Eco-Literacy Among Urban Indian Consumers and Its Relation with Socio Demographic Factors and Green Household Practices: An Empirical Investigation

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ABSTRACT

Purpose

This paper is based on field research that assesses eco- literacy of urban Indian consumers from ten select cities of India. It also studies the association of socio-demographic factors as well as green household practices with eco-literacy scores.

Design/Methodology/Approach

The study involves 507 respondents from various cities belonging to Tier 1, Tier 2 and Tier 3 categories in India. A structured self- reporting questionnaire is prepared based on scales adapted from previously proven research instruments by famous researchers. Cross tabulation and Chi-square Analysis have been mainly used to test the hypotheses of the present study.

Findings

The study revealed that Gender, Age, Occupation, Educational Qualification, Household Size did not have any significant relationship with eco-literacy. Also, it was found that Green Household Practices have significant relationship on eco-literacy. However, taking City Tier as a Control Variable, we find that. For Tier 1 cities, there is a significant relation between eco-literacy and Green Household Practices. For Tier 2 cities, there is a significant relation between Eco-literacy and Gender, Eco-literacy and Age and Eco-literacy and Occupation. Also, there is significant relation between eco-literacy and monthly income for Tier 1 and tier 2 cities.

Practical Implications

Earlier studies have not studied the role of control variables which must actually be considered for meaningful results.

Originality/Value

It gives importance on the role of green household practices

Keywords: control variable, eco-literacy, green household practices, socio-demographic, tier cities.

INTRODUCTION

Eco-literacy studies in urban India plays a significant role in taking forward the environmental sustainability agendas at both the international and national levels. It fosters a deeper understanding of ecological concepts thereby empowering communities to contribute to a greener future and face the world sustainably and with resilience. These studies are very much essential as the cities suffer the most due to environmental challenges like pollution, waste management, and non resource depletion. Several studies have focused on understanding the level of eco-literacy among urban populations and exploring ways to improve the eco-literacy standards.

Eco-literacy is considered as an advanced field of environmental education, which helps in enabling people to become effective members of society with a sound understanding about the world as an ecological system (McBride et al., 2013). If we consider 'modern', scientific knowledge and various forms of traditional knowledge, Eco-literacy can be defined as 'understanding of the principles of the organisation of ecosystems and the application of those principles in order to create sustainable human communities and societies' (McBride et al., 2013: 14). An eco-literate person is generally believed to have gained a deeper 'understanding of basic principles of ecology, or principles of sustainability, and living accordingly' (Capra & Luisi, 2014: 353).

Eco-literacy has a significant role to play in creating awareness in children about the importance of environment protection (Salimi et al.,2021). Human behaviour has been excessively exploiting natural resources with no or little thought for environmental renewal. Hence, with the increase in environmental damage day by day, it has become absolutely necessary to understand and incorporate the principles of ecosystems to form a sustainable society, which can be called eco-literacy (Nurfajriani et al., 2018). Juhriati et al., (2021) found that a person should not only have knowledge about ecology, but should also be equally responsible in solving environmental problems effectively. Majumdar and Chatterjee (2022) found that the success of eco-literacy depends on environmental knowledge, awareness and life skills that are in harmony with nature. According to Majumdar and Chatterjee (2022), gender, occupation and total monthly income of respondents do not have any influence on eco-literacy level. That study conclusively indicated that detachment from forest and natural resources is detrimental to the preservation and cultivation of eco-literacy.

LITERATURE REVIEW

For many generations ago, human beings have been consistently relying upon traditional ecological knowledge which has its roots in the ecosystems they have been living (Drew, 2005; Pyle, 2001). The respective local 'traditional' knowledge base of the ecosystem along with the environment has been recognised as 'Eco-literacy' which is a term, coined by Capra (1997) after Orr (1992) conducted a pioneering study on ecological literacy.

However, Agrawal (1995) warned about the glorification of indigenous knowledge. He suggested one must engage such knowledge for productive and development purpose and to rethink it as a concept which is far above the dichotomy of indigenous versus scientific, and to work towards greater autonomy for 'indigenous' peoples.

Eco-literacy comprises of a learning process aimed at fostering students' knowledge, awareness and skills in managing and preserving nature (Stone, 2017). Similarly, Juhriati et al., (2021) defines eco-literacy as a movement for increasing

one's awareness, attitude, knowledge, skills, and sensitivity with respect to the natural environment which needs maintenance in the present as well as future. There are three indicators of eco-literacy: aspects of knowledge, awareness, and application.

According to Okur-Berberoğlu (2018), there are five sub-sets of eco-literacy. They are

(i)eco logical intelligence (development of social and environmental responsibility)

(ii) economy (sustainable economic development)

(iii)emotional intelligence (sense of negative impacts of humans on other people, the environment and living organisms)

(iv) social intelligence (sense of sustainable society among people) and

(v) green consumer behaviour.

Salimi et al (2021) found in their eco-literacy study that cognitive aspects of students in the nature primary school were quite good which was indicated by a systematic understanding of nature; emotional aspects were good, displayed by high caring and empathy; spiritual aspects were good which was indicated by the attitude of respecting nature; along with high activity aspects, indicated by ability to apply ecological knowledge into day-to-day life practices. This research concludes that the profile of eco-literacy in nature school was quite good.

Several attitudes describe a person's eco-literacy ability, including sensitivity or empathy to the environment, being responsible with his group friends, following the steps, procedures, or rules in a system, being fully responsible for his work, and being aware of environmental management (Goleman, 2010).

Eco-literacy or ecological literacy encompasses understanding the principles of organisation of ecosystems and their potential application to understanding how to build a sustainable human society(Capra,1997). It is the combination of the sciences of systems and ecology in drawing together elements required to foster learning processes toward a deep appreciation of nature and our role in it. Systems thinking is the recognition of the world as an integrated whole rather than a collection of individual elements. Within systems thinking, basic principles of organization become more important than the analysis of various components of the system in isolation. Ecological literacy and systems thinking implies a recognition of the manner in which all phenomenon are part of networks that define the way that element functions. Systems thinking is necessary to understand complex interdependence of ecological systems, social systems and other systems on all levels. According to Fritjof Capra, "In the coming decades, the survival of humanity will depend on our ecological literacy – our ability to understand the basic principles of ecology and to live accordingly. This means that eco-literacy must become a critical skill for politicians, business leaders, and professionals in all spheres, and should be the most important part of education at all levels – from primary and secondary schools to colleges, universities, and the continuing education and training of professionals." David W. Orr has stated that the goal of ecological literacy is "built on the recognition that the disorder of ecosystems reflects a prior disorder of mind, making it a central concern to those institutions that purport to improve minds.

There is an urgent importance of ecological literacy in today's world, where young people are faced with escalating environmental challenges, including climate change, depletion of resources, and environmentally linked illnesses.

With an understanding of ecological literacy, it is believed that human perceptions naturally shift. The need to protect the ecosystems is not simply a belief held by environmentalists; it is now a biological imperative for survival over the time. This value will become a basic principle for prioritizing thought and action in a sustainable society.

The more knowledge people have about green behavior practices, the more they will act positively (Roberts, 1996).

Ecological literacy is based upon our knowledge and understanding of the functionality of the ecological systems of the Earth and its relation with life. Industrialisation, urbanisation and population growth have resulted in changed relationships between many human communities and the natural world. Evaluation of the level of community understanding of ecological systems may have a key role to play in the process of determining how current and future populations can live more sustainably on Earth (Daniels and Pitman,2016)

Pitman et al(2016) did an assessment on over 1000 South Australian adults from diverse sectors including industry, government, nongovernment, business and community organisations. They studied for both local and global knowledge about ecology along with an understanding of the relation of human society with natural systems. Quantitative analyses from this study revealed significant relationships between scores and a range of socio-demographic characteristics. It was observed that there was a significant variation of scores with gender, age, education, employment, place of growing up and time spent in South Australia. Highest average scores were found in males, middle-age groups, the most highly educated, those with science-related educational backgrounds, those working in environment-related fields, those who grew up in small town environments rather than in large towns or cities and in those who had spent more than 10 years in South Australia.

These findings form a valuable foundation on which to build efforts to further understand and develop ecological literacy within our citizens. There has always been a widespread concern that levels of ecological literacy within many contemporary human communities are inadequate to enable effective decision-making about sustainable ways of living.(Pitman et al 2016)

It incorporated a multiple-choice test, a highly regarded and generally applicable test form selected for its efficiency. Socio-demographic items were designed to gather information considered to be most relevant to the study including basic questions in relation to gender, age group, level of education, income,job and household size.

While a number of international studies have evaluated adult environmental knowledge (Arcury 1990; Hsu & Roth 1996; Morrone et al. 2001; Coyle 2005; McDaniel & Alley 2005; Murphy & Olson 2008; Davidson 2010), the present study is a bit different one. Like most previous studies, the knowledge section is a component of a larger project that also examined attitudes and behaviours(Arcury 1990; Hsu & Roth 1996; Miller 1998;Morrone et al. 2001; Pe'er et al. 2007; Davidson 2010;Minnesota EE 2002-2008). With this in mind, we have made comparisons between our findings and those of previous studies where they have some relevance and contribution to the overall picture.

Eco-literacy has a significant impact on environmental behavior. Unless we understand the relationship between humans and the natural environment it is useless to take any action to protect the environment. Socio-demographic factors such as age, gender, education, income, and living environment can have a huge impact on environmentally caring behavior. Its important to understand the ecological principles as well as the socio demographic factors such as age, gender, education, income, and living conditions. These factors play a crucial role in shaping an individual's awareness, attitudes, and actions toward the environment.The efforts made to increase environmental awareness, conservation and sustainability would go to waste if one does not consider the critical role played by eco-literacy and socio-demographic factors(Kesuma et al 2024).

Eco-literacy has a crucial role in increasing the level of awareness of individuals regarding environmental issues. Individuals who have a deeper understanding of ecological principles tend to be more sensitive to climate change, environmental change, and ecosystem damage(Kollmuss & Agyeman, 2002). Awareness of environmental issues relates to the willingness to change individual behavior(Synthia & Kabir, 2015). In a study conducted in Medan,a cityin Indonesia, it was found that high levels of eco-literacy are associated with a better understanding of students' environmentally caring behavior(Wahyuni et al., 2022).

Socio-demographic factors in this study involve social characteristics, including age, gender, education, income, job and household size. These factors can play a key role on the extent to which individuals understand environmental issues, adopt environmentally caring attitudes, and engage in actions that support environmental sustainability (Patel et al., 2017).

Daniels and Pitman(2016) explores the concept of ecological literacy and describes the development, application and initial results of an instrument capable of providing an indicative assessment of the level of knowledge and understanding of ecological systems and processes within a self-selecting sample of the adult community of South Australia. They have shown that it is possible to assess and describe indicative levels of ecological knowledge and understanding within an adult community. Through research,consultation, testing and analysis they had developed a valid and reliable assessment instrument with demonstrated capacity to discriminate between differing levels of ecological comprehension.

Furthermore, the test could deliver a determinant of ‘extremely low’ through to ‘extremely high’ standards, including an identified aspirational target score. These standards could be used to benchmark individuals, groups, organizations and communities within the wider population.

Application of the instrument yielded considerable data for analysis. The ecological knowledge and understanding of a self-selecting sample of 1,010 adults within the South Australian community was shown to be generally moderate to high, with a small percentage in the low ranges and a small percentage in the extremely high range. Examination of the relationships between scores and socio-demographic and psychographic characteristics has generated detailed analyses of the data, presented and discussed in further papers. This work contributes to a deepening understanding of factors associated with ecological knowledge and understanding within an industrialised and urbanised Western society.

Most of the earlier research studies on eco-literacy have mainly been focused on tribal population and young students. The urban working population in particular has never been given much importance with respect to assessment of eco-literacy in earlier research studies. Moreover, hardly any studies have been done earlier taking city tier as control variable

for studying the role of socio-demographic factors as well as the role of green household practices on eco-literacy of the urban Indian population.

The present study aims to study the role of socio-demographic factors as well as the role of green household practices on eco-literacy in the Indian urban context by taking city tier as control variable. Cities in India have been classified into three different categories(tiers)Tier 1, 2 and 3. Tier 1 cities are the most developed ones. The lesser developed ones are called Tier 2 and Tier 3 cities

Tier 1 cities in India are the major urban centres that actually drive economic and social development of the country. Tier 1 cities in our study are Delhi, Mumbai, Kolkata, Hyderabad, Chennai and Bangalore. These cities have robust infrastructure, high living standards, and significant business opportunities. Whereas Tier 2 cities in this study are Noida, Gurugram and Lucknow. Whereas Guwahati is the only Tier 3 city chosen in this study.

RESEARCH OBJECTIVES

The present study aims to study the following objectives:

1.To assess the level of eco-literacy City Tier wise and also considering the socio demographic factors wise.

2.To study if there is any relation between green household practices and eco-literacy

3.To study if there exists any relation between the various socio-demographic factors of the urban population and eco-literacy

RESEARCH HYPOTHESES

Based on the above broad objectives, following are the research hypotheses for the study.

These seven hypotheses will be tested with and without control variable 'City Tier'

Ho1: There is no significant relation between green household practices and eco-literacy

Ho2: There is no significant relation between gender and eco-literacy

Ho3: There is no significant relation between age and eco-literacy

Ho4: There is no significant relation between occupation and eco-literacy

Ho5: There is no significant relation educational qualification between and eco-literacy

Ho6: There is no significant relation between household size and eco-literacy

Ho7: There is no significant relation between monthly income and eco-literacy

RESEARCH METHODOLOGY

The research study was mainly conducted in ten cities across India viz New Delhi, Gurugram, Noida, Mumbai, Hyderabad, Bengaluru, Chennai, Lucknow, Kolkata and Guwahati among consumers in the age group 18 to 60 years. The study sites were selected based on accessibility through networking, a focus on select cities of India which encompasses a huge number of consumers of green personal care products. A survey was undertaken among 612 respondents out of which the data of 507 respondents were actually eligible for data analysis purpose in our study based on some elimination criteria.

In the study, a few questions were intentionally set for screening purpose so that the analysis can be done only for the eligible respondents.

The answer obtained from each eliminatory questions was marked according to the competency level as follows:

0 = if the respondent does not choose any of the options and

1 = if the respondent has bought at least one from the given options or 'others'

The final eco-literacy score of a respondent was determined by adding up all the obtained marks from four questions, viz.Q8,Q10, Q11 and Q12 in the questionnaire. The highest mark obtained for this eco-literacy assessment was 5 and lowest was 1. Data were entered into Excel and then inputted in SPSS (Statistical Package for Social Sciences) for coding the data followed by statistical analysis using SPSS software.

Test included is the Pearson Chi-square test. The null hypothesis were tested by utilising a significance level of 0.05

RESULTS

The main results of our research are presented here.

Following are six tables illustration Crosstabulation across the three city tiers ,viz. Tier 1, Tier 2 and Tier 3

(i) Age and Eco-Literacy

(ii) Gender and Eco-Literacy

(iii) Occupation and Eco-Literacy

(iv) Educational Qualification and Eco-Literacy

(v) Monthy income and Eco-Literacy

(vi) Household size and Eco-Literacy

(i)AGE AND ECO-LITERACY

Age * Eco literacy score * City Tier Cross tabulation								
Count								
City Tier			Eco literacy score					**Total**
			1.00	2.00	3.00	4.00	5.00	
Tier 1	Age	1		3	7	27	60	97
		2		1	11	42	89	143
		3		0	5	25	44	74
		4		1	0	11	10	22
	Total			5	23	105	203	336
Tier 2	Age	1	2	1	1	13	23	40

		2	0	1	8	22	35	66
		3	0	1	2	7	18	28
		4	0	0	1	1	5	7
	Total		2	3	12	43	81	141
Tier 3	Age	1	0	0	1	11	23	35
		2	1	1	10	13	33	58
		3	0	1	1	8	15	25
		4	0	0	5	1	11	17
	Total		1	2	17	33	82	135
Total	Age	1	2	4	9	51	106	172
		2	1	3	29	77	157	267
		3	0	2	8	40	77	127
		4	0	1	6	13	26	46
	Total		3	10	52	181	366	612

Table 1: Crosstabulation across the Three City Tiers between Age and Eco-Literacy

(ii)GENDER AND ECO-LITERACY

Gender * Eco literacy score * City Tier Cross tabulation								
Count								
City Tier			Eco literacy score					**Total**
			1.00	2.00	3.00	4.00	5.00	
Tier 1	Gender	1		2	12	67	110	191
		2		3	11	38	93	145
	Total			5	23	105	203	336
Tier 2	Gender	1	1	2	11	33	54	101
		2	1	1	1	10	27	40
	Total		2	3	12	43	81	141
Tier 3	Gender	1	1	2	7	14	37	61
		2	0	0	10	19	45	74
	Total		1	2	17	33	82	135
Total	Gender	1	2	6	30	114	201	353
		2	1	4	22	67	165	259

	Total	3	10	52	181	366	612

Table 2: Crosstabulation across the Three City Tiers between Gender and Eco-Literacy

(iii)OCCUPATION AND ECO-LITERACY

Occupation * Eco literacy score * City Tier Cross tabulation								
Count								
City Tier			Eco literacy score					**Total**
			1.00	2.00	3.00	4.00	5.00	
Tier 1	Occupation	1		1	4	15	28	48
		2		1	14	58	115	188
		3		2	3	24	36	65
		4		1	2	8	24	35
	Total			5	23	105	203	336
Tier 2	Occupation	1	0	0	0	8	14	22
		2	0	2	11	23	42	78
		3	0	0	1	6	15	22
		4	2	1	0	6	10	19
	Total		2	3	12	43	81	141
Tier 3	Occupation	1	0	0	7	11	15	33
		2	1	0	4	10	36	51
		3	0	2	2	7	19	30
		4	0	0	4	5	12	21
	Total		1	2	17	33	82	135
Total	Occupation	1	0	1	11	34	57	103
		2	1	3	29	91	193	317
		3	0	4	6	37	70	117
		4	2	2	6	19	46	75
	Total		3	10	52	181	366	612

Table 3: Crosstabulation across the Three City Tiers between Occupation and Eco-Literacy

(iv)**EDUCATIONAL QUALIFICATION AND ECO-LITERACY**

Educational qualification * Eco literacy score * City Tier Cross tabulation								
Count								
City Tier			Eco literacy score					**Total**
			1.00	2.00	3.00	4.00	5.00	
Tier 1	Educational qualification	1		0	1	1	3	5
		2		0	1	5	0	6
		3		2	12	60	83	157
		4		3	9	39	117	168
	Total			5	23	105	203	336
Tier 2	Educational qualification	1	0	0	0	0	1	1
		2	0	0	1	2	1	4
		3	1	1	8	17	39	66
		4	1	2	3	24	40	70
	Total		2	3	12	43	81	141
Tier 3	Educational qualification	1	0	0	0	1	0	1
		2	0	0	0	1	2	3
		3	0	0	1	8	20	29
		4	1	2	16	23	60	102
	Total		1	2	17	33	82	135
Total	Educational qualification	1	0	0	1	2	4	7
		2	0	0	2	8	3	13
		3	1	3	21	85	142	252
		4	2	7	28	86	217	340
	Total		3	10	52	181	366	612

Table 4: Crosstabulation across the Three City Tiers between Educational Qualification and Eco-Literacy

(v)**MONTHLY INCOME AND ECO-LITERACY**

Monthly income * Eco literacy score * CityTier Cross tabulation						
Count						
City Tier	Eco literacy score					**Total**
	1.00	2.00	3.00	4.00	5.00	

Tier 1	Monthly income	1		0	7	1	8	16
		2		0	1	15	24	40
		3		3	5	44	86	138
		4		2	10	45	85	142
	Total			5	23	105	203	336
Tier 2	Monthly income	1	1	0	1	2	5	9
		2	1	1	2	7	12	23
		3	0	1	6	19	29	55
		4	0	1	3	15	35	54
	Total		2	3	12	43	81	141
Tier 3	Monthly income	1	0	0	2	4	4	10
		2	0	1	2	0	10	13
		3	1	1	9	24	43	78
		4	0	0	4	5	25	34
	Total		1	2	17	33	82	135
Total	Monthly income	1	1	0	10	7	17	35
		2	1	2	5	22	46	76
		3	1	5	20	87	158	271
		4	0	3	17	65	145	230
	Total		3	10	52	181	366	612

Table 5: Crosstabulation across the Three City Tiers between Monthly income and Eco-Literacy

(vi)**HOUSEHOLD SIZE AND ECO-LITERACY**

Householdsize * Eco literacy score * CityTier Cross tabulation								
Count								
City Tier			Eco literacy score					**Total**
			1.00	2.00	3.00	4.00	5.00	
Tier 1	Household size	1		1	6	21	37	65
		2		2	8	61	116	187
		3		2	9	23	50	84
	Total			5	23	105	203	336
Tier 2	Household size	1	0	0	2	12	17	31
		2	2	2	7	17	44	72

		3	0	1	3	14	20	38
	Total		2	3	12	43	81	141
Tier 3	Household size	1	1	0	2	4	9	16
		2	0	1	14	15	48	78
		3	0	1	1	14	25	41
	Total		1	2	17	33	82	135
Total	Household size	1	1	1	10	37	63	112
		2	2	5	29	93	208	337
		3	0	4	13	51	95	163
	Total		3	10	52	181	366	612

Table 6: Crosstabulation across the Three City Tiers between Household size and Eco-Literacy

FINDINGS

In our data, 03 respondents (0.49%) were found to have eco-literacy score of 01, 10 respondents(1.63%) achieved eco-literacy scores of 02, 52 respondents (8.49%) with eco-literacy scores of 03, 181 respondents(29.57%) scored 04 marks and 366 respondents (59.8%)scored 05 marks.

Age wise, we find that scores of 05 were achieved by 106 respondents in the age group of 25-30 years, 157 respondents in the age group of 31-40 years,77 respondents in the age group of 41-50 years and 26 respondents in the age group of 51-60 years. Similarly, score of 01 were achieved by 02 respondents in the age group of 25-30 years, 01 respondent in the age group of 31-40 years,0 respondent in the age group of 41-50 years and age group of 51-60 years respectively.

If we consider the data gender wise, scores of 05 were achieved by 201 male respondents scored and 165 female respondents; similarly score of 01 were achieved by 02 male respondents scored and 01 female respondent.

Occupation wise, scores of 05 were achieved by 57 respondents working in Public Sector, 193 respondents working in Private Sector, 70 respondents working as Self-employeds and 46 respondents working in the Others Category. Similarly score of 01 were achieved by 0 respondents working in Public Sector, 01 respondents working in Private Sector, 0 respondents working as Self-employeds and 02 respondents working in the Others Category.

If we look education qualification wise, we find that scores of 05 were achieved by 04 respondent in the Class X qualified group, 03 respondents in the Class XII qualified group,142 respondents in the graduation group and 217 respondents in the post-graduation group. Similarly, score of 01 were achieved by 0 respondent only in the Class X qualified group, 0 respondents in the Class XII qualified group,01 respondent in the graduation group and 02 respondents in the post - graduation group.

If we look monthly income wise, scores of 05 were achieved by 17 respondents in the monthly income group of less than Rs30,000, 46 respondents in the monthly income group of Rs 30,001 - Rs50,000 ,158 respondents in the monthly income group of Rs 50,001 – Rs1,00,000 and 145 respondents in the monthly income group of above Rs1,00,000.Similarly, score of 01 were achieved by 01 respondent in the monthly income group of less than Rs30,000,01 respondent in the monthly income group of Rs 30,001-Rs50,000 ,01 respondent in the monthly income group of Rs 50,001 – Rs1,00,000 and 0 respondent in the monthly income group of above Rs1,00,000.

If we see house hold wise, scores of 05 were achieved by 63 respondents with a household size of one to two, 208 respondents with a household size of three to four and 95 respondents with a household size of five or more. Similarly, score of 01 were achieved by 01 respondent with a household size of one to two, 02 respondents with a household size of three to four and 0 respondent with a household size of five or more.

If we compare Tier 1, Tier 2, Tier 3 cities eco-literacy scores irrespective of any socio demographic characteristics like age, gender, educational qualification etc as mentioned above, we find that there is minute difference in the scores ,viz 4.50,4.40 and 4.29 for Tier 1, Tier 2,Tier 3 cities respectively.

In Table 7, showing the average eco-literacy scores with respect to gender, age, occupation, educational qualification, household size and monthly income.

Age Classification	Average Eco-Literacy Score
25-30 years	4.48
31-40 years	4.45
41-50 years	4.51
51-60years	4.39
Gender Classification	Average Eco-Literacy Score
Male	4.43
Female	4.51
Occupation Classification	Average Eco-Literacy Score
Public sector job	4.42
Private sector job	4.49
Self-employed	4.47
Others	4.4
Educational Qualification Classification	Average Eco-Literacy Score
Class 10	4.43
Class 12	4.08
Graduation	4.45
Post Graduation or higher	4.49
Monthly income(in Rs)Classification	Average Eco-Literacy Score
Less than 30,000	4.11
30,001-50,000	4.45
50,0001-1,00,000	4.46
Above 1lac	4.53
Household size Classification	Average Eco-Literacy Score
1to2	4.43
3to4	4.48
5 or more	4.45

Table 7: Table showing the average eco-literacy scores with respect to gender, age, occupation, educational qualification, household size and monthly income

From the above table, it is clearly evident that socio demographic factors do not have much influence over eco-literacy scores except for monthly income where it is seen that with rising income, eco-literacy scores are also increasing.

PEARSON CHI-SQUARE TESTS

A table compiling all the Chi-square values from the different associations of Green Household Practice (GP),Gender, Age, Occupation, Educational Qualification, Household size, Monthly Income with the dependent variable Eco-literacy with and without control variable. The below Chi-square values have been compiled from tables generated from SPSS output.

	Independent Variable	Dependent Variable	Asymptotic Significance (2 sided)	Asymptotic Significance (2 sided)	Degrees of Freedom
1a	Green Household Practices	Eco-Literacy	0.786		80
1b	Green Household Practices with Control Variable City Tier	Eco-Literacy	0.167,0.589,0.006	0.786	
2a	Age	Eco-Literacy	0.638		12
2b	Age with Control Variable City Tier	Eco-Literacy	0.310,0.576,0.182	0.638	
3a	Gender	Eco-Literacy	0.501		4
3b	Gender with Control Variable City Tier	Eco-Literacy	0.328,0.354,0.426	0.501	
4a	Occupation	Eco-Literacy	0.175		12
4b	Occupation with Control Variable City Tier	Eco-Literacy	0.761,0.031,0.158	0.175	
5a	Educational Qualification	Eco-Literacy	0.259		12
5b	Educational Qualification with Control Variable City Tier	Eco-Literacy	0.009,0.857,0.794	0.259	
6a	Monthly income	Eco-Literacy	0.005		12
6b	Monthly income with Control Variable City Tier	Eco-Literacy	<0.001,0.435,0.256	0.005	
7a	Household size	Eco-Literacy	0.858		8
7b	Household size with Control Variable City Tier	Eco-Literacy	0.468,0.678,0.049	0.858	

Table 8: Chi-square values considering all city tiers together as well as considering city tiers separately

A p-value of less than or equal to 0.05 is regarded as evidence of a statistically significant result, and in these cases, the null hypothesis should be rejected in favor of the alternative hypothesis.

From the above table, we find that there is no significant relation between Gender and Eco-literacy, Age and Eco-literacy, Occupation and Eco-literacy, Educational Qualification and Eco-literacy, Household Size and Eco-literacy.

Therefore, it can be reported that there is no significant relationship at 5% significance level between between Gender and Eco-literacy, Age and Eco-literacy, Occupation and Eco-literacy, Educational Qualification and Eco-literacy, Household Size and Eco-literacy (Chisquare values, degrees of freedom at 5% level of significance as illustrated in the above table (Table 6)

Whereas, from the same table, we also find that there is significant relation between Green Household Practices and Eco-literacy and also there is also significant relation between Monthly Income and Eco-literacy. Therefore, it can be reported that there is significant relationship at 5% significance level between between Green Household Practices and Eco-literacy and between Monthly Income and Eco-literacy (Chi-square values, degrees of freedom at 5% level of significance as illustrated in the above table (Table 6).

If we consider Tier1, Tier2 and Tier3 cities as Control Variable, we find the following:

Green Household Practices: For Tier 2 and Tier 3, Null Hypotheses are accepted; for Tier 1 cities, Null Hypothesis is rejected. That means for Tier 1 cities, there is a significant relation between Eco-literacy and Green Household Practices. But for Tier 2 and Tier3 cities, there is no significant relation between Eco-literacy and Green Household Practices.

Gender: For Tier 2 cities, Null Hypothesis is rejected; for Tier 1, Tier 3 cities, Null Hypotheses are accepted. That means for Tier 2 cities, there is a significant relation between Eco-literacy and Gender. But there is no significant relation between Eco-literacy and Gender for Tier 1 and Tier3 cities.

Age: For Tier 2 cities, Null Hypothesis is rejected; for Tier 1and Tier 3 cities, Null Hypotheses are accepted. That means for Tier 2 cities, there is a significant relation between Eco-literacy and Age. But there is no significant relation between Eco-literacy and Age for Tier 1 and Tier3 cities.

Occupation: For Tier2 cities, Null Hypothesis is rejected; for Tier 1 and Tier 3 cities, Null Hypotheses are accepted. That means for Tier 2 cities, there is a significant relation between Eco-literacy and Occupation. But there is no significant relation between Eco-literacy and Occupation for Tier 1 and Tier3 cities.

Educational Qualification: Null Hypotheses are accepted for all tier cities. That means there is no significant relation between eco-literacy and educational qualification for Tier1, Tier2 and Tier 3 cities.

Household Size: Null Hypotheses are accepted for all tier cities. That means there is no significant relation between eco-literacy and household size for Tier 1, Tier 2 and Tier 3 cities.

Monthly income: For Tier 3 cities, Null Hypotheses are accepted ;for Tier 1, Tier2 cities ,Null Hypotheses are rejected. That means there is significant relation between eco-literacy and monthly income for Tier 1 and tier 2 cities

DISCUSSION AND CONCLUSION

From the present study, it has been found that socio demographic factors do not have much influence over eco-literacy scores except for monthly income where it is seen that with rising income, eco-literacy scores are also increasing. Gender, Age, Occupation, Educational Qualification, Household Size did not influence the eco-literacy level. Whereas, Green Household Practices have some influence on Eco-Literacy scores. The respondents who support Green Household Practices are found to have good eco-literacy scores. There are certain limitations of our research like convenience sampling has been used. Future research may find it useful to include larger sample sizes and also using probabilistic sampling methods. More research is needed on how young Indians perceive this topic. It is highly recommendable on the basis of the present research to conserve nature and strengthen ecological knowledge through various government policy, corporate policies as well as pedagogic initiatives at all levels. Environmental awareness and promotion of eco-literacy are not merely a matter of educational curriculum but it should be made a mandate across all Indian citizens whether educated or uneducated, irrespective of gender and any other socio demographic criteria. The importance of eco-literacy and maintaining contacts with nature should not only remain confined to tribal populations only who depend on forests for their livelihood. Cultivating eco-literacy is not the same as becoming 'religious', but relates everywhere to philosophy (Callicott & Ames, 1989; Rankin, 2018), the cultivation of the fourth level of eco-literacy theorised by Berkes (1999) as literacy regarding worldviews that guide the respective local value system. Evidently, the growth of modernity and rationality (d'Avray, 2010) created risks for the extinction of the experience of nature (Pyle, 2001), alienating individuals and whole communities from environmentally-conscious ways of living in which nature is an integral part. Thus, it may highly suggested that eco-literacy should be strictly incorporated in the curriculum in schools as well as colleges. India had already introduced the teaching of environmental studies from the beginning of school education in 1975, discussed by Rout (1988: 1), who emphasises the need to develop awareness and understanding of the environment and problems related to it. Also, within tribal communities, all community members must be encouraged to promote verbally about eco-literacy, traditional culture, farming practices, efficient use of natural resources and conservation. Also, there is a bigger responsibility for the older community people also, who still have command over this traditional knowledge, and they must pass it on to the next generations to ensure that it is not lost forever.

Communities might also inspire at the local level to conduct their own research on eco-literacy topics and also provide written documentation in local knowledge by utilising intellectual property rights (IPRs) for reference purpose (Downes, 2002).

Eco-literacy studies need tremendous support from all stakeholders in the entire ecosystem, including the various states of the country across various departments. The government and various agencies should actively support eco-literacy-focused pedagogic innovations, which will have significant implications for teacher education and course curriculum development policies. Also, the findings from eco-literacy studies enable integrating environmental education into urban planning frameworks, incentivizing sustainable practices, and implementing green infrastructure projects. Although earlier studies have done assessment of Eco-literacy Levels, they have not studied the role of green household practices on eco-literacy. Apart from such studies, engaging urban communities in environmental conservation efforts is vital. Studies explore participatory approaches, citizen science initiatives, and community-based conservation projects to foster eco-literacy and collective action.

Researchers have also identified barriers to eco-literacy in urban India, such as lack of awareness, infrastructural gaps, and competing priorities. They also highlight opportunities for collaboration between government, academia, businesses, and civil society to address these challenges effectively.

Continuous monitoring and evaluation are very much essential to track changes in eco-literacy levels over time and assess the impact of government interventions to bring desired behavioural changes in the urban Indian society. To address this issue, longitudinal studies can pave the way by providing insights into the effectiveness of various strategies in promoting environmental awareness and behavior change.

SCOPE FOR FUTURE RESEARCH

The present paper has been an attempt to study eco- literacy among the Indian urban population of a few selected cities only across the three different city tiers of India. Only the working population has been considered in this study. The aged population and school going children have not been covered. We have used convenience sampling in this study. Future research can implement probalistic methods for better results. Also, future research can widen the scope of respondents by also including respondents from the manufacturers' side as well.

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