waste/hazardous/index.htm).

[www.srigaythribiotec.com](http://www.srigaythribiotec.com)

[www.swlf.ait.ac.th](http://www.swlf.ait.ac.th)

[www.unispal.un.org](http://www.unispal.un.org), 2008

[www.wisegeek.com/what-is-household-waste.htm](http://www.wisegeek.com/what-is-household-waste.htm), 2014

<http://beta.bodhiccommons.org/article/waste-management-in-india>

<http://ec.europa.eu/environment/waste/compost/>, 2014

---

[http://en.wikipedia.org/wiki/Solid\\_waste\\_policy\\_in\\_the\\_United\\_States](http://en.wikipedia.org/wiki/Solid_waste_policy_in_the_United_States), 2013).

[http://en.wikipedia.org/wiki/Waste\\_management](http://en.wikipedia.org/wiki/Waste_management)

<http://epubl.ltu.se/1402-1544/2008/33/LTU-DT-0833-SE.pdf>

<http://EzineArticles.com/3956984>

<http://hareenvironment.gov.in/html/notifications/HOUSEHOLD%20WASTE.pdf>

[http://ms.about.com/od/newsresearch/g/pilot\\_study.htm](http://ms.about.com/od/newsresearch/g/pilot_study.htm), 2012

<http://stats.oecd.org/glossary/detail.asp?ID=1261>

<http://webarchive.nationalarchives.gov.uk>

<http://webarchive.nationalarchives.gov.uk/+http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/composition.pdf>

[http://wiki.answers.com/Q/Why\\_do\\_you\\_need\\_waste\\_management](http://wiki.answers.com/Q/Why_do_you_need_waste_management)

<http://www.2273.pdf/Central-Research-Institute-for-Dryland-Agriculture.htm>

<http://www.apo-tokyo.org/publications/files/ind-22-swm.pdf>

<http://www.articlesbase.com/environment-articles/solid-waste-management-definition-3981929.html>

<http://www.audit-commission.gov.uk/performance-information>

<http://www.bettervegetablegardening.com/how-to-compost.html>

<http://www.boldsky.com/home-n-garden/2006/household-waste-management.html>

<http://www.boldsky.com/home-n-garden/2006/household-waste-management.html>

<http://www.buzzle.com/articles/household-waste-disposal.html>, May 21, 2010

[http://www.ces.iisc.ernet.in/biodiversity/pubs/ces\\_tr/TR118\\_SPoolanacha/Index.htm](http://www.ces.iisc.ernet.in/biodiversity/pubs/ces_tr/TR118_SPoolanacha/Index.htm)

<http://www.ch28.pdf>

[http://www.devon.gov.uk/index/environmentplanning/waste\\_disposal/the\\_problem\\_with\\_waste.htm](http://www.devon.gov.uk/index/environmentplanning/waste_disposal/the_problem_with_waste.htm)

---

<http://www.dorsetforyou.com/wakeuptowaste>

<http://www.earthwatch.unep.net/emergingissues/solidwaste/wastedisposal.php>

<http://www.ecolife.com/define/biodegradable.html>

<http://www.econ.sinica.edu.tw>

<http://www.edugreen.teri.res.in/explore/solwaste/segre.htm>

<http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009/part-b-sectoral-guidance-chapters/6-waste/6-a-solid-waste-disposal-on-land/6-a-solid-waste-disposal-on-land.pdf>

[http://www.eecentre.org/Modules/DWMG/docs/8/Sri\\_Lanka\\_Practical\\_Action.pdf](http://www.eecentre.org/Modules/DWMG/docs/8/Sri_Lanka_Practical_Action.pdf)

<http://www.ehc.bstarconsulting.com/WasteProblems.htm>

[http://www.ehow.com/about\\_5409295\\_importance-vermicompost.htm](http://www.ehow.com/about_5409295_importance-vermicompost.htm)

[http://www.ehow.com/about\\_5409295\\_importance-vermicompost.html](http://www.ehow.com/about_5409295_importance-vermicompost.html)

<http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownload,28637,en.pdf>

<http://www.environ.ie/en/Publications/Environment/Waste/WasteManagement/FileDownload,28637,en.pdf>

[http://www.environment-agency.gov.uk/static/documents/Business/low\\_guide\\_v1.2\\_1397222.pdf](http://www.environment-agency.gov.uk/static/documents/Business/low_guide_v1.2_1397222.pdf)

[http://www.epa.ie/pubs/advice/waste/municipalwaste/EPA\\_Protocol\\_For%20BMW%20Final.pdf](http://www.epa.ie/pubs/advice/waste/municipalwaste/EPA_Protocol_For%20BMW%20Final.pdf)

<http://www.fullcycle.co.za/index.php/what-is-waste-and-why-is-it-a-problem.html>, 2009

<http://www.georgiarecycles.org/business-recycling-programs/agriculture,October,29,2009>

<http://www.gogreen.theconsortium.co.uk/tackling-the-uks-growing-waste-problem/>

[http://www.google.co.in/url?meaning\\_and\\_concept\\_of\\_biodegradable\\_waste\\_management](http://www.google.co.in/url?meaning_and_concept_of_biodegradable_waste_management)

<http://www.greenbiz.com/blog/2012/08/07/trash-problem-profit-opportunity>

---

<http://www.grida.no/publications/vg/waste/page/2853.aspx>, 2013

<http://www.home.howstuffworks.com/composting-for-a-vegetable-garden.html>

<http://www.hood.army.mil/netzero/files/RecyclingHouseholdWasteBrochure.pdf>

<http://www.huntington-study-group.org/Portals/BecomingASiteGreenGlobe.jpg>

[http://www.imok.ufl.edu/vegetable\\_hort /compost/utilization/](http://www.imok.ufl.edu/vegetable_hort /compost/utilization/)

<http://www.jobsearch.about.com/od/jobinterviewtypes/g/semi-structured-interview.htm>

<http://www.learner.org/interactives /garbage/solidwaste.html>

<http://www.learner.org/interactives/garbage/solidwaste.html>

<http://www.livemint.com/2007/11/19170845/Household-waste-could-fetch-Rs.html>

<http://www.livestrong.com/article/187361-household-waste-recycling/>

<http://www.ma.gov.nl.ca/ma/publications/pswms/waste management strategy apr2002.pdf>

<http://www.mestverwerken.wur.nl/home/..%5CInfo%5CBibliotheek%5Cpdf/Macropollutants.pdf>

[http://www.mora.org/education/solid\\_waste\\_definitions](http://www.mora.org/education/solid_waste_definitions), October 7, 2008

<http://www.motherson.com/Waste-Recycling-Systems.html>

<http://www.ndswra.org/dnn/HouseholdHazardousWaste/DefinitionofHouseholdHazardousWaste.aspx>, Oct 16, 2013

<http://www.nswai.com/aboutnswai.php-national-solid-waste-association-india>

<http://www.publications.parliament.uk>

<http://www.recyclingfactsguide.com/managing-organic-waste/>

<http://www.recycling-waste.blogspot.in/2009/11/need-for-waste-management.html>

<http://www.springer.com/earth+sciences+and+geography/environmental+science+%26+engineering/book/978-3-642-28680-3>

<http://www.ssi-schaefer-asia.com/waste-management/ biodegradable-waste.html>

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<http://www.thefreedictionary.com/waste>, 2013

[http://www.un.org/esa/dsd/dsd\\_aofw\\_ni/ni\\_pdfs/NationalReports/finland/WASTE.pdf](http://www.un.org/esa/dsd/dsd_aofw_ni/ni_pdfs/NationalReports/finland/WASTE.pdf)

[http://www.un.org/esa/dsd/dsd\\_aofw\\_ni/ni\\_pdfs/NationalReports/finland/WASTE.pdf](http://www.un.org/esa/dsd/dsd_aofw_ni/ni_pdfs/NationalReports/finland/WASTE.pdf).

<http://www.unispal.un.org/UNISPAL.NSF/0/B1C28A48C8238C49852575DA0068714E>,  
2008

<http://www.waste-management-world.com/articles/2012/01/waste-to-energy-for-integrated-waste-management-in-india.html>

[http://www.whqlibdoc.who.int/php/WHO\\_PHP\\_38.pdf](http://www.whqlibdoc.who.int/php/WHO_PHP_38.pdf)

<http://www.wormpost.com/benefits/composting2.html>

<http://www.ymparisto.fi/download.asp?contentid=102639&lan=en>,2005

<https://www.avma.org/PracticeManagement/Administration/Pages/Definitions-What-is-Waste.aspx>, 2013 American Veterinary Medical Association

<https://www.barnsley.gov.uk/services/environment-and-planning/recycling-rubbish-and-waste/household-waste-collection>



- 6. Type of house** :
- a. Own house
- b. Rented

**7. Educational status**

S. No.	Educational status	Homemakers
1.	Illiterate	
2.	Primary	
3.	Secondary	
4.	Higher Secondary	
5.	Graduate	
6.	Post Graduate	
7.	Diploma	
8.	Professional	

**8. Occupational Status**

S. No.	Occupational Status	Homemakers
1.	Agriculture	
2.	Teacher	
3.	Entrepreneur	
4.	Any Other	

If agriculture is the occupation, then what type of land do you have

- a. Dry land       b. Wet land       c. Garden land

**B. INFORMATION REGARDING HOUSEHOLD WASTE**

**a. Kitchen waste**

S. No	Wastes type	Per day in kg	Alternative day in kg	Weekly in kg	Every 15 days	Monthly in kg
1	Raw foods					
2	Vegetable peels					
3	Food left over					
4	Tea and coffee powder					
5	Coconut shells					
6	Fruits skins					
7	Egg shells					
8	Bone and meat waste					
9	Any other					

**b. General waste**

S. No	Waste type	Per day in kg	Alternative day in kg	Weekly in kg	Every 15 days	Monthly in kg
1	Packets					
2	Paper bags					
3	Polythene bags					
4	Tins					
5	Bottle					
6	Plastic container					
7	Match boxes					
8	Tooth paste tube					
9	Glass					
10	Glass bangles					
11	Tissue paper					
12	Disposal diapers					
13	Napkins					
14	News paper					
15	Magazines					
16	Computer paper					
17	Refill					
18	Any other					

**c. Garden waste**

S. No	Waste type	Per day in kg	Alternative day in kg	Weekly in kg	Every 15 days	Monthly in kg
1	Leaves					
2	Sticks					
3	Animal waste					
4	Any other					

**d. Total quantity of household waste available**

S. No	Waste	Per day in kg	Alternative day in kg	Weekly in kg	Every 15 days	Monthly in kg
1.	Kitchen waste					
2.	General waste					
3.	Garden waste					
Total						

### C. METHOD OF COLLECTING HOUSEHOLD WASTE

a. Do you have separate bins for collection of household waste?

- Yes                       No

If yes, give details

S. No	Type of Container Used	Position and Location	Material it is Made of	Capacity
1.				
2.				
3.				
4.				

b. Frequency of disposal of waste

- a. Daily                       b. On alternate days                       c. Weekly

c. Who is responsible for disposing of waste?

- a. Home maker                       b. Head of the family                       c. Children   
d. Domestic helper                       e. Any other (specify)

### D. METHOD OF DISPOSAL OF HOUSEHOLD BIODEGRADABLE WASTE

- a. Use of government dust bins                       b. Burning   
c. Throwing in the empty plots                       d. Converted into home compost   
e. Throwing in the road sides                       f. Converted into vermicompost

### E. PROBLEM FACED BY ACCUMULATION OF HOUSEHOLD WASTE

- 
- 1 Breeding places for insects, mosquitoes, flies and rodents
  - 2 Unhygienic surrounding
  - 3 Environmental pollution
  - 4 Unpleasant odour
  - 5 Polluted water supply
  - 6 Health problems
  - 7 Street dogs problems
  - 8 Overflows of drainage

**F. RECYCLING THE WASTE**

a. Do you reuse or recycle any of the waste?

- Yes  No

If yes, how do you recycle the waste?

b. Are you willing to separate collected wastes like plastic, paper, metals, etc, into separate bags for collection purposes?

- Yes  No

If yes, give me the reason

If no, give me the reason

c. How do you recycling them?

S. No	Product	Reused as	Recycled into	Sold to vendor	Disposed as

**G. PREVAILING ENVIRONMENTAL CONDITION IN THE SELECTED AREA**

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**a. Existing environmental condition**

1. Surface water contamination due to waste disposal in water bodies
2. Raised atmospheric temperature
3. Soil contamination and toxic effect of soil
4. Loss of biodiversity
5. Increased generation of Industrial, commercial waste
6. Air pollution

**b. Reasons for environmental degradation**

1. Lack of knowledge on disposal of waste
2. Indiscriminate throwing of waste
3. Improper management of waste
4. Lack of environmental awareness
5. Improper collection of waste by Government Agency
6. Mishandling of dustbins
7. Laziness of managing waste in a proper manner
8. Population explosion
9. Lack of space and provision for disposal

**c. Type of domestic pollutants**

1. Garbage
2. Sewage
3. Excreta

**d. Need for clean environment**

1. Good health
2. Clean atmosphere
3. Good and neat surrounding
4. Mental relaxation
5. Life satisfaction

**d. Do you compost your waste?**

---

Yes                      No  
If yes, give me the reason  
  
If no, give me the reason

**e. If you do not compost, would you consider starting composting at home?**

Yes                      No  
If yes, give me the reason  
  
If no, give me the reason

**f. Do you have idea how composting helps you to reduce waste**

Yes                      No  
If yes, give me the reason  
  
If no, give me the reason

**g. Do you have garden?**

Yes                      No  
If yes, list the Plants and Vegetables available in your garden  
  
If no, Give reason

**h. Are you interest in organic kitchen gardening?**

Yes                      No  
If yes, give reason  
  
If No, give reason

**i. Do you feel it will improve your economic condition**

Yes                      No  
If yes, give reason  
  
If No, give reason

**j. Have you attended any training programme before**

Yes                      No

## APPENDIX – II

### MONOGRAPH

**“TECHNO – TRANSFER THROUGH INTERVENTION ON  
BIODEGRADABLE WASTE MANAGEMENT IN RURAL SETTINGS”**



### Candidate

**Suranjana Agamacharya, Ph.D Research Scholar**

### Guide

**Dr. (Mrs.) K. Manimozhi, Associate Professore**

Department of Resource Managemnet  
Avinashilingam Institute for Home Science and Higher Education for Women,  
Coimbatore- 43

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### APPENDIX III

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**BOOKLETS AND PAMPHLET ON INTERVENTION PROGRAMME  
IN REGIONAL LANGUAGE**

**Booklets**

1. சுற்றுப்புறச் சூழல்  
(Environmental condition)
2. திடக்கழிவுமாசுபாடுகளும் அதன் மேலாண்மையும்  
(Biodegradable waste management)

**PAMPHLET**

1. Àí Ì òÀ; ÒÈø ¼É ÅÉ ¼Éÿ Àí Ì  
(Role of a man to control pollution)

வெளியீடு:

Í Æý fÉ; - , Á; °; i; i; Å;

முனைவர் பட்டஆய்வாளர்

முனைவர் திருமதிக.மணிமொழி M.Sc., B.Ed., M.Phil., Ph.D.,

இணைப்பேராசிரியர், வளநிர்வாகத் துறை

அவினாசிலிங்கம் பல்கலைக்கழகம்

கோயம்புத்தூர் - 641 043.

# சுற்றுப்புறச்சூழல்



சுரன்ஐனா ஆகமசாநீயா  
முனைவர் பட்டஆய்வாளர்

முனைவர் திருமதி க.மணிமொழி M.Sc., B.Ed., M.Phil., Ph.D.,

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அவினாசிலிங்கம் பல்கலைக்கழகம்  
கோயம்புத்தூர் - 641 043.

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# திடக்கழிவுமாசுபாடுகளும்அதன் மேலாண்மையும்



**கரன்ஜனா ஆகமசாநீயா**  
முனைவர் பட்டஆய்வாளர்

**முனைவர் திருமதி க.மணிமொழி M.Sc., B.Ed., M.Phil., Ph.D.,**  
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அவினாசிலிங்கம் பல்கலைக்கழகம்  
கோயம்புத்தூர் - 641 043.

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#### APPENDIX IV

#### KNOWLEDGE INVENTORY TO ASSESSED THE KNOWLEDGE OF THE WOMEN LEADERS TOWARDS BIODEGRADABLE WASTE MANAGEMENT PRACTICED

S. No	Knowledge Statement	Before Training	After Training
<b>A. Types of household waste</b>			
1.	Solid waste- biodegradable and non-biodegradable		
2.	Liquid waste		
<b>B. Methods of disposing household waste</b>			
3.	Throwing in the road sides		
4.	Government dust bins		
5.	Home compost pit		
6.	Vermicomposting		
<b>C. Reasons for improper disposal of household waste</b>			
7	Lack of knowledge		
8	Laziness		
9	Lack of environmental awareness		

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**D. Problems due to improper disposal of household waste**

- 10 Air, water and soil pollution
- 11 Health problems
- 12 Flooding due to garbage blocking drains and gullies
- 13 Providing place for Insects, mosquitoes, flies and rodents breeding
- 14 Unhygienic surrounding
- 15 Unpleasant odour

**E. Preparation of fertilizers and pesticides**

- 16 Eco-friendly fertilizers
- 17 Eco-friendly pesticides
- 18 Eco-friendly growth-boosters

**F. Resource recovery from biodegradable waste**

- 19 Composting
- 20 Botanical pesticides
- 21 Organic fertilizers
- 22 Jeevamirthum
- 23 Amuthakaraisal

**G. Follow standard procedure for preparation of compost**

- 24 Collection of everyday household waste and agricultural waste
- 25 Segregating the household waste
- 26 Proper collection of biodegradable waste in bins
- 27 Adding cow dung, soil and botanical leaves
- 28 Converting waste to manure

**H. Opinion regarding advantages of home composting**

- 29 Availability of compost for gardening

- 
- 30 Clean environment
  - 31 Saves money
  - 32 Improve the health of the family members

**H. Advantages of kitchen gardening**

- 33 Fresh vegetables
- 34 Recreation and mental relaxation
- 35 Clean atmosphere and neat surrounding
- 36 Guiding younger generation
- 37 Subsidiary income
- 38 Self-satisfaction

**APPENDIX V**

**ATTITUDE SCALE USED PRIOR TO AND AFTER THE TRAINING PROGRAMME**

S.No.	Statements	SF	F	N	UF	SUF
1.	Recycling is a difficult process	1	2	3	4	5
2.	Regular collection of garbage is the only solution of environment problem	5	4	3	2	1
3.	Household waste management is very difficult process	1	2	3	4	5
4.	Home composting requires more procedure	1	2	3	4	5
5.	Kitchen garden require more space	1	2	3	4	5
6.	Segregation of waste is very difficult process	1	2	3	4	5
7.	Home composting require more time and money	1	2	3	4	5
8.	Home composting speads bad smell	1	2	3	4	5
9.	Flies and mosquitoes breeding are high in home composting	1	2	3	4	5
10.	Home compost ensure the protection of environment	5	4	3	2	1
11.	Technical guideline required for home composting	1	2	3	4	5
12.	Composting is a time consuming process	1	2	3	4	5

13.	Household waste management practices demands excessive labour for periodical cleaning and maintenance	1	2	3	4	5
14.	Organic vegetables contains more nutrients	5	4	3	2	1
15.	Organic vegetable maintain the quality and flavor	5	4	3	2	1
16.	Organic vegetable ensures increased shelf-life of vegetables	5	4	3	2	1
17.	The use of organic manure helps to reduce the application of chemicals pesticides and insecticides	5	4	3	2	1
18.	Improper disposal of waste leads to health problem	5	4	3	2	1
19.	Biodegradable waste can be easily to recycling	5	4	3	2	1
20.	Biodegradable waste management provides subsidiary income	5	4	3	2	1

SF – Strongly Favourable; F – Favourable; N – Neutral;

UF – Unfavourable, SUF – Strongly Unfavourable

## APPENDIX IX

### AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN, COIMBATORE -43

#### Details of the case study conducted

- A. Socio-economic survey- Questionnaire
- B. Average quantity of kitchen waste generated by the selected households
- C. Average quantity of garden waste generated by the selected households
- D. Average quantity of animal waste generated by the selected households
- E. Total quantity of biodegradable waste generated by the selected households
- F. The quantity of greens produced by the households in one cropping in one month
- G. The quantity of vegetables produced by the households in one cropping in three months

#### A. Socio-economic survey

Name:

Address:

Occupation: Agriculture

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1. **Age of the respondent**

- e. Below 30
- f. 30 – 40
- g. 40 – 50
- h. 50 and above

2. **Type of family**

- d. Joint family
- e. Nuclear

3. **Size of family**

- d. Small (1-4)
- e. Medium (4-6)
- f. Large (6 to above)

4. **Stages in the family life cycle**

- d. Beginning
- e. Expanding
- f. Contracting

5. **Income of the family in ₹**

- d. Low (₹5,000- 7,000)
- e. Middle (₹7,000- 9,000)
- f. High (Above ₹ 9,000)

6. **Type of house**

- c. Own house
- d. Rented

7 **Type of farmers**

- a. Marginal
- b. Small
- c. Large

1. Feasibility: Feasibility of composting and vermicomposting in terms of time, work input and cost.

Aspects	Degree of feasibility		
	Strongly Favourable	Favourable	Unfavourable
Time			

Work Input			
Cost			

2. Accessibility: Access to material inputs for composting technique like kitchen waste, garden waste, animal waste.

Type of waste	Quantity obtained		
	Per Day	Per month	yearly
Kitchen waste			
Garden waste			
Animal waste			

3. Duration taken to get ready compost and vermicompost

Vermicompost	0-1 ½	1 ½- 3
a. Silpaulinvermibed		
b. Compost pit		

4. Economic benefits

- How many loads in 4 or 6 months sold? What is the price load? How much income obtained in the last 3 years.
- Whether used for kitchen garden for raising resistible? If yes, what are the resistible grow for your family and what percentage of expenditure in income has reduced.

5. Acceptability:

Aspects	Degree of acceptability	
	Acceptable	Not Acceptable
a. Composting		
b. Vermi Composting		
c. Amuthakaraisal		
d. Neem leaf extract for protection		
e. Jivamrutham		
f. Cow dung extract		
g. Neem kernel extract		
h. Seed treatment with cow's urine		