

GENDER- BASED AWARENESS TOWARDS BIODIVERSITY AND SUSTAINABLE DEVELOPMENT- A SURVEY ON RURAL STUDENTS**Sarmita Pal***

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E-Mail : supatrasen@gmail.com**Abstract**

The main purpose of this study is to analyze the awareness towards biodiversity and sustainable development under different categorical variables like gender (male-50, female-50), district (Burdwan-50, South 24 Parganas-50). A total of 100 school students under West Bengal Council of Higher Secondary Education were randomly chosen as sample. 2 self made attitude scales divided into 3 parts:

- To know personal information
- To measure knowledge of subject of school students on biodiversity and sustainable development and
- To measure awareness of school students on biodiversity and sustainable development.

Results reveal that gender and district-wise variations exist in biodiversity awareness and sustainable development. Female students of South 24 Parganas are significantly more aware than male students. But at the same time, that there is no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development between Male and Female Students of Burdwan district, perhaps indicating that students from suburban areas are pro-environment as compared to their more urban counterparts. Gender and habitat wise diversity as the study indicates, should be two major concerns in biodiversity awareness and sustainable development in daily life styles.

Keywords: Awareness, Biodiversity, Sustainable Development

Introduction

Biodiversity is an all encompassing term to describe the variety of all life and natural processes on earth. **The Convention on Biological Diversity** defines Biodiversity as:

“The variability among living organisms from all sources this includes diversity within species, between species and of ecosystems.” [1]

On the other hand **Sustainable Development** means development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Environmental education programme encompasses raising awareness, acquiring new perspectives, values, knowledge and skills, and formal and informal processes leading to changed behaviour in support of a sustainable environment. [2]

‘Know Your Ecosystem’ is an environmental education programme (initiated in 1997) for conservation of ecosystems, environmental management, and sustainable planning education for schools. Its holistic, participatory approach and combination of learning and action make it an ideal way for schools to embark on a meaningful path for improving the environments of schools and their local communities, and for influencing the lives of young people, school staff, families, local authorities, NGOs, and many more. [3] There is a strong belief in the international scientific community that the environmental problems can be solved and sustainable development and global environmental sustainability achieved only with the application of science and technology alone. But the progress towards sustainable development is dependent upon a fundamental change in societies' attitude to nature and the environment. Science and technology, however advanced, cannot help in this matter. Hence, what is needed to bring about this change of attitude is education in moral and ethical philosophy. In the young minds, it is essential to reinforce the environment-respecting moral values [4]

In the field of Environmental Education, Sauvé explains the stages of experiential learning in the following manner:

- Concrete *experimentation* is a mode of learning centered on *feeling*. During this stage, the learner is in a learning or problem-solving situation; one gains new experiences by interacting with one's environment.
- *Reflective observation* is centered on the act of *observing*. The learner must observe, reflect and try to understand reality from his or her experiences.[5]
- *Conceptualization* The learner *thinks about*, fashions and constructs his or her conceptions
- *Active experimentation* is centered on the act of *doing*. At this stage, the learner relies on his or her new found knowledge to make decisions and solve problems. The learner also makes a transfer by experimenting that knowledge in new situations.

During reflective observation, the student can reflect alone or with a teacher on what was experienced. Furthermore, during synthesis (active experimentation), the learner can share the value of his or her experience with peers, or apply it to another context. Experiential learning thus allows students to feel different emotions such as challenge, pleasure, desire to share their impressions, amazement, compassion etc.

Another strategy that encourages conceptual development is verbal interaction between peers allows students to verbally communicate their ideas and opinions, and thus their conceptions. Social interactions create cognitive dissonance and debate among the children, making them aware of the existence of ideas different from theirs. This contradiction can lead them to modify their initial ideas. [5]

Finally, scientific writing is another strategy that helps conceptual change. Having to write down their ideas allows students to elaborate on them, evaluate and revise them.

➤ **Objective**

Following major objectives were identified for the present study:

1. To analyze the subject knowledge on biodiversity and sustainable development between rural male and female students.
2. To analyze the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Rural Male and Female Students.
3. To know the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students district wise.

➤ **Hypotheses**

H₀1: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Rural Male and Rural Female Students.

H₀2: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of Burdwan district.

H₀3: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of S.24 Parganas district.

➤ **Delimitation**

1. The study was delimited to only school students.
2. The study was delimited to only 100 number of school students.
3. The study was delimited to only rural schools.
4. The study was delimited to the schools under West Bengal Council of Higher Secondary Education only.
5. The study was delimited to only two districts – South 24 Parganas and Burdwan.

➤ Methodology

Sample:

100 school students under the West Bengal Council of Higher Secondary Education from south 24 Parganas and Burdwan district were selected through random sampling method for this study.

RURAL (Burdwan) (50)		RURAL (South 24 Parganas) (50)		TOTAL
MALE	FEMALE	MALE	FEMALE	100
25	25	25	25	

Table 11: Sample Frame Locality Wise

MALE (50)		FEMALE (50)		TOTAL
Burdwan	South 24 Parganas	Burdwan District	South 24 Parganas	100
25	25	25	25	

Table 1.2: Sample Frame Gender Wise

Tools for the study

Present study contained two self made attitude scale divided into 3 parts:

- i) to know personal information
- ii) to measure knowledge of subject of school students on biodiversity and sustainable development and
- iii) to measure awareness of school students on biodiversity and sustainable development.

Both the scales were developed by the present researcher and her supervisor Dr. Supatra Sen, Assistant Professor of Asutosh College.

Description of attitude scale

First scale was consisted of 10 items to measure knowledge of subject of school students on biodiversity and sustainable development. The categories of responses were various types of responses with only one probable answer.

Second scale was consisted of 20 items to measure awareness of school students on biodiversity and sustainable development in everyday life. The categories of responses were 'Always', 'Very often', 'Sometimes', 'Rarely', 'Never' and '5', '4', '3', '2', '1' were the

respective scores awarded for the responses. Some items were negative in nature and the scoring was done in reverse order.

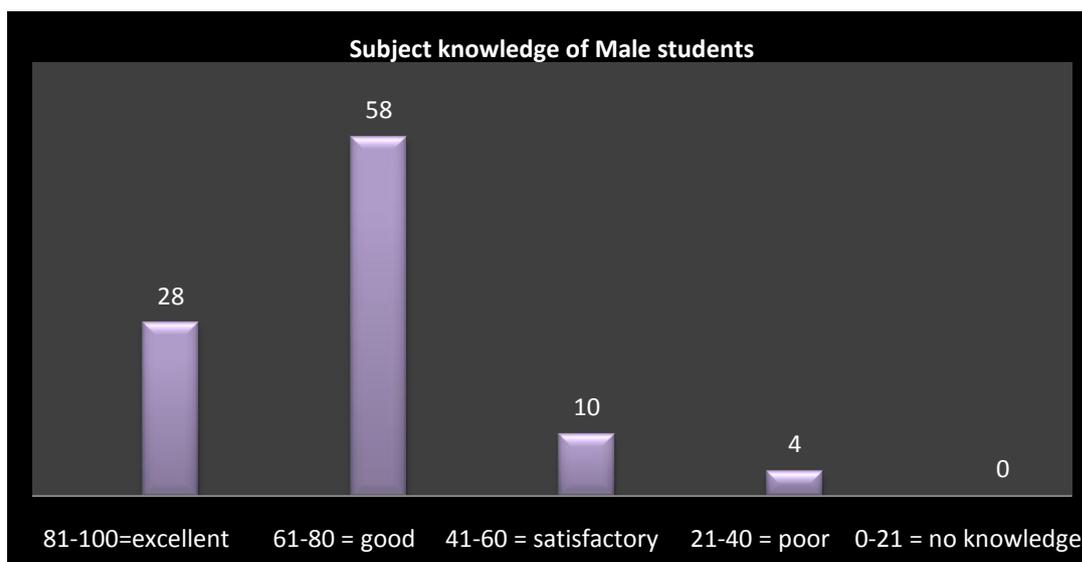
Method of data collection

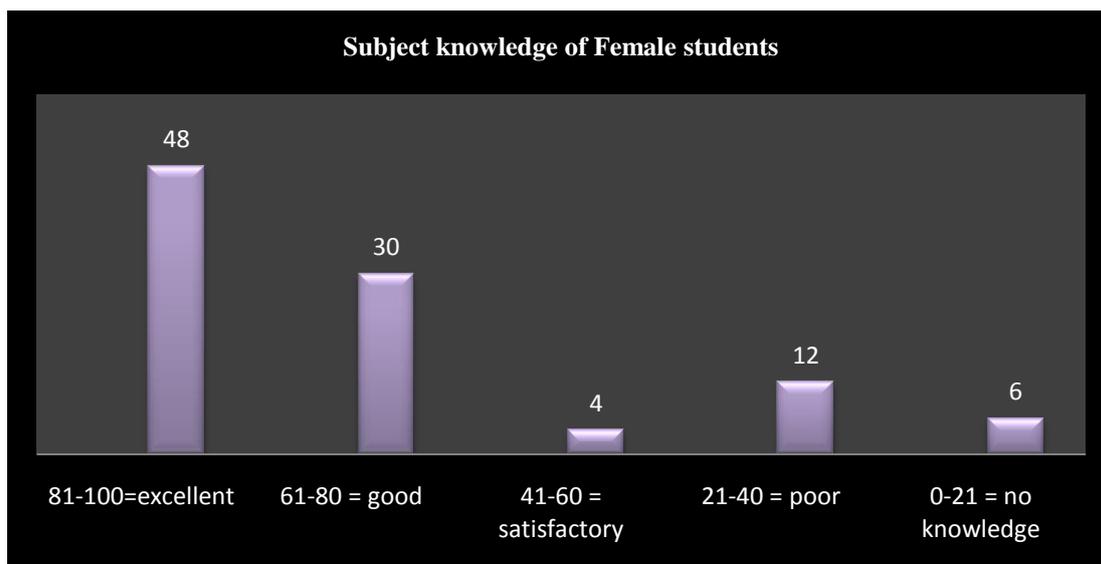
For conducting the work, data had been collected from different schools under WBCHSE conveniently from the district of Burdwan and South 24 Parganas. The students were requested to seat in an empty classroom and then the scale were administered to students from those schools chosen under study and asked to respond according to their own belief and thought without any consultation with another students and to submit the responded scale after 1 hour.

➤ Analysis and interpretation of data (Objective wise analysis)

Objective -1

O1: To analyze the subject knowledge on biodiversity and sustainable development between rural male and female students.





Interpretation:

A questionnaire consisted of 10 items were administered, to analyze the subject knowledge of biodiversity and sustainable development between rural male and female students. From that questionnaire, we developed a scale. Students who got '81-100 are excellent', '61-80 are good', '41-60' are satisfactory, '21-40 are poor' and '0-21 have no knowledge' about subject. Now percentage was calculated to know how many students were fall in each category.

It is found that, 28% males and 48% females fall in first category. 58% males and 30% females fall in second category, 10% males and 4% females fall in third category, 4% males and 12% females fall in fourth category and 0% males and 6% females fall in fifth category.

So, we can conclude that, no male students fall in last category whereas 6% female students fall in last category. But female 'Excellence' are greater than male 'Excellence', whereas greater percent of males are good than females.

Objective-2

O₂: To analyze the awareness towards Biodiversity Conservation and Sustainable Development in everyday life between Rural Male and Female Students.

To fulfill this objective, three null hypotheses were formulated and tested which are as follows:

H₀₁: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in everyday life between Rural Male and Rural Female Students.

Testing of Null Hypotheses:

To test **H₀₁** the group statistics and inferential statistics are computed. The results are given below:

Group Statistics						
	Gender	N	Mean	Std. Deviation	Std. Error	
Awareness towards Biodiversity Conservation and Sustainable Development between Rural Male and Rural Female Students.	Male	50	73.56	9.90		1.40
	Female	50	78.98	9.41		1.33

Table 1.5: Group Statistics of Gender

Independent Samples Test				
Awareness towards Biodiversity Conservation and Sustainable Development between Rural Male and Rural Female Students	Equal variances assumed	t-test for Equality of Means		
		t	df	Sig. (2-tailed)
		2.8059**	98	0.0061

(**significant at 0.05 level of significance)

Table 1.6: independent samples test of awareness towards biodiversity conservation and sustainable development _ male and female

Interpretation:

From the analysis of Table 1.5 and 1.6, it is seen that in case of comparing the awareness towards biodiversity and sustainable development between rural male (mean- 73.56) and rural female (mean- 78.98), the calculated $t_{(98)}$ value is 2.8059 and 'p' value is 0.0061 ($p > 0.05$). Hence 't' is very much significant at 0.05 level. So H_0 is rejected. So we can say, there is very much significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in everyday life between Rural Male and Rural Female Students, and rural female students have high level of awareness.

Objective-3

O₃: To know the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students district wise.

To fulfill these objectives, 2 null hypotheses were formulated and tested which are as follows:

H₀2: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of Burdwan district.

H₀₃: There would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of S.24 Parganas district.

Testing of H₀₂:

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Awareness towards Biodiversity Conservation and Sustainable Development between Male students of Burdwan district and Female Students of Burdwan district.	Male (Burdwan)	25	74.56	12.03	2.40
	Female (Burdwan)	25	78.48	10.57	2.11

Table 1.7: Group Statistics of Gender (Burdwan District)

Independent Samples Test				
Awareness towards Biodiversity Conservation and Sustainable Development between Male students and Female Students of Burdwan district.	Equal variances assumed	t-test for Equality of Means		
		t	df	Sig. (2-tailed)
		1.2239**	48	0.2270

(**Not significant at 0.05 level of significance)

Table 1.8: independent samples test of awareness towards biodiversity conservation and sustainable development - male and female students of Burdwan district.

Interpretation:

From the analysis of Table 1.7 and 1.8, it is seen that in case of comparing the awareness towards biodiversity and sustainable development between rural male (mean- 74.56) and rural female (mean- 78.48) students of Burdwan district, the calculated $t_{(48)}$ value is 1.2239 and 'p' value is 0.2270 ($p > 0.05$). Hence 't' is not significant at 0.05 level. So **H₀₂** is not rejected. So we can say, there is no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of Burdwan district.

Testing of H₀₃:

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Awareness towards Biodiversity Conservation and Sustainable Development between Male and Female Students of S.24 Parganas district.	Male (S.24 Parganas)	25	72.56	7.31	1.46
	Female (S.24 Parganas)	25	79.48	8.26	1.65

Table 1.9- Group Statistics of Gender (South 24 Parganas District)

Independent Samples Test				
Awareness towards Biodiversity Conservation and Sustainable Development between Male and female students of S.24 Parganas district.	Equal variances assumed	t-test for Equality of Means		
		t	df	Sig. (2-tailed)
		3.1369**	48	0.0029

(significant at 0.05 level of significance)**

Table 1.10: independent samples test of awareness towards biodiversity conservation and sustainable development _male and female students of S 24 Parganas district.

Interpretation:

From the analysis of Table 1.9 and 1.10 it is seen that in case of comparing the awareness towards biodiversity and sustainable development between rural male (mean- 72.56) and rural female (mean- 79.48) students of South 24 Parganas district, the calculated $t_{(48)}$ value is 3.1369 and 'p' value is 0.0029 ($p > 0.05$). Hence 't' is very much significant at 0.05 level. So **H₀₃** is rejected. So we can say, there is very much significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life between Male and Female Students of S.24 Parganas district.

➤ **Discussion**

While to search and compare the present scenario of biodiversity awareness and sustainable development in everyday life in West Bengal under different categorical variables, it has been

found from this study that, gender plays a significant role in awareness of biodiversity. **Here rural female students are more aware than rural male students.** Findings of Shahnawaj (1991), [6] Connell *et al.*, (1998) [7], Raju (2007) [8], Chandrasekar S., Sundaravadivelan C., Selvan A. (2012) [9], lend support to this result.

Connell *et al.*, (1998) [7] stated that girls are more environmentally conscious and active than boys and girls have stronger feelings and verbal commitment to the environment while boys have greater knowledge. Raju (2007) [8] found that girls and rural students exhibited higher environmental ethics than their counterparts. In an earlier study, Mitra and Sen (2016) [10] found that rural students were more environmentally positive and eco-friendly than urban students. Singh (1978) [11] noted that girl students had more knowledge and had a stronger positive attitude than boys. Shahnawaj (1991) [6] showed that Girls possessed significantly more awareness of environment than boys. So, it is seen that hypotheses 1 is rejected.

Results also reveal that **habitat wise diversity exists in biodiversity awareness and sustainable development in everyday life styles.** Female students of South 24 Parganas district are more environmentally aware than the male students. The findings of Gnanadevan (2007) [12] support the result. In his study, Gnanadevan found that scores differ significantly with respect to gender and residential area.

Hypotheses 2, 4 and 5 are not rejected *i.e.* there would be no significant difference in the awareness towards Biodiversity Conservation and Sustainable Development in daily life styles between Male and Female Students of Burdwan district, Female students of Burdwan and S.24 Parganas District, Male students of Burdwan and S.24 Parganas District. Nair, Chithra (1998) & Negev Maya, *et al.* (2008) [13] support the result.

So we can say **Gender and Habitat both are significant in these research findings.**

➤ **Limitation of the study**

No study is flawless. The present study also had some limitations which were as follows:

1. The major limitation of this study is the small sample size.
2. The selection of schools for this study was only from two districts.
3. The schools were selected according to present workers convenience.
4. The number of school students might be increased by taking more schools under the study.
5. The self made opinionnaire had lengthy enough and also time consuming according to students.
6. Some students were reluctant to fill the opinionnaire.
7. Some students did not have any idea about Biodiversity, sustainable development.

8. Some students did not have minimum awareness.

➤ **Conclusion**

The study was conducted to find out the level of biodiversity awareness and sustainable development of everyday life of the sample groups. Predictably, a significant relationship between the two variables i.e. male and females have been observed. This is consistent with the previous research findings. **Gender and habitat wise diversity as the study indicates, should be two major concerns in biodiversity awareness and sustainable development in daily life.** They should be encouraged from their families and schools perspective. Improvement in curriculum reconstruction and teachers' attitude and innovations should be taken into serious consideration (Sen 2013, 2014) [14] [15]. Some initiatives have been taken by the Govt. of India in this regard, but need is still many fold than availability.

➤ **Suggestion for further study**

It is recommended that qualified teachers must be enrolled into our secondary schools in order to give students what is expected. School garden has a great deal in creating environmental awareness among secondary school students, because it will bring to the students the different varieties of plants and animals which need to be conserved. Biodiversity awareness programs should be encouraged in our secondary schools. This is what will motivate the students to develop environmental awareness skills and also to have solutions to different environmental treats. More researches are encouraged to be carried out at different parts of West Bengal.

- A study can be conducted to develop environmental education materials for different sections of society.
- Research can be conducted to develop appropriate technology for promoting environmental education among children, youths, women and decision makers.
- Surveys can be conducted to analyse the present attitude of students towards the environment.
- Studies can be conducted for the development of curriculum in environmental education at different levels; pre-school to university level.
- Development of environmental awareness programmes for different sections of society is a useful attempt of study.
- Case studies can be planned for the solution about the environmental problems of a locality.
- A survey of the topics related to environmental education of schools that are scattered in various subjects, not only in the Natural science, but also in the Physical science. Social science, Geography, Economics and Literature can be conducted.
- As a path finding application of this research effort, an example of a model curriculum, focusing the contemporary relevance of plant systems for sustainable development can be developed for the curriculum makers to study its scope and plausibility.

References

1. https://en.wikipedia.org/wiki/Convention_on_Biological_Diversity
2. <http://ee.environment.gov.au>
3. http://wgbis.ces.iisc.ernet.in/energy/water/paper/environment_education/environment.html
4. Sen, Supatra (2017) “Environmental Psychology: Integrating Psychology with Sustainability” in Mission Sustainability : Through Environmental Education pp.10-19 ISBN 978-81-928627-5-0
5. Govindaswamy, Vennila,(2015) “Importance of Environmental Education for Sustainable Development”.
6. Shahnawaj, J. (2009), Environmental awareness and environmental attitude of Secondary and higher secondary school teachers and students : Ph.D. thesis In Education, Rajasthan university; 5th Survey of Educational Research (1988-1992) N.C.E.R.T. 1997
7. CONNELL, S., FIEN, J., SYKES, H. & YENCKEN, D. (1998) Young people and the environment in Australia: beliefs, knowledge, commitment and educational implications, Australian Journal of Environmental Education, 14, pp. 39±48.
8. Raju, G. (2007) Environmental Ethics of Higher Secondary Students. *Edutracks* 11, 6, 32-35.
9. Chandrasekar,S.,Sundaravadivelan,C., Selvan, A (2012). “Awareness on Biodiversity among higher Secondary students in Vilathikulam area”, Volume 2, Issue 9, ISSN: 2249-5894.
10. Mitra, Banani and Supatra Sen 2 (2016) Towards Awareness of Sustainable Life-Styles : A Comparative Survey Between Urban-Rural Secondary Students; *The Beats of Natural Sciences* 3(2) : 1-10
11. Singh, Amarbir., *International Journal of Educational Planning & Administration*. ISSN 2249-3093 Volume 1, Number 2 (2011), pp. 99-107
12. Gnanadevan (2007). Environmental awareness of higher secondary students, *Journal of Research and Reflections on education*, 5(1)
13. Abraham, Mercy & Nair, Chitra (1998). Secondary school students' attitude towards environmental protection: Differential effect of gender and locale. *Pedagogies (Journal of Schools of Pedagogical Sciences)*, I (I), 27-31
14. Sen, Supatra (2013) “Innovative Approaches to Environmental Education : The Indian Perspective” *Magis* 2: 42-47 ISSN :2319-3239
15. Sen, Supatra (2014). Strive to Sustainability: Education for Sustainable Development, *Magis –Xaverian Journal of Education* 3: 1-7. ISSN : 2319-3239