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RESEARCH ARTICLE

A GENDER PERSPECTIVE ON SOLID WASTE MANAGEMENT PRACTICES: A CLIMATE CHANGE MITIGATION INITIATIVE

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Abstract

This study assessed the extent of involvement of rural women in climate change mitigation initiative through solid waste management practices conducted during the calendar year 2020 in the eight lakeshore towns in the 4th District of Laguna. The study employed descriptive-quantitative correlational design. Employment influenced the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices who favored that environmental education be taught in schools and educating about proper garbage management to fix garbage crisis, and insisting the local government put recycling laws and program in place. Moreover,they had stance on using alternative energy source such as windmills, solar power and others, learning to make right practical decisions for adapting to climate change, and learning more on climate change response strategy and promoting them to others. Consequently, rural women had utmost involvement in climate change mitigation initiative about health risk related to burning garbage, illegal dumps polluting rivers, streams and wells and about flooding due to garbage blocking drains and gullies.

Introduction:-

There are inherent problems that result from inefficient solid waste disposal that need to be addressed such as respiratory diseases due to continuous burning of wood, papers, and plastic materials, among others; massive flooding with waste debris clogging the drainage such as plastics of many kinds that do not biodegrade and improper methods of their disposal pose hazards to environment and human health. Hence, the long term- effects of improper solid waste management can be detrimental, especially to the poor who are the most vulnerable population.

The theory of Bell and Braun (2010) enunciated a relation of gender to the environment and how women differ from men in relation to, conceiving of and understanding the environment of which, Terry (2009), further clarified that these differences are the result of the historic structures, cultural traditions, and social forces that position women as caregivers, subsistence providers, and collectors of resources needed by the household. Hence, in essence, ecofeminist perspectives offer that occupying such roles reinforces direct links to the health of the environment, a dynamic that is especially pronounced in less developed countries. Accordingly, women and the environment represent twin dimensions of exploitation that suffers from the current capitalist regime and patriarchal structures of domination therein. These linkages make environmental degradation especially consequential for women and are also believed to increase women's propensity to protect and preserve the environment, when they are afforded positions of power in society.

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Global Agenda Council on Women's Empowerment (2012), boldly said that 'be it nurture or nature, in all instances it is widely accepted that women are better stewards of resources than men, hence, they are an important part of the formula to address sustainable development by way of sustaining the physical environment in part because they are much closer to the problem and are also closer to the solution', especially in the case of the developing or third world countries worsened by the prevalence of solid waste, climate change, cleanliness problems and inefficiency of policy and enabling mechanisms to manage the environment.

Objectives Of The Study:-

1. Determine the demographic profile of respondents.
2. Determine the solid wastes generated in the eight lakeshore towns in the 4th District of Laguna.
3. Determine the solid waste management attitude of households in the eight lakeshore towns in the 4th District of Laguna.
4. Determine the extent of the involvement of rural women in climate change mitigation initiative in terms of solid waste management practices in the 4th District of Laguna.
5. Determine the extent of compliance to and implementation of Solid Waste Management Act of the eight lakeshore towns in the 4th District of Laguna.
6. Determine the significant relationship between the Profile of the respondents and the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices.

Methodology:-

This study assessed the extent of involvement of rural women in climate change mitigation initiative through solid waste management practices conducted during the calendar year 2020 in the eight lakeshore towns in the 4th District of Laguna namely Kalayaan, Paete, Pakil, Pangil, Siniloan, Famy, Mabitac, and Sta. Maria.

Descriptive-quantitative correlational design was employed to discuss the variables such as the profile of the respondents, the solid wastes generated, the solid waste management attitude of households, the extent of the involvement of rural women in climate change mitigation initiative in terms of solid waste management practices, the extent of compliance to and implementation of Solid Waste Management Act of the eight lakeshore towns in the 4th District of Laguna, and the significant relationship between the profile of the respondents and the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices were analyzed using frequency, percentage, mean, and chi-square respectively.

Findings:-

Table 1:-Demographic Profile of the Respondents.

Age	**Frequency**	**Percentage**	**Rank**
17 – 20	71	56.3	1
21 – 24	43	34.1	2
25 – 28	6	4.8	3
29 – 32	3	1.6	5
33 – 36	4	3.2	4
Total	126	100	

Educational background	**Frequency**	**Percentage**	**Rank**
High school level	2	4.6	2
College Level	120	95.2	1
College graduate	4	3.2	3
Total	126	100	

Employment	**Frequency**	**Percentage**	**Rank**
Student	119	94.0	1
Employed	7	6.0	2
	126	100	

Monthly Family Income	**Frequency**	**Percentage**	**Rank**

No Income	1	8	4.5
Less than 10,000	73	57.9	1
10,001 – 20,000	33	26.2	2
20,001 – 30,000	3	2.4	6
30,001 – 40,000	2	1.6	7
40,000 or more	1	8	4.5
No response	3	10.3	3
Total	126	100	

Table 1 shows the findings as regards to the profile of rural women respondents in the eight lakeshore towns in the 4th District of Laguna. The age bracket of 17 to 20 years old dominate the number of respondents consisting of 71 out of 126. Majority have college level education numbering to 120. As regards employment and monthly family income, 119 are students and 73 out of 126 earn less than 10, 000 pesos, respectively.

Table 2:- Waste Generated by Households in the Eight Lakeshore Towns in the 4th District of Laguna.

Toxic waste	**Frequency**	**Percentage**	**Rank**
Old medicine	27	21.4	2
Paints	8	6.3	7
Chemical	38	30.2	1
Bulbs	18	14.3	4
Spray cans	4	3.2	6
Fertilizer/ Pesticide container	11	8.7	5
Batteries	20	15.9	3
Total	**126**	**100**	

Recyclable waste	**Frequency**	**Percentage**	**Rank**
Paper	69	54.8	1
Glass	6	4.8	3
Plastic	47	37.3	2
Metal	1	.8	5
Aluminum	3	2.4	4
Total	**126**	**100**	

Organic waste	**Frequency**	**Percentage**	**Rank**
Food waste	49	38.9	1
Kitchen waste	8	6.3	4
Fruits and vegetable peel	44	34.9	2
Flower trimmings			

Wool trimmings	2	1.6	6
Leaves	3	2.4	5
	20	15.9	3
Total	**126**	**100**	

Inorganic waste	**Frequency**	**Percentage**	**Rank**
Rubber	55	43.7	1
Tires	15	11.9	3
Leather	5	4.0	7
Textile	7	5.6	5.5
Fly ash	3	2.4	8
Slag/Dust	22	17.5	2
Polyethylene bags	12	9.5	4
Nursery plots	7	5.6	5.5
Total	**126**	**100**	

Table 2 shows that as regards the wastes generated, chemical ranks first out of six kinds of toxic waste while spray cans is the least; out of five kinds of recyclable waste, paper ranks first and metal is the least; out of six kinds of organic waste, food ranks first while flower trimmings is the least; and out of seven inorganic waste, rubber ranks first while leather is the least. The findings provided that from among the four main kinds of wastes paper is the majority generated by the respondents.

Table 3:- Solid Waste Management Attitude of Households In The Eight Lakeshore Towns In the 4th District Of Laguna

Food waste	**Frequency**	**Percentage**	**Rank**
Burn	7	5.6	6
Bury	9	7.1	5
River/Gully	1	.8	9
In yard	10	7.9	3.5
LGU Dumped site	10	7.9	3.5
Garbage truck	37	29.4	2
Recycle	2	1.6	8
Reuse	3	2.4	7
Other/compost	47	37.3	1

Total	**126**	**100**	

Yard Trimmings	**Frequency**	**Percentage**	**Rank**
Burn	24	19.0	2
Bury	9	7.1	6
River/Gully	1	.8	9
In yard	14	11.1	4
On road	1	.8	9
LGU Dumped site	9	7.1	6
Garbage truck	23	18.3	3
Recycle	9	7.1	6
Reuse	6	4.8	8
Other/compost	30	23.8	1
Total	**126**	**100**	

Paper/ Card board	**Frequency**	**Percentage**	**Rank**
Burn	18	14.3	4
On road	1	.8	7
LGU Dumped site	5	4.0	5
Garbage truck	24	19.0	2
Recycle	53	42.1	1
Reuse	22	17.5	3
Other/compost	3	2.4	6
Total	**126**	**100**	

Plastic	**Frequency**	**Percentage**	**Rank**
Burn	11	8.7	5
Bury	1	.8	7.5
River/Gully	1	.8	7.5
LGU Dumped site	12	9.5	4
Garbage truck	45	35.7	1
Recycle	23	18.3	3

Reuse	29	23.0	2
Other/compost	4	3.2	6
Total	**126**	**100**	

Metal	**Frequency**	**Percentage**	**Rank**
Burn	1	.8	8
Bury	1	.8	8
River/Gully	1	.8	8
In yard	8	6.3	6
LGU Dumped site	13	10.3	5
Garbage truck	25	19.8	2
Recycle	32	25.4	1
Reuse	21	16.7	4
Other/compost	24	19.0	3
Total	**126**	**100**	

Glass	**Frequency**	**Percentage**	**Rank**
Bury	11	8.7	4.5
In yard	11	8.7	4.5
On road	3	2.4	8
LGU Dumped site	13	10.3	3
Garbage truck	46	36.5	1
Recycle	23	18.3	2
Reuse	10	7.9	6
Other/compost	9	7.1	7
Total	**126**	**100**	

Table 3 shows that within the range of solid waste management attitude of households namely bury, in yard, on road, LGU Dumped Site, garbage truck, recycle, reuse, and other/compost pertaining to kinds of wastes such as food waste, yard trimmings, paper/ card board, plastic, metal, and glass, recycling is the foremost attitude to paper/card board waste while bury, river/gully, burn, on road are the least attitude to food, yard trimmings, plastic, and metal. The findings provided waste management attitude depends on its kinds.

Table 4:- Involvement In Climate Change Mitigation Initiative

Involvement	Mean	Verbal interpretation	Rank
1. I attended seminar/s on climate change and assessed the negative impact of it.	2.86	Involved	9
2. I am applying some tips I learned from the seminar/s . I attended to reduce the risk of climate change.	3.13	Involved	8
3. I participated in the planning session on how to facilitate climate change adaptation.	2.76	Involved	10
4. I am buying household products that are non-hazardous and environment friendly.	3.42	Much involved	5
5. I am aware that climate change adaptation is a shared responsibility that's why I cooperate in the different programs and activities initiated by our local government officials.	3.40	Involved	7
6. I shared the information I learned on climate change adaptation to my family members and encouraged them to become responsible on that matter.	3.48	Much involved	4
7. I support research studies on climate risks, climate change and adaptation	3.41	Much involved	6
8. I am favor in the use of alternate energy source such as windmills, solar power and others.	3.83	Much involved	1
9. I should learn to make the right practical decisions for adapting to climate change.	3.78	Much involved	3
10. I should learn more on climate change response strategy and I want to help promote them to others.	3.79	Much involved	2
General average	**3.39**	**Involved**	

1. How concerned are you about health risks related to burning garbage?	2.91	Concerned	1
2. How concerned are you about illegal dumps polluting rivers, streams, and wells?	2.90	Concerned	2.5
3. How concerned are you about diseases that are related to improper storage and disposal methods, like leptospirosis and malaria?	2.83	Concerned	5.5
4. How concerned are you about flooding due to garbage blocking drains and gullies?	2.90	Concerned	2.5
5. How concerned are you about the reduction of			

natural resources that are used to make the products we buy and use (such as, oil for plastic bottles and trees for paper)?	2.79	Concerned	9
6. How concerned are you about the service provided by the garbage truck in your area?			
7. How concerned are you about litter in your area?			
8. How concerned are you about illegal dumping in your area?	2.80	Concerned	8
9. How concerned are you about the presence of rats in your area?			
10. How concerned are you about garbage in your barangay as a Local Government?	2.83	Concerned	5.5
	2.77	Concerned	10
	2.81	Concerned	7
	2.84	Concerned	4
General Average	**2.81**	**Concerned**	

Table 4 shows the highest mean for the extent of involvement in climate change mitigation initiative is in favor of use of alternative energy source such as windmills, solar power and others. Followed by statement number nine and ten stated that should learn to make right practical decisions for adapting to climate change and should learn more on climate change response strategy and help promote them to others. The general average for the extent of involvement in climate change mitigation initiative is 3.39 with an interpretation of involved.

It is also shows the concern for the extent of involvement in climate change mitigation initiative about health risk related to burning garbage which is in the rank one and with a highest mean followed by concerned about illegal dumps polluting rivers, streams and wells and about flooding due to garbage blocking drains and gullies.

Table 5:- Compliance and Implementation of Solid Waste Management Act Of the Eight Lakeshore Towns In the 4th District of Laguna.

Compliance and Implementation	Mean	Verbal interpretation	Rank
1. I play an important role in the management of garbage in my community.	2.67	Agree	6
2. Environmental education should be taught in schools.	2.92	Agree	1
3. The purchase decisions that I make can increase or decrease the amount of garbage my household must get rid of (dispose of).	2.75	Agree	5
4. I don't care that burning garbage can be bad for my health and the health of others.	2.07	Disagree	10.5
5. People throw garbage on the streets and in the drains and gullies because they have no other means of getting rid of (disposing of) their garbage.	2.07	Disagree	10.5
6. The Local Government is not doing enough to fix the garbage problem			
7. Correct garbage management should be taught in schools.	2.13	Disagree	9
8. Other personal issues (like crime, unemployment, and	2.79	Agree	4

cost of living) are more important to me than a garbage-free community.	1.92	Disagree	12
9. Regular collection of garbage is the only solution to the garbage problem.			
10. Picking up garbage around my community is my responsibility as a barangay resident.	2.55	Agree	8
11. Public education about proper garbage management is one way to fix the garbage crisis.	2.64	Agree	7
12. It is very important that the Local Government put recycling laws and programs in place.	2.90	Agree	2.5
	2.90	Agree	2.5
General Average	**2.53**	**Agree**	

Table 5 shows the compliance and implementation of Solid Waste Act Management Act of the Eight Lakeshore Towns in the 4th district of Laguna. The highest mean obtained on the statement number two stated, environmental education should be taught in school. Followed by statement 11 and 12, educating about proper garbage management is one way to fix garbage crisis and Local government put recycling laws and program in place. The general average for the compliance and implementation of Solid Waste Act Management Act of the Eight Lakeshore Towns in the 4th district of Laguna is 2.53 with an interpretation of agree.

Table 6:- Significant Relationship Between The Profile Of The Respondents And The Extent Of Involvement Of Rural Women In Climate Change Mitigation Initiative In Terms Of Solid Management Practices.

Variables	Statistical tool	χ^2 value	Pvalue	Decision	Interpretation
Age	Chi square	12.945	.373	Fail to reject Ho	Not significant
Educational background	Chi square	9.856	.131	Fail to reject Ho	Not significant
Employment	Chi square	7.863	.049	Reject Ho	Significant
Monthly Income	Chi square	22.716	.202	Fail to reject Ho	Not significant

Table 6 shows that the employment has a significant relationship to the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices. Since its P-value is .049 which is less than .05 alpha level of significance, thus, to reject Ho. It means that employment has an association to the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices. While for Age, Educational background, and monthly income, interpreted as not significant to the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices since their Pvalue is greater than .05 alpha level of significance, thus to accept Ho.

Table 7:- Significant Relationship Between Solid Waste Management Attitude And Solid Waste Generated In Terms Of Toxic Waste.

Variables	Statistical Tool	χ^2 value	Pvalue	Decision	Interpretation
Foof waste	Chi square	15.245	.913	Fail to reject Ho	Not significant
Yard trimming	Chi square	35.335	.231	Fail to reject Ho	Not significant
Paper cardboard	Chi square	15.844	.603	Fail to reject Ho	Not significant
Plastic	Chi square	12.726	.918	Fail to reject Ho	Not significant
Metal	Chi square	27.546	.280	Fail to reject Ho	Not significant
Glass	Chi square	17.776	.663	Fail to reject Ho	Not significant

Table 7 shows that there is no significant relationship between the solid waste management attitude and solid waste generated in terms of toxic waste since the Pvalue obtained is all greater than .0500 alpha level of significance. Thus, failed to reject null hypothesis.

Table 8:- Significant Relationship Between Solid Waste Management Attitude And Solid Generated In Terms Of Recyclable Waste.

Variables	Statistical Tool	χ^2 value	Pvalue	Decision	Interpretation
Foof waste	Chi square	18.219	.311	Fail to reject Ho	Not significant
Yard trimming	Chi square	48.542	.000	Reject Ho	Highly Significant
Paper cardboard	Chi square	12.866	.379	Fail to reject Ho	Not significant
Plastic	Chi square	12.326	.580	Fail to reject Ho	Not significant
Metal	Chi square	37.818	.002	Reject Ho	Significant
Glass	Chi square	29.292	.010	Reject Ho	Significant

Table 8 shows that there is no significant relationship between the solid waste management attitude and solid waste generated in terms of recyclable waste in foof waste, paper cardboard and plastic, since the Pvalue obtained is all greater than .0500 alpha level of significance. Thus, failed to reject null hypothesis. While yard trimming is highly significant since its Pvalue is .000 which is less than .001. It is also shows that metal and glass interpreted as significant since their pvalue is less than .05 alpha level of significance, thus, to reject null hypothesis.

Table 9:- Significant Relationship Between Solid Waste Management Attitude And Solid Generated In Terms Of Organic Waste.

Variables	Statistical Tool	χ^2 value	Pvalue	Decision	Interpretation
Foof waste	Chi square	20.333	.206	Fail to reject Ho	Not significant
Yard trimming	Chi square	25.505	.183	Fail to reject Ho	Not significant
Paper cardboard	Chi square	9.683	.644	Fail to reject Ho	Not significant
Plastic	Chi square	14.176	.437	Fail to reject Ho	Not significant
Metal	Chi square	35.435	.003	Reject Ho	Significant
Glass	Chi square	21.557	.088	Fail to reject Ho	Not significant

Table 9 shows that there is significant relationship between the solid waste management attitude and solid waste generated in terms of organic waste in metal, since its pvalue obtained is .003 which is less than .05 alpha level of significance, thus to reject null hypothesis, while the other variables are interpreted as not significant, thus failed to reject null hypothesis.

Table 10:- Significant Relationship Between Solid Waste Management Attitude And Solid Generated In Terms Of Inorganic Waste.

Variables	Statistical Tool	χ^2 value	Pvalue	Decision	Interpretation
Foof waste	Chi square	21.230	.170	Fail to reject Ho	Not significant
Yard trimming	Chi square	17.190	.641	Fail to reject Ho	Not significant
Paper cardboard	Chi square	3.244	.994	Fail to reject Ho	Not significant
Plastic	Chi square	13.667	.475	Fail to reject Ho	Not significant
Metal	Chi square	45.209	.000	Reject Ho	Highly Significant
Glass	Chi square	15.442	.349	Fail to reject Ho	Not significant

Table 10 shows that metal was interpreted as a highly significant in relation between the solid waste management attitude and solid waste generated in terms of inorganic waste since its pvalue is .000 which is less than .001, thus, to reject null hypothesis.

Summary of findings:
The profile of rural women respondents in the eight lakeshore towns in the 4th District of Laguna revealed that the highest frequency in age bracket is 17 to 20 years old. Majority have college level education. As regards to employment and monthly family income, 122 are students and 73 out of 126 earn less than 10, 000 pesos, respectively.

The findings provided that from among the four main kinds of wastes paper is the majority generated by the respondents which is in recyclable waste. Within the range of solid waste management attitude of households, the findings provided waste management attitude depends on its kinds.

The general average for the extent of involvement in climate change mitigation initiative is 3.39 with a verbal interpretation of involved. Most are in favor of use of alternative energy source such as windmills, solar power and others and learn to make right practical decisions for adapting to climate change and should learn more on climate change response strategy and help promote them to others

It is also shows the concern for the extent of involvement in climate change mitigation initiative about health risk related to burning garbage which is in the rank one and with a highest mean followed by concerned about illegal dumps polluting rivers, streams and wells and about flooding due to garbage blocking drains and gullies.

The general average for compliance and implementation of Solid Waste Act Management Act of the Eight Lakeshore Towns in the 4th district of Laguna is 2.53 with the verbal interpretation of agree, for environmental education should be taught in school and educating about proper garbage management is one way to fix garbage crisis and Local government put recycling laws and program in place.

Employment has a significant relationship to the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices. Since its P-value is .049 which is less than .05 alpha level of significance, thus to reject Ho. It means that employment has an association to the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices.

Yard trimming is highly significant since in relation between the solid waste attitudes and solid waste generated in terms of recyclable waste. It is also shows that metal and glass interpreted as significant since their pvalue is less than .05 alpha level of significance, thus, to reject null hypothesis.

Metal was interpreted as a highly significant in relation between the solid waste attitudes and solid waste generated in terms of inorganic and waste since its pvalue is .000 which is less than .001, thus, to reject null hypothesis.

Conclusion:-

Based on the result gathered and analyzed, the researchers concluded that employment influenced the extent of involvement of rural women in climate change mitigation initiative in terms of solid management practices. It was because most of the respondents were students who favored that environmental education be taught in schools and educating about proper garbage management to fix garbage crisis, and insisting the local government put recycling laws and program in place.

Most were in favor of use of alternative energy source such as windmills, solar power and others and learn to make right practical decisions for adapting to climate change and should learn more on climate change response strategy and help promote them to others.

They had utmost involvement in climate change mitigation initiative about health risk related to burning garbage, illegal dumps polluting rivers, streams and wells and about flooding due to garbage blocking drains and gullies.

Compliance and implementation of Solid Waste Management Act of the Eight Lakeshore Towns in the 4th district of Laguna is alarming hence needs utmost concern and attention.

Recommendations:-

The following recommendations were suggested by the researchers based on the conclusions formed:

The researchers recommend that environmental education should be taught in schools in terms of Compliance and Implementation of Solid Waste Management Act of the Eight Lakeshore Towns In the 4th District of Laguna.

The researchers recommend that Government put recycling laws and programs in place and conduct seminars on climate change and assessed the negative impact of it.

The researchers recommend the promotion of the use of alternative energy source such as windmills, solar power, among others.