

Pro-Environmental Behaviour of Secondary School Students: A Topographical Analysis

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Abstract: *Persons' behavior, personal values, attitudes and level of consciousness are shaped by a number of factors that include locality, culture, religion, opportunities, environment and personal experiences. Among all other factors the gender and localities of individual was assumed to mediate the effects on pro-environmental behavior. The topographical condition in terms of climate, temperature, rain rate throughout the year, humidity, resources available and natural calamities may have more and less impact in forming personality characteristics i.e. behaviour, knowledge, values, etc. The present study has been emerged out of the above considerations. For that purpose, the state, West Bengal has been divided into six topographical zones and a sample of 145 (N = 145) secondary students of different parts of West Bengal has been taken. Samal and Sarkar Pro-environmental Behaviour Questionnaire (SSPBQ) developed by researchers has been used to measure the selected variable. Descriptive statistics along with ANOVA have been employed to analyze the data. No difference of the pro-environmental behaviour was found in case of gender but the significant differences were found in case of localities as well as topographical zones. It might be concluded that the localities and topographical zones might mediate in pro-environmental behaviour of person.*

Keywords: Secondary Students, Pro-environmental Behaviour, Topographical zones.

1. Introduction

For making life more luxurious and gratifying his unwanted and excessive needs, human being regularly has been destroying forests ruthlessly, polluting air and water apathetically, cutting the mountains recklessly and despoiling the nature truculently. The consequence of anti-environmental behaviour and incautious and unwary life styles call the various new health hazards and killer diseases. The deliberate abuse, misuse and overuse of natural resources by mankind arise many environmental crises which ultimately brings natural calamities. It is the right time to check the environmental degradation because present is in hand but future might be costly. But still today such anti-environmental behaviors is not seen as a universal phenomenon because there are some people who are sensible in environmental issues and raise their voices and offer their big hands for preservation and protection of the environment. The present researchers assumed that, such variation in environmental behavior and attitudes may have both temporal and spatial phenomenon. The explanation of pro-environmental behavior often focus on predictors in specific level of abstraction, such as personal values, Knowledge, attitudes or norms, gender, locale, or regions of individuals where persons reside. This paper aims to explore the extent of secondary students' pro-environmental behaviour i.e. their habits and dealings to save the environment, making it clean and tidy avoiding pollution, practice of using the natural resources, practice of saving energies etc. in respect to their gender, localities and geographical regions.

1.1 Objectives

The objectives of the study were:

- 1) To measure the pro-environmental behavior of the secondary students in respect of Gender (Boys and Girls) and Localities (Rural and Urban).
- 2) To find out the differences of the pro-environmental behavior of the secondary students belonging to different topographical regions.
- 3) To develop the tool for measuring pro-environmental behaviour of the secondary students
- 4) To suggest for fostering better pro-environmental behaviour among the students.
- 5) To provide valuable findings and offer measures for greater success of environmental studies included in school curriculum.

1.1.1 Significance of the Study

Proper research on environmental education and its related issues are vital to enhance the protection and proper well use of natural resources. The proper selected studies might be helpful in identifying the factors influencing the pro-environmental behaviour in different contexts. Campaigns and programs should be designed in a sustainable way to assist target groups with the acquisition of knowledge, skills, and attitudes that are necessary to solve actual and local environmental problems. The study would be helpful to teachers, educational planners, administrators, further researchers etc. in various ways. The results and findings would help to prepare and plan novel, creative and unique program on environmental issues. Ultimately the study might be helpful for qualitative upliftment of environmental education in West Bengal and India as a whole. The present study would be highly significant for suggesting the measures to enhance the pro-environmental behavior of secondary school going students.

2. Review of Related Studies

Researchers reviewed some studies conducted on pro-environmental behavior and also some models showing the predictors in pro-environmental behavior developed by various authors.

Kumari, *et. al.*, (2006) in their study on 'Environmental Awareness, Environmental Attitude and Intentional Ecological Behaviour among Adolescents', found that majority of respondents fall in the category of high awareness level. Very few (4% girls and 14% boys) were found to have low awareness level. The 36% of girls and 44% boys had favourable attitude while equal percentage of boys and girls had unfavourable attitude towards environment. McStay & Dunlap (1983) in their study 'Male-female differences in concern for environmental quality' had shown that women showed more pro-environmental behaviours than men. Hines, *et al* (1987) found the factors like internal locus of control, verbal commitment and personal responsibility were prerequisites of environmental behaviour. They have developed a Model of predictors of environmental behavior showing how the locus of control, attitudes, personal responsibility, personality factors, knowledge issues, action strategies, action skills and intention to act predict one' pro-environmental behavior. With these above predictors, the situational factors had also contributing factors that had been highlighted in their models developed. Hungerford & Volk (1990) in their research paper 'Changing learner behaviour through environmental education' had developed an 'Environmental Behaviour Model' taking into consideration the major and minor variables involved in environmentally responsible citizenship behaviour. Their model was based on the component objectives of Environmental Education as laid out in the Tbilisi conference declaration (Awareness, Attitudes, Skills and Participation). Stern, *et al.* (1999) in their research paper entitled 'A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism' have explained the variables that predicted responsible environmental citizenship. This theory linked three elements like (a) Moral Norm Activation, (b) Personal Values and (c) New Ecological Paradigm (NEP). These were linked in a chain, with behavioral outcomes that vary in degree of commitment. The theory did well at predicting not only highly committed activism, but also lower levels of citizenship involvement. Kaiser, Ranney, Aartig and Bowler (1999) in their research paper "Ecological Behavior, Environmental Attitude, and Feelings of Responsibility for Environment" highlighted the domain of morality and rationality as an additional predictor of intentions to behave ecologically. Stepath (2000) in his research publication "Awareness and Community-based Monitoring" proved that Awareness is only a first step in the process of responsible environmental behavior, not an end in itself. Promoting responsible environmental behavior requires changing human attitudes linking with Participatory action. Fietkau & Kessel, (1981) used sociological as well as psychological factors to explain pro-environmental behavior. According to that Model five variables i.e. Attitudes and values, Possibilities to act ecologically, Behavior incentives, Perceived feedback about ecological behavior and Knowledge related to environment influence pro-

environmental behavior. Kollmuss and Agyeman (2002) in their research paper "Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior"? had described the factors influencing the pro-environmental behavior such as demographic factors, external factors (e.g. institutional, economic, social and cultural factors) and internal factors (e.g. motivation, environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities and priorities). Stewart Barr (2007) made an investigation into "The Factors Influencing Environmental Attitudes and Behaviors : A U.K. Case Study of Household Waste Management" and found that environmental values, situational characteristics, and psychological factors all play a significant role in the prediction of waste management behavior, within the context of a core intention-behavior relationship. Groot and Steg (2009) in their research publication "Mean or green: which values can promote stable pro-environmental behavior"? had described a model of how egoistic, altruistic, and biospheric values influence pro-environmental beliefs, intentions, and behavior. They focused on the relationships between values and pro-environmental behavior. Chenyang Xiao and Aaron M. McCright (2012) investigated into "A Test of the Biographical Availability Argument for Gender Differences in Environmental Behaviors" Compared with men, women often express stronger proenvironmental attitudes and values and more frequently engage in private environmental behaviors (e.g., recycling), but not in public environmental behaviors (e.g., joining a protest about an environmental issue).

2.1 Problem Definition

After studying the related literatures and keeping the silent issues and crisis of environment, researchers had selected major variable like Pro-environmental Behaviour for the present study. Hence the preset study might be stated as "PRO-ENVIRONMENTAL BEHAVIOUR OF SECONDARY SCHOOL STUDENTS: A TOPOGRAPHICAL ANALYSIS". Accordingly the Problem chosen for the study, it has been considered to assess and analysis the Pro-environmental Behavior in respect to Gender, Localities and Topographical regions.

What is Pro-environmental Behavior?

The term "Pro-environmental Behavior" denotes so many terms and the people use it as interchangeably as 'Eco-friendly Behavior' or 'Environmentally significant behavior' or 'Environment Behaviour' or 'Environment Friendly Behavior' or 'Ecological Behavior' or 'Green Behavior's or 'Environmental Responsible Behavior'. It is explained by Asclurd and Lehman, (1993) as individual's 'Ecological Behaviors', which is in action, that contributes towards environmental preservation and/or conservation or how can behavior be changed in a more ecological direction. Investigators had considered the aspects of Biotic, Abiotic, Energy Utilisation and General Issues which might be taken as the dimensions of the Proenvironmental Behaviour to measure the Proenvironmental Behaviour of secondary school students. Hence, in the present study the researchers employed the concept of Proenvironmental behavior as "the actions incorporating biotic, abiotic, energy utilization and

general issues and the individuals' propensity to protect and (or) preserve the environment”.

Geographical Status and Topographical Regions of West Bengal

West Bengal as a province of India is a land of heterogeneity in terms of climate which extends between latitude 21° 50' N and 27° 10' N and longitudes 85° 58'E and 89° 50'E. The state covers an area of 88,752 sq.km stretching from the Himalayas in the north to the Bay of Bengal in the south. This state of West Bengal is bounded on the north by Sikkim and Bhutan, on the east by Assam and Bangladesh, on the south by the Bay of Bengal and on the west by Orissa, Jharkhand and Bihar. West Bengal is a land of the great rivers, Great Plains including deltaic hive of massed humidity. The state of West Bengal is divided into 20 districts. The term 'region' is generally applied to an area of any size throughout which there is some kind of homogeneity as specified by the criteria adopted to define it. Such type of homogeneity of geographical conditions in a region is clearly observed only around the core of its territory. On the basis of landforms, structure, climatic characteristics and human activities, the state of West Bengal may be divided into the following regions:

1) Darjeeling Himalayan Region, 2) Tarai Region, 3) North Bengal Plains, 4) Eastern Fringes of the Chhotanagpur Plateau Region, 5) Rarh Region, 6) Coastal Plain, 7) Sunderbans and 8) Ganga Delta. Out of eight regions, only six regions have taken for the present study.

2.1.1 Hypotheses

The following null-hypotheses were considered for the present study.

H_1^0 : There exists no significant differences among Secondary School Students belonging to different topographical zones in respect to their Pro-environmental Behavior.

H_2^0 : There exists no significant difference between Secondary School Girls and Boys in respect to their Pro-environmental Behavior.

H_3^0 : There exists no significant difference between Urban and Rural Secondary School Students in respect to their Pro-environmental Behavior.

3. Procedure of the Study

I. Variables Studied: As a multivariate approach, the present study comprised of four Variables such as-

- (a) One dependent variable i.e. Pro-environmental Behavior
- (b) Three attribute variables i. e. Gender (boys and girl), (c) Localities (Rural and Urban) and Topographical regions (Categorised into six regions).

II. Methods of the Study Employed: The study aims at comprising the level of Pro-environmental Behaviour in respect to persons' localities and gender. The method of the investigation was confined to a descriptive and analytical approach.

III. Tools Used: For measuring the selected variable, Samal and Sarkar Pro-environmental Behaviour Questionnaire (SSPBQ) developed by the researchers was used.

IV. Population: The population of the study was secondary schools students of West Bengal. The schools included in the sample were found in seven districts from six topographical zones classified on the basis of climate existing in West Bengal.

V. Sampling Procedure Followed: Purposive sampling method was followed. A sample of 145 (N = 145) students from ten (10) schools were selected, on basis of the main consideration that the schools should be situated in both the rural and urban areas. Moreover, all the schools were categorized into six zones in accordance with the climate existing. The distribution of the simple had been presented in the table – 1

Table 1: Showing the Sampling Distribution (N = 145)

Topographical zones→		Tarai Region	North Bengal Plains	Plateau region	Rarh Region	Sundarban Region	Ganga Delta	Total	
Localities	Gender								
↓	↓								
Rural	Boys	12	13	6	8	13	0	52	92
	Girls	8	7	6	7	12	0	40	
Urban	Boys	0	0	7	7	0	12	26	53
	Girls	0	0	6	8	0	13	27	
Total		20	20	25	30	25	25	145	

Rural = 92 (52 + 40), Urban = 53 (26+27), Boys = 78 (52+26), Girls = 67 (40+27).

Statistics Used

The collected data from students were subjected to different statistical techniques. All the statistics used in the study can be divided into two major parts, i.e.

- i) Descriptive Statistics: Mean, SD, Histogram
- ii) Inferential Statistics: t-test, ANOVA

3.1 Analysis of Data

Descriptive Statistics:

Table 2: Showing the N, Mean and SD of the strata considered for Pro-Environmental Behaviour (SSPEB)

Strata/Localities	N	M	SD
Tarai	20	83.95	7.037
Plateau	20	86.00	7.233
Rarh	25	84.84	8.37
Northern Plains	30	93.43	4.854
Sundarban	25	90.56	6.69
Gangetic Deltaic	25	79.36	8.578
Boys(Total)	78	83.91	7.488
Girls(Total)	67	84.21	7.465
Rural (Total)	92	84.546	7.827
Urban (Total)	53	80.674	7.143
TOTAL (N)	145	84.696	7.525

The study of the descriptive statistics for the measure of the Pro-environmental behavior in case of secondary students showed that, mean score (93.43) of the Northern Plains was almost higher and Gangetic Delta's mean score (79.36) was lowest among all six regions. In case of gender (boys and girls) the difference of mean scores was very negligible and in case of locality (rural and urban), there revealed a difference in their mean values.

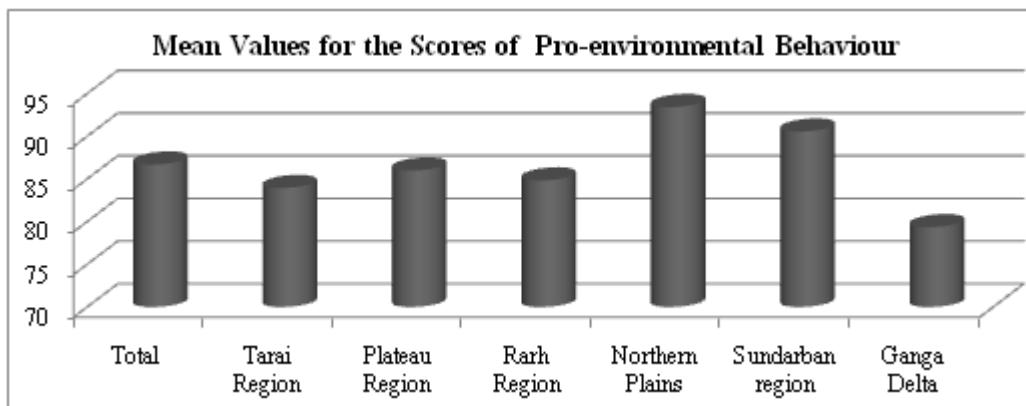


Figure 1: Showing the Mean Values of Pro-environmental Behaviour of Secondary Students (topographical zone wise)

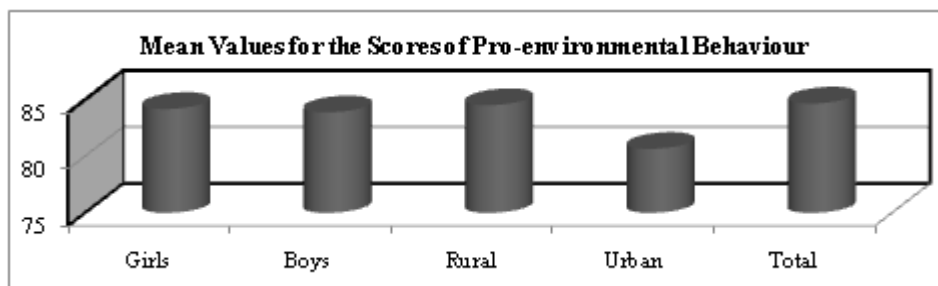


Figure 2: Showing the Mean Values of Secondary Students (Gender & Location wise)

The Fig.-2 showed that, the urban students at secondary level were better than their rural counterparts in Pro-environmental behavior and it also showed as a little difference between boys and girls in their Pro-environmental behavior.

Inferential Statistics

To draw the better and more reliable conclusion for the study, researchers used ANOVA and t-tests.

Table 3: Showing the ANOVA Summary

Source of Variation	SS	df	MSS	F
Between	3327	5	MS _b = 665.4	$F = \frac{MS_b}{MS_w} = \frac{665.4}{258.96} = 11.286$
Within	8139.65	139	MS _w = 58.56	
Total	156	144		

F = 11.286 with df (5, 139)

From the Table F values with df 5/139 at 0.05 level is 2.279 and at 0.01 level is 3.152. The variance ratio or F is 11.286. The df for between means is 5 and the df for within groups is 139. Entering the table – F with these dfs it reads the column 5 and row 139 that the 0.05 level is 2.21 and 0.01 level is 3.02. The calculated F of 11.286 is highly greater than 3.02. Hence F is significant. The Null hypothesis (⁰H-1) is rejected with a conclusion that the six means differ significantly at both 0.05 and 0.01 level, which proved that there is a significant differences among students of six zones in their pro-environmental behaviour.

Table 4: Showing ‘t’-value of Pro-Environmental Behaviour of Secondary School Boys (SSB) and Secondary School Girls (SSG)

Variable	Difference Between	N	M	SD	SE _D	t-value	df
Pro-Environmental	SSB	78	83.91	7.488	1.245	0.241**	143
	SSG	67	84.21	7.465			

** Insignificant at both 0.01 and 0.05 levels.

The table showed that, the ‘t’ value between secondary boys and secondary girls in Pro-environmental behavior was insignificant at 0.01 and 0.05 levels. Hence, the Null-hypothesis (⁰H-2) was retained. Thus it might be concluded that, there was no significant difference between secondary boys and secondary girls in relation to their Pro-environmental behavior. The mean score of the secondary girls were slightly higher than the mean score of boys; it was due to chance error. So it might be interpreted that, the gender would not be the predictor in case of Pro-environmental behavior.

Table 5: Showing ‘t’-value of Pro-Environmental Behaviour of Rural Secondary School Students (RSSS) and Urban Secondary School Students (USSS)

Variable	Difference Between	N	M	SD	SE _D	t-value	df
Pro-Environmental Behaviour	RSSS	92	84.546	7.827	1.276	3.034*	143
	USSS	53	80.674	7.143			

* Significant at both 0.01 and 0.05 levels.

A perusal of table-5 showed that, ‘t’ value between rural secondary students and urban secondary students in Pro-environmental behavior was significant at both 0.01 and 0.05 levels. Thus, the null hypothesis (⁰H-3) was rejected. It was established that, there existed a significant difference between rural secondary students and urban secondary students regarding their Pro-environmental behavior. Since the mean score of secondary students in rural area was higher than the urban students, it might be interpreted that, the rural students at secondary level were more eco-friendly than their urban counterparts.

3.1.1 Major Findings

- 1) The descriptive statistics showed that, mean score of the Northern Plains was almost higher and Gangetic Delta's mean score was lowest among all six regions. In case of gender (boys and girls) the difference of mean scores was very negligible and in case of locality (rural and urban), there revealed a difference in their mean values.
- 2) The table showed that, the 't' value between secondary boys and secondary girls in Pro-environmental behavior was insignificant. It was found that, there was no significant difference between secondary boys and secondary girls in relation to their Pro-environmental behavior. Thus, it was proved that Gender was no way a predictor of pro-environmental behavior. This result contradicts with the previous findings of Chenyang Xiao and Aaron M. McCright (2012).
- 3) By the detail study of 't' value between rural secondary school students and urban secondary students in respect to their Pro-environmental behavior, it was established that, there existed a significant difference between rural secondary school students and urban secondary school students regarding to their Pro-environmental behavior. Locality was established as a factor of pro-environmental behavior. The result of the study corroborates the findings of Hines et al (1986) because the situational factors was explained as contributing factors to pro-environmental behavior in the Model of Hines et al.
- 4) By analysis of ANOVA table, it was concluded that there exists a significant differences among the students belonging to various topographical zones regarding to their pro-environmental behaviour. Hence, the topographical region is a factor of pro-environmental behaviour. This supported the view of Kollmuss and Agyeman (2002) as they gave emphasis on external factors in pro-environmental behavior and also supported the Ecological Paradigm of Stern, *et al.* (1999). Thus, on the basis of findings of present study and previous studies, researchers considered the external factors like topographical status and localities contribute in pro-environmental behavior.

4. Implications

On the basis of above discussions, some suggestions to implement the findings may be stated. The secondary students differed themselves significantly with respect to their Pro-environmental behaviour. The locality and topographical position where the individual reside are responsible for such variation. Such factors might be taken into consideration in developing as well as measuring the said above personality traits. It was also revealed that, out of many factors the geographical region or topographical zones might be a great factor in pro-environmental behaviour. So in setting the educational situations like framing the curriculum, developing strategies and methods, formulating goals, forming the policies or programmes, the factors like localities and topographical position might be considered. Lastly but not least, the effort should be done from all sides to change the students more in attitudinal level than in cognitive level. Hence following points would be worthwhile in case of developing pro-environmental

behaviour among adolescence students studying in school level:-

- Enhancing the collective actions where school, community, government, NGOs, teachers, students and guardians might work cooperatively.
- Establishment of Eco-Club by the Students at each topographical zone.
- Inclusion of Disaster Management, Waste Management and process of Recycling, Soil and Water preservation, etc. in the school curriculum.
- Inclusion of local, national and global issues in curriculum.
- Provision of the Nature study.
- Observation of Environment Day and other Environment related Days.
- Comprising the sufficient and authentic information on environmental issues.
- Literature on Environmental issues.
- Conducting the Project Work by students on regional and global issues.
- Increasing Pro-social values.
- Conducting Eco-team Programme taking the students of various zones. .
- Employing the Value based methods.
- Conducting various action oriented programmes like Swachha Bharat Abhiyan, Clining Drives, Deforestation, etc. By the students.
- Both Nature and Value Talk.
- Conducting environment literacy programmes.
- Field study and eco tour programme at various topographical zones.

5. Conclusion

According Kothari Commission (1964-66), "the destiny of India is made in her class- room." In the present study, researchers viewed that; "the environmentally responsible nation is made in class room". Hence, in grass root level, particularly from school level, the educational system should be designed in such a manner that can create the environmentally responsible citizens as the present students are the future protector and preserver of this earth. For this purpose, over a period of time, environmental studies as a compulsory subject in school curriculum at secondary level has been included aiming to providing right kind of knowledge and available information about the environment for enhancing the sustainable eco-friendly behaviour and attitudes among adolescent students.

6. Future Recommendation

In the light of present study the following suggestions were recommended for further researches:

The prediction of pro-environmental behaviour may be explained elaborated in relation to factors like parental attitude, cognitive style, psycho- social constraints, curriculum practice, level of education, social processes, and socio-economic status. The study needs to be made on a larger sample of educational organization for various strata such us:- Nursery, Primary, Middle schools, Colleges and

other educational institutions, so as to get a more reliable and comparable results. The study needs to be made on larger cross sections of populations like illiterate, literates, educated and high educated to have a broad generalization. To draw the better conclusion it may be suggested to study on such variables in case of variations of professions such as students, teachers, administrators, common people etc. The investigation of the same type may be conducted at different regions of the country to make a comparative study. Cross-cultural studies of these variables among students in India and some foreign countries may be attempted.

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