CHAPTER VI

SUMMARY, MAJOR FINDINGS, CONCLUSIONS, EDUCATIONAL IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

This chapter deals with the summary, major findings, conclusions, educational implications and suggestions for further research.

6.1 SUMMARY

Today developing and developed countries are facing severe and serious environment problems. We not only face environmental problems but also create them. In this context the future citizens of the country who are the present generation of students, should develop basic understanding about nature and society, personal health and public hygiene, and should realize the need do have sustainable environment with conservation of natural resources and ecological balance for the survival of life on this planet i.e., earth. The need for environmental education has also been formally aimed not merely imparting knowledge and understanding man’s total environment and of the methods of and their applications for improving the surroundings of man, both near and far but also it aims at including skills, attitudes, and values necessary to understand appreciate and improve the quality of life. It is a way of implementing the goals of environmental protection. It is not a separate branch of science or subject study. It is carried out according to the principles of life long integral education. In this context it is obvious the right type of education of with effective class room teaching supported with interesting learning experience has the potential to develop required awareness, understandings, attitudes and skills in students. It is also fact that students may gain knowledge and have positive attitude towards environment, but fails to transfer the same into action to avoid or solve any environmental problems.

Every human being in the society has a responsibility in respect of protection preservation and conservation of environment. This responsibility is to be developed in students from secondary school level. School education has to play a significant role in this sphere. There is a need for including Environmental Education (EE) in the school curriculum because it is directly needed by all citizens of all ages to make their lives better, systematic and proper.
6.1.1 Statement of the problem

The present study is concerned with the environmental awareness and achievement in Biological science of secondary school students. It examines the main and interaction effects of locality, management and gender on the environmental awareness and achievement in Biological science of secondary school students. It establishes the relationship between the environmental awareness and achievement in Biological science of secondary school students and other variables namely; locality, management, gender, annual income of the family, medium of study, caste, religion, father education, father occupation, library facility, mother education, mother occupation, habit of visiting to science exhibitions, size of the family, works at leisure time and period allotted in the school time table for environmental education. It also predicted the environmental awareness and achievement in Biological science of secondary school students with the help of different sets of socio demographic variables.

6.1.2 Title of the problem

The title of the present study is, “An Evaluative Study on Environmental Awareness among Secondary School Students”.

6.1.3 Need for the study

Human beings have always exploited the resources available in their natural surroundings for their benefits. Education is the only the way to boost environmental awareness. In the long run behaviors can be modified through the process of Environmental Education.

It is the necessary to protect the environment from pollution. To avoid pollution, we need to initiate awareness among people. Just for any disease “Prevention is better than cure”. Protecting our environment is economically more valuable than cleaning it up once, it is damaged. This can only be made possible through initiating Awareness.

The right age group to start this initiation is secondary level students, because the students at the secondary level are much more mature than the primary level students with respect to the development of cognitive, affective and psychomotor domains of Environmental Education. Therefore Secondary level students have been thought to be more appropriate for imparting awareness about
environmental problems through environmental education. For this it is imperative that a definitive goal of environmental education involving knowledge and skills about understanding and solving the problems of environment through the development of proper curriculum are developed. The strategy of implementation of the curriculum at different levels of study, especially the secondary level of education has also to be developed. Hence, the students required some awareness regarding the environmental protection.

The above crucial conditions lead the investigator to make an attempt in this area of environmental awareness and achievement of secondary school students.

The title of the present study is, “An Evaluative Study on Environmental Awareness among Secondary School Students”.

6.1.4 Scope of the study

The main intention of the study is to find the environmental awareness and achievement in Biological science among secondary school students in relation with socio – demographic variables. Environmental Awareness Scale (EAS) and Achievement Test in Biological Science (ATB) were constructed and standardized by the investigator to study the environmental awareness and achievement in Biological science among secondary school students. The socio – demographic variables are measured by using the relevant instruments.

The study attempted to predict the environmental awareness and achievement in Biological science among secondary school students with the help of different socio - demographic variables.

6.1.5 Objectives of the study

The study has been designed with the following specific objectives

1. To know the environmental awareness and achievement in Biological science among secondary school students.

2. To compare the performance of pupils in rural and urban schools, in Government, Aided and Private schools, in boys and girls and to examine the significance of environmental awareness and achievement in Biological science among secondary school students.
3. To establish the relationships between areas of environmental awareness and achievement in Biological science among secondary school students.

4. To establish the relationships between locality and areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

5. To establish the relationships between management and areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

6. To establish the relationships between gender and areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

7. To establish the relationships between annual income of the family and environmental awareness and achievement in Biological science among secondary school students.

8. To establish the relationships between medium of study and environmental awareness and achievement in Biological science among secondary school students.

9. To establish the relationships between caste and environmental awareness and achievement in Biological science among secondary school students.

10. To establish the relationships between religion and environmental awareness and achievement in Biological science among secondary school students.

11. To establish the relationships between father’s education and environmental awareness and achievement in Biological science among secondary school students.

12. To establish the relationships between father’s occupation and environmental awareness and achievement in Biological science among secondary school students.

13. To establish the relationships between library facility and environmental awareness and achievement in Biological science among secondary school students.
14. To establish the relationships between mother’s education and environmental awareness and achievement in Biological science among secondary school students.

15. To establish the relationships between mother’s occupation and environmental awareness and achievement in Biological science among secondary school students.

16. To establish the relationships between habit of visiting to science exhibitions and environmental awareness and achievement in Biological science among secondary school students.

17. To establish the relationships between size of the family and environmental awareness and achievement in Biological science among secondary school students.

18. To establish the relationships between works at leisure time and environmental awareness and achievement in Biological science among secondary school students.

19. To establish the relationship between period allotted in the school time table for environmental education and environmental awareness and achievement in Biological science among secondary school students.

20. To study the environmental awareness among secondary school students with regards to environmental areas i.e., Air, Water, Noise, Soil and Environmental concern.

21. To establish the association between the environmental awareness and achievement in Biological science of the secondary school students.

22. Which of the 16 independent variables (all the variables in the study) turnout to be significant predictors of environmental awareness and achievement in Biological science among secondary school students?

23. To predict the environmental awareness and achievement in Biological science among secondary school students with the help of socio – demographic variables.
6.1.6 Hypotheses of the study

In the light of the above objectives, the following major null hypotheses have been set up for the purpose of this investigation.

1. All the secondary school students would not have the same environmental awareness and achievement in Biological science.

2. Locality, management and gender would not have significant influence on the environmental awareness and achievement in Biological science among secondary school students.

3. There would be no significant relation between areas of environmental awareness and achievement in Biological science among secondary school students.

4. There would be no significant impact of locality on the areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

5. There would be no significant impact of management on the areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

6. There would be no significant impact of gender on the areas of environmental awareness, environmental awareness and achievement in Biological science among secondary school students.

7. There would be no significant impact of annual income of the family on the environmental awareness and achievement in Biological science among secondary school students.

8. There would be no significant impact of medium of the study on the environmental awareness and achievement in Biological science among secondary school students.

9. There would be no significant impact of caste on the environmental awareness and achievement in Biological science among secondary school students.
10. There would be no significant impact of religion on the environmental awareness and achievement in Biological science among secondary school students.

11. There would be no significant impact of father’s education on the environmental awareness and achievement in Biological science among secondary school students.

12. There would be no significant impact of father’s occupation on the environmental awareness and achievement in Biological science among secondary school students.

13. There would be no significant impact of library facility on the environmental awareness and achievement in Biological science among secondary school students.

14. There would be no significant impact of mother’s education on the environmental awareness and achievement in Biological science among secondary school students.

15. There would be no significant impact of mother’s occupation on the environmental awareness and achievement in Biological science among secondary school students.

16. There would be no significant impact of habit of visiting to science exhibitions on the environmental awareness and achievement in Biological science among secondary school students.

17. There would be no significant impact of size of the family on the environmental awareness and achievement in Biological science among secondary school students.

18. There would be no significant impact of works at leisure time on the environmental awareness and achievement in Biological science among secondary school students.

19. There would be no significant impact of period allotted in the school time table for environmental education on the environmental awareness and achievement in Biological science among secondary school students.
20. There would be no significant difference among secondary school students on environmental awareness with regards to environmental areas i.e. Air, Water, Noise, Soil and Environmental concern.

21. There is no significant association between the environmental awareness and achievement in Biological science of the secondary school students.

22. No independent variable out of 16 (all independent variables in the study) turn out to be significant predictors of environmental awareness and achievement in Biological science among secondary school students.

23. It would not be possible to predict the environmental awareness and achievement in Biological science among secondary school students with the help of socio-demographic variables.

6.1.7 Variables studied

The following variables were taken into consideration in this study.

**Dependent Variables**

1. Environmental Awareness
2. Achievement in Biological science

**Independent Variables**

1. Locality
2. Management
3. Gender
4. Annual income of the family
5. Medium of the study
6. Caste
7. Religion
8. Father’s education
9. Father’s occupation
10. Library facility
11. Mother’s education
12. Mother’s occupation
13. Habit of visiting to science exhibitions
14. Size of the family
15. Works at leisure time
16. Period allotted in the school time table for environmental education

Total numbers of variables in the investigation are 2 dependent variables and 16 independent variables.

6.1.8 Methods of the study

The present study is survey type investigation. Various procedures that are followed in the construction and standardization of data gathering instruments and the tools adopted to study the impact of different variables that are included in the study are discussed. The methods adopted in selection of the sample, collection of data, scoring and analysis are as follows.

The investigator followed the scientific principles and procedures of test construction and developed a preliminary environmental awareness scale. Pilot study is conducted by the investigator to established validity and reliability to the tool. The pilot study of environmental awareness scale consists of 100 items covering 5 broad areas such as air, water, noise, soil and Environmental concern on the sample of 200 secondary school students in selected high schools in Chittoor district of Andhra Pradesh. The final environmental awareness scale is prepared after deleting, the invalid 47 items. This procedure of item analysis is adopted from the prescribed standardized procedure. For the present study, the items with ‘t’ values less than 1.98 (0.05 level) were deleted. In this investigation 47 items were deleted and 53 items were retained for final study. For the calculation of the ‘t’ values the procedure suggested by Edwards, A. L. (1957) was followed. For the purpose of scoring numerical values (weightages) were assigned to each of the three categories Yes (Y), Some Extent (SE) and No (N) based on the Likert (1932) method.

The achievement test is prepared and standardized by the investigator. Pilot study is conducted by the investigator. The pilot study of achievement test consists of 120 items in the sample of 200 secondary school students in selected high schools.
in Chittoor district of Andhra Pradesh. The final achievement test is prepared after deleting, the invalid 20 items whose validity index is less than 0.30, from the preliminary test. The final study of achievement test consist 100 items. This procedure of item analysis is adopted from the prescribed standardized procedure, for construction and use of tests for class room examinations. For the present study, the difficulty index and validity index of each item are computed, by following the Garrett (1973).

A questionnaire is prepared to collect the necessary information about the secondary school students regarding their personal characteristics, home background, school facilities and socio – economic conditions of the family. A sample of 1200 secondary school students representing all categories of high schools is selected by following the standardized procedures. The necessary data is collected in a planned way and are analyzed using appropriate statistical techniques and the results are interpreted accordingly.

6.1.9 Tools used

The tools used in the present study are shown here under:

1. Environmental Awareness Scale (EAS)
   To study the environmental awareness of the students, the environmental awareness scale is prepared and standardized by the investigator.

2. Achievement Test in Biological Science (ATB)
   To study the achievement of the students, the achievement test is prepared and standardized by the investigator.

3. Socio – Demographic Scale (SDS)
   Socio – Demographic Scale is developed by the investigator to study socio – demographic variables.

6.1.10 Sample selected

The sample for the investigation consisted of 1200 secondary school students. The stratified random sampling was applied in three stages. In the first stage locality of the school i.e. Rural and Urban, in the second stage management of
the school i.e. Government, Aided and Private school and the third stage gender of the students i.e. Boys and Girls are considered. Total 600 Boys and 600 Girls are included in this study. It is a 2X3X2 factorial design with 1200 sample subjects.

6.1.11 Collection of data and analysis

Having selected the high schools, following stratified random sampling method, the investigator consulted the heads of institutions selected, personally and explained them, the purpose of the test and took their permission for holding the test. The test dates for different schools were intimated in advance. The students were thoroughly motivated for the tests and they were given proper instructions for answering the different sets of test tools. The investigator personally visited the high schools with the permission of the head masters of the concerned schools. The students who attended to the school on the day of collection of data are considered for the purpose of the investigation. The students were given necessary instructions about the various instruments and motivated to respond genuinely to all the items. Achievement test and Socio – Demographic Scale were administered in the forenoon session. The environmental awareness scale was administered in the Afternoon session. All the data gathering instruments are collected from the students and they are evaluated following the weightages given by the test constructing authorities concerned. All the collected data are given for statistical analysis. Scoring is done as already explained in the preceding pages, under each tool. The data on each variable is properly coded to suit for computer analysis.

6.1.12 Statistical Analysis

On the basis of the objectives of the investigation, statistical analysis is carried out by employing appropriate statistical techniques.

Frequency distribution tables were prepared for the total sample and for some other variables. Measures of central tendency, measures of dispersion, percentages, skewness, kurtosis and standard error of mean were computed wherever necessary. The inferential statistical techniques such as ‘t’ test (critical ratio), ‘F’ test and $\chi^2$ test were employed to test different hypotheses. Multiple ‘R’ was computed by carrying out Step – Wise Multiple Regression analysis to find out whether it would be possible to predict environmental awareness and achievement of
secondary school students. For dividing the groups, quartile values and sten values are used wherever necessary. The obtained numerical results are adumbrated by graphical representations wherever necessary.

The significant levels employed with respective symbols are given here under:

** Indicates significant at 0.01 level  
* Indicates significant at 0.05 level  
@ Indicates not significant at 0.05 level

6.2 MAJOR FINDINGS OF THE STUDY

The statistical treatment of the data reveals the following major findings of the study.

Distribution characteristics of the environmental awareness and achievement in Biological science scores

1. The frequency distribution of environmental awareness scores for the whole group is slightly negatively skewed. The frequency distribution of environmental awareness scores for the whole group is platy kurtic. The distribution is platy than the normal distribution. On the whole the environmental awareness of the secondary school students is positive, because mean environmental awareness score is greater than 50 percent.

2. The frequency distribution of environmental awareness scores for the secondary school students of Rural is slightly negatively skewed. The frequency distribution of environmental awareness scores for the secondary school students of Rural locality is platy kurtic. The distribution is platy than the normal distribution.

3. The frequency distribution of environmental awareness scores for the secondary school students of Urban is slightly negatively skewed. The frequency distribution of environmental awareness scores for the secondary school students of Urban locality is lepto kurtic. The distribution is peaked than the normal distribution.
4. The frequency distribution of environmental awareness scores for the Government secondary school students is slightly negatively skewed. The frequency distribution of environmental awareness scores for the Government secondary school students is platy kurtic. The distribution is platy than the normal distribution.

5. The frequency distribution of environmental awareness scores for the Private secondary school students is slightly negatively skewed. The frequency distribution of environmental awareness scores for the Private secondary school students is platy kurtic. The distribution is platy than the normal distribution.

6. The frequency distribution of environmental awareness scores for the Aided secondary school students is slightly negatively skewed. The frequency distribution of environmental awareness scores for the Aided secondary school students is lepto kurtic. The distribution is peaked than the normal distribution.

7. The frequency distribution of environmental awareness scores for the boys is slightly negatively skewed. The frequency distribution of environmental awareness scores for the boys is platy kurtic. The distribution is platy than the normal distribution.

8. The frequency distribution of environmental awareness scores for the girls is slightly negatively skewed. The frequency distribution of environmental awareness scores for the girls is platy kurtic. The distribution is platy than the normal distribution.

9. The mean values of secondary school students of Rural and Urban indicates that environmental awareness of secondary school students of urban are better than secondary school students of Rural. The mean values of Government, Private and Aided secondary school indicates that Private secondary school student’s environmental awareness are better than Government secondary school students. From the mean values of environmental awareness scores for boys and girls of secondary school students indicates that girls environmental awareness better than boys. The values of skewness for all the distribution except aided students are negatively skewed. The values of kurtosis of Urban and Aided students is lepto kurtic. It indicates that the distribution is peaked
than the normal distribution, remaining distribution of environmental awareness scores are platy kurtic, it indicates that the distribution is platy than the normal distribution.

10. The frequency distribution of achievement in Biological science scores for the whole group is slightly negatively skewed. The frequency distribution of achievement in Biological science for whole group is lepto kurtic. The distribution is peaked than the normal distribution. On the whole the achievement of the secondary school students is good, because mean achievement score is greater than 50 percent.

11. The frequency distribution of achievement in Biological science scores for the secondary school students of Rural is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the secondary school students of Rural locality is lepto kurtic. The distribution is peaked than the normal distribution.

12. The frequency distribution of achievement in Biological science scores for the secondary school students of Urban is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the secondary school students of Urban locality is lepto kurtic. The distribution is peaked than the normal distribution.

13. The frequency distribution of achievement in Biological science scores for the Government secondary school students is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the Government secondary school students is lepto kurtic. The distribution is peaked than the normal distribution.

14. The frequency distribution of achievement in Biological science scores for the Private secondary school students is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the Private secondary school students is platy kurtic. The distribution is platy than the normal distribution.

15. The frequency distribution of achievement in Biological science scores for the Aided secondary school students is slightly positively skewed. The frequency distribution of achievement in Biological science scores for the Aided secondary school students is lepto kurtic. The distribution is peaked than the normal distribution.
16. The frequency distribution of achievement in Biological science scores for the boys is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the boys is lepto kurtic. The distribution is peaked than the normal distribution.

17. The frequency distribution of achievement in Biological science scores for the girls is slightly negatively skewed. The frequency distribution of achievement in Biological science scores for the girls is lepto kurtic. The distribution is peaked than the normal distribution.

18. The mean values of secondary school students of Rural and Urban indicates that secondary school students of urban achievement in Biological science are better than the secondary school students of rural. The mean values of Government, Private and Aided secondary school students indicates that Private secondary school students achievement in Biological science are better than Aided secondary school students. From the mean values of achievement in Biological science scores for boys and girls of secondary school students indicates that girls achievement better than boys. The value of skewness for the distribution of Aided students is positively skewed. Remaining all the distributions are negatively skewed. All the distributions of achievement in Biological science scores are lepto kurtic, except Private secondary school students. The distribution is peaked than the normal distribution since the values of kurtosis for different groups are less than 3.00.

**Factorial designs**

19. There is significant main effects of locality, management and gender at 0.01 level on the environmental awareness of secondary school students.

20. There is significant interaction effects of locality Vs management and management Vs gender at 0.01 level on the environmental awareness of secondary school students.

21. There is no significant interaction effect of Locality vs Gender at 0.05 level on the environmental awareness of secondary school students.

22. There is significant interaction effect of locality Vs management Vs gender at 0.01 level on the environmental awareness of secondary school students.
23. There is significant main effects of locality, management and gender at 0.01 level on the achievement in Biological science of secondary school students.

24. There is significant interaction effects of locality Vs management and locality Vs gender at 0.01 level on the achievement in Biological science of secondary school students.

25. There is no significant interaction effect of Management vs Gender at 0.05 level on the achievement in Biological science of secondary school students.

26. There is significant interaction effect of locality Vs management Vs gender at 0.01 level on the achievement in Biological science of secondary school students.

Correlation between areas of environmental awareness and achievement

27. There is significant relation between areas of environmental awareness and achievement in Biological science of the secondary school students at 0.01 level.

ʻtʻ values and ʻfʻ ratios with respect to the influence of the independent variables on dependent variables

28. There is significant influence of locality at 0.01 level on the areas of environmental awareness namely air pollution, water pollution, environmental concern, environmental awareness and achievement in Biological science and 0.05 level on the soil pollution and noise pollution of secondary school students.

29. There is significant influence of management at 0.01 level on the areas of environmental awareness namely air pollution and water pollution, environmental awareness and achievement in Biological science and 0.05 level on the soil pollution of secondary school students.

30. There is no significant influence of Management at 0.05 level on the areas of environmental awareness namely Noise pollution and Environmental concern.

31. There is significant influence of gender at 0.01 level on the areas of environmental awareness namely noise pollution, environmental concern and achievement in Biological science and 0.05 level on the soil pollution and environmental awareness of secondary school students.
32. There is no significant influence of gender at 0.05 level on the areas of environmental awareness namely Air pollution, Water pollution of secondary school students.

Influence of socio – demographic variables on environmental awareness and achievement in Biological science

33. There is significant influence of annual income of the family at 0.01 level on the environmental awareness and achievement in Biological science of secondary school students.

34. There is significant influence of medium of study at 0.01 level on the environmental awareness and achievement in Biological science of secondary school students.

35. There is significant influence of caste at 0.01 level on the environmental awareness and achievement in Biological science of secondary school students.

36. There is no significant influence of religion at 0.05 level on the environmental awareness of secondary school students.

37. There is significant influence of religion at 0.01 level on the achievement in Biological science of secondary school students.

38. There is significant influence of father’s education at 0.05 level on the environmental awareness and at 0.01 level achievement in Biological science of secondary school students.

39. There is significant influence of father’s occupation at 0.05 level on the environmental awareness and at 0.01 level achievement in Biological science of secondary school students.

40. There is no significant influence of library facility at 0.05 level on the environmental awareness of secondary school students.

41. There is significant influence of library facility at 0.01 level on the achievement in Biological science of secondary school students.

42. There is no significant influence of mother’s education at 0.05 level on the environmental awareness of secondary school students.
43. There is significant influence of mother’s education at 0.01 level on the achievement in Biological science of secondary school students.

44. There is significant influence of mother’s occupation at 0.05 level on the environmental awareness and at 0.01 level achievement in Biological science of secondary school students.

45. There is significant influence of habit of visiting to science exhibitions at 0.01 level on the environmental awareness of secondary school students.

46. There is no significant influence of habit of visiting to science exhibitions at 0.05 level on the achievement in Biological science of secondary school students.

47. There is no significant influence of size of the family at 0.05 level on the environmental awareness and achievement in Biological science of secondary school students.

48. There is no significant influence of works at leisure time at 0.05 level on the environmental awareness of secondary school students.

49. There is significant influence of works at leisure time at 0.01 level on the achievement in Biological science of secondary school students.

50. There is significant influence of period allotted in the school time table for environmental education at 0.05 level on the environmental awareness and at 0.01 level achievement in Biological science of secondary school students.

χ² as a test of independence

51. There is significant difference on environmental awareness with regards to environmental areas i.e., air, water, noise, soil and environmental concern at 0.01 level on the secondary school students.

52. There is significant association between the environmental awareness and achievement in Biological science at 0.01 level on the secondary school students.

Step – Wise Multiple Regression - Analysis

53. There are five steps in this regression analysis. The value of R² is 0.063. This shows that these five variables put together could explain 6.30 percent of variance in the dependent variable (EA).
The regression equation at the end of 5th step could be written as;

\[ EA = 117.524 + (4.664) (MOS) + (-2.127) (CA) + (1.898) (M) + (3.448) (L) + (-3.313) (HVSE) \]

Hence it is concluded that environmental awareness score could best be predicted with the help of **Medium of the study, Caste, Management, Locality and Habit of visiting to science exhibitions** among the sixteen (1 – 16) socio – demographic variables.

54. There are four steps in this regression analysis. The value of R² is 0.348. This shows that these four variables put together could explain **34.80** percent of variance in the dependent variable (A).

The regression equation at the end of 4th step could be written as;

\[ A = 17.394 + (14.398) (MOS) + (7.154) (L) + (3.113) (M) + (-1.199) (AIF) \]

Hence it is concluded that achievement score could best be predicted with the help of **Medium of the study, Locality, Management and Annual income of the family** among the sixteen (1 – 16) socio – demographic variables.

6.3 CONCLUSIONS

In the light of the findings presented in preceding pages, the following conclusions are drawn.

1. The Frequency distribution of environmental awareness and achievement in Biological science of secondary school students is very nearer to normal distribution.

2. All the secondary school students do not have same environmental awareness and achievement in Biological science.

3. Main effects of locality, management and gender have significant influence on the environmental awareness of secondary school students.

4. Two factor interaction effects of locality Vs management and management Vs gender have significant influence on the environmental awareness of secondary school students.
5. Three factor interaction effects of Locality Vs Management Vs Gender have significant influence on the environmental awareness of secondary school students.

6. Main effects of locality, management and gender have significant influence on the achievement in Biological science of secondary school students.

7. Two factor interaction effects of locality Vs management and locality Vs gender have significant influence on the achievement in Biological science of secondary school students.

8. Three factor interaction effects of Locality Vs Management Vs Gender have significant influence on the achievement in Biological science of secondary school students.

9. Areas of environmental awareness and achievement in Biological science have significant relation of secondary school students.

10. Locality has significant influence on the areas of environmental awareness namely air pollution, water pollution, soil pollution, noise pollution, environmental concern, environmental awareness and achievement in Biological science of secondary school students.

11. Management has significant influence on the areas of environmental awareness namely air pollution, water pollution, soil pollution, environmental awareness and achievement in Biological science of secondary school students.

12. Gender has significant influence on the areas of environmental awareness namely soil pollution, noise pollution, environmental concern, environmental awareness and achievement in Biological science of secondary school students.

13. Annual income of the family has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

14. Medium of study has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

15. Caste has significant influence on the environmental awareness and achievement in Biological science of secondary school students.
16. Religion has significant influence on the achievement in Biological science of secondary school students.

17. Father’s education has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

18. Father’s occupation has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

19. Library facility has significant influence on the achievement in Biological science of secondary school students.

20. Mother’s education has significant influence on the achievement in Biological science of secondary school students.

21. Mother’s occupation has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

22. Habit of visiting to science exhibitions has significant influence on the environmental awareness of secondary school students.

23. Works at leisure time has significant influence on the achievement in Biological science of secondary school students.

24. Period allotted in the school time table for environmental education has significant influence on the environmental awareness and achievement in Biological science of secondary school students.

25. There is significant difference on environmental awareness with regards to environmental areas Air, Water, Noise, Soil and Environmental concern.

26. There is significant association between the environmental awareness and achievement in Biological science of secondary school students.

27. The study exhibited that the secondary school students showed moderate level of environmental awareness and achievement in Biological science, which shows that the component is available in the curriculum but the emphasis requires to be concentrated.
28. It is possible to predict the environmental awareness and achievement in Biological science of secondary school students with help of different sets of independent variables.

29. It is possible to develop, the regression equations for predicting the environmental awareness and achievement in Biological science of secondary school students with the help of different sets of independent variables.

6.4 EDUCATIONAL IMPLICATIONS AND RECOMMENDATIONS

1. It is observed from the study that performance of urban students better than rural students. Which indicates that locality has influence on the environmental awareness and achievement in Biological science of secondary school students. The influence may be due to the technological accessibility to urban students than rural students. In addition the awareness given through the curriculum is also influence. It is evident from the study that the students who had the environmental education period had scored well than those who did not have the class.

2. It is observed from the study that performance of private school students is better than government and aided school students. Which indicates that management has influence on the environmental awareness and achievement in Biological science of secondary school students. From the study it is evident that most of the private schools are located in urban area and the period allotted to environmental education was taken seriously than that of government and aided schools which are mostly located in the rural areas.

3. It is observed from the study that performance of girls better than boys in environmental awareness and achievement in Biological science, which indicates influence of Gender. Research has proved that girls students have more patience and positive attitude and awareness towards personal hygienic, beautiful and clean environment.

4. It is observed from the study that performance of low annual income secondary school students is better than high annual income group students on the environmental awareness and achievement in Biological science.
The finding indicated that the income influences the awareness and achievement in environmental awareness. This also shows the higher income group are less empathetic towards hygienic environment.

5. It is observed from the study that performance of English medium students is better than Telugu medium students. Which indicates that medium of the study had influence on the environmental awareness and achievement in Biological science of secondary school students. The reason may be that the most of the Telugu medium is offered in the rural areas and Government schools where as the English medium offered by the private schools. The study also revealed that environmental education classes is offered more in the private school in urban area than the Government schools in rural area. In addition more secondary source of information on environmental awareness is available in English than the Telugu.

6. It is observed from the study that performance of OC students awareness better than other caste groups and achievement in Biological science ST students is better than other caste group students. The researches have proved that caste has influence on environmental awareness and achievement. The study showed that ST students have better achievement than other groups, This shows community disproving the socio cultural misconceptions.

7. It is observed from the study that performance of Muslim students is better than other religion group students. This indicated that Religion has influence on the achievement in Biological science of secondary school students. The reason may be that recent educational policies and acts and reservation facilities encourage their studies, to take active participation and compute with others on studies indirectly Biological science. So their performance is better than other religions.

8. It is observed from the study that performance of library facility ‘No’ group students are better than library facility is ‘Yes’ group students in achievement in Biological science. Which shows that library facility has influence on the achievement in Biological science of secondary school students. The reason may be that students with no library facilities can also gain awareness with their own resources like internet, magazines, other secondary sources etc.
9. It is observed from the study that performance of habit of visiting to science exhibition is ‘Yes’ group students is better than habit of visiting to science exhibition ‘No’ group students. Which indicated that habit of visiting to science exhibitions has influence on the environmental awareness of secondary school students. The reason may be that students having more chances to visit and participate science exhibitions and science fairs get practical perceptual experience.

10. It is observed from the study that performance of students of works at leisure time is reading is better than the students of work at leisure time is playing and helping to others. Which indicates that works at leisure time has influence on the achievement of Biological science of secondary school students. The study projects that reading more help in the achievement which shows that more material and knowledge is available in the form of reading source.

11. It is observed from the study that performance of period allotted in the school time table for environmental education is ‘yes’ group students is better than period allotted in the school time table for environmental education is ‘no’ group students. Which indicated that time table allotted for environmental awareness and achievement in Biological science of secondary school students. The study depicts that through the curriculum awareness in environmental education can be achieved. Even though if the component is there in curriculum unless it is incorporated in the curriculum the students will not get the practical exposure.

12. Environmental awareness with regards to environmental areas i.e. air, water, noise, soil and environmental concern has significant influence.

13. There is significant association in the environmental awareness and achievement in Biological science.

14. It was found that majority of secondary school students having moderate level of environmental awareness and 23% students exhibited high level of environmental awareness and 9.3% of students showed low level of environmental awareness.
15. It was also found that half of secondary school students having moderate level of achievement in Biological science and 25.75% students exhibited high level of achievement and only 23.08% of students showed low level of achievement in Biological science.

The following recommendations have been made by the investigator based on the findings and conclusions of the study.

1. Appropriate environmental programmes with practical experience to the students needs to be affectively planned and provide thoroughly.

2. Number of environmental related activities need to organized in schools in making the students to protect environment and conserve the natural resources for the future generations.

3. Schools should equipped with facilities related to environmental and arranged with expert teachers to popularize the use of environmental education and measures of protection among the children.

4. To make the environmental awareness programmes success, it is better to use different techniques like film shows, models, charts, pictures, slides which help in awaring the child affectively.

5. It is our aim to make the children to realize the importance of plantation in controlling all types of environmental pollution, and we have to make them to participate in plantation activities in school and surroundings.

6. As a part of practical experience and participation field trips need to conducted by the schools and students are brought to the industrial areas, slum areas, and make them to understand the pollutants and its effects on environmental pollution.

7. Teachers and schools should need to conduct and made the students to participate in science fairs exhibitions and elocution competitions related to environmental education which are conducted by the different organizations and institutions.

8. The Government has to take necessary steps and policies to conduct environmental awareness programmes in the secondary school level as a compulsory one, and students should be given with participation
certificates with different grades of their performance and considered in the job applications and higher educations.

9. The teachers and schools encouraging the students to take participation in NGC, and initiate the students to expand their knowledge and measures with respect to environmental conservation.

10. A small effort made by each individual at his own place will take pronounced effect at the Global level. It is aptly said “Think globally act locally”.

The following suggestions implemented will go long way in improving the environmental education practices in schools. Hygienic drive programmes should be affectively implemented in all school in the following types of activities and teacher should take initiation and interest in this regard.

i. All children must be made accountable to keep the school environment free from dust particles wastages like bits of papers, plastic covers, dry covers. And they must be taught not to split and not to drop any waste material in the school premises and make them maintain sanitary habits.

ii. Students are instructed and make them to participate in preparing charts related to different pollutants and agence of sound air and earth pollution and its effects on biosphere.

iii. Orientation programmes should be conducted to the students and their parents in realizing the affects and causes of sound earth and air pollution during celebrations like Diwali, Ganesh Chathurdhi and Holi respectively by a grating crackers, using colours and painted of Idols and different chemicals colour using in holi.

iv. Activities like plantations and electution on NGC painting pictures about Environmental Education, participation on debate and seminars exploit their thoughts related to topics assigned them.

v. Students are initiated to participated in the activities of collecting slogans, pictures posters, paper reports related to environmental education and displayed on the walls of classes and schools.
6.5 DELIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

The following are the delimitation as for the present study

1. The study is confined to only Chittoor district of Andhra Pradesh

2. The study is confined to 1200 sample only.

3. The study is confined to three managements (i.e.) Government, Aided and Private schools of Chittoor district only.

4. The study is confined only to the 9th class students of the above mentioned schools of Chittoor District.

5. The present study concerns itself for the subject of Biological science of secondary school students only.

6. The effect of only a few independent variables on the environmental awareness and achievement of secondary school students has been studied.

7. The environmental awareness and achievement of secondary school students are taken only from the environmental awareness scale and objective achievement test constructed and standardized by the investigator.

8. The study is based on survey type research, where in the techniques of analyzing the data, are based on the questionnaires only.

9. The environmental awareness and achievement of secondary school students o depends on a number of psychological, sociological, demographic and environmental factors. It is not possible to include each and every factor in this investigation.

The following are suggestions for the further research

1. Similar study can be carried out on other sample subjects of other states.

2. The study is confined only to secondary school students. A similar investigation may be conducted by taking students from different classes also, namely 8th and 10th classes, intermediate, under -graduate, post -graduate courses.
3. The study may be undertaken to cover the other age groups.

4. Other significant factors like emotional maturity, parental commitment, parental behaviour, child rearing practice may be studied for environmental awareness and achievement.

5. The present study is confined to 1200 secondary school students. It is suggested that future researchers may undertake studies with larger sample.

6. Only very few socio-demographic variables are studied in the present study. Some other variables like merits, attendance, regularity of students etc., may help to know their impact on the environmental awareness and achievement.