CHAPTER-IV
RESULTS AND DISCUSSION

The result of the study on "**Disseminating Knowledge on Solid Waste Management**" is presented under the following heads:

4.1.Socio economic characteristics of women.

4.2.Existing conditions of the selected area on solid waste management

4.3.Knowledge, Attitude and Practices on solid waste management.

4.4.Impact of educational intervention on solid waste management before and after the intervention.

The chapter presents the socio economic characteristics of women, followed by the assessment of existing practices on solid waste management and assessment of knowledge, attitude and practices on solid waste management and the impact of educational intervention on solid waste management before and after is assessed and presented in statistical form.

4.1. SOCIO ECONOMIC CHARACTERISTICS OF WOMEN

The socio economic characteristics of the women are assessed and presented in following Table-IX

TABLE-IX

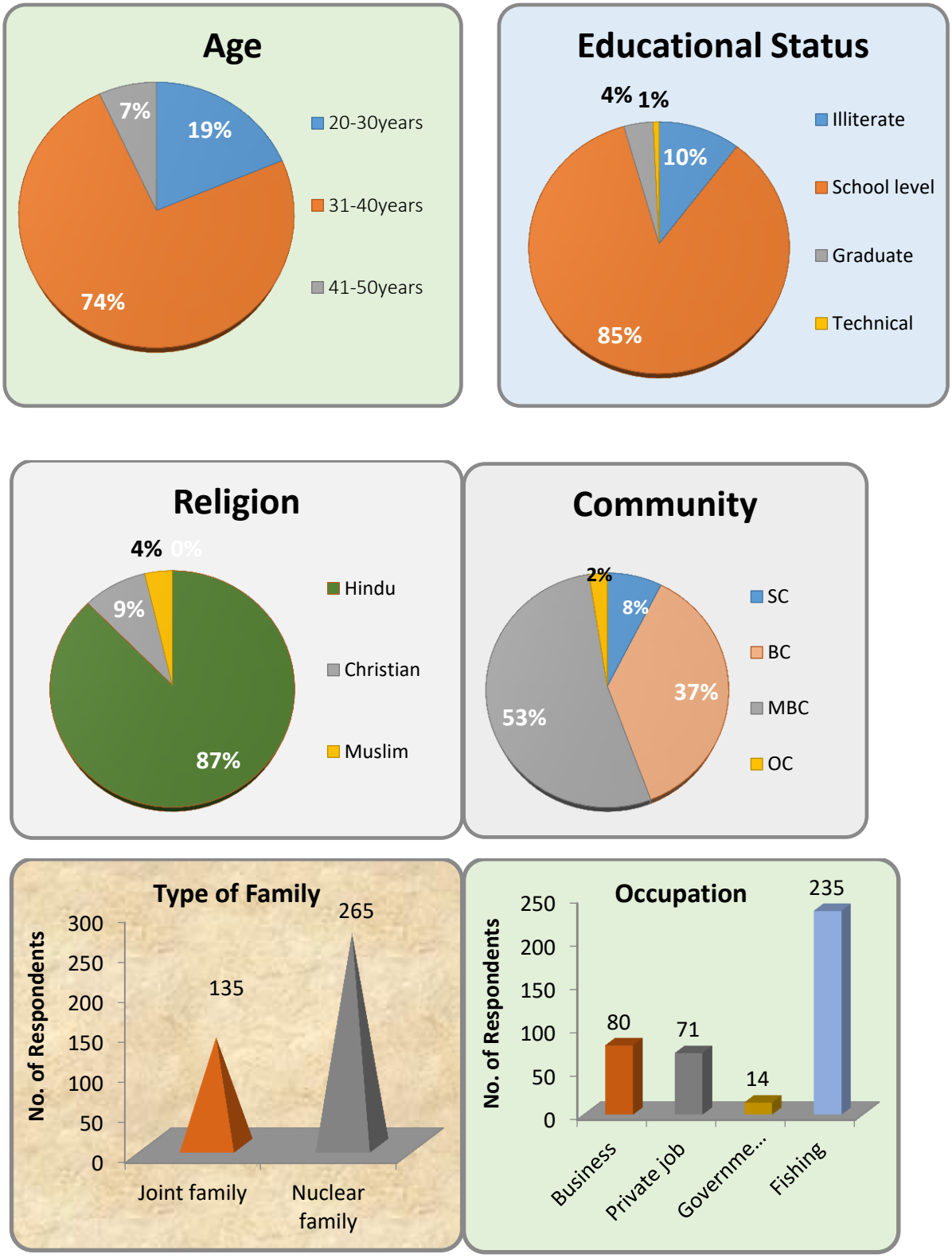
SOCIO ECONOMIC CHARACTERISTICS OF WOMEN

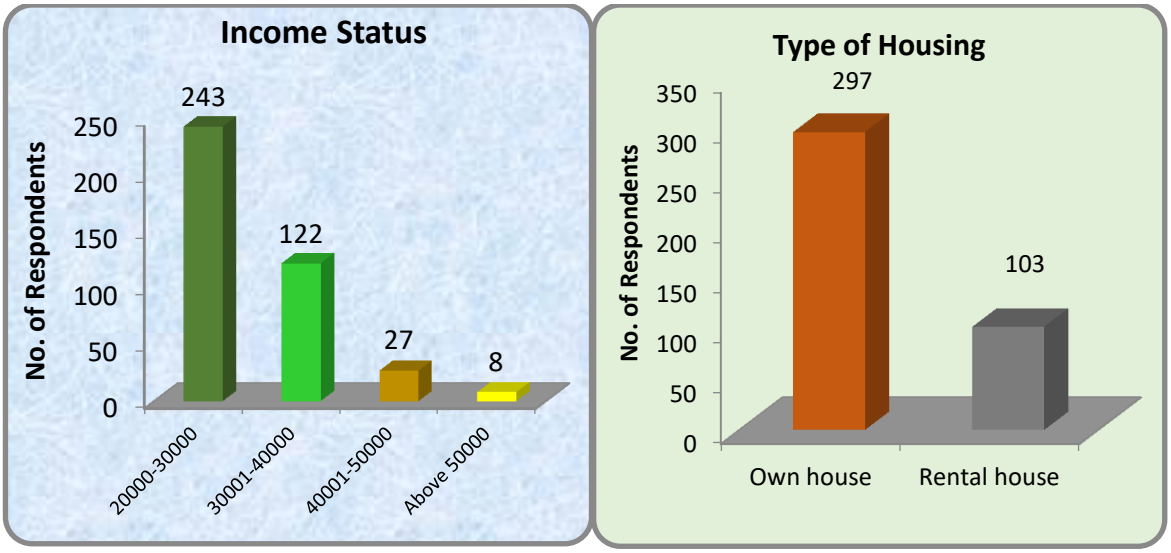
Variables	Characteristics	N=400	Percent
Age	20-30 years	75	19
	31-40 years	297	74
	41-50 years	28	07
Educational status	Illiterate	42	11
	School level	340	85
	Graduate	15	04
Religion	Hindu	350	88
	Christian	35	09
	Muslim	15	03
Community	SC	30	08
	BC	147	37
	MBC	212	53
	OC	10	02
Type of Family	Joint Family	135	34
	Nuclear Family	265	66
Occupation	Business	80	20
	Private Job	71	18
	Government Job	14	03
	Fishing	235	59
Income(Rs/annum)	20000-30000 (low income)	243	61
	31000-40000(middle income)	122	30
	41000-50000 (high income)	27	07
	Above 50000	08	02
Familysize (members)	1-5	297	74
	Above 5	103	26

Source: Primary data

FIGURE 8

SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN





The socio-economic background of the women is very important as it gives clear perceptions regarding the subject under study, its goals, opportunities, achievements and contributions to society. The factors include caste, age, religion, marital status, education, and economic activities, occupation and economic status. Karl Manheim considers social atmosphere as an important factor in framing the personality of a person.

Age

Age is a biological factor and it has been found prominent in all activities of a person and it is an indicator of a person is physical and psychological maturity from biological perspective and social activities.

The data from table VI reveals that 74 per cent are in the age group between 31-40 years. It is followed by 19 per cent of the women belonging to the age of 20-30 years and 7 per cent of the selected women belong to the age of 41-50 years.

Educational status of the women

The socio economic status comprises not only the income but also the educational attainment and the perceptions of social status and social class. Education enriches the quality of their lives and gives broad social benefits to the individual and the society. Education gives awareness to humans to differentiate good from bad. Singh (1973) has observed that education plays an important role in social change.

The data depicts that 85 per cent of the women have completed their schooling, out of which only four percent of the women completed their graduation and about 10 per cent are illiterates.

Religion

Religion is also a social institution. Social scientists recognize that religion exists as an organized and integrated set of beliefs, behaviors, and norms centered on basic social needs and values. Moreover, religion is a cultural bond found in all social groups in the world. Durkheim is considered as the first sociologist has analyzed religion in terms of its societal impact. Above all, he believed that religion binds people together (social cohesion), promotes behavior consistency (social control), and offers strength during life's transitions and tragedies (meaning and purpose). Religion is an important factor that influence the other factors of persons and the social status is highly influenced by religion. The table reveals that majority (87.5%) of the women belong to Hindu religion as Rameswaram is a famous Hindu pilgrim centre. 9 per cent of Christians and four percent of Muslim women are also in the team.

Community

Caste or Community is a major factor in socio economic background. Each and every person's status is determined by caste. India is a traditional country and it has a multifarious caste system. In the Hindu caste tradition, people are expected to work in the occupation of their caste and to enter into marriage according to their caste. Due to urbanization, modernization there is significant change in caste system compared to the past, but in villages the caste system still exists. According to a study conducted by National Institute of Community development (1967) it is observed that majority of the village leaders are from Brahmins or Non Brahmin upper castes and their economic and education level is also high.

The table states that 53 per cent of the women belong to Most Backward Caste and 37 per cent of the women belong to Backward Caste only meagre percentage belong to Scheduled Caste and even less (2%) of the women only belong to Forward Caste.

Family

Family is a small unit but it is one of the most powerful units of the society as family and marriage are key structures in societies. The study also reveal that 60 per cent of the U.S. respondents agree that if you consider yourself a family, you are a family (a concept that reinforces an interactionist perspective) (Powell 2010). The government, however, is not so flexible in its definition of "family." The U.S. Census Bureau defines family as "a group of two people or more (one of them is the leader) related by birth, marriage, or adoption and residing together" (U.S. Census Bureau 2010). Our families nurture, preserve, and pass on to each succeeding generation the values we share and cherish, values that are the foundation of our freedoms" (Lee 2009). Kolenda, (1987) describe different types of joint families and nuclear families based on their members and relatives.

The study reveals that 66.3 per cent of women belong to nuclear family. Nuclear families were on increase in urban areas but nowadays in rural areas also it has become common.33.8 per cent of the women are in joint family. It is to be noted that urbanization is the main reason for increase in nuclear families.

Occupation

Occupation is a vital factor that influences the socio economic status of an individual. It plays an important role in determining the economic status. In the traditional India occupation was based on their caste. Now the constitution of India provides freedom to people to choose their occupation. The table depicts that 59 per cent of the selected women earn their income by fishing as it is an island, fisheries play a main role in their livelihood. Eighteen percentage have taken up private jobs related to the island jobs like algae production, ice factory, and sea shell factory. And about 20 per cent of women have their income from business only a meager percentage of the women are government employees or workers.

Income

Income for the family is vital factor to determine the economic status of the women. The income depends on various aspects such as lands, occupation, business, and so on. Due to unemployment many people have shifted to town and cities to earn their livelihood.

The area under study mainly depends on fisheries and tourism.60.8 per cent of the women belong to the annual income group of Rs 20000-Rs 30000. 30.5 per cent of the women earn uptoRs 40000, and about 7 per cent of the women have their income between Rs 40000 to Rs 50000, only 2 per cent of them belong to the income group of above Rs 50000.

Household size

Information related to the size of the household is directly related to the quantity of waste generated in the household. Majority of the women have up to 4 members in the family.

4.2. EXISTING CONDITIONS OF THE SELECTED AREA ON SOLID WASTE MANAGEMENT

Existing practices on solid waste management among women are discussed under the following aspects:

4.2.1. Types of solid waste generation at household level

4.2.2. Existing practices on waste disposal method

4.2.3. Storage and disposal of solid waste

4.2.1. Types of solid waste generation at household level

Types of solid waste generated at households as experienced by the women are presented in Table- X

TABLE X

TYPES OF SOLID WASTE GENERATED AT HOUSEHOLD LEVEL

			N=400
Type of waste	**Waste**	**N**	**Percent**
Biodegradable waste	Food debris	311	78
	Tea and coffee dust	294	73
	Paper	284	71
	Fruit skin	262	65
	Egg shell	255	64
	Vegetable peel	215	54
Non-biodegradable waste	Food packets	294	74
	Glass items	294	74
	Plastic container	229	57
	Electronic items	284	71
Hazardous or reject waste	Adult napkins	262	65
	Disposal diaper	255	64
	Used medicine	215	54

Source: Primary data

The types of solid wastes generated at the household level are depicted in this table. Food debris (78%) is the most common biodegradable trash in the research area, followed by tea and coffee dust amounting to (73%) and paper (71%). Food packets and glass objects account for the majority of non-biodegradable garbage generated at the household level by 57 percent of women.

Hazardous waste, often known as refuse waste, is waste that poses a risk to public health or the environment if it is not properly disposed of in time eg wastes from industries, hospitals and fertilizer plants are hazardous wastes. Adult napkins and the disposable diapers are the major waste generated at household and it should be disposed properly to prevent health hazards to the public. 54 percent of women believe that outdated and used medicine or tonics are also a type of waste generated at the household level.

The existing practice of the waste disposal is to throw degradable and non-degradable waste together in the dustbins. Therefore an attempt is made to assess the number of women and their existing practices on waste disposal methods. The results are presented in the Table- XI

TABLE XI

EXISTING PRACTICE ON WASTE DISPOSAL METHOD

			N=400
Type of waste	**Method of disposal**	**N**	**Percent**
Food waste	Dumping	192	48
	Throwing out	112	28
	Feed to animal	96	24
Plastics	Throwing outside	254	63
	Burning	51	13
	Reuse	35	09
	Selling	60	15
Cardboard/paper	Throwing outside/Dustbin	236	59
	Burning	112	28
	Selling	40	10
	Reuse and Recycle	12	03
Utensils/Vessels	Exchanging to buy new things	278	69
	Throwing outside/Dustbin	122	30
Glass	Throwing outside	265	66
	Selling	135	34

Source: Primary data

The present study exhibits a clear picture on the existing practices in waste disposal methods. 48 per cent of the women dump their food debris in open place, 28 per cent of the women throw the food waste outside their houses. Only about 24 per cent of the women use the food waste as animal feed.

The present data stated that plastic waste is the major non-biodegradable waste generated at households and 63 per cent of the women throw the plastic waste in open

places, 13 per cent of the women burn the plastics unmindful of the fact that burning plastics waste in open places creates air pollution and it affects human health. Very meagre percentage of women sell the plastics waste for money.

Cardboard and the paper waste yet another prominent waste generated frequently at the household level. Majority of the women throw them into dustbin and 28 per cent of the women burn the paper and cardboard, while ten per cent of the women sell them out for the money and only three percentage reuse the paper and cardboard for handicraft.

The majority of women are unaware of solid waste management, trash types, waste management strategies, and the harmful consequences of inappropriate solid waste management. Hence awareness on solid waste management is analysed and given in Table XII

TABLE XII

AWARENESS ON SOLID WASTE MANAGEMENT

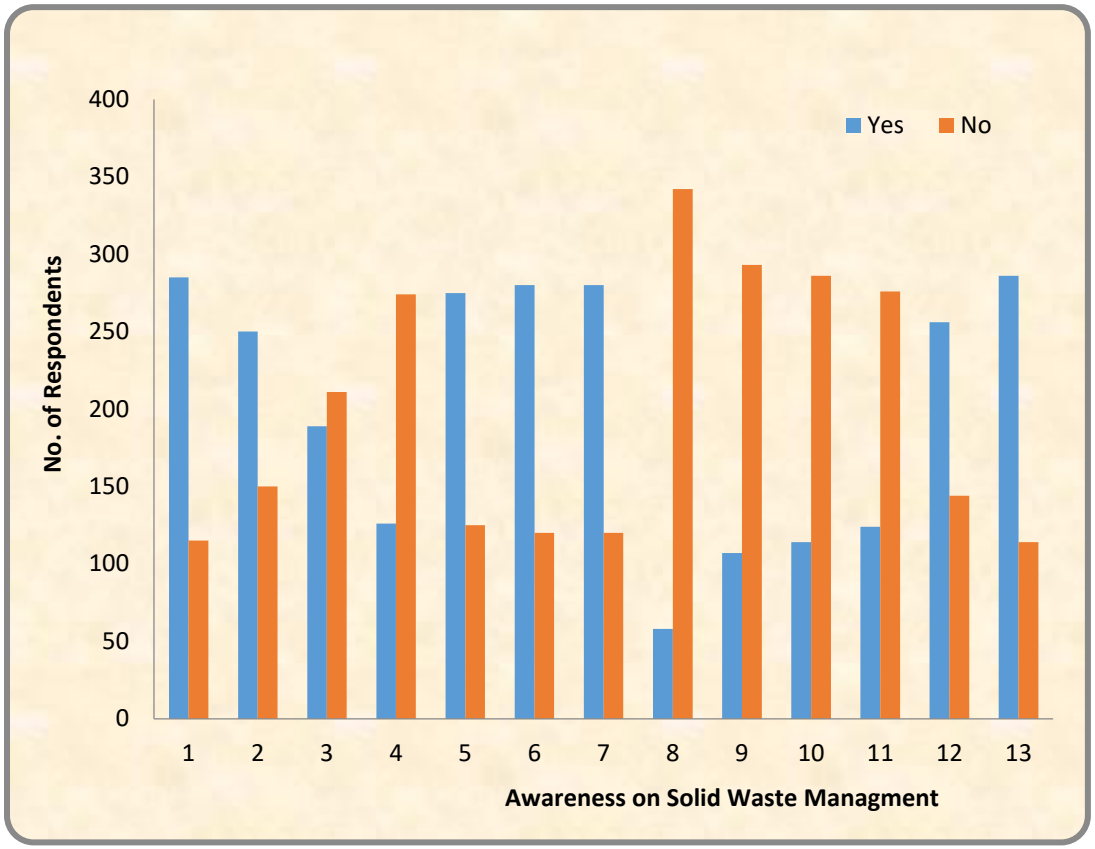
N=400

Awareness	**Yes**	**Percent**	**No**	**Percent**
Concept of waste	285	71	115	29
Types of waste	250	63	150	37
About Waste Segregation	189	47	211	53
Aware of Bio-degradable and Non-biodegradable waste	126	31	274	69
Positive and negative effects of Waste Management.	275	69	125	31
Aware of composting method	280	70	120	30
Compost is rich in nutrients and used as fertilizer	280	70	120	30
Aware of composting technologies	58	15	342	85
Types of composting method	107	27	293	73
Concept on kitchen gardening	114	28	286	72
Aware of pollution	124	31	276	69
Types of pollution	256	64	144	36
Improper waste management leads to environmental pollution	286	71	114	29
Burning of waste leads to air pollution	215	54	185	46

Source: Primary data

FIGURE 9

AWARENESS ON SOLID WASTE MANAGEMENT



Raising municipal waste management knowledge is an important component of efficient waste management. The benefits of efficient solid waste management are well understood by waste management. According to Hasan SE (2004), public knowledge and engagement in waste management programmes are essential.

It is evident from the table that women are aware on the concept of waste, types of waste and pollution, and negative effects of improper waste management. But a large extent of 53 per cent of the women are unaware on the segregation of the waste, and about 85 per cent are aware on composting technologies. This is the reason for all the women throwing and burning their wastes in public places. Kitchen gardening is one of the best techniques used in households but it is not practiced by the majority. 54 per cent of the women are aware that burning of waste leads to air pollution but still many people burns the waste in public places.

4.2.3. STORAGE AND DISPOSAL OF SOLID WASTE

Waste poses a major threat to public and the environment if it is not collected, stored and disposed in a proper way.

The types of containers used by the women for the storage of waste is presented in Table XIII

TABLE XIII

TYPE OF CONTAINER USED FOR STORAGE OF WASTE

		N=400
Types of container	**N**	**Percent**
Buckets	138	35
Dust bin	100	25
Polythene bag	54	13
Plastic container	48	12
Old vessels	20	05

Source: primary data

Plastic containers, polythene bags, antique vessels, and buckets are commonly used to store solid waste. They are also thrown in the back yards of houses. It varies depending on the amount and type of garbage generated in the home. In the study area, buckets are used primarily by 35 per cent of the women. 25 per cent of the women store the waste in dust bins. Polythene bags are used as waste containers by 13 per cent of the women. Twelve percentage of the women use plastic containers while old vessels are used by about 5 per cent of the women.

The methods of solid waste disposal used by women are listed in Table XIV.

TABLE XIV

DISPOSAL OF SOLID WASTE

		N=400
Disposal of solid waste	**N**	**Percent**
Separating the waste before the disposal		
Yes	192	48
No	208	52
Place of waste bin kept in houses		
Kitchen	103	26
Backyard of the house	118	29
On street corner	58	15
No storage	121	30
Number of disposal bin		
One	64	16
Two	128	32
No bin/container	208	52
Separate bin for storage of waste		
Yes	118	30
No	282	70

Source: Primary data

The table clearly shows the habit of the women on segregation and disposal of solid waste, 52 per cent of the women do not separate the waste before disposal due to lack of awareness and negligent attitude.52 per cent of the women do separate the waste before they dispose.

The location of placing the dustbin differs from house to house. 30 per cent of the women do not store the waste and they are not willing to keep the waste bin inside their house. 29 per cent of the women use the backyard of their houses for dumping the waste. 26 per cent of the women keep the waste bin inside their kitchen itself while fifteen percentage of the women throw the waste in the street corner.52 per cent of the women state that they do not have containers to dispose the solid waste. 32 per cent of the women

have two bins and they are separate the waste as organic and in organic waste. Sixteen per cent of the women are have only one waste bin in their houses.

Information on garbage collection is a very important factor because improper waste management results in environmental degradation. Collection service is one of the prominent roles in waste management in all places. Garbage collection is an important part of waste management. As a result, an attempt is made to evaluate the waste collection practices of women, which is provided in Table XV.

TABLE XV

INFORMATION ON GARBAGE COLLECTION

		N=400
Information	**N**	**Percent**
Mode of method adopted		
Community Dust bin	215	54
Door to Door Collection	185	46
Transportation of waste from house		
Self	298	75
Children	34	08
Housemaid	68	17
Frequency of disposal of waste		
Daily	98	25
On alternative days	91	22
Weekly	117	29
Two week once	94	24
Using regular collection service		
Yes	198	50
No	202	50
Reasons for not using the collection service		
Frequency of time is not satisfaction	175	44
Improper way of collecting of waste	119	30
Improper behavior of worker	106	26
Satisfaction with collection service		
Yes	168	42
No	232	58
Reasons for not satisfaction on collection service		
Lack of clean appearance	98	24
Frequency of collection service is poor	196	49
Workers behave rude	106	27

Source: Primary data

From the table it is observed that 54 per cent of the women use community dustbin and 46 per cent of the women use door to door collection service.75 per cent of the women transport the waste on their own, while the 17 per cent of women employ their housemaids to transport the waste to collection service people and very few women engage their children to dispose their waste from house to the collection point. The frequency of collection service is not satisfactory because majority women except daily collection service and 22 per cent of the women are use the collection service on alternative days, 29 per cent on weekly, and 24 per cent of the women use to have once in two weeks while 25 per cent utilize daily service. Due to erratic frequency of waste collection, 50 per cent of women do not use the collection service and 50 per cent use the service regularly. Reason for not utilizing the collection service varies due to many reasons but citing irregular, 44 per cent of the women do not use the collection service.30 per cent of women responses say that they collect waste in improper way, while 26 per cent of the women are not satisfied because of issues related to the behavior of the workers. So majority of the women are not satisfied with the collection service. 49 per cent of the women are not satisfied with the collection service because the collection service is poor and 27 per cent of the women hesitate to use the service because the rudeness of the workers and about 24 per cent of women state that the appearance of the workers is not good.

The local garbage collection service mode of operation is also a key aspect in proper solid waste management. It is also evaluated and the results shown in Table XVI.

TABLE XVI

MODE OF OPERATION ON GARBAGE COLLECTION SERVICE

		N=400
Operation of garbage collection service	**N**	**Percent**
Authorities for collection of waste		
Municipality	96	24
Community organization	142	35
Private organization	162	41
Mode of transport used for clearance of waste		
Tricycle	198	49
Battery operator vehicle	116	29
Lorry	86	22
Frequency of clearance of waste by collection service		
Everyday	105	26
Once in two days	124	31
Once in week	98	25
Occasionally	73	18
Provisions of community large bins by authority		
Yes	202	50
No	198	50
Location of community bin		
Corner of the street	104	26
Public property	198	49
Appropriate disposal site	98	25
Distance between residence and location of community large bin		
10-20 mtrs	115	29
20-30 mtrs	165	41
Above 30 mtrs	120	30
Satisfaction by using large bin		
Yes	165	41
No	235	59
Reasons for dissatisfaction in using large bins		
Due to height of the bin	47	12
Due to spreading of wastes around the bin	63	16
Animal menance	92	23
Odour and unhygienic appearance	102	25
Distance from home to bin	96	24

Source: Primary data

The table shows the mode of operation on garbage collection service. The collection of waste by three ways, directly by the municipality, community organizations like NGOs and private concerns. According to the present study 41 per cent of the women prefer private concern to collect the waste from houses, while 35 per cent of the women prefer community organizations for collection of waste and only a meagre per cent of the women use the municipality service for their garbage disposal.

The data indicate that 49 per cent of the women use tricycles and 29 per cent of the women use battery vehicles while closed truck is used by about 22 per cent of the women.

Clearance of waste is the main responsibility to prevent health hazards. The frequency with which waste is cleared is determined by the quantity and qualities of the waste. In this present study, 31 per cent of the women have opined that waste is collected in alternative days and 26 per cent of the women have stated that it is cleared by authorities every day, while 25 per cent of the women say that solid waste is cleared only once in a week. Eighteen percentage of the women opine that collection service is not frequent.

The collection service usually keeps large bins in the corner of the street or in convenient place. But 76 per cent of the women complain that they are not provide the community large bins.24 per cent of the women use the community large bins for their waste disposal. 49 per cent of the women have their community bins kept in public or unused property and 26 per cent use the bins kept in street corners while others have their bins in appropriate disposal sites. The reasons for not using community bin is noted as follows: 25 per cent of the women state that odor and unhygienic appearance around the bin and animal menace is also one of the reasons, 24 per cent of the women opine that distance from home to bin is far and due to the height of the bin 12 per cent of the women do not use the large bins present in the locality.

The satisfaction level on present solid waste management is assessed and discussed with the data in table- XVII

TABLE XVII

LEVEL OF SATISFACTION ON PRESENT SOLID WASTE MANAGEMENT

				N=400
Level of satisfaction	**Satisfied**	**Percent**	**Not satisfied**	**Percent**
Provision for waste collection	198	50	202	50
Frequency of collection of waste is maintained	189	47	211	53
Provision of community bins at locality	197	49	203	51
Behavior of waste collecting workers	203	51	197	49

Source: Primary data

The table given above explains the satisfaction level of the women with respect to their current waste collection service. It is inferred that half of the women are satisfied with provision for waste collection and the other half of the women are not satisfied.

With respect to periodicity of collection of waste 53 per cent of the women were not satisfied while 47 per cent women were satisfied. Based on the provisions of community bins at locality 51 per cent of the women are not satisfied and almost the same per cent of the women are satisfied with the behavior of waste collecting workers.

The present environmental condition of the selected area shows the awareness level of the people, their knowledge and reasons for the environmental degradation; therefore it has been widely assessed and depicted in table- XVIII

TABLE XVIII

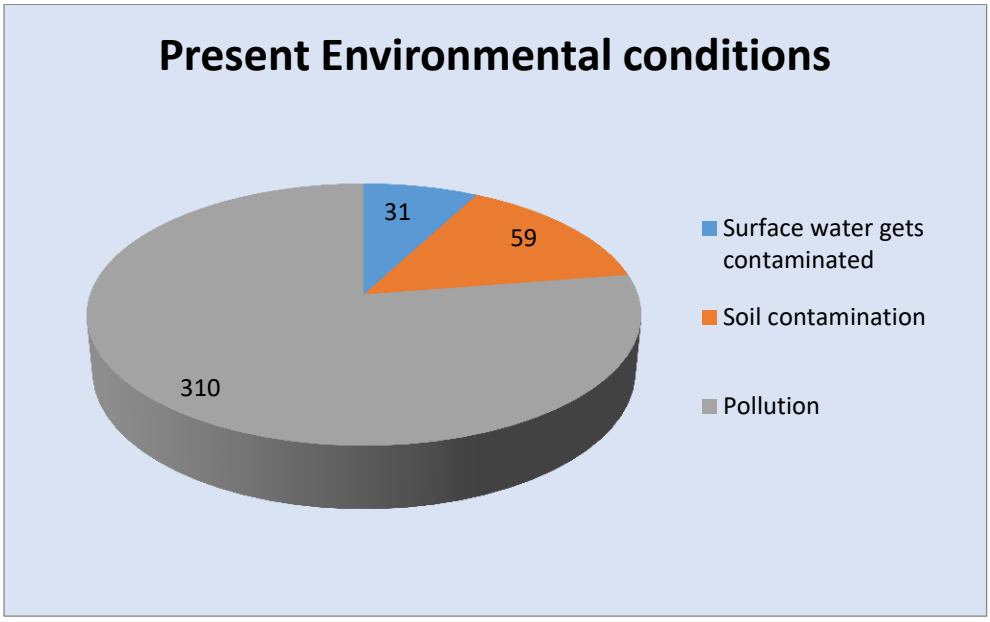
PREVAILING ENVIRONMENTAL CONDITION OF THE STUDY AREA

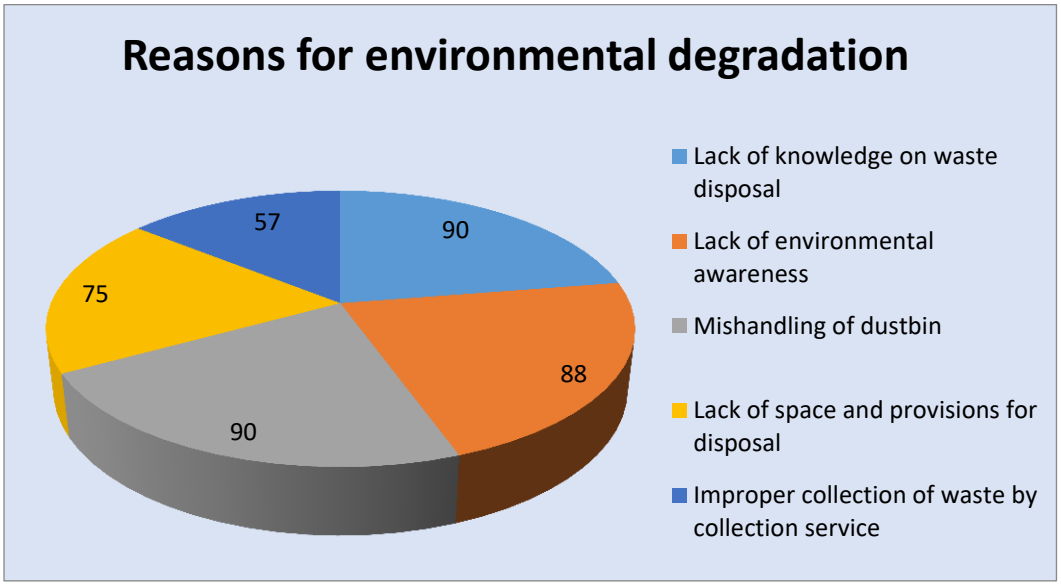
		N=400
Present Environmental conditions	**N**	**%**
Surface water gets contaminated	31	8
Soil contamination	59	15
Pollution	310	77
Reasons for environmental degradation		
Lack of knowledge on waste disposal	90	22
Lack of environmental awareness	88	22
Mishandling of dustbin	90	23
Lack of space and provisions for disposal	75	19
Improper collection of waste by collection service	57	14

Source: Primary data

FIGURE 10

PREVAILING ENVIRONMENTAL CONDITION OF THE STUDY AREA





The table depicts the existing environmental conditions. A maximum of 77 per cent of the women responded that pollution is the major cause for the prevailing ecological condition. 15 per cent of the women are of the view that soil contamination is the foremost reason for current climatic condition while some of the respondents have an opinion that surface water contamination is the major reason. The data shows reasons for environmental degradation, lack of knowledge on waste disposal, lack of environmental awareness and mishandling of dustbins. 19 per cent of the women feel that there is lack of space and provisions for disposal of waste, while 14 per cent of the women respond that improper collection of waste by collection service personnel is the reason for environmental degradation.

The problems faced by the people due to improper solid waste management, and challenges faced by the women are assessed, interpreted and shown in table- XIX

TABLE XIX

PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF HOUSEHOLD WASTE

Problems	N=400									
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%
Breeding places for insects, mosquitos and rodents	03	1	01	-	16	4	95	24	285	71
Surrounding becomes unhygienic	03	1	06	1	15	4	164	41	212	53
Environmental pollution	04	1	18	5	04	1	145	36	229	57
Unpleasant odour	08	2	05	1	25	6	132	33	230	58
Polluted water supply	10	3	12	3	49	12	118	29	211	53
Health problems	11	3	18	5	22	5	159	40	190	47
Over flow of drainage	20	5	54	14	61	15	90	22	175	44
Street animal menace	20	5	18	5	21	5	146	36	195	49
Soil become infertile	15	4	39	10	48	12	72	18	226	56

Figures in the parentheses indicate percentage, Source: Primary data, SD-Strongly disagree, D-Disagree, N-Neutral, A-Agree, SA-strongly agree

The table narrates the problems faced by the people due to accumulation of household waste. Majority of the women express that it becomes the breeding places for insects, mosquitos, rodents, and surrounding becomes unhygienic, polluted. With similar study of Sisay. S, 2007, concluded that if the wastes are not properly treated or disposed the places becomes a breeding places for insects such as flies, mosquitoes and residents for insect and rats and leads to high risks in health problems and also imposes an economic problem. The unpleasant odour, polluted ground water, overflow of drainage, street animal menace and clogging of waste are the other major problems. More than 50 per cent of the women strongly agree with the problem such as unpleasant odour, environmental pollution, and surroundings become unhygienic.

The problem faced by people due to accumulation of household waste, classified in to mild, moderate and severe based on the score level of problems by descriptive statistics. The problems scores of the respondents vary between a minimum of 13 to a maximum of 45. The mean score is 38.68 with a S.D of 5.38. The extent of problems faced by the respondents was grouped based on Mean± 0.5 S.D classifications. Accordingly those who have scored Mean-0.5S.D or below were classified as having mild problems and those who have scored above Mean+0.5S.D were classified as having severe problems. The respondents who have scored between Mean-0.5S.D and Mean+0.5S.D were classified as having moderate level of problems. The distribution of respondents based on Mean ± 0.5S.D classification the problems are categorized into Mild, Moderate, and severely affecting the people due to accumulation of solid waste. And the chi square test attempt was done to assess the association between major socio economic variables and the attitudes towards the problems faced by people due to accumulation of household waste. For this chi-square test was done between major variables age, Community, education, family, occupation, income, family size and the attitudes towards the problems faced by the people due to accumulation solid wastes and the results are presented in following tables.

TABLE XX

ASSOCIATION BETWEEN AGE AND PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=41) %	No	%		
Age	20-30	32	31	37	75	100	8.481	0.075Ns*
	31-40	26	44	30	297	100		
	41-50	18	32	50	28	100		
Total					400			

***Ns-Not significant**

The table reveals that there will be no association between age and the attitudes towards the problems faced by the people due to accumulation of solid waste. There is no significant association (p>0.05) between age and the problems faced by people due to accumulation of waste.

The chi-square test is applied to verify the hypothesis. The value of chi-square is 8.481 and it is found insignificant and hence the hypothesis is accepted.

TABLE XXI

ASSOCIATION BETWEEN COMMUNITY AND PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=42) %	No	%		
Community	SC	17	53	30	30	100	8.346	0.214Ns
	BC	24	44	32	147	100		
	MBC	28	36	36	212	100		
	OC	45	46	9	11	100		
Total					400			

Ns- Not significant

The hypothesis "There **is no association between community and the attitudes towards the problems faced by the selected women household**" is accepted and it is found that there is no association (p>0.05) between the selected variables.

TABLE XXII

ASSOCIATION BETWEEN EDUCATION AND PROBLEM FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=42) %	No	%		
Education	Illiterate	33	36	31	42	100	3.259	0.515Ns*
	High school level	26	41	33	340	100		
	Graduate	11	50	39	18	100		
Total					400			

Ns-Not Significant

The table reveals that there is no **association between Education and attitudes towards the problems faced by the people due to accumulation of solid waste"**, this shows that attitude towards solid waste management does not vary significantly.

TABLE XXIII

ASSOCIATION BETWEEN TYPE OF FAMILY AND PROBLEMS FACED BY THE PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	**Moderate (36-41) %**	**Severe (>=42) %**	**No**	**%**		
Type of family	Joint Family	25	39	36	135	100	1.008	0.604Ns*
	Nuclear Family	27	42	31	265	100		
Total					400			

Ns- Not significant

The hypothesis "There **is no association between Family and challenges faced by the selected women household**" is accepted and it is found that there is no association between family and challenges faced by the selected women household.

TABLE XXIV

ASSOCIATION BETWEEN OCCUPATION AND THE PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=42) %	No	%		
Occupation	Business	9.1	63.6	27.3	11	100	12.174	0.058Ns
	Private job	8.3	41.7	50.0	12	100		
	Govt job	25.9	42.3	31.8	336	100		
	Fishing	39.0	22.0	39.0	41	100		
Total					400			

Ns- Not significant

The hypothesis "There **is no association between Occupation and challenges faced by the selected women household**" is accepted and it is found that there is no association between Occupation and challenges faced by the selected women household.

TABLE XXV

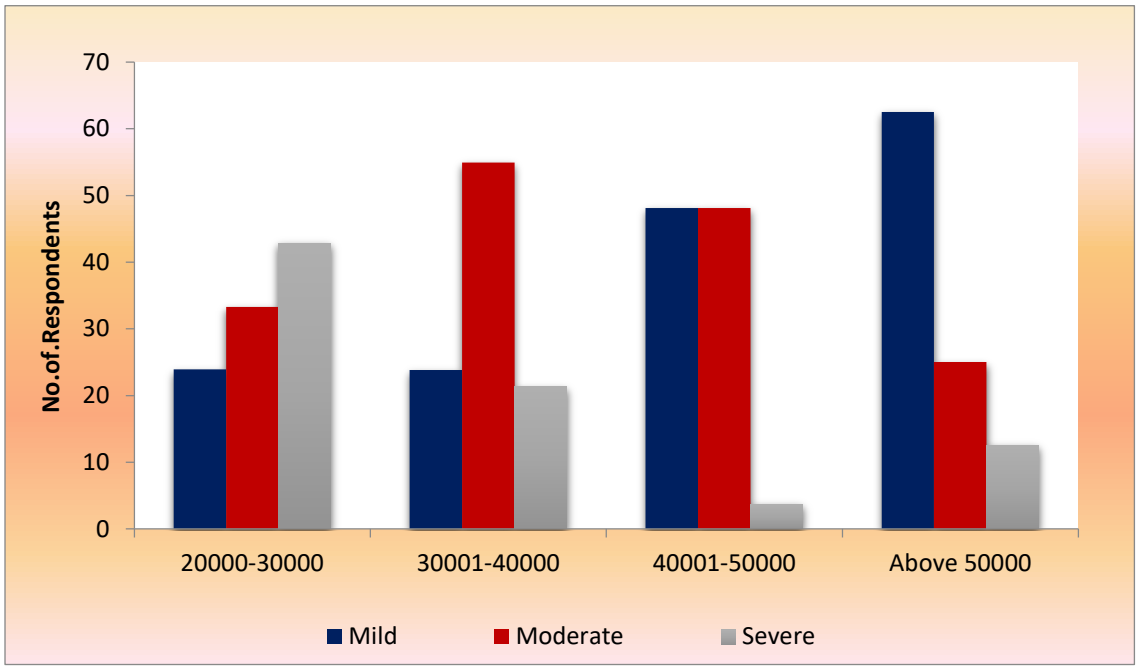
ASSOCIATION BETWEEN INCOME AND THE PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=41) %	No	%		
Income	20000-30000	23.9	33.3	42.8	243	100	40.049	0.000**
	30001-40000	23.8	54.9	21.3	122	100		
	40001-50000	48.1	48.1	3.7	27	100		
	Above 50000	62.5	25.0	12.5	8	100		
Total					400			

****- Significant**

FIGURE 11

ASSOCIATION BETWEEN INCOME AND THE PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE



According to the data discerned from Table **XXV**, that the association between an individual's income and the challenges faced by the people due to accumulation of solid waste is found to be significant at 1 per cent level of probability. Hence the hypothesis **"There will be no association between income and problems faced by the people due to accumulation of solid waste"is rejected. Therefore it is concluded that there is an association between income and problems faced by the people due to accumulation of solid waste**. It is a fact that if the individual's income increases then purchase of materials will also increase and it runs towards more generation of solid waste. F.Philippe and M.Cutlot, 2009 and N.P.Thanth, Y.Matsui, 2010, have concluded from the study that income of the household has a direct and making positive relationship with the daily per capita waste generation.

TABLE XXVI

ASSOCIATION BETWEEN FAMILY SIZE AND THE PROBLEMS FACED BY PEOPLE DUE TO ACCUMULATION OF SOLID WASTE

Variable		Problem Score level			Total		Chi square value	Sig
		Mild (<=35) %	Moderate (36-41) %	Severe (>=42) %	No	%		
Family size	1-5	26	40	34	297	100	.505	0.777Ns
	Above 5	25	44	31	103	100		
Total					400			

Ns- Not significant

The hypothesis "There **is no association between the size of the household and problems faced by the selected women household**" is accepted and it is found that there is no association between size of the family and problems faced by the selected women households.

Regarding harmful effects on health due to improper waste management, some of the diseases that are reported in past 3 months are assessed and presented in the following Table- XXVII

TABLE XXVII

HEALTH HAZARDS DUE TO IMPROPER WASTE MANAGEMENT

	N=400	
Health hazards	**N**	**%**
Chicken pox	02	-
Diarrhea	120	30
Dysentery	128	32
Typhoid	95	24
Dengue	12	03
Viral fever	33	08
Malaria	10	03
Reason for diseases		
Pollution is the reason	148	37
Improper solid waste management leads to diseases	128	32
Lack of awareness is the main reason	60	15
Unaware of causative agents of diseases	64	16

Source: Primary data

The table reveals the data related to harmful effects due to improper waste management. The study shows that for the past 3 months. 32 per cent of the women have suffered from dysentery, 30 percent of the women from diarrhea while 24 per cent of the women are affected by typhoid fever. Eight percentage are infected by viral fever, while dengue and malaria fever are also equally reported among the women. The following diseases are mostly water and airborne diseases and it is due to improper waste management.

The table shows awareness on causative factors of the diseases. About 37 per cent of the women think that pollution is the reason for diseases, 32 per cent of the women respond that improper solid waste management leads to diseases and 16 percentage are unaware of the causative agents of diseases while a few reveal that lack of awareness on environmental protection is the main reason for the occurrence of the diseases.

According to their opinion on the current health status in the existing area, it is found that 42 per cent of the women are feeling good, 28 per cent of the women are not satisfied and they feel bad while 24 per cent of the respondents are feel very good about their area and less than 10 per cent of the women have no idea about the current health status of the area.

The concerns of women about the present environmental conditions is assessed and depicted in table-XXVIII

TABLE XXVIII

OPINION ABOUT SAFE DISPOSAL OF WASTE

Opinion	N=400			
	Yes	Percent	No	Percent
Concerned about dumping waste on road side	285	71	115	29
Concerned that health hazards are due to solid waste management	197	49	203	51
Concerned that pollution is a major problem	256	64	144	36
Concerned about future of environment	187	47	213	53

Figures in the parentheses indicate percentage, Source: Primary data

The data given in the table shows the opinion of women on safe disposal of waste. 71 per cent of the women concerned about dumping waste on road side while 29 per cent of the women doesn't care on proper dumping of waste.64 per cent of the women are concerned about pollution and 36 per cent of the women feel that pollution is not a major problem.53 per cent of the women do not bother about future environment while 47 per cent have some sort of concern about future environment.

Table-XXIX presents the factors responsible for environmental degradation in Rameswaram.

TABLE XXIX

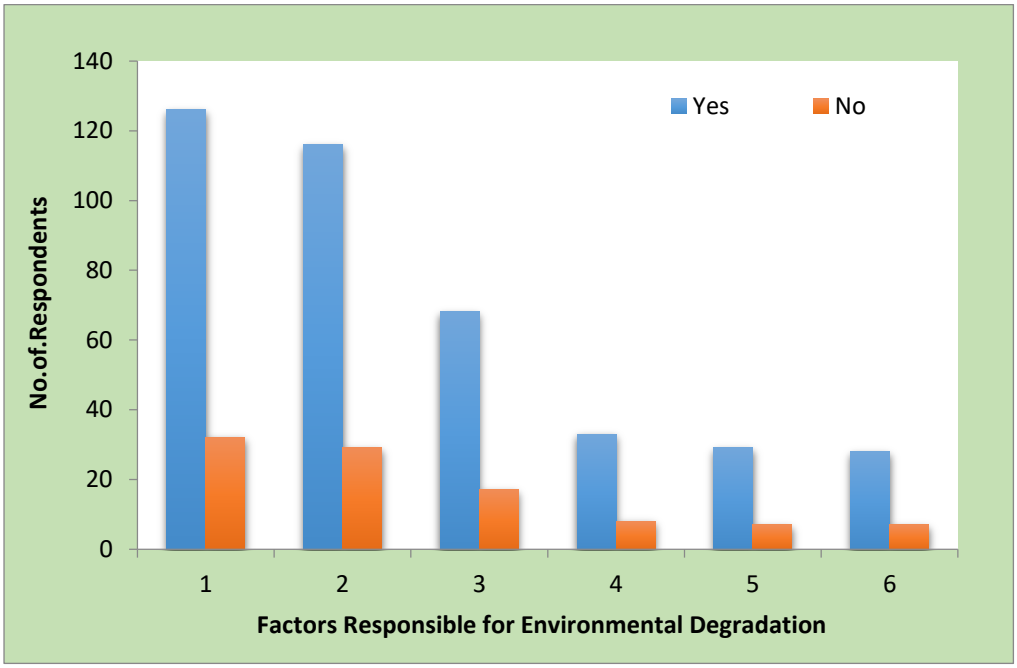
FACTORS RESPONSIBLE FOR ENVIRONMENTAL DEGRADATION IN RAMESWARAM

Factors		N=400
		Percent
Improper solid waste management	126	32
Floating population	116	29
Lack of awareness on environment	68	17
Attitude on solid waste management	33	8
Pollution	29	7
Lack of law enforcement	28	7

Source: Primary data

Figure 12

FACTORS RESPONSIBLE FOR ENVIRONMENTAL DEGRADATION IN RAMESWARAM



It is evident from the table that 32 per cent of the women state that improper solid waste management is the main reason for environmental degradation. 29 per cent of the women state that Rameswaram being a pilgrim centre the floating population is high compared to other places and that is also a main reason for environmental degradation. Seventeen percentage of women attribute environmental degradation to a lack of public awareness about solid waste management, and eight percent believe that proper solid waste management attitudes are also a cause of environmental degradation. Pollution and lack of law enforcement are the two major reasons as opined by the women for environmental degradation in Rameswaram.

The various causes for enormous solid waste generation is analyzed and presented in table-XXX

TABLE XXX

CAUSES FOR ENORMOUS SOLID WASTE GENERATION

Factors	N=400*									
	Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
	N	%	N	%	N	%	N	%	N	%
Population growth	09	2	16	4	38	10	69	17	268	67
Changes in life style	16	4	22	5	28	7	71	18	263	66
Lack of knowledge	43	11	26	6	54	13	105	26	172	43
Poor municipal services	40	10	59	15	68	17	86	21	147	36
Government towards environment	30	7	24	6	44	11	54	14	248	62
Lack of strict laws	22	6	21	5	54	13	73	18	230	58
Public attitude	30	7	17	4	47	12	104	26	202	51
Floating population	31	8	17	4	27	7	62	15	263	66

Figures in the parentheses indicate percentage, Source: Primary data

SD-Strongly disagree, D-Disagree, N-Neutral, A-Agree, SA-strongly agree

The table indicates the causes for increasing solid waste generation at the selected area. 67 per cent of the women strongly agree that population growth is the main reason for increasing solid waste generation, along with changes in life style. The selected area being a tourist place, 66 per cent of the women state that floating population in the area is a major reason for solid waste generation. In contrast a meagre percentage of the women strongly disagree that population growth, changes in life style, attitude of government towards environment, floating population, and lack of strict laws responsible for enormous solid waste generation.

The table XXXI shows the result of hiring charges for collection of garbage

TABLE XXXI

HIRING CHARGES FOR COLLECTION OF GARBAGE

		N=400
Particulars	**N**	**Percent**
Willing to pay for collection service	223	56
Reasons for not willing to pay for collection service		
Improvement will not happen	125	31
We don't need collection service	115	29
Already paying tax	113	28
Don't want to afford	19	5
Getting salary	28	7
Percentage of amount that can afford to collection service		
5-10%	283	71
11-15%	107	27
Above 15%	10	2
Suggested method to collect fee for solid waste management		
As municipality service charge every month	198	49
As a part of property tax	164	41
As part of water tax	28	7
As part of EB bill	10	3
Prefer of collection service		
Private Company	189	47
Municipality	160	40
Community organisations	51	13

Source: Primary data

The table shows 56 per cent of the women are willing to pay for collection service while 44 per cent of the women are not willing and they are not concerned about the collection service also. The reasons for unwilling to pay for collection service are stated 31 per cent of the women believe that improvement will not happen and it is waste of money and 5 per cent feel that they can't afford to pay even though they need clean environment and 29 per cent of the women stated that they don't need collection service as they are unsatisfied with the collection service. About 28 per cent of the women think that they are already paying tax and they don't need to pay for collection service.

The table shows that there are many more reasons for not willing to pay for collection service. Seventy one percentage of the women state Rs 30 per month is the maximum they could afford for collection service and very small percentage are ready to spend up to Rs 50 as a collection service charge.

Majority of the women suggest to collect the fee as municipality service charge every month, and 41 per cent of the women state that it could be collected as property tax and very few people suggest to add in part of EB bill as a water tax.

The data shows that the majority of women are prepared to pay private corporations because they are satisfied with their service, 40 per cent of women prefer municipalities, and very meagre percentage of women favour community organisations for waste collection.

4.3. KNOWLEDGE, ATTITUDE, PRACTICES ON SOLID WASTE MANAGEMENT

The knowledge, Attitude, and Practices on solid waste management for the selected women is assessed before and after the education intervention programme is analysed and the impact level among the women. The knowledge is assessed by various concept relates to solid waste management.

Knowledge on storage of solid waste management

The results revealed that majority of the households got an knowledge after the educational intervention about the storage of waste as bio and non-biodegradable separately as it can be reduce the dumping of waste, ninety seven percentage of the household learn about plastic recycling instead of throwing or dumping into outside or else it can cause the soil erosion or infertility of the soil. Before education intervention the households are unaware of throwing waste in open place but they gain knowledge on kitchen composting and also they starts to put a composting pit in their own backyards of their houses. Regarding the E-waste households starts to store in recycle bin to avoid accident while handling by other person, glass materials are placed carefully before disposing in proper place.

Process of solid waste management

Process of solid waste management is important role in management, wastes involves various process before they are disposed, 98 per cent of the households know about methods involving in processing but majority (100%) unaware on biological treatment and bio gas process after the educational intervention they learnt about wastes involves in biological treatment as a results they are used as fuel consumption. Majority of the households gained knowledge related to composting, vermicomposting and the end product after the process it is used as the manure to the soil. Regarding color of the bin households learnt about the color of the bin based on the type of the wastes. Reduction of waste at source level can decrease the quantity of waste is the basic concept from 3 R's (Recycle, Reduce, Reuse) in the solid waste management is explained through the educational intervention to the household.

Policies and laws on solid waste management

Majority of the household got a knowledge on different policies, laws on solid waste management. The waste generators have to segregate the waste before handling to waste collector is the basic rule and it is acquainted by the majority of the household and starts to have source segregation. Majority of the household got knowledge on spot fine rule, 2016 and eradication of plastic by plastic waste management rule, 2016.

Effects due to improper waste management

The educational intervention gives a high impact on getting knowledge on effects on environment and health due to improper dumping of wastes, water borne diseases, direct dumping of untreated waste water into rivers, lakes, and unsanitary conditions and clogging of drain.

The impact level of educational intervention programme among women knowledge was assessed and significantly proven by using Paired‘t’ test. The results are presented in table XXXII.

TABLE XXXII

Impact of Education Intervention programme among women knowledge on solid waste management-Paired‘t’ test

Variables		Mean	SD	SE	t-value	Sig-value
Knowledge on storage of solid waste						
Storing the waste in to bio and non-biodegradable waste	Before	0.12	0.33	0.03	22.798	.000*
	After	0.96	0.20	0.02		
Plastic waste should be put in recycle bin	Before	0.05	0.22	0.02	33.742	.000*
	After	0.97	0.17	0.02		
Vegetable and fruit peel, food waste should not throw in open place	Before	0.02	0.14	0.01	36.382	.000*
	After	0.97	0.17	0.02		
Separate disposal bin for adult napkins and diapers	Before	0.03	0.17	0.02	24.661	.000*
	After	0.89	0.31	0.03		
E waste can be store in recycle bin	Before	0.04	0.20	0.02	23.685	.000*
	After	0.89	0.31	0.03		
Glass material should be segregated carefully before disposing	Before	0.06	0.24	0.02	23.685	.000*
	After	0.91	0.29	0.03		

Variables		Mean	SD	SE	t-value	Sig-value
Process of solid waste management						
There are several methods involved in solid waste management	Before	0.02	0.14	0.01	26.944	.000*
	After	0.90	0.30	0.03		
Biodegradable waste involves biological treatment and used in many ways	Before	0.00	0.00	0.00	29.850	.000*
	After	0.90	0.30	0.03		
Bio gas is used as fuel consumption	Before	0.00	0.00	0.00	31.639	.000*
	After	0.91	0.29	0.03		
Biogas can be done by cow dung and human excreta also	Before	0.02	0.14	0.01	28.302	.000*
	After	0.91	0.29	0.03		
Composting is one of the solid waste management processes.	Before	0.02	0.14	0.01	29.850	.000*
	After	0.92	0.27	0.03		
Vermicomposting is a product of composting process using various worms	Before	0.00	0.00	0.00	36.267	.000*
	After	0.93	0.26	0.03		
Disposal Bins are differentiated according to colour of bin	Before	0.05	0.22	0.02	28.302	.000*
	After	0.94	0.24	0.02		
Green color of disposal bin is used for biodegradable waste	Before	0.05	0.22	0.02	29.850	.000*
	After	0.95	0.22	0.02		
Blue color disposal bin is for Non-biodegradable waste	Before	0.07	0.26	0.03	28.302	.000*
	After	0.96	0.20	0.02		
3 R's (Recycle, Reduce, Reuse) is important process in solid waste management	Before	0.00	0.00	0.00	39.383	.000*
	After	0.94	0.24	0.02		
Waste reduction at the source reduces the amount of waste produced.	Before	0.02	0.14	0.01	33.742	.000*
	After	0.94	0.24	0.02		
Recycling of non-biodegradable waste helps to prevent land pollution	Before	0.01	0.10	0.01	36.267	.000*
	After	0.94	0.24	0.02		
There are materials under recyclable and non-recyclable	Before	0.00	0.00	0.00	43.370	.000*
	After	0.95	0.22	0.02		
Recyclable material can be reuse	Before	0.00	0.00	0.00	43.370	.000*
	After	0.95	0.22	0.02		
Concept of "wealth from waste" can be used in solid waste management	Before	0.05	0.22	0.02	31.639	.000*
	After	0.96	0.20	0.02		

Variables		Mean	SD	SE	t-value	Sig-value
Policies and Laws on solid waste management						
Knowledge on municipal solid wastes (management and handling) rules, 2000	Before	0.00	0.00	0.00	39.383	.000*
	After	0.94	0.24	0.02		
Waste generators have to segregate the waste before handling to waste collector	Before	0.00	0.00	0.00	36.267	.000*
	After	0.93	0.26	0.03		
Plastics waste management rule 2016 main aim to eradicate the plastic generator	Before	0.00	0.00	0.00	33.742	.000*
	After	0.92	0.27	0.03		
Spot fine rule formulated under Rule solid waste management rule 2016	Before	0.00	0.00	0.00	39.383	.000*
	After	0.94	0.24	0.02		
Recycled plastic manufacture and usage rules,1999	Before	0.00	0.00	0.00	39.383	.000*
	After	0.94	0.24	0.02		
Effects due to improper waste management						
Improper waste management leads to health hazards	Before	0.02	0.14	0.01	48.744	.000*
	After	0.98	0.14	0.01		
Improper dumping of waste leads to land pollution	Before	0.05	0.22	0.02	39.383	.000*
	After	0.99	0.10	0.01		
Aware on water borne diseases	Before	0.03	0.17	0.02	56.577	.000*
	After	1.00	0.00	0.00		
Direct dumping of untreated waste water into rivers, lakes, and sea cause hazards plants, animals, and human being	Before	1.00	0.00	0.00	57.158	.000*
	After	1.92	0.15	0.01		
Unhygienic environments and drain clogs pose a health risk	Before	0.03	0.17	0.02	56.577	.000*
	After	1.00	0.00	0.00		

***Significant at 1% level, **Significant at 5% level, NS = Not Significant**

The above table shows the output of the Paired sample t-test analysis, that the significance value shows that the variables knowledge on solid waste management were statistically significant at 1 per cent level. Similarity Karout et.al. 2012, study shows the effect of educational intervention on knowledge in solid waste management found to be positive results with 1 per cent significant level. And Karimi et al. 2015 conducted a research to study the educational intervention through pamphlets and face to face training on process and recycling of waste they showed the effective ness of training method.

A similar study conducted in Jordan found similar results that by providing environment awareness program to people enhances the greater efficiency of waste management (Mrayyan and Hamdi, 2006).

The effects and the changes in their knowledge level before and after educational intervention programme based on their socio economic characteristics of the women was assessed and presented in following tables.

TABLE XXXIII

DIFFERENCE BETWEEN KNOWLEDGE LEVEL BEFORE AND AFTER INTERVENTION BASED ON SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN

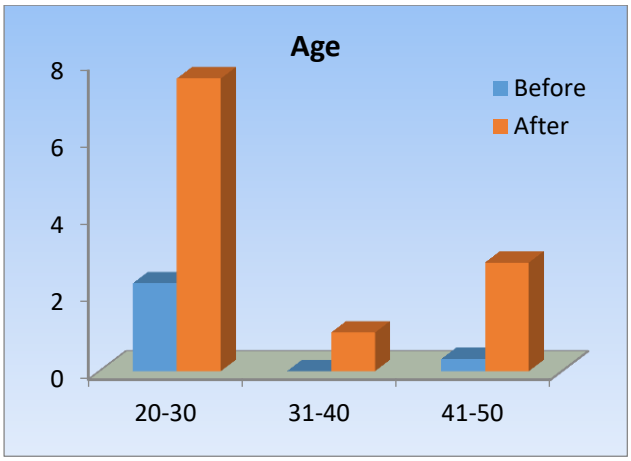
Variables	No	Before					After			
		No	mean	SD	F	Sig	Mean	SD	F	Sig
Age	20-30	30	2.27	3.78	11.902	0.00002**	7.57	2.87	24.762	0.000**
	31-40	54	.00	.00			1.00	.00		
	41-50	16	.31	.48			2.81	.62		
Occupation	Business	8	.50	.53	.941	0.424Ns	4.38	.93	39.006	0.000**
	Private job	12	.08	.29			9.83	.48		
	Government job	10	.00	.00			3.00	.00		
	Fishing	70	.97	2.70			7.53	.17		
Income	20000-30000	5	.20	.45	1.304	0.276Ns	1.20	.45	47.443	0.000**
	30001-40000	25	.16	.37			2.08	.37		
	40001-50000	70	.97	2.70			5.53	.14		
	Above 5	25	.20	.41			1.12	.17		

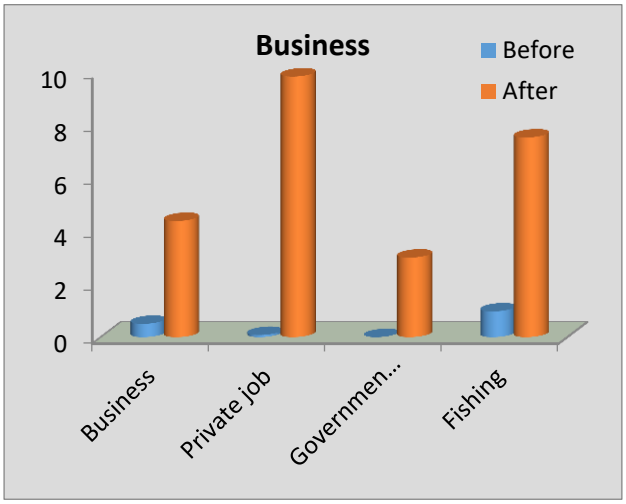
*ANOVA test

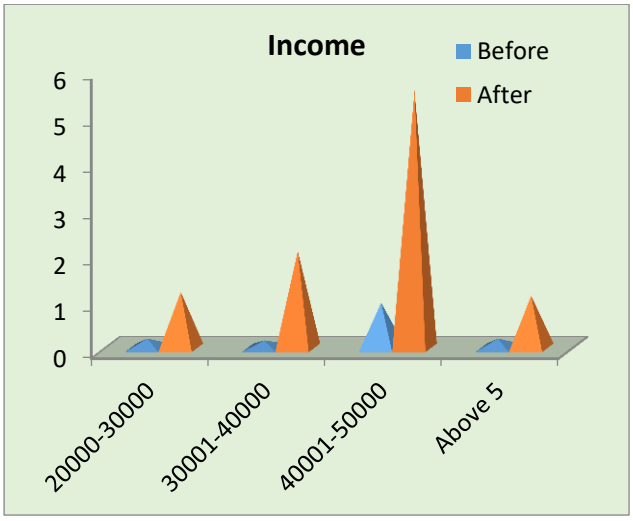
**Significant $p<0.01$

FIGURE 13

DIFFERENCE BETWEEN KNOWLEDGE LEVEL BEFORE AND AFTER INTERVENTION BASED ON SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN







The f-value (11.902) with regard to Knowledge score-before the educational intervention (Mean =0.73; S.D=2.29) shows $P<0.01$, indicating a significant difference in the Knowledge score-before for age distribution. In the same way, the f-value (24.762) with regard to Knowledge Improvement Score for age distribution (Mean =28.50; S.D=5.68) also shows $P<0.01$, indicating a significant difference in the Knowledge score-after for age distribution. However, from the F- value, it is clear that Knowledge Improvement Score is higher than the Knowledge score- before towards age distribution.

Based on the occupation of the participants in the study (business, private, government, and fishing), the analysis on knowledge score is done and compared before and after training as shown in the table. The mean and S. D (0.97, 2.29) of fishing category is greater than the households belonging to business (0.50, 0.53), followed by households with private (0.08, 0.29) and government job (0, 0). The F value is measured as 0.941 without any significant differences between the mean of categories. The knowledge score of households after training is higher in government workers (3.00, .00), followed by private workers (9.83, .48), fishing (7.53, .17), and business (4.38, .93). The f value of 39.006, has greater significance among the groups ($p < 0.001$).

The analysis of knowledge score based on income of households before and after training is shown in the table. The F score is 1.304 without statistical difference between the mean value of various income range ($p < 0.01$), before training. The mean and S. D values are 0.73 and 2.29. After training, the knowledge score has been improved with the mean of 28.50 and S. D of 5.68. The F value is 47.443 with significant difference between the income categories based on knowledge score. The knowledge score has increased after the educational intervention (F value = 47.443).

Attitude on solid waste management

The attitude on various aspects differ from each other and regarding the generation of waste, 90 percent of the women agree that while purchasing the material 3 R's should be taken care while after the educational intervention ninety percentage of women considered that reusing plastic bags for shopping is good for waste reduction. Regular collection of solid waste and picking plastic waste to selling will helps to manage the waste problem was agreed by the ninety percentage of the women, while 10 per cent of the women strongly agree that daily collection of waste can minimize the waste management.

Transport and transfer of waste is a vital aspects in method of waste management is disagree by ninety two percentage while after educational intervention nine per cent of the women strongly agree with this attitudes. Eighty nine per cent agree that proper collection and transfer of waste needs effective mechanism. Ninety five per cent of the women strongly agree improper disposal of waste leads to health hazards and after intervention ninety five per cent strongly agree that throwing of waste in open places because they lack in spacious and leads to clogging of waste.

The impact level of educational intervention programme among women attitude was assessed and significantly proven by using Paired‘t’ test. The results are presented in table XXXIV.

TABLE XXXIV

IMPACT OF EDUCATION INTERVENTION PROGRAMME AMONG WOMEN ATTITUDE ON SOLID WASTE MANAGEMENT-PAIRED‘t’ TEST

Variable		Mean	SD	SE	t-value	Sig
Generation of Waste						
While purchase of materials I care about 3 R’s (Reduce, Recycle, Reuse)	Before	2.07	0.640	0.064	28.308	.000*
	After	4.10	0.302	0.030		
I encourage waste reduction at source itself	Before	2.23	0.423	0.042	36.393	.000*
	After	4.05	0.219	0.022		
Reusing plastic bags for shopping is good for waste reduction	Before	2.58	0.535	0.054	25.759	.000*
	After	4.01	0.100	0.010		
Prefer to choose Recyclable materials	Before	2.24	0.429	0.043	33.830	.000*
	After	3.94	0.312	0.031		
Collection of Waste						
Regular collection of solid waste is one of the important aspect in garbage problem	Before	2.02	0.471	0.047	36.957	.000*
	After	4.10	0.302	0.030		
Picking plastic waste to selling helps to manage waste	Before	2.50	0.759	0.076	18.261	.000*
	After	4.10	0.302	0.030		
Willing to pay fee to collection service	Before	2.04	0.197	0.020	84.912	.000*
	After	4.91	0.288	0.029		
Daily collection of waste can minimize the waste management	Before	3.44	0.671	0.067	8.143	.000*
	After	4.01	0.438	0.044		

Variable		Mean	SD	SE	t-value	Sig
Transport and Transfer of Waste						
I help to sort out and transfer the waste to proper place	Before	2.97	0.171	0.017	27.024	.000*
	After	4.10	0.302	0.030		
Transport of waste is vital part in solid waste management	Before	2.08	0.273	0.027	201.000	.000*
	After	4.09	0.288	0.029		
I use large bin and helps to manage transfer of waste	Before	2.13	0.338	0.034	57.563	.000*
	After	4.01	0.100	0.010		
Proper collection and transfer pf waste needs effective mechanism	Before	2.89	0.314	0.031	19.398	.000*
	After	4.11	0.314	0.031		
Disposal of wastes						
Disposing of wastes into garbage bin is responsibility for everyone	Before	2.08	0.273	0.027	143.562	.000*
	After	4.10	0.302	0.030		
Improper disposal of waste leads to health hazards	Before	2.06	0.371	0.037	68.175	.000*
	After	4.95	0.219	0.022		
Improper incineration of waste leads to air pollution	Before	1.98	0.492	0.049	54.960	.000*
	After	4.95	0.219	0.022		
Throwing of waste in roads, drains. Open space because they lack in spacious for disposal and leads to clogging of waste	Before	1.92	0.563	0.056	49.624	.000*
	After	4.95	0.219	0.022		

The table shows the output of the Paired sample t-test analysis, that the significance value shows that the variables attitude on solid waste management were statistically significant at 1 per cent level. Regarding generation of waste after educational intervention programme, women started to choose recyclable materials and the attitude of using cloth for shopping and it reduce the waste generation and it proved significant at per cent level. Similar studies conducted in Malaysia, results showed that educational programme will affect the respondent's attitude towards solid waste management and their motives and attitudes towards recycling found to have significant effect (Anni et. al., 2002).

The effects and the changes in their attitude level before and after educational intervention programme based on their socio economic characteristics of the women was assessed and presented in following tables.

TABLE XXXV

DIFFERENCE BETWEEN ATTITUDE LEVEL BEFORE AND AFTER INTERVENTION BASED ON SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN

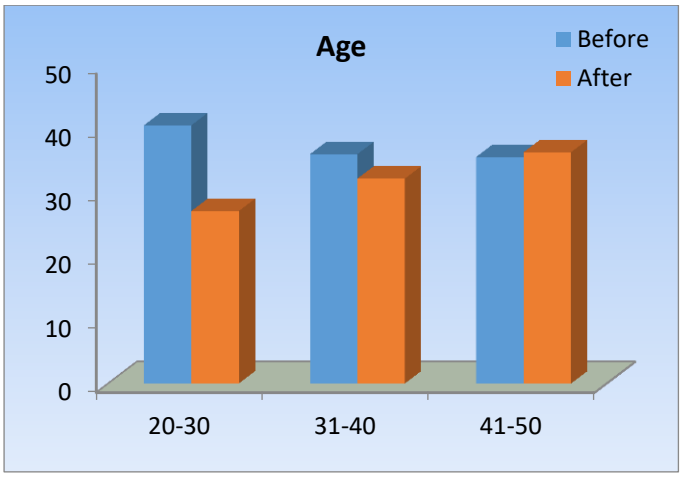
Variables	No	Before					After			
		No	mean	SD	F	Sig	Mean	SD	F	Sig
Age	20-30	30	40.47	1.41	90.357	0.0000**	27.03	1.73	117.648	0.0000**
	31-40	54	35.94	1.75			32.11	1.83		
	41-50	16	35.50	1.21			36.25	3.02		
Occupation	Business	8	35.63	1.51	27.472	0.0000**	37.75	3.06	48.676	0.0000**
	Private job	12	34.92	1.00			34.75	1.82		
	Government job	10	33.40	.52			34.60	.52		
	Fishing	70	38.36	2.23			29.43	2.53		
Income	20000-30000	5	34.80	1.30	36.241	0.0000**	39.40	2.70	82.394	0.0000**
	30001-40000	25	34.56	1.39			34.72	1.28		
	40001-50000	70	38.36	2.23			29.43	2.53		

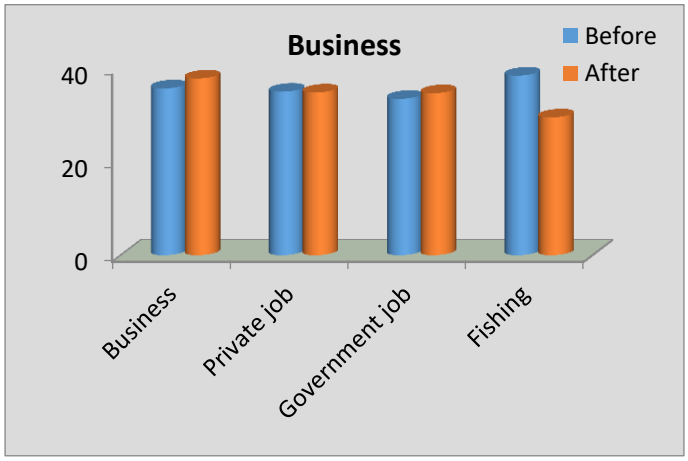
*ANOVA test, **Significant $p<0.01$

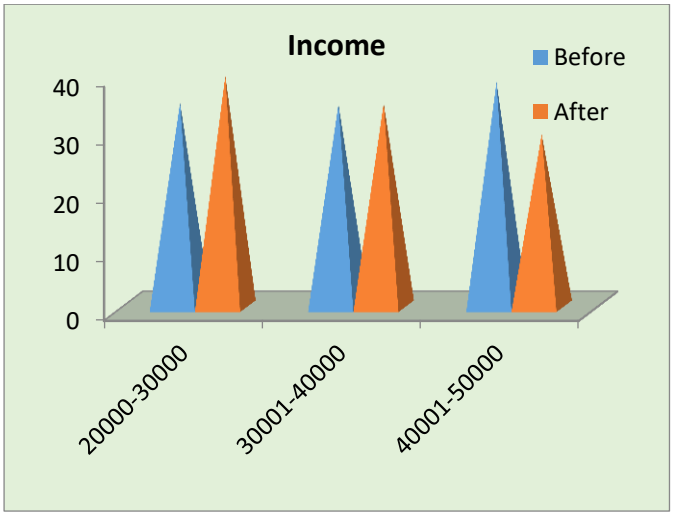
The table shows that there is a significant difference (P<0.01) on attitude score among the age distribution after the educational intervention. This implies that the change of attitudes among the respondents with regard to age distribution is statistically significant. An analysis on the attitude scores done and compared before and after educational intervention is shown in the above table. The mean and S. D (38.36, 2.23) of occupation belonging to fishing is greater than the distribution among business (35.63, 1.51), followed by households respondents working in private companies (34.62, 1.00) and among households with government jobs (33.40, 0.52). The attitude score of households after the intervention is higher among the category of business (37.75, 3.06), followed by private workers (34.75, 1.82), government workers (34.60, 0.52), and fishing people (29.43, 2.53). The f value (48.676) is significantly different after the educational intervention.

FIGURE 14

DIFFERENCE BETWEEN ATTITUDE LEVEL BEFORE AND AFTER INTERVENTION BASED ON SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN







The table shows the statistical difference among the respondents before and after the educational intervention. The mean and S. D value (37.23 and 2.65) have improved with scores of (31.25 and 3.73). The F value after the educational intervention (82.394) shows significant difference at1 per cent level.

Practices on solid waste management

The practices on solid waste management among the women is influenced by the educational intervention regarding the sorting of waste cent percentage of the women start to sort their waste in to recyclable and non- recyclable. Ninety percentageof the women sorting their harmful and hazardous waste separately after the intervention.

Waste reduction is one of the main factors to minimize the waste segregation and ninety eight per cent of the women get in to practice that they will buy what they need. cent percent of the women starts to reuse of waste like papers, old cloth materials and plastic covers after the educational intervention programme. After the educational intervention programme ninety eight per cent of the women got practices of not to incinerate the waste in common places. Practicing of sorting of waste before disposal were implement by the ninety eight per cent of the women. Hence there is a positive feedback in practices after educational intervention programme is significantly proved and presented in the table XXXVI.

TABLE XXXVI

Impact of Education Intervention programme among women practices on solid waste management-Paired‘t’ test

Variable		Mean	SD	SE	t-value	Sig
Sorting of Waste						
I sort biodegradable and non-biodegradable waste	Before	2.02	0.45	0.04	17.330	.000*
	After	1.09	0.29	0.03		
I sort recyclable and non-recyclable waste	Before	2.04	0.20	0.02	52.806	.000*
	After	1.00	0.00	0.00		
I sort harmful and hazardous waste	Before	2.99	0.10	0.01	60.102	.000*
	After	1.10	0.30	0.03		
Waste reduction						
I will not throw the waste on open place	Before	2.76	0.43	0.04	25.354	.000*
	After	1.10	0.30	0.03		
I buy only what I need	Before	2.42	0.50	0.05	28.434	.000*
	After	1.02	0.14	0.01		
I am cautions and responsible to every waste I generate	Before	2.76	0.43	0.04	35.913	.000*
	After	1.02	0.14	0.01		
Reuse of waste						
I reuse papers	Before	2.58	0.67	0.07	23.604	.000*
	After	1.00	0.00	0.00		
I reuse old cloth materials	Before	2.52	0.67	0.07	22.555	.000*
	After	1.00	0.00	0.00		
I reuse containers	Before	2.82	0.44	0.04	41.809	.000*
	After	1.00	0.00	0.00		
I reuse plastic covers	Before	1.92	0.39	0.04	23.357	.000*
	After	1.00	0.00	0.00		
I use washable instead of disposable diapers/napkins	Before	3.00	0.00	0.00	63.016	.000*
	After	1.10	0.30	0.03		
Disposal of wastes						
I will not throw or dump the waste in improper way	Before	2.87	0.34	0.03	55.326	.000*
	After	1.00	0.00	0.00		
I will not incinerate the waste in common places	Before	2.76	0.43	0.04	35.913	.000*
	After	1.02	0.14	0.01		
I dispose the waste in garbage container	Before	2.53	0.63	0.06	23.074	.000*
	After	1.01	0.10	0.01		
I practice home composting	Before	2.30	0.78	0.08	14.015	.000*
	After	1.05	0.22	0.02		
I sort the waste before disposable	Before	1.92	0.56	0.06	14.722	.000*
	After	1.02	0.14	0.01		
I dispose harmful and hazardous waste in specific container	Before	2.98	0.14	0.01	70.417	.000*
	After	1.06	0.24	0.02		

The table revealed the output of the Paired sample t-test analysis, that the significance value shows that the variables practices on solid waste management were statistically significant at 1Percent level.

The effects and the changes in their practices level before and after educational intervention programme based on their socio economic characteristics of the women was assessed and presented in following tables.

TABLE XXXVII

DIFFERENCE BETWEEN PRACTICES LEVEL BEFORE AND AFTER INTERVENTION BASED ON SOCIO ECONOMIC CHARACTERISTICS OF THE WOMEN

Variables	No	Before			F	Sig	After		F	Sig
		No	mean	SD			Mean	SD		
Age	20-30	30	21.90	1.30	178.772	0.0000**	29.10	1.30	175.042	0.000**
	31-40	54	23.89	2.43			27.11	2.43		
	41-50	16	33.38	1.59			13.94	5.01		
Occupation	Business	8	34.63	.52	400.956	0.0000**	9.88	2.85	403.017	0.000**
	Private job	12	31.42	1.44			19.00	2.70		
	Government job	10	26.20	1.55			24.80	1.55		
	Fishing	70	22.36	1.16			28.64	1.16		
Income	20000-30000	5	34.60	.55	196.859	0.000**	8.60	2.88	202.737	0.000**
	30001-40000	25	29.72	3.40			20.48	4.71		
	40001-50000	70	22.36	1.16			28.64	1.16		

*ANOVA test, **Significant $p<0.01$

The f-value 178.772 with regard to practice score before among age distribution shows there is no significant difference, while regarding the occupation with f-value 400.956 before educational intervention and after educational intervention the practice score shows the significant value with f- value 403.017 and distribution among income group the f- value 196.859 and after practices score is significant difference in the practice score after the educational intervention.

Based on the occupation of the participants of households in the area of educational intervention (business, private, government, and fishing), the analysis on practice score is done and compared before and after training as shown in table. The mean and S. D (22.36, 1.16) of fishing occupation category is less than the category under business (34.63, 0.52), and working in private companies (31.42, 1.44) and government job (26.20, 1.55). The F value is measured as 400.956 with significant differences between the mean of categories. The practice score of households after training is higher in category under fisheries (22.36, 1.16), followed by government workers (24.80, 1.55), private workers (19.00, 2.70), and business (9.88, 2.85). The f value 403.017, has greater significance among the groups ($p < 0.001$).

The analysis of practice score based on income of people before and after educational intervention is statistically shown in the table. Before educational intervention the F value is 196.859 with statistical difference between the mean value of various ranges of income ($p < 0.01$). The mean and S. D values are 22.36 and 4.35. After intervention, the practice score has improved with the mean of 25.60 and S. D of 5.87. The F value is 202.737 with significant difference between the income and the practice score.

4.4. Impact of educational intervention on solid waste management before and after the intervention

The impact of educational intervention was analysed by finding the knowledge scores before and after intervention. The mean scores are given below.

TABLE XXXVIII

COMPARISON OF KNOWLEDGE SCORE BEFORE AND AFTER THE INTERVENTION

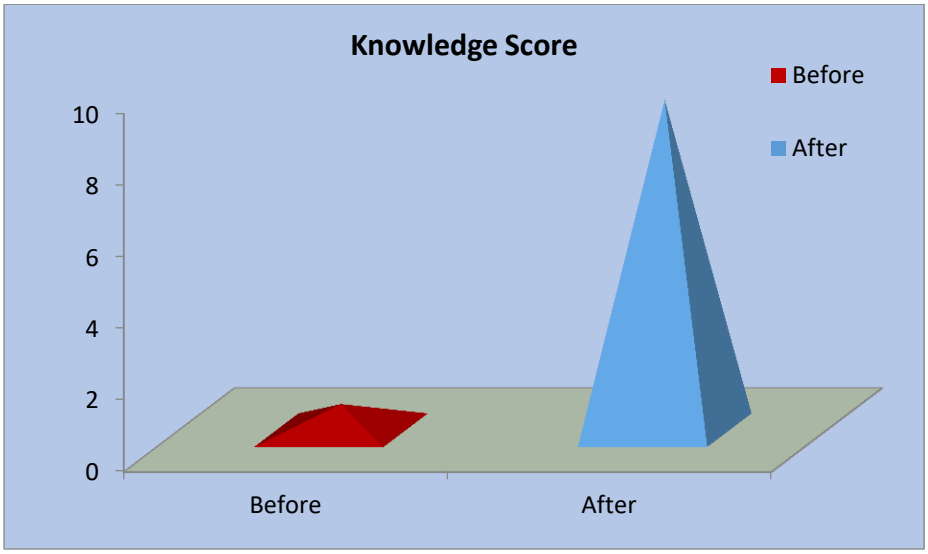
N=100

Content	Mean	SD	t- test value	Sig value
Knowledge Score-Before	.73	2.29	**50.184**	**0.0000****
Knowledge Score-After	9.23	3.73		

****-Significant at 1% level**

FIGURE 15

COMPARISON OF KNOWLEDGE SCORE BEFORE AND AFTER THE EDUCATIONAL INTERVENTION



It is observed that average knowledge score before intervention is 2.29 and it has increased to 3.73 after intervention. The following hypothesis is framed to test the effect of intervention regarding knowledge.

There is no significant difference between knowledge score-before and Knowledge score-after intervention.

Paired sample t-test is applied to test the above hypothesis. The calculated t-value is found to be 50.184 which is significant at 1 per cent level. Hence it is inferred that there is significant difference between before and after intervention in the mean knowledge scores and the hypothesis is rejected. The comparison of attitude score before and the after is presented in the table XXXIX

TABLE XXXIX

COMPARISON OF ATTITUDE SCORE BEFORE AND AFTER EDUCATIONAL INTERVENTION

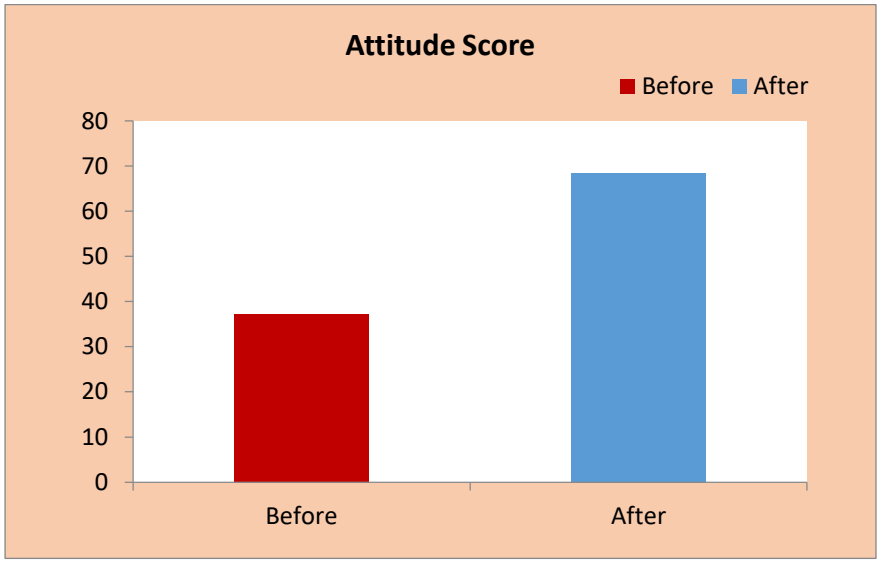
N=100

Content	Mean	SD	t- test value	Sig value
Attitude Score-Before	37.23	2.65	83.860	**0.0000****
Attitude Score-After	68.48	1.85		

****-Significant at 1% level**

FIGURE 16

COMPARISON OF ATTITUDE SCORE BEFORE AND AFTER INTERVENTION



The table depicts the attitude score as 2.65 and after the intervention the score is 1.85.

Ho. There is no significant difference between knowledge score-before and Knowledge score-after intervention.

Paired sample t-test was applied to test the above hypothesis. The calculated t-value is found to be 83.860 which is significant at 1 per cent level. Hence it is inferred that there is significant difference between before and after intervention in the mean attitude scores and the hypothesis rejected. The comparison of practice score was tabulated and presented in the table XL

TABLE XL

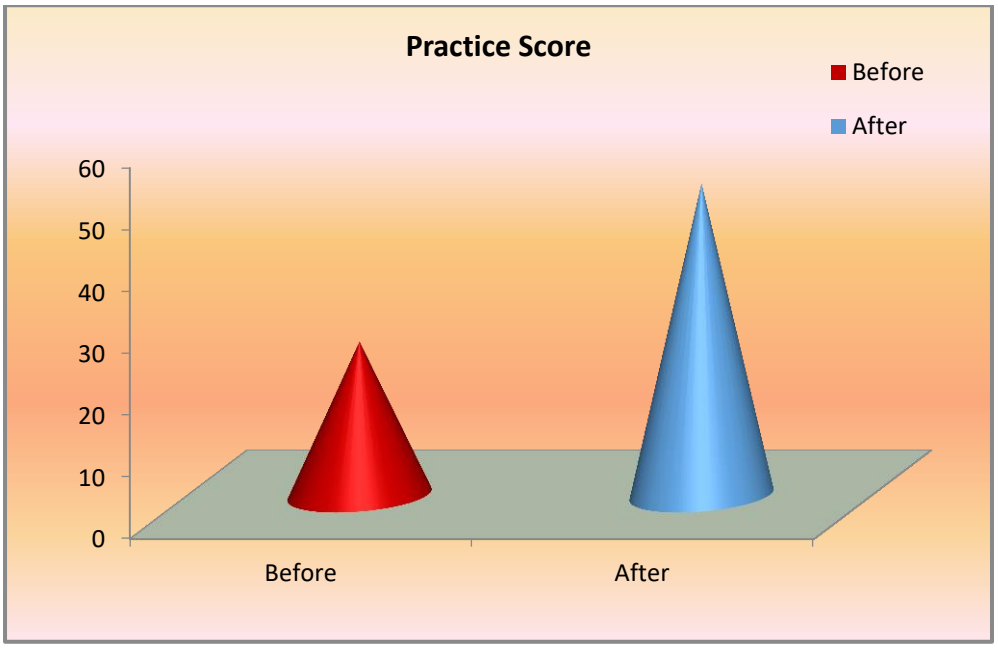
COMPARISION OF PRACTICE SCORE BEFORE AND AFTER INTERVENTION

				N=100
Content	**Mean**	**SD**	**t- test value**	**Sig value**
Practice Score-Before	24.81	4.35	43.645	**0.0000****
Practice Score-After	50.41	1.95		

****-Significant at 1% level**

FIGURE 17

COMPARISION OF PRACTICE SCORE BEFORE AND AFTER EDUCATIONAL INTERVENTION



It is observed that average Practice score before intervention is 4.35 and after intervention the score is 1.95. The following hypothesis is framed to test the effect of intervention.

Ho. There is no significant difference between practice score-before and score-after intervention.

Paired sample t-test is applied to test the above hypothesis. The calculated t-value is found to be 43.645 which is significant at 1% level. Hence it is inferred that there is significant difference between before and after intervention in the mean practice scores and the hypothesis rejected.