

**A STUDY ON ENVIRONMENT AWARENESS AMONG
THE SECONDARY SCHOOL STUDENTS OF
PHEK DISTRICT**

**THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY (Ph. D) IN EDUCATION**



SUPERVISOR
Dr. Khotole Khieya
Associate Professor
Nagaland University

INVESTIGATOR
Neikhrolo-u Wetsah
Regd. No. 857/2020

**DEPARTMENT OF EDUCATION, NAGALAND UNIVERSITY
KOHIMA CAMPUS : MERIEMA
HEADQUARTERS : LUMAMI, NAGALAND**

2022

DEPARTMENT OF EDUCATION, NAGALAND UNIVERSITY

KOHIMA CAMPUS, MERIEMA

2022

DECLARATION

I Ms Neikhrolo-u Wetsah hereby declare that the thesis entitled, “**A Study on Environment Awareness Among the Secondary School Students of Phek District**”, is a record of original research work done by me and submitted for the degree of Doctor of Philosophy to the Department of Education, under the supervision and guidance of Dr. Khotole Khieya, Associate Professor of Nagaland University, Kohima Campus, Meriema. This research work has not been submitted to any other University/Institution for the award of any degree.

Date:

Place:

Neikhrolo-u Wetsah

Research Scholar

Registration No. 857/2020



NAGALAND UNIVERSITY

(A Central University Estd. by the Act of Parliament No. 35 of 1989)

Kohima Campus, Meriema – 797001

Ref. No.....

Date.....

CERTIFICATE

This is to certify that the thesis entitled, “A study on environment awareness among the secondary school students of Phek district” submitted by Ms Neikhrolo-u Wetsah for the award of degree of Doctor of Philosophy in Education, Department of Education, Nagaland University, Kohima campus, Meriema, is a record of original research work done by her and it has not been submitted for the award of any degree or fellowship to any University/ Institution. It is further certified that the candidate has completed all the formalities as per the requirements of Nagaland University. I therefore, recommend that the thesis may be places before the examiners for consideration of award of Degree of Doctor of Philosophy in Education in this University.

HOD

Department of Education
Nagaland University

Supervisor

Dr. Khotole Khieya
Associate Professor
Nagaland University

ACKNOWLEDGEMENT

I thank God Almighty for strengthening me throughout my research work without which I might have succumbed to the setbacks faced during my research work. My deepest gratitude goes to my supervisor Dr. Khotole Khieya, Associate Professor of the Department of Education, Kohima campus-Meriema without whom I would have been unable to complete my research. My success was possible only through her continuous support, encouragement, guidance, compassionate and understanding nature I have been able to complete my research. I also extend my deepest gratitude to Dr. M. Rajendra Nath Babu, Assistant Professor from the Department of Teacher Education who provided guidance throughout my research as well kept me updated about the seminars, career prospects in various departments/institutions as well as helped me get the plagiarism test done for my research work. I am also very grateful to Professor Rakesh Rai, former Head of Department of Education, who along with my supervisor Dr. Khotole Khieya collaborated and made my accession from Junior Research Fellow (NET-JRF) to Senior Research Fellow (NET-SRF) simpler. I am very grateful to Mr. Imnatizuk Jamir for taking care of all my scholarship paper works without which I might not have completed my research.

I extend my deepest gratitude to Dr. Khotole Khieya, Dr. M. Rajendra Nath Babu, Dr. Buno Legiese, Dr. Venkata Rao, Ms. Seno Tsuhah and Mr. Pupetso Wezah for the guidance rendered while constructing and finalizing of my research tool without which I couldn't have completed my research. I am also very grateful to all teaching and non teaching staffs of Nagaland University at Kohima campus, who had rendered help to me throughout my research work.

I am very grateful to my family who supported me financially, spiritually and physically throughout my research work. Me been able to pursue my dream is because of their continual support and encouragement. My deepest gratitude also goes to Narotola Imchen who had been a constant source of help throughout my research.

I am very grateful to every individual-Headmaster/Headmistress, teachers, leaders and friends who have helped me throughout my research work as well as throughout my data collection. I will forever remain humbled and indebted to all individuals who have helped me in successfully completing my research. May God bless you all for your kindness!

Thanking you all.

Neikhrolo-u Wetsah



Document Information

Analyzed document	Neikhrolo-u Wetsah-Ph.D Scholar-857-2020- A Study on Environment Awareness Among the Secondary School Students of Phek District.docx (D133951115)
Submitted	2022-04-19T13:32:00.0000000
Submitted by	MURATHOTI RAJENDRA NATH BABU
Submitter email	mrajendranathbabu@nagalanduniversity.ac.in
Similarity	1%
Analysis address	mrajendranathbabu.naga@analysis.arkund.com

Sources included in the report

W	URL: https://pdfs.semanticscholar.org/b7cb/1628eae0b931083e8c2f6e88cb63fed132a7.pdf Fetched: 2021-06-26T16:48:49.3830000	 2
W	URL: https://stars.library.ucf.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1177&context=etd Fetched: 2021-11-05T15:19:03.3470000	 2
W	URL: https://files.eric.ed.gov/fulltext/EJ1223640.pdf Fetched: 2020-12-10T18:06:23.2900000	 1
W	URL: https://www.academia.edu/14523954/A_Study_of_Environmental_Education_Attitude_and_Awareness_of_Students_at_College_Level_in_Nagaland Fetched: 2022-04-19T13:33:06.8370000	 1
W	URL: https://files.eric.ed.gov/fulltext/EJ1249747.pdf Fetched: 2020-12-04T18:45:57.6900000	 2
W	URL: https://issuu.com/thewriterspublication/docs/28-mohanta_biswas Fetched: 2019-10-02T10:28:44.9470000	 2
W	URL: https://www.uok.ac.in/notifications/Anju%20Gupta%20Education.pdf Fetched: 2019-11-08T05:23:09.8230000	 1
W	URL: https://www.greenschoolsalliance.org/blogs/60/628 Fetched: 2019-11-28T00:02:54.7570000	 1
W	URL: https://phek.nic.in/ Fetched: 2022-04-19T13:33:00.0000000	 1
W	URL: https://doi.org/10.1108/00242531211288263 Fetched: 2022-04-19T13:35:00.0000000	 1



नागालैण्ड विश्वविद्यालय NAGALAND UNIVERSITY

(संसद द्वारा पारित अधिनियम 1989, क्रमांक 35 के अंतर्गत स्थापित केंद्रीय विश्वविद्यालय)

(A Central University established by the Act of Parliament No.35 of 1989)

मुख्यालय : लुमामी, जुन्हेबोटो (नागालैण्ड), पिन कोड – 798627

Headquarters: Lumami, Dist: Zunheboto, (Nagaland), Pin Code-798 627

PLAGIARISM FREE UNDERTAKING

Name of Research Scholar/Student	Neikhrolo-u Wetsah
Ph. D/M. Phil. Registration Number	857/2020
Title of Ph. D thesis/M. Phil. Dissertation	A Study on Environment Awareness Among the Secondary School Students of Phek District
Name & Institutional Address of the Supervisor/ Joint Supervisor	Nagaland University Kohima Campus: Meriema Head Quarters: Lumami Nagaland
Name of the Department and School	Department of Education
Date of submission	
Date of plagiarism check	19 th April 2022
Percentage of similarity detected by URKUND software	1%

I hereby declare/ certify that the Ph. D Thesis/ M. Phil. Dissertation submitted by me is complete in all respect, as per the guideline of Nagaland University (NU) for this purpose. I also certify that the Thesis/ Dissertation (soft copy) has been checked for plagiarism using URKUND software. It is also certified that the contents of the electronic version of the thesis/ dissertation are the same as the final hardcopy of the thesis/ dissertation. Copy of the report generated by the URKUND software is also enclosed.

Date:

(Name and Signature of the Scholar)

Place:

Neikhrolo-u Wetsah

Name & Signature of the Supervisor:

Seal

Name & Signature of the Joint Supervisor (if any):

Seal

CONTENTS

	Page No.
Declaration	i
Certificate	ii
Acknowledgment	iii
Plagiarism Report	iv
Plagiarism Free Undertaking	v
Contents	vi-viii
List of Tables	ix
List of Figures	x-xi
Abbreviation	xii
 CHAPTER – 1: INTRODUCTION	
1.1. Overview of Nagaland	1
1.2. Phek district	2
1.3. Chakhesang tribe	4
1.4. Environmental Education at the secondary level in India	4
1.5. Status of Environmental Education in Nagaland at the secondary level	5
1.6. Background of the study	5
1.7. Need and significance of the study	6
1.8. Justification of the study	7
1.9. Statement of the problem	8
1.10. Operational definitions of the terms used	8
1.11. Objectives of the study	8
1.12. Research questions	8
1.13. Delimitations of the study	9
 CHAPTER – 2: REVIEW OF LITERATURE	
2.1. Introduction to Review of Literature	10
2.2. Studies done in India	10

2.3. Studies done abroad	24
2.4. Summary	36

CHAPTER – 3: METHODOLOGY AND DESIGN OF THE STUDY

3.1. Introduction	39
3.2. Design of the study	39
3.3. Population of the study	40
3.4. Sample of the study	41
3.5. Construction of the research tool	42
3.6. Descriptions of the questionnaires	43
3.7. Standardization of tools for the present study	44
3.8. Pilot study	44
3.9. Method and procedure of data collection	45
3.10. Data collection	45
3.11. Analysis of the data	45
3.12. Statistical techniques used	45

CHAPTER – 4: ANALYSIS AND INTERPRETATION OF DATA

4.1. Introduction	47
4.2. Analysis and interpretation of data related to objective 1	47
4.2.1. Secondary students awareness on environmental degradation	48
4.2.2. Secondary students awareness on environmental pollution	49
4.3. Analysis and interpretation of data related to objective 2	57
4.4. Analysis and interpretation of data related to objective 3	61
4.5. Analysis and interpretation of data related to objective 4	73
4.6. Analysis and interpretation of data related to objective 5	79

CHAPTER – 5: MAJOR FINDINGS AND DISCUSSIONS, SUGGESTIONS

5.1. Introduction	101
5.2. Major findings and discussions of the study	101
5.2.1. Major findings and discussions related to objective 1	101
5.2.2. Major findings and discussions related to objective 2	110
5.2.3. Major findings and discussions related to objective 3	114
5.2.4. Major findings and discussions related to objective 4	121
5.3. Suggestions of the study	124
5.3.1. Measures for higher level of environmental awareness among the secondary school students	124

5.3.2. Measures to initiate more awareness among the secondary school students on effects of environmental degradation on human life	125
5.3.3. Measures to introduce more curricular and co-curricular activities and programmes on environment at the secondary level	127
5.3.4. Measures to initiate more awareness through programmes by government and NGO's	130

**CHAPTER – 6: SUMMARY, EDUCATIONAL IMPLICATIONS OF THE STUDY,
RECOMMENDATIONS FOR FURHER RESEARCH AND CONCLUSION**

6.1. Introduction	136
6.2. Summary	136
6.3. Educational implications of the study	153
6.4. Recommendations for further studies	155
6.5. Conclusion	155
Bibliography	158
Appendices	
Appendix - I	170
Appendix - II	178
Appendix - III	181

LIST OF TABLES

Table No.	TITLE	Page No.
1.2.1	List of institutions of Phek district registered under NBSE 2021	3
3.2.1	Design of the study	40
3.4.1	Sample based on management	41
3.4.2	Sample based on gender	41
3.4.3	List of educational institutions chosen for the present study	41
3.4.4	List of villages chosen for the study	42
3.6.1	Questionnaire for secondary school students	43
3.6.2	Questionnaire for teachers	43
3.6.3	Questionnaire for leaders	44
3.8.1	Sample of the pilot study	44
4.1.1	Levels of environmental awareness	47
4.2.1	Secondary school student's awareness on environmental degradation	48
4.2.4	Secondary school student's awareness on soil pollution-ill effects of deforestation	52
4.2.5	Secondary school student's awareness on soil pollution-negative effects of SC/J/S and BC	53
4.2.6	Secondary school student's awareness on noise pollution	54
4.2.7	Other types of pollution mentioned by the secondary school students	55
4.2.8	Secondary school student's opinion on waste management among the Chakhesangs	55
4.4.3	Secondary school student's other opinions on why Environmental Education/Environmental Studies should be made compulsory	65
4.4.7	Environment friendly code of behavior/activities of leaders	71
4.5.4	Initiatives taken by various organizations to raise environmental awareness as mentioned by the secondary school students	76
4.6.3	Teacher's suggestions for environmental restoration	85

LIST OF FIGURES

Figure No.	TITLE	Page No.
1.2.2	Map of Phek district	3
4.2.2	Secondary school student's awareness on air pollution and its causes	50
4.2.3	Secondary school student's awareness on water pollution and its causes	51
4.2.9	Opinions of the secondary school students on proper waste disposal method followed by the Chakhesangs	55
4.2.10	Secondary school students awareness on improper waste disposal method followed by the Chakhesangs	56
4.3.1	Secondary school student's awareness on diseases caused due to pollution	57
4.3.2	Secondary school student's awareness on disasters	58
4.3.3	Secondary school student's awareness on problems caused due to disasters	59
4.3.4	Secondary school student's awareness on diseases caused due to climate change	60
4.4.1	Secondary school student's opinion on curricular program on Environmental Education/Environmental Studies at the secondary level	63
4.4.2	Secondary school students and teacher's opinion on why Environmental Education/Environmental Studies should be made compulsory	64
4.4.4	Teacher's opinion on dissemination of knowledge and information on environment	66
4.4.5	Teacher's opinion on Environmental Education/Environmental Studies	67
4.4.6	Teacher's co-curricular activity on environment	71
4.4.8	Leaders response on activities on environment	72
4.5.1	Secondary school students response on governmental organizations working on environmental protection and preservation in Nagaland	73

4.5.2	Secondary school student's response on NGO's working on environmental protection and preservation in Nagaland	74
4.5.3	Secondary school student's response on measures and programmes undertaken by various organizations	75
4.5.5	Leader's response on environmental legislations	77
4.5.6	Leader's response on framing and implementation of environmental laws	78
4.6.1	Teacher's opinion on climate change	84
4.6.2	Teacher's response on environmental restoration and preservation	84
4.6.4	Leader's response on eco-friendly farming technique	99
4.6.5	Leader's response on innovative waste management	100

ABBREVIATION

SC/J/S and BC

Shifting Cultivation/Jhum/Slash and Burn Cultivation

CHAPTER 1

INTRODUCTION

1.1 NAGALAND OVERVIEW

Nagaland, the sixteenth state of Indian Union was created on 1st December 1963. The major part of the present Nagaland, excluding its eastern side consisting of Tuensang and Mon districts was formerly a district of Assam under the name, Naga Hills. Naga Hills was opened in 1866. In 1957, Naga Hills was renamed as the Naga Hills Tuensang Area (NHTA). In 1961, the Naga Hills Tuensang Area (NHTA) became a tribal state under the name “Nagaland”. The state was carved out of the territories earlier known as the Naga Hills Tuensang Area (NHTA), through the State of Nagaland Act of 1962.

Nagaland is situated in the north-eastern part of Nagaland, sharing an international border with the neighbouring country Myanmar. It is bounded by Assam in the West, Arunachal Pradesh in the North, Manipur in the South and Myanmar in the East. From the geographical point of view, Nagaland is roughly triangular in shape. The total area of Nagaland is 16,579 sq.kms and is situated in between 25° 6’N and 27°4’N latitudes and between 95°20’E and 95°15’E longitudes.

Nagaland has a rich and varied heritage of biodiversity owing to its varying physiographic and geo-climatic conditions favourable for luxuriant growth of vegetation. It varies from tropical rain forest to alpine vegetation and from evergreen forests to sub-tropical climatic region. The state supports approximately 2,431 species belonging to 936 genera and 186 families under angiosperms. Gymnosperms also register their presence with 9 species, under 6 genera from 5 families. Nagaland is called as the cradle of flowering plants. The faunal diversity of the state is also rich with rare birds and animals. There are about 32 species of mammalian fauna, 42 species of fishes belonging to 10 families and 24 genera, and 9 species of reptilian fauna.

Scientists from the Zoological Survey of India (ZSI) have discovered a new species of water strider from Nagaland. The species named *Ptilomera Nagalanda Jehamalar and Chandra*, was found at river Intanki, Peren district of Nagaland. Two rare butterfly species, Tawny Emperor (*Chitoria Ulupi Ulupi*) and Comic Oakblue (*Arhoppala Comica*), were sighted at Chizami Village of Phek district of south-eastern Nagaland by Tshetsholo Naro and Sanjoy Sondhi.

1.2 PHEK DISTRICT OVERVIEW

Phek district is situated in the south-eastern part of Nagaland with its headquarters at Phek town. It is bounded by Myanmar in the east, Zunheboto and Tuensang in the north, Manipur in the south and Kohima in the west. The district covers an area of 2026 sq.kms. Phek got its name from the word, 'Phekrededze' which means 'Watch Tower'. Phek is also called the land of tradition. Earlier it was a part of Kohima district, but on 21st December 1973, Phek was turned into a separate district covering an area of 2026 sq.km. The government of Nagaland approved Phek district to be a separate and full-fledged district vide notification number. APA 15/12/71 (HQ) dated 19th December 1973. Till 1946, the inhabitants of Phek district were known as eastern Angami it was only after August 1946, that they came to be known by a separate name called the "Chakhesang", denoting a separate tribe. The district is inhabited by three major tribes, the Khezha, the Chokri and the Pochuri. There are five linguistic groups in the district which are the Chokri, the Khezha, The Pochury, the Sapu and the Semas. The district has 14 subdivisions namely Pfutsero, Phek Sadar, Chetheba, Chozuba, Meluri, Chizami, Sekruzu, Raziaba, Sakraba, Zuketsa, Phor, Khuza, Khezhakheno and Phokhungri. As per 2021 report of Phek district administration, 98 villages were recognised by it.

Phek district is a mountainous region rich in flora and fauna with 70% of the land covered in evergreen forest. The district headquarter is at Phek town which lies at the lowest altitude of the district at 1,524m above sea level, while Pfutsero town lie at the highest altitude at 2,136m above sea level. The highest table top peak is Mt. Kupamedzu at 2620 m above sea level and Glory Peak at 2600 m above sea level, which is one of the highest mountains in Nagaland at Phek district. Other important mountain peaks in Phek district are Mt Zanubou 2750 m above sea level, Mt Zephu 2605 m above sea level, Mt Terapimithu 2232 m above sea level. The largest rivers of the district are Tizu, Lanye, Arachu and the three most important lakes are Shilloi, Chida and Dzudu. Avankhung International Border Checkpost also known as Avankhu in Phek district of Nagaland is an International Border Checkpost on India-Myanmmar barrier.

The summers are moderately warm with the average temperature of 27⁰ C to 32⁰ C. Monsoon starts towards the end of May and is over by the end of September. Winters are cold with temperature dropping to 0⁰ C in January and February. The average annual rainfall is 1,527mm.

Agriculture is the main occupation in the district. Jhum, zabo and terrace cultivation is predominant in the district. The main crops are rice, maize, millets etc. Besides agriculture, people also engage in salt making in Meluri area, paddy cum fish and snail rearing, making fruit juice, weaving, knitting, pottery, baskets, furniture, wood carving etc.

As per 2011 census report, Phek district have a population of 163,418 of which 83,743 were males and 79,675 were females and the average literacy rate is 78.05 where male literacy rate was 83.66% and female literacy rate was 72.21%.

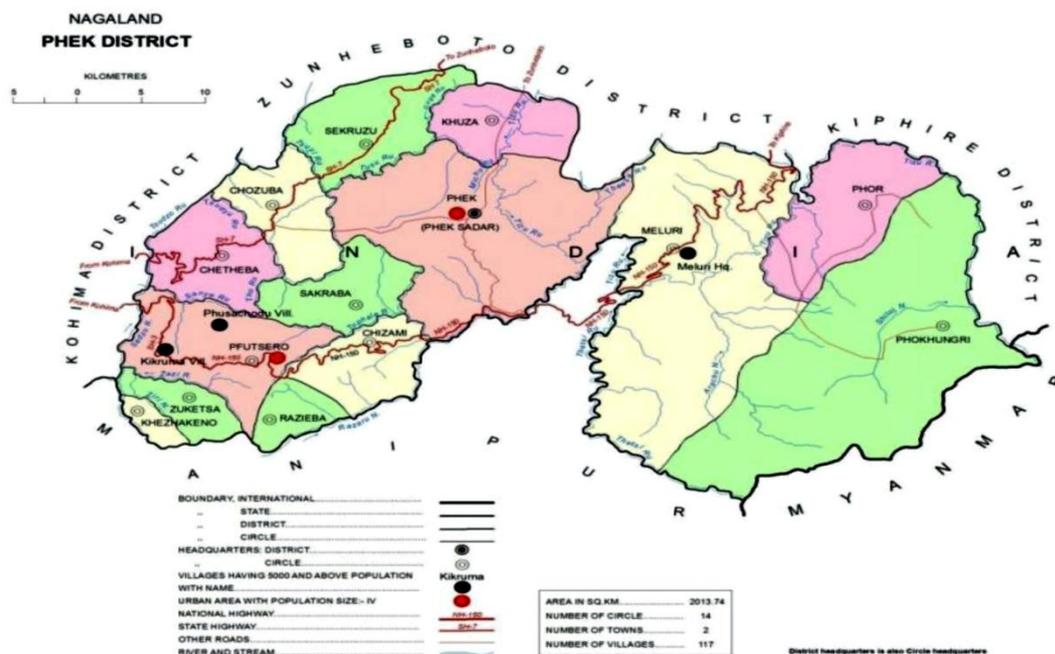
Table1.2.1 List of institutions of Phek district registered under NBSE 2021

Government Higher Secondary Schools	Government High Schools	Private Higher Secondary Schools	Private High Schools	Permitted Schools	Total
4	35	6	12	4	61

Table 1.2.1 shows the status of educational institutions in Phek district as per Nagaland Board of School Education (NBSE) report 2021.

Jawahar Navodaya Vidhyalaya School Zuketsa in Phek district is registered under Central Board of Secondary Education.

Figure1.2.2 Map of Phek district



Directorate of Census Operation, Nagaland

Figure 1.2.2 shows the map of Phek district as per Directorate of Census Operation Report.

1.3 CHAKHESANG TRIBE

The word “Chakhesang” is derived from the names of three major sub tribes, “Cha” from “Chokri”, “Khe” from “Khezha” and “Sang” from “Sangtam”. Originally the Chakhesang tribe consisted of three major sub tribes namely Chokri, Khezha and Sangtam. These tribes have similar dress pattern and socio-cultural practices which brought them under a common name called “Chakhesang”, according to Das and Sinha (1994). However in 1993, the Sangtam gained their separate tribal identity. Now the Chakhesangs consists of two major tribes, “Chokri” and “Khezha” and one minor tribe “Zhamai” or “Zhavame”, who belong to the Pomai Naga tribe living predominantly in Manipur. Phek district is the home of the Chakhesangs.

1.4 ENVIRONMENTAL EDUCATION AT THE SECONDARY LEVEL IN INDIA

The implementation of Environmental Education in the formal school curriculum has been structured by two policy documents-The National Curriculum Framework (2005) and the directive of the Supreme Court to make study of environment a compulsory subject in schools and colleges. Following the directive, the National Council of Educational Research and Training (NCERT) has developed a graded syllabus for Environmental Education from class 1 till 12. The National Curriculum Framework (2005) endorsed that schools have a major role to play in ensuring that children are socialised into a culture of self-reliance, resourcefulness, peace oriented values and health.

As per the National Curriculum Framework 2005, the aim was to generate among learners an awareness and sensitivity to the total environment in a holistic manner and the problems associated with it. It would also equip the learners with the requisite knowledge of the total environment, natural and social, the problems associated with it and the necessary skills for solving problems/issues in a sustainable manner.

Environmental Education focus on fostering ownership, empowerment and active participation which would positively influence learners in meeting the goals of sustainability and contribute effectively to educational reform.

1.5 STATUS OF ENVIRONMENTAL EDUCATION IN NAGALAND AT THE SECONDARY LEVEL

Till 2021, Environmental Education and Home Science was the curricular programme of education on environmental study in the secondary level of education however the Nagaland Board of School Education (NBSE) has decided to discontinue Environmental Education and Home Science as the sixth subjects at the secondary level (July 8, 2021). The Environmental Education components will however be integrated or incorporated in other academic subjects and new subjects will be introduced which will be vocational in nature. The Environmental Education and Home Science subject would be dropped as a course of study from the academic session 2022 in phases – class IX in 2022 and class X in 2023.

1.6 BACKGROUND OF THE STUDY

The word ‘environment’ is derived from the French word ‘environer’ which means ‘to surround’ or ‘to encircle’. Hence everything around us is called the environment. According to Dikshit (1984), environment is defined more comprehensively as a holistic view of the world as it functions at any point of time, with a multitude of spatial elemental and socio-economic systems distinguished by quality and attributes of space and mode of behaviour of abiotic and biotic forms. Environmental awareness means the knowledge about the status of the environment in relation to human life. To help social groups and individuals acquire and awareness and sensitivity to the total environment viz. Physical, biological, social and cultural aspects and its allied problems. Environmental awareness is defined as an understanding of natural systems combined with how they interact with human social system. In the present study the main objective was to find out the environmental awareness among the secondary school students where it means awareness on environmental degradation and pollution and effects of environmental degradation on human life. Curricular and co-curricular programmes play a major role in initiating awareness among the students, hence the present study also tried to seek out the curricular and co-curricular programmes offered by educational institutions under study. Measures and programmes initiated by various organisations also generate positive environmental awareness hence the study also sought out the measures and programmes adopted by organisations to promote environmental awareness.

A secondary school is a school which provides education to students from classes IX to XII (students of 14 to 18 years of age). Secondary education is the link between primary and

higher education. It provides the link to the whole education that forms the inter connectivity to the higher education system, by providing the required input. For the present study, the secondary school students of Phek district and the Chakhesang tribe of Nagaland was chosen as sample for the study.

1.7 NEED AND SIGNIFICANCE OF THE STUDY

During the past decades, environmental issues have grown considerably. Natural resources have been depleted by excessive use. Dramatically increasing population has caused pollution, deforestation, desertification, biodiversity loss, global warming simultaneously which currently are the global concerns. Air and water pollution have reached alarming levels and that have caused serious health problems as well as negative impact on the environment, and inevitably influencing prospects for long term economic growth. (Krishnamaracharyulu and Reddy 2005). The root cause of enhancement of these problems is the low level of awareness towards environmental issues. Prevention of environmental degradation must become a part of our lives. Just as for any disease, prevention is better than cure, protecting our environment is economically more viable than cleaning it up once it is damaged. Hence the present study was undertaken to increase awareness among the students community on environmental degradation and negative effects of environmental degradation on human life. Environmental Education/Environmental Studies as a part of the school curriculum fosters positive environmental awareness hence the present study will highlight the curricular and co-curricular programmes under the secondary education curriculum so that better teaching models and concept and programmes can be adopted for effective analysis-cum-action on environmental crisis.

India has more than 40% of young people in the world. The conscious practice of a code of ecology will improve the present environmental conditions. In spite of many ordinances and rules framed by the Central and State Government and innumerable environmental programmes for environmental security, there is still a need to create environmental awareness in the society, especially among the youngsters. National Policy on Education (NPE 1986) highlighted that there is a paramount need to create a consciousness of the environment. Environmental Education/Environmental Studies is a tool to foster a healthy and dynamic awareness-analysis action chain to solve environmental issues and problems. Government as well as private organisations and agencies also play major roles in protecting and preserving the environment however without support from local community or residents

of the state, the government, agencies and organizations cannot function alone, hence the present study also focussed on role played by organizations in protection of the environment.

1.8 JUSTIFICATION OF THE STUDY

Environmental awareness is necessary to achieve environmental protection and restoration. The public must have a grasp of environmental problems. Leaders in the field of environmental education must not only have extensive knowledge and understanding of environmental problems, but must have environmental awareness to solve these problems. They must be committed to initiate action, based upon knowledge and understanding (Madsen 1996). Awareness and involvement of the civil society is a pre-condition for checking environmental degradation. There is large scale environmental degradation, which have caused global concern about protection of the earth's environment. Hence efforts should be made for inculcating awareness about the environment.

Environmental Education is inter-disciplinary, multi-disciplinary and trans-disciplinary in nature. It involves subject matters from both sciences and social sciences. Hence there is a fusion of subject matter, which in turn develops inquiry skills among the students. Through environmental education, students can inquire, explore and observe man's interaction with the environment. Late Mrs Gandhi stated that Environmental Education is to help arouse social consciousness and make the community aware of the fact that the good of the individual and that of the community are both harmed by ecological disruptions. (Votiba) The main purpose of imparting environmental education in schools is to acquaint and sensitise the young minds to the environmental problems and concerns, to inculcate in them healthy personal and social attitude and behaviour towards environment. Hence it is important to know how far the secondary school students are aware about the environmental issues. Curricular and co-curricular activities play a major role in creating awareness among the students hence the present study was also done to find out the various curricular and co-curricular activities and programmes at the secondary level as well role played by the Government and NGO's to protect and preserve the environment. Environmental degradation negatively impacts human health, hence the present study sought at finding out the awareness of the secondary school students on effects of environmental degradation on human life.

Earlier researches have not been done on environmental awareness in Phek district. Thus the study would promote understanding and awareness about the environmental issues under Phek district which in turn will lead to preservation of flora and fauna in the community.

1.9 STATEMENT OF THE PROBLEM

The problem is stated as, “**A Study on Environment Awareness Among the Secondary School Students of Phek District**”.

1.10 OPERATIONAL DEFINITIONS OF THE TERMS USED

- **Environment awareness**

To help social groups acquire an awareness and sensitivity to the total environment and its allied problems and an understanding of natural systems combined with how they interact with human social system.

- **Secondary school students**

It includes students from 9th and 10th standard/class (14-16 years of age) and students from 11 and 12 standard/class (16-18 years of age).

- **Phek district**

Phek district is situated in the south-eastern part of Nagaland. For the study the Chakhesangs of Phek district were surveyed.

1.11 OBJECTIVES OF THE STUDY

The objectives of the study are as under:

- To find out the environmental awareness among the secondary school students of the Chakhesangs Nagas (Phek district).
- To find out the awareness on the effects of environmental degradation on human life among the secondary school students.
- To study the various curricular and co-curricular activities and programmes at the secondary level.
- To study the measures and programmes undertaken by the Government and NGO's to achieve global objectives of environmental awareness.
- To suggests measures for environmental protection and awareness.

1.12 RESEARCH QUESTIONS

- What is the present status of the secondary school student's level of environmental awareness among the Chakhesang Nagas of Phek district?

- What is the secondary student's level of awareness on effects of environmental degradation on human life?
- What are the various curricular and co-curricular activities and programmes on environment at the secondary level?
- What are the roles played by the government and NGO's to achieve global objectives of environmental awareness?
- What are the measures that can be adopted to protect and preserve the environment?

1.13 DELIMITATIONS OF THE STUDY

- a. The study was limited to students from arts and science stream of secondary schools of Phek district.
- b. The study was limited to 1000 secondary school students, 106 teachers and 100 leaders from Chakhesang Naga tribe of Phek district.
- c. The study was limited to 22 secondary schools in Phek district of Nagaland.

CHAPTER 2

REVIEW OF LITERATURE

2.1 INTRODUCTION TO REVIEW OF LITERATURE

Keeping in view the objectives, an extensive review of literature was done relating to the topic under study. The literatures reviewed for the present study were divided into two sections viz. studies done in India and studies done abroad and were presented in a chronological order.

2.2 STUDIES DONE IN INDIA

Menla Rasem (1984) carried out a study on Environmental Education programme in some selected primary schools in Mokokchung town. The objectives of the study were to find out the reactions of the teachers towards Environmental Education programme in primary schools and to find out the difficulties faced by the teachers in teaching the subject at the primary level. The findings revealed that teacher's reaction towards Environmental Education was positive. Teachers faced considerable difficulties in teaching environment at the primary stages in Mokokchung town. The study also revealed that 100% of the teachers were of the opinion that Environmental Education helped children acquire awareness and understanding of the environment in which they live. 95% of the teachers were of the opinion that Environmental Education helps children to understand the various problems associated with the environment. 91% of the teachers were of the opinion that the environmental subject helps to motivate children to actively participate in environmental protection. 85% of the teachers were of the view that the environmental subject helps children acquire skills for identifying and solving environmental problems. 91.70% of the students took keen interest in Environmental Education but the teachers faced constraints and difficulties for successful performance due to shortage of materials. 50% of the teachers felt that the topics on environment were not related to the actual situation of the school. 73% of the teachers were of the view that the syllabus on environment does not suit the children of certain stages and syllabus on environment was too hard for the child. 11.70% of the teachers felt that the students do not take interest in the environmental subject. 36.70% of the teachers felt that the topics on environment were not according to local needs. 63.30% of the teachers hold the view that the syllabus on environment is too hard for the child. 85% of the teachers were of the view that teaching aids were not locally available and 91.70% of the teachers felt that supplementary and reference materials on environment were not easily available.

Pareek, Ashok and Kumar (1986) conducted a study on environment awareness among higher secondary school students. The main objective was to assess the existing environmental awareness and to identify the lessons needed for secondary school students of Jaipur. The findings of the study revealed that 40% of the students showed poor environmental awareness and the remaining 60% were well versed with their surroundings and have appreciably well to excellent knowledge about the various environmental issues. There was significant difference between rural and urban secondary students. Urban secondary school students had a higher cognitive level of environmental awareness. There was no significant difference between boys and girls studying in secondary schools, both have equal cognitive level of environmental awareness.

Shahnawaj (1990) made a study on environmental awareness and environmental attitude of secondary school teachers and students. The study was related to issues of teachers and students awareness and attitudes towards the environment. The major findings of the study revealed that there was no significant difference between the environmentally trained teachers and untrained teachers in their environmental awareness and attitude. Teachers possess more environmental awareness than the students. Female students possessed significantly more awareness of the environment than male students.

Synrem (1996) made a study on environmental awareness and environmental attitude towards environmental education among the college students in greater Shillong. The objectives of the study were to find out the environmental awareness among the college students; to compare the awareness level among the college students on the basis of gender, course of study and type of colleges; to find out the relationship between environmental awareness and attitude towards environmental education among the college students. The major findings of the study indicated that the level of environmental awareness and attitude towards environmental education of the college students was very good. There was no significant difference on the basis of gender, course of study and type of college in their attitude towards environmental education and environmental awareness. The findings also revealed that the third year degree course college students have a satisfactory level of environmental awareness and favourable attitude towards environmental education.

Nakro Vengota (1999) carried out a case study on rainwater harvesting on Kikruma village of Phek district. The findings revealed that the Chakhesangs have evolved an indigenous way of harvesting water by constructing water harvesting ponds and trapping runoff rainwater

through contour trenches and have used even highways as catchment areas whereby speed breakers shaped like slanting risers are constructed to divert runoff water to the pond to irrigate their rice fields. Irrigation channels were constructed to supply the water to the terrace fields. The water harvesting pond serves as a reservoir for irrigation as well as acts as a source of drinking water for animals. Rice, fish and tomato were produced from such type of farming and the surplus produce was also supplied to markets.

Nakro Vengota and Liezie (1999) carried out a comparative study on agroforestry system of Vietnam, Laos and Nagaland. The purpose of the study was to study the transition from subsistence shifting cultivation to market oriented agriculture in Yen Bai district in Vietnam and Xiengguen, Pak Xeng, Ban Katchet and Ngoi districts in Laos. The study revealed that the extent of shifting cultivation is not very extensive in Vietnam whereas in Laos and Nagaland the practice of shifting cultivation was very extensive, sometimes even covering the whole mountain. The entire area under shifting cultivation was cleared and tree stumps were also cut down close to ground in Vietnam as well as Laos whereas in Nagaland, some trees are cut off at chest height while some trees are left alone. Poles were also erected to provide support to climbing varieties of plants. The plot is then burned whereby in Nagaland the unburned residue was used as contour bunds to prevent soil erosion. In Vietnam and Nagaland mixed cropping is practiced whereas in Laos only rice is cultivated. It was observed that there was massive soil erosion in Vietnam as well as Laos in areas under shifting cultivation whereas in Nagaland, there was less soil erosion. Vietnam aimed at converting jhumlands into a permanent source of income by growing cash crops like styra, bamboo, eucalyptus and tea, while Laos planted teak and made efforts for growing cash crops and Nagaland cultivates ginger and colocasia and plant trees.

Rajakumari (1999) conducted a study on environmental concern and sustainable development – the role of NGO's. The main objectives of the study were to assess the role of the NGO's in sustainable development with special reference to environmental protection; to study the impact of grass root level NGO's on the environmental awareness of the students; to study the catalytic role of the NGO's in bringing about pro-environmental attitudes and behaviour among the housewives of a residential colony. The study revealed that the impact of non-formal education imparted by the NGO's on environmental awareness and knowledge of students was positive and on pro-environmental perception and practices of the housewives was high.

Sema N. Savito (2002) carried out a study on the status and problems of teaching environmental studies at the primary level in Nagaland. The main objectives of the study were to make an inquiry into the nature and scope of the existing environmental studies and existing facilities available for teaching of environmental studies programme in Nagaland; to study the professional preparation of teachers of environmental studies at the primary level; to study the methods and techniques followed in the teaching of environmental studies; to find the awareness level and attitude of students and teachers towards the environment and its relationship with human life; to find the impact of environmental studies on daily living of primary school children; to suggest measures helpful in the improvement of teaching of environmental studies at the primary school level and to develop a programme for environmental studies for primary school level. The findings revealed that there was no separate cell for environmental studies in the concerned department. No separate fund, facilities and provisions specifically for environmental studies were provided. Under qualified teachers were made to deal with the course. Course concentrates on theoretical aspect but neglect the practical aspect. The investigator suggested that subject teacher training programme should be extended to both public/government and private school teachers since both are teaching the same course.

Sharma Bidula (2002) conducted a study on environmental education and environmental awareness among the secondary school students with special reference to Nagaon town. The main objectives of the study were to find out the activities of the school regarding environmental education and environmental awareness; to find out the environmental awareness and knowledge of environmental education and awareness; to know the students participation on environmental education programmes; to make a comparison between the views of the boys and girls regarding environmental education and environmental awareness. The findings revealed that the activities regarding environmental education and environmental awareness were not adequate. No difference was found between the views of boys and girls regarding environmental education and awareness. Environmental awareness and knowledge of environmental education was confined to a small number of students.

Bhatterjee, Tanushree (2003) carried out a study on environmental education and awareness in the secondary schools of Silchar, Assam. The main objectives of the study were to examine the availability of literature pertaining to environmental education and awareness in the secondary school curriculum; to analyze environmental education and awareness among the secondary school students with respect to sex, medium of instruction, and management of

the school; to analyze teaching-learning methodologies adopted by teachers in dealing with environmental education and awareness; to study the problems faced by the teachers in dealing with environmental education and awareness. The findings of the study revealed that more than 83% schools involve themselves in plantation of trees, generating quiz and debate competition etc. Awareness programmes on environmental education was rendered by NGO's in Assam. Schools from English medium backgrounds undertake environmental education activities in a better manner than their counterparts. Books and magazines were adopted as the major medium to generate awareness among students on environment by more than 83% of teachers. Teachers perceive four main hurdles in the context of environmental education. 50% to more than 83% of teachers perceive that environmental education is not possible due to limited time availability, lack of government support in terms of programmes and resource materials and unwillingness of the principal.

Lalchharliani (2004) did a study on environmental pollution, awareness and attitude towards environmental education among college students in Aizawl district. The main objectives of the study were to find out the level of environmental pollution awareness among college students; to compare the environmental pollution awareness level among the college students on the basis of gender, streams and type of colleges; to find out the relationship between environmental pollution awareness and attitude towards environmental education among college students. The findings revealed that the level of environmental pollution awareness of the male college students is higher than their female counterparts. The study also showed that the students studying in both deficit and private colleges possess a satisfactory high level of environmental awareness.

Vizo Kiyasetuo (2007) carried out a study on farming practices in relation to village level social institutions for sustainable development in Nagaland. The main objective of the study was to find ways and means of establishing symbiotic partnership between the farmers and the village level social institutions for accelerating the process of sustainable agricultural development for bringing about rural prosperity in Nagaland. Study revealed that shifting cultivation in a hilly region with high annual rainfall was not conducive to the health of the natural resources as well as not the best farming system hence farmers should be encouraged to adopt more settled permanent agriculture/ terrace cultivation. Integrated farming or mixed farming which is taking up both animal husbandry and crop husbandry together is the best option. The Village Councils (VC) and Village Development Board (VDB) can help rural farmers through introducing new farming technology, training the farmers through

programmes like capacity building and skill upgradation, give loans at cheap interest rates and creation of marketing networks, as they have the resources. The government instead of following a top-down approach should adopt a bottom-up approach in sustainable agricultural development whereby major decisions should be left to the farmers and their village communities led by their council and development boards. The desired result can be achieved through strengthening the partnership between the farming community, their councils along with the development boards and the state government.

Pradepta K. Bhuyan et al, (2010) discussed the use of Air Quality Index (AQI) describing air pollution in Choudwar area. This study identifies the potential sources of air pollution. The data obtained showed the highest complaints. Shortness of breath and skin irritation is mainly shown by the tempo drivers and the others in Thatipur. Since this is a commercial area of Gwalior, the percentage of people affected by sneezing, sore throat and shortness of breath, was the highest in railway station and Gola ka mandir. This may be due to the fact that tempos, buses, trucks, trains and private cars are more common and they are not well maintained. Shortness of breath is very common in these areas. The health effects in Kampoo were found rare, this may be due to the fact that this area is not congested and the fleet of traffic is lesser. The people were mainly affected by skin irritation, this may be due to the fact that their vehicles which are not well maintained.

Bhandwaj and Behal (2011) carried out a study on environment awareness and attitude among college students of Delhi. The objectives of the study were to study the level of students awareness about environment; find out the relationship between students environment awareness and attitude; examine the differences in students awareness and attitude about environment based on gender, level and academic stream. The results revealed that overall environment awareness was moderate while environment attitude was high. There was no significant difference between gender towards environment awareness and environmental attitude. The significant positive correlation between environment awareness and attitude showed that students having more awareness towards environment were having proper attitude towards environment. There was significant difference between different academic stream of students as well as level of study towards environment awareness and attitude. Science students had more awareness and positive attitude towards environment. There was significant difference in environment awareness and attitude of undergraduate and postgraduate students. Thus the study revealed that the level of study improve the level of awareness and attitude regarding environmental issues.

Sivamoorthy, Nailini and Kumar (2013) conducted a study on environment awareness among college students in Tamil Nadu. The objective was to measure the environment awareness level and general environment practices among the college students. Findings revealed that 90.47% of the students have high environment awareness whereas 9.53% had moderate awareness. There was no association between gender and environment awareness. Hence it can be said that irrespective of gender, students were aware about environmental protection. Majority of the students had moderate level of environment practice. There was significant difference between gender and environment practice. The environment practice was much higher among the females than the males. There was no significant correlation between environment awareness and environment practice.

Ao Lanukumla (2014) carried out a study on deforestation in Nagaland. The main objective of the study was to find out the extent of deforestation. The findings revealed that gradual disappearance of forest over the years is due to logging as logging cannot be regulated. On climate, Dimapur, Kohima, Mokokchung, Phek, Wokha and Zunheboto showed rise in temperature with Dimapur district making a record of gradual rise for the past three years and in most of the years, rainfall shows a fluctuating rate. The jhum cultivation which is a predominant form of agriculture in Nagaland was the major cause of forest fires and that although traditionally jhum was sustainable but due to increasing population it has led to shortened cycle. Water scarcities are a potential constraint for the people and the absence of an effective irrigation system or water harvesting practices adds to the vulnerability of the people. Use of firewood as primary source of energy leads to forest loss especially in rural areas and keeping of piles of firewood at home is a matter of prestige and material wealth. Private land ownership pattern has hindered implementation of forest conservation laws as the state government owns only 11.70% of the forest land while communities own 88.30% therefore lack of cooperation among landowners leads to failure of forest conservation programmes. Nagas mainly depend on agriculture for their survival. The forest department establishes laws to conserve the forest, however at the same time, policies to provide for economic livelihood of farmers involve the introduction of economic plants and cash crops, thus farmers are lured to cultivate them leading to further degradation. To limit or prevent the people's occupation in agriculture means the intensification of economic problems. Therefore deforestation due to agriculture cannot be avoided and deforestation is a serious threat to global climate change.

Lohe Sakhoveyi (2014) conducted a study on resource management, environmental management of degraded ecosystems in Phek district of Nagaland. One of the objectives of the study was to propose appropriate plan for ecosystem restoration, natural resource conservation and utilization and environmental management for sustainable development. Findings revealed that the environment in Phek district has been degraded by land use mainly due to shifting cultivation, deforestation, road construction, soil erosion, landslide and dwindling water resources. Although Phek district has an area of 2026 sq.km yet 65% of the total area is degraded and the area is unstable and fall under 5th seismic zone. The damage to the ecological balance is primarily man induced or due to human unscrupulous negligence or ignorance of the delicately fragile ecosystem of the region. The whole of Phek district is under moderate to severe soil erosion and there is also water degradation or pollution. Improvements in the environmental state of affairs may be achieved through check on the destructive activities of man, conservation, regulation and regeneration of nature. It advocates rational adjustments of man with nature involving judicious exploitation and utilization of natural resources without disturbing the ecological balance and economic equilibrium. Environmental management involves socio economic development of the society on one hand and maintenance of environmental quality on the other hand.

Nikhat and Shafeeq (2014) carried out a study on environment awareness among professional and non-professional undergraduate students of Aligarh Muslim University. The objective of the study was to study the environment awareness among undergraduate students in relation to type of course, gender, Socio-Economic Status, religion and academic stream. The results showed that 95% of the students in professional courses have high level of environment awareness and 5% of students have moderate level of awareness whereas under non-professional courses, 27% of the students had high level of environment awareness, 70% of the students have moderate level of environment awareness and 31% fell in the category of low level of environment awareness. Girls were more aware than boys in their environment awareness. Students from professional courses were more aware than students of non-professional courses in relation to their SES. There was no impact of religion on students over environmental concern. Students from professional courses from religious background viz., Hindu and Muslim, have equal concerns about their surroundings. Science students were more aware than arts students. There was no significant difference between commerce and arts students. Science students have more environment awareness than commerce

students. Thus it can be said that students from professional courses exhibit relatively higher degree of environmental awareness than their counterparts.

Sharma (2014) conducted a study on environment awareness of college students in relation to sex, rural-urban background and academic streams in Himachal Pradesh. Results showed that no students have low environment awareness level. Among male students, male students from science stream had high level of environment awareness compared to commerce and arts students. In the urban areas, male students from both commerce and arts streams have high level of environment awareness in comparison to science students whereas in the case of rural female students, all science students had high level of environment awareness compared to commerce and arts students. In urban areas, both female students from science and commerce streams had high level of environment awareness compared to arts students in relation to sex. There was no significant difference in environment awareness among the students and students of both sex possessed equal level of environment awareness. In relation to area, there was no significant difference between environment awareness of students belonging to science, commerce and arts stream.

Brenda (2015) carried out a geographical analysis on the impact of shifting cultivation on environment in Mokokchung district of Nagaland. The main objectives of the study were to promote sustainable economic development of the people living in rural areas, to propose management plans for its natural habitat that is usually destroyed during jhum operations, to promote environmental conservation and restoration of ecological imbalance and to generate and adopt technologies that promote sustainable use of resources and improve livelihood. Study revealed that jhum or shifting cultivation is a way of life for the Ao- Nagas and which is deeply rooted in all the Naga cultures, customs and beliefs. Conservation and management should be done through active mass community participation. The practice of jhum cultivation coupled with high population growth has degraded the area and deforestation. Human interference led to climate change, soil erosion, loss of forest cover, low yield crops and massive extinction of flora and fauna. At present most of the jhum lands are converted to monoculture and plantation farming, permanent forests or cash crop plantation areas and wildlife reserve. One of the main reasons of deforestation is due to shifting cultivation followed by demand for firewood and logging and forest fires. Home garden are also done by farmers thus helping in the overall production system as well as maintaining stable ecological environment. Watershed management may increase production of fuel wood and fodder, boost horticulture, animal husbandry and pisciculture which in turn

will reduce surface run off and flood and also up avenues for job. Traditional methods of conservation by using physical barriers like stones or boulders, poles, bamboo, soil furrow and live barriers like use of crops and broom grass. Good fallow management systems that are biologically and economically sustainable are needed for better production. Agro-forestry should be adopted. Participatory planning, finance activities and general awareness programmes would enable sustainable land use and ecological management.

Gunde and Parit (2015) undertook a study to find out the effect of sex and faculty on environment awareness of the college students. The objectives were to study the effect of sex on environment awareness of the college students, to determine the effect of faculty on environment awareness of the college students and to examine the influence of interaction between sex and faculty on environment awareness of the college students. Results indicated that females have better environment awareness than the males. Art students were not significantly inferior to commerce students on environment awareness. However science students were significantly superior to arts and commerce students on environment awareness. Sex and faculty are independently affected on environment awareness whereas interaction effect was not significant.

Imchen Nukshienla (2015) carried out a study on integrated watershed management as a key to sustainable development in Nagaland. The objectives of the study were to encourage people's participation in different levels for successful planning and implementation of massive watershed management programmes in Nagaland, to explore ways and means to promote sustainable development through integrated watershed management in Nagaland. Findings revealed that the state has been greatly affected by the land use change mainly due to shifting cultivation on the hill tops, deforestation, accelerated soil erosion and landslide. Population growth has aggravated the land use system therefore conservation and development is possible only through integrated watershed management in Nagaland. Sustainable development strategy can be evolved through people's participation at all stages of planning, execution and maintenance and equitable share of benefits and by strengthening village level institutions. Creation of environmental awareness is a must and introduction of water harvesting practices in the areas which face water scarcity.

Kholi (2015) conducted a study on environmental education, attitude and awareness of students at college level in Nagaland. The main objective of the study was to compare the attitude and awareness of college students regarding the environment. The results revealed

that 36% of the students participated in creating environmental awareness programmes, 30% did not participate and 35% participated sometimes. 52% participated in environmental conservation, 24% did not participate and 26% participated sometimes. 92% of the students participated in environmental awareness activities viz., mass social work and cleanliness drives, 42% participated in mass tree plantation, 48% bought eco-friendly products, 55% practised proper waste disposal method, 44% participated in environmental seminars and workshops and 71% participated in field study. Student's awareness about healthy environment in college campus was as follows; 91% said that smoking should be banned in college campus, 92% said that there should be no spitting on the walls and 92% said that they didn't use tobacco in college campus. 80% of the students showed interest in environmental education subject whereas 6% did not show interest and 12% said they cannot say. 92% of the students said that environmental education was important whereas 8% said that environmental education is unimportant. Hence it can be said that although only one-third of the students participated in creating environmental awareness programmes, a large majority of the students participated in environmental awareness activities like tree plantation, buying eco-friendly products etc and also majority of the students had positive attitude towards environment and showed interest in environmental education subject.

Kinny Avitoli (2017) carried out a study on socio economic change and their impacts on environment in Nagaland with special reference to Zunheboto district. The objectives of the study were to ascertain the socio-economic and environmental status of Nagaland in general and Zunheboto district in particular, to examine the trends and patterns of socio-economic changes on the environment and to develop strategies for sustainable economic growth. Findings revealed that with the passage of time, production in terms of rice and other crops have witnessed changes. Though the yield of rice have remained unchanged over the years other crops yield have decreased or fails. Study also revealed that traditionally preserved seeds are infested by storage grain pest which were of recent occurrence and increased pest population was observed which can be attributed to global warming. Area under jhum cultivation is decreasing even though there is increase in people practicing jhum cultivation due to decreased labour force. Use of sophisticated tools for hunting and fishing has led to decreased wildlife. Families that practiced jhum cultivation suffered from respiratory/chest problem which was caused due to smoke inhalation while burning the forest, improper ventilated kitchen and dust pollution. The larger population was not aware about the various schemes by the initiated by the state and central government as well as other agencies on

environment. Many of the villagers were not aware of the environmental issues as well as the importance of conservation.

Shikhu, Alomi Cynthia (2017) carried out a study on woman and resource management and shifting cultivation. The objectives of the study were to analyze the role of women in agriculture through shifting cultivation and the nature of Naga women's participation in the management of resources. Findings revealed that though considered economically inefficient and ecologically harmful to the environment, shifting cultivation continues to be widely practiced in many parts of the state with up to 90% of the cultivable land under this form of cultivation. Naga women play a significant role in using the resources and actively contributing to the conservation of the biodiversity through seed preservation. Women are the primary seed selectors as well as preservers in all the districts of the state. The study also found that 96% of the womenfolk practiced kitchen garden out of which 96% was maintained exclusively by women. The produce from kitchen garden were used for consumption as well as sharing with neighbours, family and friends and the surplus products were sold.

T.K. Bhartiya (2017) carried out a study on assessment of environmental awareness among general public of Assam. The main objectives of the study were to study the environment awareness among the males and females of Assam and to compare the awareness between the males and females population. The findings revealed that females were more aware than the males of Assam in terms of environment awareness and environment protection. But on observing the t-value between the scores of males and females, it was found that there was no significant difference in environment awareness among the males and females of Assam.

Dr. D. Satabdi (2020) carried out a study on India's environmental laws and COVID-19/green economy. Findings revealed that suspension of industrial activities, transportation and other activities during lockdown imposed due to outbreak of COVID-19 caused rapid improvement in air and water quality across the country. Some studies have shown association between air pollution and increased chances of death due to COVID-19. Water shortage constrains communities from maintaining basic hygiene and sanitation during outbreak of infectious diseases like COVID. Thus dealing with pollution to maintain carrying capacity of the ecosystems and community health in a highly populated country with unplanned human settlements is a challenge. Anthropological threats to the biodiversity and ecosystems in protected areas and biodiversity hotspots make India more vulnerable to future pandemic. Protected areas management principles, which are materialised through wildlife

and forest protection laws, fall short on certain aspects as it include lack of surveillance and standards, unsustainable tourism practices, denial of the role of indigenous communities in forest and wildlife conservation activities and withdrawal of the rights of the communities to have access to forest resources which often aggravate human-wildlife conflicts. Cultivation of indigenous crops with genetic diversity, sustaining ecosystem functioning and maintenance of agro-biodiversity need to be ensured to be better prepared for situations like the current pandemic or climatic threats. Agricultural laws and regulations should be driven in that direction. Coastal and inland resilience should be developed through integrated action towards of disaster proof infrastructural planning, crop planning, and social security and livelihood protection through strengthening of disaster management plan, coastal regulation, zone notification and its implementation. India should rethink and redesign the national policy focus that follows a green and sustainable path. After COVID-19 outbreak, the economic recovery package announced by the government focussed primarily on short term coping mechanisms which neither had any long term vision nor any measure to make economic recovery greener or pro-environmental, instead India had diluted Environmental Impact Assessment (EIA). Hence the needs to focus on environmental factors have become more evident.

M.H. Shakil (2020) carried out a critical review and research agenda on COVID-19 and the environment. The aim of the study was to critically review literatures available on the environmental causes and consequences of COVID-19. A total of fifty seven reviews on literature available worldwide was done. Findings revealed that COVID-19 pandemic has led to improved environmental quality. Actions taken by the government across the world have led to significant reductions in environmental pollution and improvements in environmental quality, particularly in countries with severe COVID-19 transmission like China, United States of America, Italy and Spain. These countries experienced sharp reductions in sharp reductions in carbon emissions, air pollution, sound pollution and pollution of beaches. However these reductions were due to lockdown and were persistent within the lockdown. Whether the environmental quality will persist in the long run is unknown therefore it is crucial to investigate whether the reduction in pollution will continue post-lockdown. Findings also revealed that environmental factors also contributed to both the spread and reduction of COVID-19 transmission and mortality rates. It was also evident from published research that carbon emissions and air pollution reduced significantly due to lockdown. However research/literature on how to deal with a large volume of medical waste and how to

recycle and decompose waste in the post lockdown period is not evident. Hence future research should provide necessary policy recommendations and purpose holistic model for government and regulatory bodies on how to control environmental pollution and recycle medical waste post lockdown.

S. Lokhanwala and P. Gautum (2020) carried out a study on environmental research-indirect impact of COVID-19 on environment in Indian context. Results indicated that there was 85% reduction in particulate matter (PM_{2.5}) concentration. Lockdown has no effect on sulphur dioxide (SO₂) concentration on air quality. Lockdown have significant impact on concentration of most of the parameters like PM_{2.5} (particulate matter/course particles with diameter of 2.5 micrometers to 10 micrometers), PM₁₀ (particulate matter with diameter of 10 microns or less), nitrogen dioxide (NO₂), nitric oxide (NO), Oxone (O₃), ammonia (NH₃), carbon monoxide (CO) and Benzene (C₆H₆). Control of local transportation and limited industrial activities has decreased the overall pollution load on air. European space agency had revealed that there was significant reduction in nitrogen dioxide (NO₂) levels in the Indian atmosphere during the lockdown. The concentration of PM_{2.5} and PM₁₀ had reduced considerably. Air quality had being significantly improved after corona outbreak. There was improvement in the quality of water in rivers in India.

M, Nchumthung and D, Sanjoy (2021) carried out a study on zabo farming system, a sustainable farming based traditional knowledge for natural resource management practiced by the tribals in Nagaland, India. The study focused on the practices and importance of the zabo farming system which is as indigenous farming model practiced by the Naga tribes in Nagaland. Zabo is an integrated farming system comprising of crops, animal husbandary, fishery, silviculture, water harvesting etc done along the slopes of hills. This farming system comprises a protected forest on the hilltop, animal husbandry, harvesting pond at the middle elevation and paddy cultivation at the lower elevation. The protected forest acts as a catchment area whereby runoff water is collected in the harvesting pond, which is then diverted to the paddy field through the irrigation channel. The water is made to pass through the livestock enclosure which in turn enriches the soil fertility. Cultivation of paddy is the main component of the zabo farming system. Paddy is reared along with fishes during the growing season of the paddy. Thus zabo farming system is an alternative to shifting cultivation which is sustainable and eco friendly and feasibly for a hilly topography like Nagaland.

2.3. STUDIES DONE ABROAD:

Sigler (1973) focused his attention in awareness on solid wastes as a problem and other environmental problems and the effect of social variables in explaining these differences in attitudes. The major findings of the study were there was a hierarchy among pollution problems for the people of Illinois, with the pollution of rivers and lakes ranking highest, followed by air, solid waste, noise and visual pollution. Younger people felt more serious problem than older persons from the effect of solution. More highly educated people rated pollution as more serious than less educated people. The high income group rated pollution more serious than the low income group. There was no relationship between the problem of solid waste and sex, the highest correlation was with city size. The higher the socio-economic status the more respondents were willing to or currently did participate in recycling operations.

In a study by Szagun and Pavlov (1995) on German and Russian adolescents environment awareness, it was found in both nationalities, anxiety, sadness and anger about environmental destruction was high, but hopelessness was rejected. German adolescents expressed more readiness for pro-environmental action and more consideration in human relations with living things than Russians. German adolescents were willing to perform small scale pro-environmental action but with age, they became increasingly reluctant to accept greater commitments on ecology. Females of both nations agreed more strongly to emotions and actions than males, particularly males aged 15 and above.

Badkobi et al (2001) conducted a study on assessment of primary school teacher's educational condition in different zones of Tehran municipality in environmental subjects and the ways of elevating their awareness. The study revealed that male teachers have more awareness about the environment. The level of environmental awareness of science teachers was more than that of other subject teachers. The level of environmental awareness of teachers was enhanced by increasing their education level.

Hadipour and Shokravi (2002) study on the public level of environmental awareness and methods of environmental education for housewives and women teachers in the elementary schools of Arak city indicated the necessity of Environmental Education and a basic weakness in information dissemination. It was found that popular lack of information and awareness is the vital factor for creating and increasing of environmental problems. More than one-third of the teachers are of the opinion that viewing training films and holding

training class for students are the most effective methods in Environmental Education. Lack of sufficient popular training and proper organisation are the outstanding reasons for unsatisfactory levels of official organizational activities.

Ifegbesan Ayodeji (2002) carried out a study on students perceptions of Environmental Education elements in Nigerian junior secondary school curricula. The major findings of the study were that the majority of students get environmental education from non-formal sources of information viz., - radio, television, newspapers and magazines, very few learned from workshops and seminars. Students possessed low cognition about environmental education elements in their curricula. There was no significant difference between males and females on environmental education perception. Students were found to be willing to participate in environmental programmes organized by the government and NGO's.

Karimi (2003) carried out a survey on Environmental Education needs for students, teachers and housewives in the Khak Sefid district of Tehran. In this survey, the degree of awareness of three groups of people of different social classes of people in this district had been studied by using Kaufman, Currihan and Johnson's models of needs assessment. Results showed that the consciousness of the average housewife on environmental awareness was very limited. The relative knowledge of the teachers and students on the general concept of environment was greater. In each of the three groups (students, teachers, housewives) most of the individuals were eager to learn more about the environmental issues. Yet very few were willing to pay the costs for such training. Finally the investigator proposed training program and appropriate training styles for each group.

Flora (2009) conducted a study on the effect of college student's gender and major on beliefs towards organic food in Ohio, United State. The main objective of the study was to measure if academic major and gender influence the perception of organic food at Northeast Ohio University. The findings of the study revealed that students perceived organic food as being superior to conventional food in every aspect while not knowing the regulations and production of organic foods. There was no significant difference with respect to gender and academic major in relation to their perception of organic foods.

Hansen-Ketchum, Marck and Reutter (2009) concluded that there are multiple evidence of gaps related to the effects of individual experiences with nature in local settings, the perceptions of barriers and facilitations to engaging with nature, the socio-political and environment conditions that contribute to disparity of ability to engage with nature, the

perspectives of health professionals and policy makers on nature based health promotion, the correlations between human and environment health, the socio-ecological complexities of engaging with nature to promote health, nature based interventions used in conjunction with other health promotion or ecological initiatives.

Aminrad (2010) evaluated the awareness and attitude of a group of 541 Iranian students of 14 Malaysian Universities. The results revealed that environmental awareness of the students was moderate while environmental attitude was high. The study also found that there was no significant difference between groups of students based on gender while environmental awareness results indicated that there was significant difference among different levels of education. It was also found that the media positively affected the level of environmental awareness and attitude of students. The study concluded that increase in age and level of education would improve the level of awareness and attitude towards environmental issues.

Dyehouse, et al (2010) conducted a study to find out the effects of resistance to change to student's environmental knowledge and attitudes when leaving high school, at Midwestern University. Results showed that over half of the students did not receive any environmental education in high school and that students were most knowledgeable about topics receiving more media attention like global warming than other topics like photochemical smog. Cognitive rigidity was a significant positive predictor of environmental knowledge for all cohorts while other resistance to change subscales was significant negative predictors. Further results showed a significant relationship between region and resistance to change. These results suggest that students views about the relevance of environmental knowledge and issues may influence their learning about the topic. Environmental sustainability is a key responsibility of the educated engineer. Thus understanding engineering student's level of environmental knowledge/attitudes in relation to resistance to change could assist pre-college educators in more effectively addressing sustainability in their curricula.

Gaye Teksoz et al (2010) carried out a study on, a new vision for Chemistry education students; Environmental Education. The main objective was to identify the level of environmental literacy and perceptions on Environmental Education of pre-service chemistry teachers. The major findings of the study were that 90% of the students felt that environment is the second or third important problem. 70% felt that they have a fair knowledge about the environment. 15% felt that they know a lot about the environment and another 15% felt that they know only a little about environmental issues and problems. Pre-service chemistry

teachers felt that the University students must have environmental awareness in the society. They strongly felt that there is an urgent need for every individual to have a total knowledge about environment so as to protect the natural resources and this can only be achieved through the teaching and learning of environmental issues. Teacher education program should compulsorily have environmental education in their education curriculum so that teachers can integrate environmental issues into their lesson.

Gokhan Bas (2010) conducted a study on the effect of multiple intelligence instructional strategy on the environmental awareness knowledge and environmental attitude levels of elementary students in science course. The main objective of the study was to identify the effects of multiple intelligence strategy and traditional methods of instruction on elementary student's environmental awareness, knowledge levels and their attitudes towards their environment. The study found that there is a significant difference between environmental awareness and attitude of the experimental group and the control group. Multiple intelligence instructional strategy helped in the positive development of the student's attitude and the environmental awareness knowledge levels. Students educated by multiple intelligence instructional strategy have more environmental awareness, knowledge levels and also have higher motivation level than the students educated by the traditional method of instruction. The student's who participated in the multiple intelligence strategy, enjoyed the activities, had great fun and became more aware of the environmental issues.

Oguz et al (2010) conducted a study on environment sensitivity and awareness of first and fourth year undergraduate students of landscape architecture, town and regional planning and environmental engineering undergraduate programmes at universities throughout Ankara, Turkey. Findings showed that even though students take many courses on environmental issues, their environment awareness and environmental behaviour are lower than expected and student's grades show no significance on the results. It is concluded that environmental knowledge do not always influence awareness and behavioural intentions, a national strategy is needed for environmental education in higher education and current curricula should be reconsidered in terms of effectiveness.

Day and Joanne (2011) conducted a study titled as combining environmental education and art world in the primary grade for sustainability. The study was designed to raise environmental awareness and improve the social responsibility and actions in grade 2 and 3 at Montecito elementary school in Burnatry. They proposed a strategy pairing environmental

education lessons with art work projects to engage the students to improve the awareness of aquatic education, ecosystem and sustainability. Students were encouraged to investigate their knowledge, thoughts and feelings regarding nature through direct instruction of the ecosystem concept on behaviour modifications. They found that direct instruction of economic information contributed to an improved rating on environmental skills of students.

Allender et al (2011) reviewed possible regulatory options for local interventions to create environment conducive to physical activity and healthy eating. They found support for policies to encourage physical activities but not healthy eating. They suggested land use zoning to improve the walking environment, the cycling environment and the built environment for physical activity. However this study did not connect possible design elements in those spaces with successful outcomes in human health or governmental policy outcomes.

Graham B., et al. (2011) conducted a study on evaluating change in students environmental values as a result of administering an environmental course at the University of Newcastle. The objective of the study was to find out the impact of environmental learning in students of undergraduate design courses. The results revealed that students had a high level of existing awareness of environmental issues. There was an increase in post-course awareness across some key areas of the new ecological paradigm scale. Findings also revealed that there were some indications of positive change in perceptions of economic crisis. In addition the study also identified areas which need to be further addressed in environment oriented design courses; namely issues of development and resource use. Results also indicated positive student perceptions of their ability to apply their environmental learning to their professional design practice.

Koutoubi et al (2011) carried out a study on environmental knowledge of college nutrition students. The objective of the study was to assess the environmental knowledge of college nutrition students in regards to global warming, Genetically Modified Organisms (GMO), sustainable food systems and United States organic standards. The findings revealed that the overall environmental knowledge among college nutrition students was low. Overall knowledge comparing juniors at the beginning of the school year was statistically significant. When comparing juniors beginning to seniors ending, there was statistically significant increase in environmental knowledge in the genetically modified organisms, sustainable food

systems and organic standards sections. There was no statistically significant improvement in knowledge in regards to global warming.

Tartiu (2011) conducted a study on attitude and knowledge of college students from Bucharest Academy of Economic Studies regarding municipal waste. The objectives of the study were to find out the level of knowledge and awareness regarding municipal waste among students in the academy, their attitudes and willingness to act in waste related activities, if there are significant differences regarding student's awareness, knowledge and concern according to their gender, age, affiliation (faculty) or job status. The findings of the study showed that majority of the students were aware of waste problems. 60.32% of the students believed that waste is a risk factor, with consequences for public health and environment. The results revealed that students wanted the provision of frequent, appropriate and practical information on waste management in order to improve their waste management behaviour. It also showed that the student's attitude towards the issue of waste was high. The results also indicated that students attitude towards waste was not influenced by their faculties and gender. It was found that 68.48% of the students had high attitude towards the management of recyclable wastes. The majority of the students suggested that more special containers would solve the problem. Solutions given by students were larger container, more publicity on T.V/radio/newspapers, regarding recyclable wastes, private companies specialized in collection and sorting waste, more investments in awareness campaigns etc. 87.94% of the students were concerned about the environmental natural resources and waste management. A large majority of the students reported that they would contribute by separating recyclable waste, 13% said that they would pay the amount agreed by the community for a waste collection system, recycling and composting scheme, 12% emphasized their desire for participative learning in relation to waste issues.

Erdogan (2013) conducted a case study on environmental world views in the higher education in Turkish college students. This study was designed to explore the nature of Turkish college student's environmental world views and test hypothesized relations on environmental views, environmental course status, gender, school status and socio economic status. The findings indicated that 56.5% of the students hold previous environmental views while 24.6% embrace views associated with the dominant social paradigm and 18.8% have ambivalent views. Results provided partial support for hypothesized relationships. Female students, students with low socio-economic status and first year students have higher pro-environmental orientations. Taking a course on environment makes only slight differences in

opinions. It was concluded that student's environmental orientations change to a varying extent according to gender, socio-economic status and education which are probably determined by the historical and cultural context and characteristics of the population under study. Results suggest that there exist a reasonable level of environmental awareness; however university policies and practices on the environmental education and issues need to be reassured and geared towards cultivating environment sensitivity.

Heyl et al (2013) conducted a study on environmental attitudes and behaviours of college students. The aim of this research was to study the influences of gender and class in university engineering students on environmental attitude and pro-environmental behaviours. The results showed that university undergraduate engineering students on average have positive environmental attitudes. Overall recycling, water and energy consumption are those with higher average scores on environmental attitudes. The pro environmental behaviour showed a slightly positive average and is within the range of environment positive behaviours. The most common behaviours were closing the taps and putting lights out while the least common ones were participation in activities and recycling paper. Actions that were carried out less frequently were in many cases those that perceived to require more effort like cycling, buying organic products and participating in activities related to the environment. With regard to class, there were no significant differences in environmental attitudes and behaviour. Significant differences were found for the environmental variables with regards to gender but only among students in their first year. More pro-environmentalism was observed in females than in males.

Althor (2014) conducted a study to understand the environmental values and conservation preferences of Tertiary Environmental Education (TEE) students studying in Australia. The objectives of the study were to identify the values that Tertiary Environmental Education (TEE) students hold for the natural environment; to identify the attitudes that TEE students hold towards effective conservation decisions. The results revealed that a vast majority of students (99%) reported belief in the intrinsic value of nature ahead of the instrumental value of nature. The study also showed that students hold very high intrinsic values for nature, very high non-use value for nature and low use value for nature. These indicated that TEE students have highly value ethical considerations such as egocentrism and greater social well being but hold little value for the direct use benefits of natural resources. These ethical considerations have a direct correlation to the selections that students made. The students with the highest intrinsic value scores were also more likely to select species protection

option when asked about conservation case studies. There were no statistically significant relationships between case choice and students demographics. The study yielded a single statistically significant correlation between rural people favouring species conservation over landscape conservation. Thus the study revealed that the students held high environmental values and rural people were more concerned about species conservation as compared to urban people.

Clinchie E.Mc (2014) carried out a study at the University of North Texas (UNT) on students environment awareness. The purpose of the study was to study the opinions of students about environment and to find the differences in relation to their gender and academic major. The results indicated that the students from all categories had average environmental knowledge. The male science students had the highest knowledge and female non-science students had the lowest knowledge but there was no significant difference between the four categories of students (male science majors, females science majors,, male non-science majors and females non-science majors). According to the students it was important to care for the environment because the planet was theirs, where they lived, they need the resources and there was no other place to live, the fabric of the society is tied to social stability, the basic beauty of the environment need to remain so that what makes the earth is not lost. Most students regarded the environment as a source of the things that are needed in their lives and not something with its own worth or value. The students cared for environment by recycling, water conservation, walking or carpooling and using energy saving appliances. Approximately 62% of the students said that they only recycled at the university and 13% of the students said that they recycled along with walking to the class and conserving water.

Filzah et al (2014) conducted a study on attitude towards recycling among business undergraduate in Malaysia. The objective of the study was to probe the recycling behaviour among business undergraduate students in Malaysia. The results indicated that the attitude of undergraduate business students on recycling was high. The student's behavioural intentions were also high in relation to recycling. It also showed that the attitude towards recycling had the highest influence on the students as compared to other independent variables i.e., subjective norms, perceived behaviour control, behavioural intention and recycling behaviour. This implicates that once the students possess a positive attitude towards recycling, the possibility of them to recycle will be higher.

Kong D. et al (2014) carried out a study on environment awareness in Shanghai college students. The purpose of the study was to look into the opinions and priorities of the students concerning environmental issues, investigate and analyse the factors which influence student's environmental views. The study showed that Shanghai college students in general, regard environmental issues with a high sense of urgency. Urban air pollution was regarded as the most urgent problem because the Chinese students had experienced the effects of some local environmental problems personally. Global warming was also on average rated as an urgent environment problem and females were more concerned about environmental issues than males. 60% of the students were of the opinion that environmental concerns should be prioritized over economic growth. Economic standards seemed to affect the opinion of the students whereby the higher the family income, the more priority was put on environmental concerns. Similarly the better developed the hometown of the students, the more willingness to prioritize the environmental concerns. The Shanghai college students in general were willing to pay extra for renewable electricity and the higher the family income of the students, the more willingness to pay for environment friendly energy. Among all renewable energy, solar energy was rated most favourable. Majority of the students regarded that the government has the most responsibility while the industry also has a lot of responsibility. Only 19% of the students hold the opinion that the general public should take the most responsibility. The students regarded the general public as having neither power, influence nor the resource to take responsibility for environmental protection.

Rideout (2014) conducted a study on environment awareness of students at Liberal Arts College. The purpose of the study was to explore student's enrolment of an environment worldview during the college years. Results indicated a low pro-environmental level of endorsement among the students. Women showed higher new ecological paradigm level of endorsement. Year of sampling had a significant effect that was restricted to one year and appeared to represent a negative effect of the recession on environmental concern. There was no significant difference by class status and academic major. Knowledge of the cause of global warming was at a relatively low level. Knowledge of definition of carbon footprint showed higher levels of understanding. Despite higher levels of new ecological paradigm scores, women showed paradoxically lower level of performance on knowledge. Students in general felt that the lack of an environment component did not indicate that the college thought these issues were unimportant but more than half felt that if there was such a component, it would increase their belief in the importance of these issues.

Hardesty D. (2015) investigated the relationship between local environmental knowledge and environmental concern among college students. The goal of the study was to find out if environmental knowledge influences an individual's level of concern for the environment; if college grade level influence a person's level of concern for the environment; if degree programmes influence a person's level of concern for the environment. Results indicated that local environmental knowledge is not significantly related to an individual's level of concern for the development and that local environmental knowledge does not affect environmental concern. College grade level also displays no significant relationship to an individual's level of concern for the environment and therefore does not affect concern. However environmental concern is significantly related to degree programme type. Students who major in agricultural sciences tend to display significantly lower levels of environmental concern as compared to humanities, applied sciences/chemistry, environmental studies/fisheries, wildlife and biology. The study found that the root cause of environmental concern is complex and that many factors play a key role in cultivating concern for the environment within a person as determined by acceptance of the new economic paradigm. Hence education plays a role but the type of education is still to be determined.

L. Matelskietal et al (2020) carried out a study on the negative impacts of environmental on COVID-19 and its health outcomes. The study discussed about how environmental pollutants increase susceptibility to COVID-19. Findings identified air pollution as a major contributor to COVID-19 mortality. Individuals living in areas with high air pollution faced more severe health outcomes and were more likely to die from COVID-19 than those living in areas with clean air. Air pollution worsens the adverse health effects caused by respiratory flu viruses like influenza and respiratory symptoms. Studies from all over the world have concluded that increased levels of particulate matter are associated with increased incidence and severity of viral respiratory infections. Even short term exposure to high levels of atmospheric pollution and chronic exposures to particulate matter concentrations within regulatory limits have been associated with increased number of hospitalisations for viral respiratory infections. Pre and prenatal exposures to a number of persistent organic pollutants are associated with reduced immune response after vaccination and increased susceptibility to respiratory infection during childhood. Occupational exposures to various pesticides are also linked with immune suppression and increased risk of respiratory diseases. Environmental pollutants are thought to influence an individual's response to viral infection by compromising host defence. Pollutants adversely affect cells performing anatomical barriers against viruses. Exposure to

particulate matter and ozone induces oxidative stress in respiratory epithelial cells leading to damage, increased permeability and cell death. Pollutant exposure can change expression of cell surface receptors to facilitate viral adhesion and subsequent entry into cells. Environmental contaminants can also alter the composition of the micro biome that colonises epithelial surfaces of the upper respiratory tract. The lung micro biome contributes to mounting an affective local immune response in the lung however particulate matter decrease native micro flora species and increase pathogenic bacteria in the lung. Air pollution is also linked to differential cytokine responses and altered expression and function of surfactant proteins, important immune signalling and clinical defence molecules, respectively in the lungs. Exposure to particulate matter compromises macrophage response to various infectious agents. Natural killer cells eliminate virally infected cells however their activity is reduced by exposure to air pollutants and per- and polyfluroalkyl substances (PFAS). Pollutants can improperly amplify the immune response increasing the possibility of cytokine storm, linked to poor health outcomes in COVID-19. Environmental pollutants also increase risk for co morbid conditions that exacerbate viral diseases and worsen prognosis. Exposure to air pollution also induces a state of chronic inflammation which could possibly hinder or exacerbate the immune response to pathogens. Mortality from COVID-19 usually results from a deregulated immune response that increases risk of secondary infections, including collateral lung damage and compromises organ function. Therefore to minimise the mortality and morbidity associated with COVID-19 and the inevitable future viral epidemics and pandemic, it is important to not only enforce but also strengthen existing environmental pollution regulations and for humans globally to embrace lifestyle and policy changes that mitigate environmental pollution to the greatest extent possible.

Researchers/scientist from National Aeronautics and Space Administration (NASA) /Goddard space flight centre, United States Geological Survey (USGS), European Space Agency (ESA), (2020) carried out a study on environmental impacts of COVID-19 pandemic, as observed from space. Findings revealed that environment is quickly changing and the timing of those changes seems to indicate that the pandemic may be a reason. Deforestation rates are changing in some places, air pollution is diminishing, water quality is improving and snow is becoming more reflected in some areas since the pandemic occurred. However T. Newman was of the opinion that more research was needed to clearly attribute environmental change to COVID-19. In India, industrial activities slowed down because of COVID-19 after which air pollution levels dropped significantly. One study found that the concentration of

particulate matter (PM₁₀) decreased around a third to a fourth of the pre-pandemic level in India. Bair and his team found that snow in the Indus was significantly cleaner during the COVID-19 lockdown. Pollutants accumulating on the snow decreased by thirty six parts per million below the pre-pandemic average. Snowmelt is an important source of drinking water for residents of the Indus river basin. While changes in the snow albedo don't change the overall amount of snowmelt, it changes the timing of snowmelt; hence it will affect the water supply in the Indus river valley basin.

T. Rume et al (2020) carried out a study on environmental effects of COVID-19 pandemic and potential strategies of sustainability. This study explored the positive and negative environmental impacts of COVID-19 pandemic by reviewing the available scientific literatures. Findings revealed that due to movement restrictions and a significant slowdown of social and economic activities, air quality had improved in many cities with a reduction in water pollution in different parts of the world. Besides increased use of PPE, their haphazard disposal and generation of a huge amount of hospital waste have negative impacts on the environment. As industries, transportation and companies have closed down; it has brought a sudden drop of greenhouse gases (GHGs) emissions. Overall 46% and 50% reduction of PM_{2.5} and PM₁₀ respectively, was reported in India during the nationwide lockdown. It was assumed that vehicles and aviation are key contributors of emissions and contribute almost 72% and 11% of the transport sector green house gases emissions respectively (Henriques 2020).

W. Qiang and S. Min (2020) carried out a case study on preliminary assessment of the impact of COVID-19 on environment in China. The objective was to analyse the dynamic impact of COVID-19 on the environment. Findings revealed that during the pandemic and lockdown period, there was significant reduction in the concentration of nitrogen dioxide (NO₂) in the atmosphere, as the government adopted outdoor restrictions, close management and travel restrictions. The decline initially occurred near Wuhan and eventually spread to the whole country during the pandemic. The study also showed that strict quarantine measures not only protect the public from COVID-19 but also exert positive impact on the environment. Findings also revealed that there was a close correlation between the economy and environmental pollution. The reduction in economic activities and traffic restrictions directly affect the changes in China's energy consumption and also effectively reduce the environmental pollution. The outbreak of COVID-19 improved China's air quality in the short term and significantly contributed to global carbon emissions reduction, it also

effectively suppressed the green house gases emissions such as carbon dioxide (CO₂). However if China lift the lockdown completely and resumes production, its energy use and green house gas emissions are likely to exceed the level before the corona outbreak. COVID-19 exerted a significant negative impact on China's energy consumption and green house gas emissions in the short term.

2.4 SUMMARY

For the present study, a total of 60 reviews whereby 30 reviews were from studies done in India and 30 reviews were from studies done abroad. The following is a summary of the reviews done.

Many studies have been conducted in India and abroad on environment and its related issues as well as on impact of COVID-19 on health and environment. Studies showed that majority of the students were aware about environment and its issues. Females were more aware about environment and they practiced pro-environmental behaviour. Increase in age led to increased environmental awareness. Apart from books teachers used mass media, Multiple Intelligence Instructional Strategy (abroad) were used as medium of instruction on environment, which brought about positive learning and awareness among the student community. Studies also revealed that through the work of organisations, students were able to gain knowledge and information on environment as a result of which there was increased awareness among the students. However a small section of the students, even after undergoing courses and trainings on environment didn't show improved environmental actions in their behaviours. Students were aware about global warming but were unaware about green house gas and carbon emissions. Studies also revealed that people supported policies dealing with activities.

In Nagaland, there was no separate cell, fund, facilities and provision for environmental studies in the department and under qualified teachers were made to teach the subject (Sema N. Savito). Course neglects the practical aspects and activities regarding environmental education and awareness were not adequate. Knowledge of environmental education was confined to a small section of the students. Some students didn't study about environment during their schooling. However students were able to apply their learning and learning into practice. Students were also aware that waste possesses a risk factor with consequences for public health and environment. Thus the students showed interest and were in favour of gaining knowledge and information on handling and management of wastes. Studies also showed that lack of awareness and information on environment leads to creation and

increasing environmental problems. Students were of the opinion that environmental concerns should be prioritized over economic growth and development.

Various research studies carried out across Nagaland showed that although shifting cultivation was considered economically inefficient and ecologically harmful for the environment, yet it continues to be widely practiced in Nagaland. Studies showed that shifting cultivation causes deforestation or land degradation and pollution and is a contributing factor to increased incidence of forest fires. However shifting cultivation cannot be given up completely because the topography of Nagaland is hilly and agriculture is the main occupation of the people as well as it is deeply linked to Naga culture and tradition.

Studies also revealed that Naga women play a pivotal role in management of resources and actively contributing to the conservation of biodiversity in their community. Studies also revealed that womenfolk engage in kitchen gardening in almost every locality in the state whereby the produce from the gardens are consumed and surplus are sold or supplied across the state. Women farmers also play an active role in seed preservation and storage.

Studies revealed that use of firewood as a primary source of energy, logging, shifting cultivation, hunting and fishing especially in rural areas have led to deforestation and extinction of wildlife and have contributed to climate change. In order to curb degradation of environmental resources and extinction of species studies recommended minimising shifting cultivation or adopting alder cum shifting farming system, adopting agro-forestry, watershed management, harvesting rainwater etc.

On impact of COVID-19 and the environment, various research findings have revealed that the pandemic was a blessing in disguise as it had a positive impact on the environment. There were improvements in environmental quality and pollution levels. There was reduction in pollutants and particulate matter concentrations and green house gases as well as carbon emissions and reduced energy consumption, around the world. Studies have also revealed that there was association between air pollution and mortality rates due to COVID-19. Availability of water also plays a very important role in curbing the spread of viral diseases however water shortage prevents communities from maintaining proper sanitation and hygiene. Hospital/medical waste were disposed of in haphazard way thus leading to negative effects on environment, however no literatures were available on how to dispose of the waste in an eco-friendly manner. Studies showed that regulations and legislations passed were only coping mechanisms for curbing the spread of the virus and thus fulfil only short term goals

and hence the positive environmental impacts are not long lasting. Therefore a well thought off plan should be done before introduction and implementation.

CHAPTER 3

METHODOLOGY OF THE STUDY

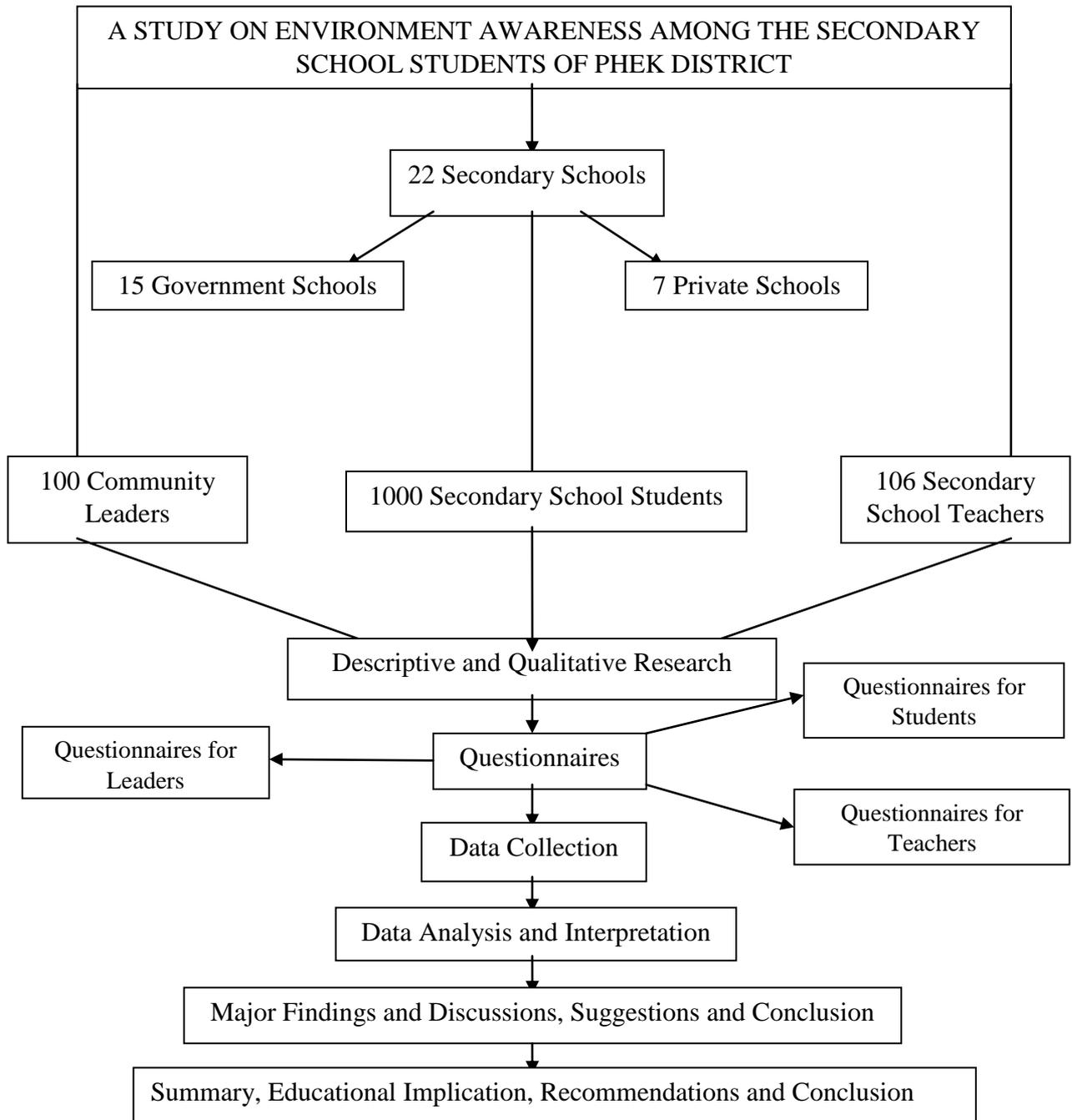
3.1 INTRODUCTION

The present chapter describes the methodology of the study. The study is descriptive in nature and data was collected from both primary and secondary sources. Quantitative method was used for the present study to generalise the results of the study to the population in consideration and Nagaland as a whole. It also reports the design of the study, technique of selection of the sample, development of research tools and techniques followed in data collection and analysis.

3.2 DESIGN OF THE STUDY

The present study is titled “A Study on Environment Awareness Among the Secondary School Students of Phek District.” The main purpose of the study was to find out the environment awareness among the secondary school students from the Chakhesang tribe of Phek district of Nagaland. The study follows a descriptive procedure. Flowchart (Figure 3.2.1) shows the research design of the present study.

Figure 3.2.1 Design of the study



3.3 POPULATION OF THE STUDY

The population of the study includes secondary school students from Chakhesang tribe of Phek district, teachers of Environmental Education/Environmental Studies, Life Skills and Science and leaders of various organisation and community.

3.4 SAMPLE OF THE STUDY

The investigator used purposive, incidental and random sampling method for selection of samples from Phek district.

Table 3.4.1 Sample based on type of management

Type of management	No. of secondary schools	No. of secondary students
Government	15	500
Private	7	500
Total	22	1000

Table 3.4.2 Sample based on gender

Gender	No. of secondary students	No. of teachers	No. of leaders
Male	500	53	74
Female	500	53	26
Total	1000	106	100

As shown above, a sample of 1000 secondary school students; out of which 500 were male and 500 were female students and 500 were from government schools and 500 were from private schools, 106 teachers of Environmental Education/Environmental Studies and Life Skills; out of which 53 were male and 53 were female teachers and 100 leaders; out of which 26 were female and 74 were male leaders were selected from Phek district.

Table 3.4.3 List of educational institutions chosen for the present study

Sl. No.	Type of Management	Secondary Schools
1	GOVERNMENT	Government Higher Secondary School Phek
2		Government Higher Secondary School Chozuba
3		Government Higher Secondary School Pfutsero
4		Government High School Cheteba
5		Government High School Japan Riba, Chozuba
6		Government High School Chizami
7		Government High School Losami
8		Government High School Kikruma
9		Government High School Thetsumi
10		Government High School Pholami

11	PRIVATE	Government High School Old Phek
12		Government High School Ketsapo
13		Government High School Mesulumi
14		Government High School Lozaphuhu
15		Government High School Khomi
16		Sacred Heart Higher Secondary School Chizami
17		Eastern Mission High School Chizami
18		Chakhesang Mission Higher Secondary School Pfutsero
19		Christian Mission Higher Secondary School Phek
20		Royal Foundation School Phek
21		Baptist Mission School Old Phek
22		Bishop Abraham Memorial School Phek

Out of the 62 secondary schools of Phek district, 22 secondary schools were chosen for the study (Table 3.4.3).

Table 3.4.4 List of villages chosen for the study

Sl. No.	Villages	Sl. No	Villages	Sl. No	Villages
1	Losami	11	Khezhakheno	21	North Kikruma
2	Lozaphuhu	12	Kami	22	Chozuba
3	Ketsapo	13	Leshemi	23	Chozu Basa
4	Phek Basa	14	Lasumi	24	Chizami
5	Phek	15	Lekromi	25	Enhulumi
6	Upper Khomi	16	Porba	26	Mesulumi
7	Middle Khomi	17	Pfutseromi	27	Sumi
8	Lower Khomi	18	Zapami	28	Testumi
9	Lanezho	19	Phusachodu	29	Chetheba
10	Losatephe	20	Kikruma	30	Pholami

Out of the 98 villages of Phek district recognised by the government of Nagaland, India 30 villages were chosen for the study (Table 3.4.4).

3.5 CONSTRUCTION OF THE RESEARCH TOOL

The investigator developed 3 tools for the collection of data, for the present study. Experts in the field of environment were consulted and relevant books, articles, magazines, journals etc were reviewed to frame the tools. Three sets of questionnaires were constructed for the

secondary school students, teachers of Environmental Education/Environmental Studies and Life Skills and community leaders from governmental and NGO`s and community leaders.

3.6 DESCRIPTIONS OF THE QUESTIONNAIRES

The questionnaires were of three types - for the secondary school students, teachers and community leaders. The questionnaires consists of open ended and closes ended questions which includes “Yes/No”, tick (√) and free form questions. Listed below is a list of the items covered by the questionnaires:

3.6.1 Questionnaire for secondary school students

ITEMS	Question No.	Total No. of Questions
Secondary school students profile	1-5	5
Environment awareness	1-10	10
Effects of environmental degradation on human life	17-21	5
Curricular and co-curricular activities and programmes	11-15, 22-27	11
Measures and programmes undertaken by organisations	16, 28 and 29	3
Measures for environmental protection and awareness	30 and 31	2

3.6.2 Questionnaire for teachers

ITEMS	Question No.	Total No. of Questions
Teachers profile	1-5	5
Curricular and co-curricular activities and programmes	1-6	6
Measures for environmental protection and awareness	4	4

3.6.3 Questionnaire for leaders

ITEMS	Question No.	Total No. of Questions
Leaders profile	1-5	5
Activities and programmes on environment	1 and 2,6 -10	7
Laws and regulations on environment	3 and 5	2
Measures for environmental protection and awareness	4, 11 and 12	3

3.7 STANDARDIZATION OF THE TOOLS FOR THE PRESENT STUDY

In the present study, the questionnaires were self constructed. However in order to test the validity of the questionnaires, a pilot study was carried out whereby the questionnaires were used as preliminary testing and try out, after which the errors, deficiencies, unrelated items and undesirable items were removed and redone.

3.8 PILOT STUDY

In the present study, a preliminary study was carried out in order to test the validity of the tools. The preliminary study was carried out in 2018. The questionnaires consisted of open ended and closed ended questions for secondary school students, teachers and leaders, which were then distributed to students, teachers/leaders, to know the validity and reliability of the questionnaires. After which the results were shown to the subject experts viz. Dr. Khotole Khieya, Dr. M. Rajendra Nath Babu, Dr. Buno Legiese, Dr. Venkata Rao, Seno Tsuhah and Pupetso Wezah, for validation and after feedbacks from experts, the tools were finalised with the approval from the supervisor.

Table 3.8.1 Sample of the pilot study

Types of Institution	No. Of Institutions	No. Of Students	No. of Teachers
Government	2	28	2
Private	1	32	Nil
Total	3	60	2

Table 3.8.1 is a classification of the pilot study. The study consisted of 60 secondary school students (28 students from government schools and 32 students from private school) and 2

secondary school teachers (Seno Tsuhah-government teacher, social worker, activist and environmentalist and Pupetso Wezah- government teacher and community leader).

3.9 METHOD AND PROCEDURE OF DATA COLLECTION

The present study is a study on environment awareness among the secondary school students of Phek district, among the Chakhesang community. Purposive, incidental and random sampling method was followed to draw samples from the Chakhesang community, residing in Phek district.

The investigator sought the permission of the all the heads of institutions after which data collection was done for students as well as teachers. There was no separate subject teacher assigned mainly for environmental education. Teachers who were from science background were mostly given the subject however teachers from arts background were also made to teach environmental education. In the present study, Science, Environmental Education and Life Skills teachers were included in the sample. 22 secondary schools out of which 15 were government schools and 7 were private schools were selected using purposive and incidental sampling technique. 1000 secondary school students, 106 teachers and 100 leaders were randomly selected for the study.

3.10 DATA COLLECTION

For the present study, both primary and secondary sources of data were used to collect information for the study. The primary sources of data were sourced from administering of the questionnaires on the secondary school students, teachers, leaders whereas the secondary sources of data were sourced from books, journals, Ph.D thesis etc. Online questionnaires/form (Google Form) was also used to gather data for teachers and leaders.

3.11. ANALYSIS OF THE DATA

The data/raw scores collected from both primary and secondary sources were arranged and converted into simple percentage (%) for analysis.

3.12 STATISTICAL TECHNIQUES USED

For the present study purposive and incidental sampling was adopted for the selection of schools and random sampling method was adopted for student sample, descriptive and

quantitative method was used to interpret and analyse the data. Basing on the objectives of the study, the scores were converted into percentage (%) to analyse the data.

CHAPTER 4

ANALYSIS AND INTERPRETATION OF THE DATA

4.1 INTRODUCTION

The aim of the present study was to find out the environmental awareness among the secondary school students of Phek district of Nagaland. The data were collected basing on the objectives, after which data was edited, processed and subjected to analysis. The data were arranged properly, analysed systematically and interpreted according to the objectives. The data was analysed and interpreted based on the following levels of environmental awareness.

Table 4.1.1 Levels of environmental awareness

Scores in Percentage (%)	Awareness Levels
0-34	Very Low level
35-49	Low Level
50-64	Moderate Level
65-79	High Level
80-100	Very High Level

4.2 Analysis and interpretation of data related to objective 1 - Environment awareness among the secondary school students of the Chakhesang Nagas (Phek district)

The following data were obtained as per objective 1, which was to find out the environment awareness among the secondary school students of the Chakhesang Nagas of Phek district. Under this objective, 10 questions were raised to the students. The questions were on awareness about environmental degradation, pollution and waste management. The analysis and interpretation regarding secondary student's awareness on environment was given in terms of percentage. Basing on the scores of the secondary students, the awareness levels shown in Table 4.1.1 were applied to analyse and interpret the data.

4.2.1 Secondary school student's awareness on environmental degradation

Table 4.2.1 Secondary school student's awareness on environmental degradation

Items	Total Awareness %	Total Unaware %
Awareness on Environmental Degradation	97.70	2.30
Awareness on causes of environmental degradation-		
Lack of environmental awareness	38.40	61.60
Pollution	33.80	66.20
Burning of fossil fuels	23.60	76.40
Clearing of forest	68.50	31.50
Exploitation of wildlife	29.70	70.30
Use of fertilizers and untreated sewage for agriculture	23.20	76.80
Destruction of habitat	27.80	72.20
Logging	43.80	56.20
Other causes of environmental degradation mentioned by the secondary students-		
Improper drainage system, improper disposal of bio-medical waste and shortage of water	0.30	99.70
Improper ways of disposing waste and faulty waste management	0.40	99.60
Excessive use of vehicles, plastic and plastic bottles and improper disposal, debris from small scale industries, hunting, domestic waste, modern agricultural practices and overgrazing	0.20	99.80
Proper environmental knowledge is not imparted in schools	0.10	99.90

As per the responses from table 4.2.1, the secondary school students have very high level of awareness about the environmental degradation taking place in Phek district. 97.70% of the students were aware about the environmental degradation in Phek district whereas 2.30% of the students were unaware about the environmental degradation. 38.40% of the students were of the view that the environmental degradation was because of the lack of awareness among the secondary school students whereas 61.60% of the students didn't think so. The students have very low level of awareness on negative effects of pollution, burning of fossil fuels, and

exploitation of wildlife, use of fertilizers and untreated sewage and destruction of habitat. The students have high level of awareness on negative effects of clearing of forests and moderate level of awareness on logging. 33.80% of the students were of the view that environmental degradation was because of the pollution of air, water and soil whereas 66.20% didn't think so. 23.60% of the students view burning or using of fossil fuels as leading to environmental degradation whereas 76.40% didn't think so. 68.50% of the students were aware that clearing of forests leads to environmental degradation whereas 31.50% were unaware. 29.70% of the students were aware that exploitation of wildlife leads to environmental degradation whereas 70.30% were unaware. 23.20% of the students of the students were aware that use of fertilizers/untreated sewage leads to environmental degradation whereas 76.80% were unaware. 27.80% of the students were aware that destruction of habitat leads to environmental degradation whereas 72.20% were unaware. 43.80% of the students were aware that logging leads to environmental degradation whereas 56.20% were unaware.

0.30% of the secondary students mentioned that environmental degradation is caused due to improper drainage system, improper disposal of bio-medical waste and shortage of water however 99.70% were unaware. 0.40% of the secondary students mentioned that improper disposal of waste and faulty waste management leads to environmental degradation however 99.60% were unaware. 0.20% of the secondary students mentioned that excessive use of vehicles, plastic and plastic bottles and improper disposal, debris from small scale industries, hunting, domestic waste, modern agricultural practices and overgrazing leads to environmental degradation however 99.80% were unaware. 0.10% of the secondary students were of the opinion that proper environmental knowledge is not imparted in the schools however 99.90% didn't have any opinions.

4.2.2. Secondary school student's awareness on environmental pollution

As per the responses of the secondary school students basing on objective one, the following are a result of the analysis and interpretation of the data.

i) Awareness on air pollution and its causes among the secondary school students

Figure 4.2.2 shows the secondary school students awareness on air pollution and its causes.

Figure 4.2.2 Secondary school student’s awareness on air pollution and its causes

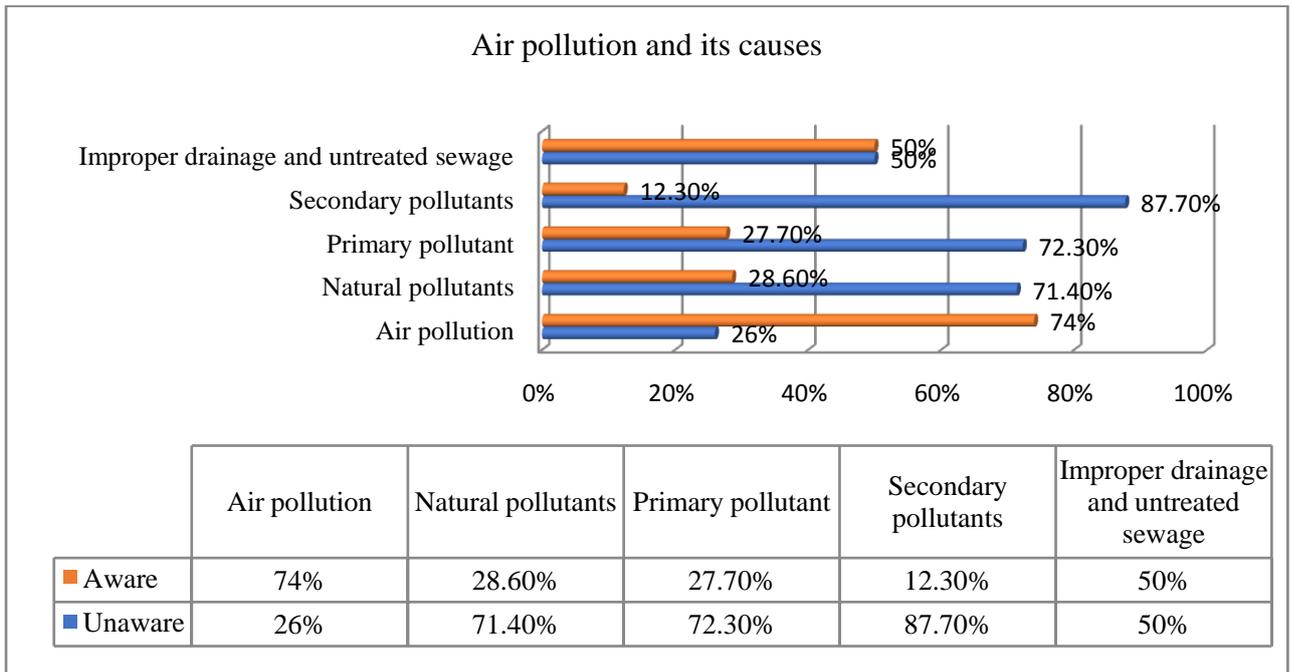


Figure 4.2.2 showed that the students have high level of awareness on air pollution. 74% of the students were aware about air pollution whereas 26% of the students were of the opinion that Phek district doesn’t face air pollution. The students have very low level of awareness on causes of air pollution - natural, primary and secondary pollutants. The students have moderate level of awareness on negative effects of improper drainage system, untreated sewage/domestic waste. 28.60% of the students were of the view that air pollution is caused due to natural pollutants whereas 71.40% were unaware. 27.70% of the students were of the view that air pollution is caused due to primary pollutants whereas 72.30% were unaware. 12.30% of the students were of the view that air pollution is caused due to secondary pollutants whereas 87.70% were unaware. 50% of the students were of the view that air pollution is caused due to improper drainage system, untreated sewage/domestic wastes whereas 50% were unaware.

ii) Awareness on water pollution and its causes among the secondary school students:

Figure 4.2.3 shows the secondary school students awareness on water pollution and its causes.

Figure 4.2.3 Secondary school student’s awareness on water pollution and its causes

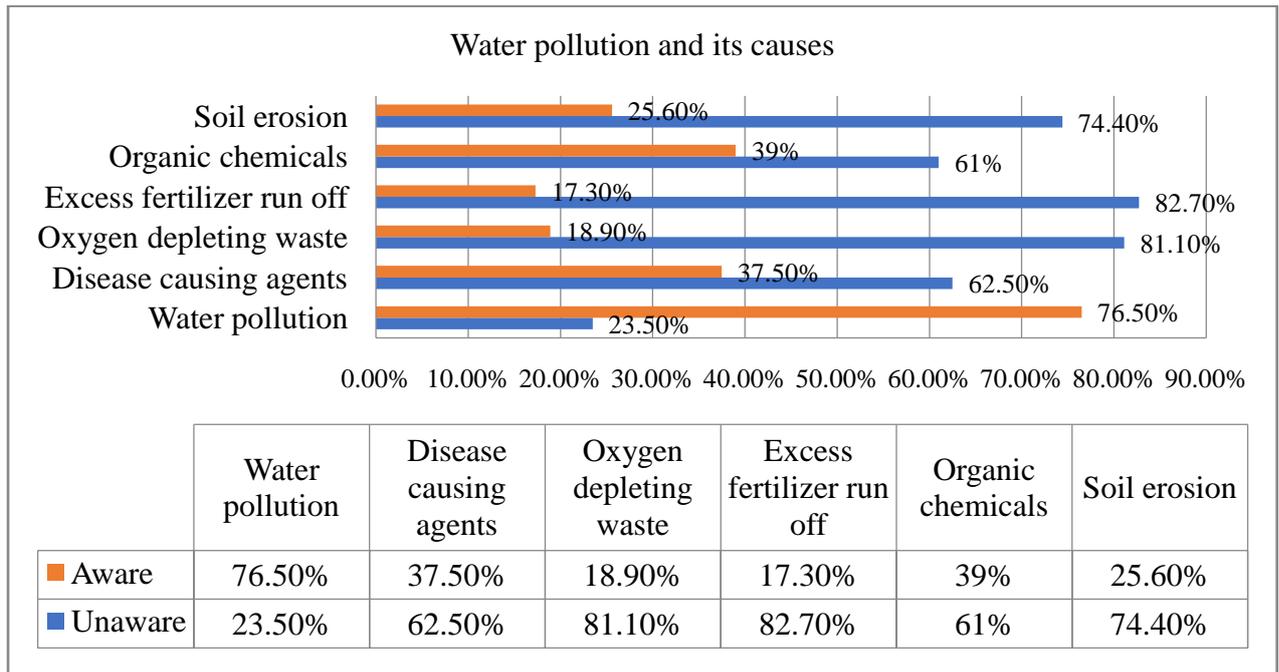


Figure 4.2.3 showed that the students have high level of awareness on water pollution. 76.50% of the students were aware about water pollution while 23.50% of the students were unaware. The students have low level of awareness on disease causing agents and negative effects of chemicals on water bodies. The students have very low level of awareness on oxygen depleting wastes; negative effects of fertilizers run off and soil erosion leading to pollution of the water bodies. 37.50% of the students were of the view that water pollution was caused due to disease causing agents or pathogens while 62.50% were unaware. 18.90% of the students were of the view that water pollution was caused due oxygen depleting wastes while 81.10% were unaware. 17.30% of the students were of the view that water pollution was due to fertilizer run off to water bodies while 82.70% were unaware. 39% of the students were of the view that organic chemicals cause water pollution while 61% were unaware. 25.60% of the students were of the view that soil erosion leads to water pollution while 74.40% were unaware.

iii) Awareness on soil pollution and the ill effects of deforestation among the secondary school students

Table 4.2.4 Secondary school student's awareness on soil pollution - ill effects of deforestation

Items	Total Awareness %	Total Unaware %
Awareness on ill effects of deforestation	94	6
Ill effects of deforestation -		
Desertification	53.70	46.30
Species extinction	53.90	46.10
Soil erosion	29.60	70.40
Loss of tropical rainforest	27.70	72.30
Increased emission of green house gases	19.50	80.50
Droughts	11	89
Ill effects of deforestation as mentioned by secondary school students -		
Increased incidence of forest fire	0.40	99.60
Weather change and global warming	0.30	99.70
Decrease in rainfall	0.20	99.80
Landslide, scarcity and wastage of water, air pollution, increase in temperature and climate change	0.10	99.90

Table 4.2.4 showed that the students have very high level of awareness on the ill effects of deforestation. 94% of the students were aware about the ill effects of deforestation whereas 6% of the students were unaware. The students have moderate level of awareness on desertification and species extinction. The students have very low level of awareness on soil erosion, loss of tropical rainforest, increased emission of green house gases and droughts. 53.70% of the students were aware that deforestation leads to desertification whereas 46.30% were unaware. 53.90% of the students were aware that deforestation leads to species extinction whereas 46.10% were unaware. 29.60% of the students were aware that deforestation leads to soil erosion whereas 70.40% were unaware. 27.70% of the students were aware that deforestation leads to loss of tropical rainforests whereas 72.30% were unaware. 19.50% of the students were aware that deforestation leads to increased emission of green house gases whereas 80.50% were unaware. 11% of the students were aware that deforestation leads to droughts whereas 89% were unaware.

0.40% of the students mentioned that deforestation also leads to increased incidence of forest fires whereas 99.60% were unaware. 0.30% of the students mentioned that deforestation leads to weather change and global warming whereas 99.70% were unaware. 0.20% of the students mentioned that deforestation leads to decreased rainfall whereas 99.80% were unaware. 0.10% of the students mentioned that deforestation leads to landslide, scarcity and wastage of water, air pollution, increased temperature and climate change whereas 99.90% were unaware.

Table 4.2.5 Secondary school student’s awareness on soil pollution – negative effects of shifting/jhum/slash and burn cultivation

Items	Total Awareness %	Total Unaware %
Awareness on negative effects of S/J/S and BC	90.10	9.90
Negative effects of S/J/S and BC -		
Desertification	41	59
Destruction of flora and fauna	48.70	51.30
Soil erosion	41	59
Air pollution due to burning of forest	49.20	50.80
Ecological imbalance	17.30	82.70
Rapid drying up of water bodies	18.60	81.40
Loss of productivity of the soil	15.50	84.50
Disappearance of local species	24.70	75.30
Burning of areas not intended for S/J/S and BC	0.10	99.90

Abbreviation of the word used:

S/J/S and BC – Shifting/Jhum/Slash and Burn Cultivation

Table 4.2.5 showed that the students have very high level of awareness about the negative effects of shifting/jhum/slash and burn cultivation. 90.10% of the students were aware about the negative effects of shifting cultivation whereas 9.90% were unaware. The students have low level of awareness on land desertification, destruction of flora and fauna and soil erosion and that smoke from burning forests leads to air pollution due to shifting cultivation. The students have very low level of awareness on ecological imbalance, rapid drying up of water bodies, loss of productivity of the soil and disappearance of local species due to shifting cultivation. 41% of the students were aware that shifting cultivation leads to land desertification and soil erosion. 48.70% of the students were aware that shifting cultivation

leads to destruction of flora and fauna. 49.20% of the students were aware that the whole process of shifting cultivation leads to air pollution. 17.30% of the students were aware that shifting cultivation leads to ecological imbalance. 18.60% of the students were aware that shifting cultivation leads to rapid drying up of water bodies. 15.50% of the students were aware that shifting cultivation leads to loss of productivity of the soil. 24.70% of the students were aware that shifting cultivation leads to disappearance of local species. 0.10% of the students mentioned that deforestation also leads to burning of areas not intended for shifting cultivation whereas 99.90% were unaware.

iv) Awareness on noise pollution:

Table 4.2.6 Secondary school student's awareness on noise pollution

Items	Total Awareness %	Total Unaware %
Awareness on noise pollution	60	40
Sources of noise pollution -		
Indoor	25	75
Outdoor	28.50	71.50
Use of machines	28.80	71.20
Use of loudspeakers and fire crackers	21.60	78.40
Fire crackers cause noise and air pollution and adversely affect health	87	13
Trees/plants purify air and absorb noise	60.90	39.10

Table 4.2.6 showed that the students have moderate awareness level about noise pollution. 60% of the students were aware about noise pollution while 40% of the students were of the view that Phek district doesn't face noise pollution. The students have very low level of awareness on indoor and outdoor sources of noise pollution as well as sources of noise pollution in rural areas due to the use of machines and small scale industries and use of fire crackers or explosives and loudspeakers. 25% of the students were aware that indoor machines were the source of noise pollution whereas 75% were unaware. 28.50% of the students were aware that outdoor sources like loudspeakers, automobiles, traffic cause noise pollution whereas 71.50% were unaware. 28.80% of the students were aware that farm machines, pump sets, saw mill, small scale industries cause noise pollution in rural areas or villages whereas 71.20% were unaware. 21.60% of the students were aware that fire crackers or explosives, loudspeakers cause noise pollution during special occasions whereas 78.40% were unaware. A very high number of students were aware that fire crackers cause noise and

air pollution and adversely affect the health of people/animals. A moderate number of students were aware that trees/plants purify the air and absorb the noise level. 60.90% of the students were aware about the beneficial effects of trees and plants whereas 39.10% were unaware.

Table 4.2.7 Other types of pollution mentioned by the secondary school students

Items	Awareness %	Unaware %
Radiation pollution	7.50	92.50
Plastic pollution	0.20	99.80
Land, dust, waste and light pollution	0.10	99.90

As shown above 7.50% of the students were aware about radiation pollution whereas 92.50% were unaware. 0.20% of the students were aware about plastic pollution whereas 99.80% were unaware. Only 0.10% of the students were aware about land, dust, waste and light pollution whereas 99.90% were unaware.

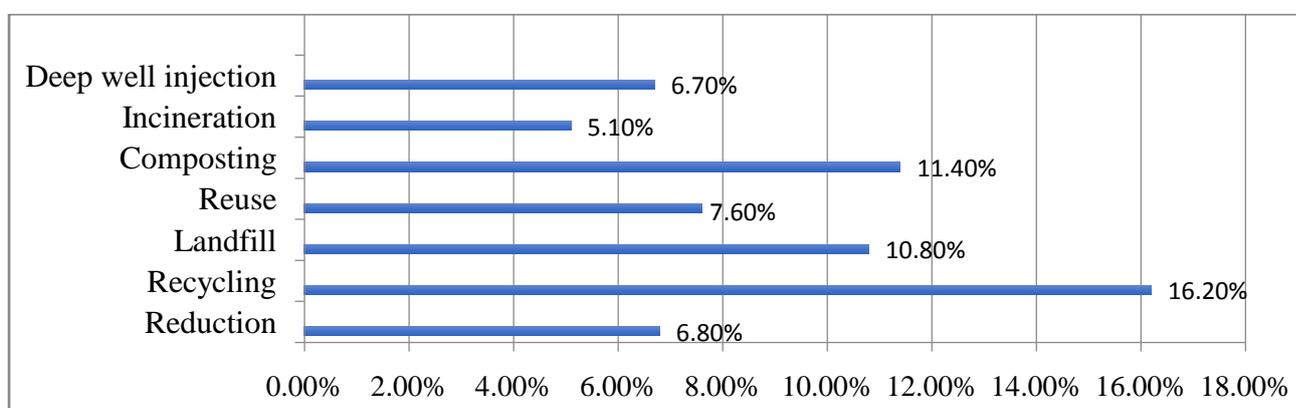
v) Secondary school student’s opinion on waste management among the Chakhesangs:

Table 4.2.8 Secondary school student’s opinion on waste disposal

Item	Total Positive Response %	Total Negative Response %
Chakhesangs dispose waste properly	33.50	66.50

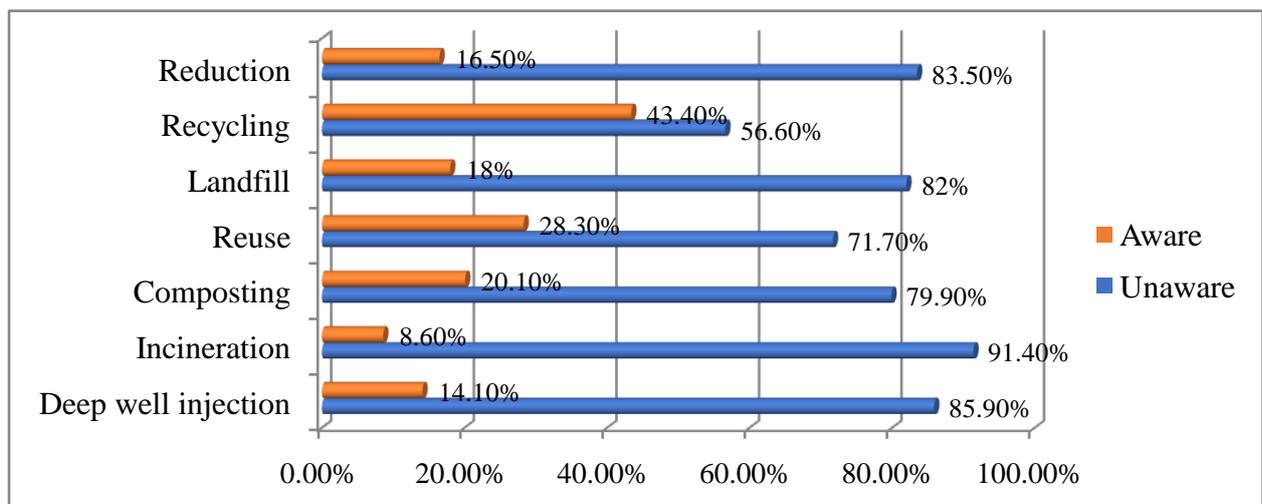
As per the responses shown in Table 4.2.8, 33.50% of the students felt that waste was disposed properly whereas 66.50 % students felt that waste was disposed of improperly.

Figure 4.2.9 Opinions of the secondary school students on proper waste disposal method followed by the Chakhesangs



As per the responses shown in figure 4.2.9, a very low number of students observed that waste was disposed of through reduction or minimising waste, recycling, landfill, reuse, composting, incineration and deep well injection. 6.80% of the students were of the view that Chakhesangs minimise/reduce waste. 16.20% of the students said that wastes were recycled. 10.8% of the students said that waste was disposed of properly through landfill. 7.60% of the students were of the view that waste was reused. 11.40% of the students said that waste was disposed of through composting. 5.10% of the students said that waste was disposed of through incineration. 6.70% of the students said that waste was disposed of in wells built specifically for the purpose. 0.10% of the students mentioned that waste was disposed of in dustbins. In some villages, community members contribute money for making dustbins and distribution in every colony. In most of the villages, the wastes were collected and burnt (khel wise). In some villages, youths of the community make dustbins which are then sold and distributed to every household. In most of the villages, bamboo dustbins were used.

Figure 4.2.10 Secondary school student’s awareness on improper waste disposal method followed by the Chakhesangs



As per the responses from figure the secondary students were aware that reduction, recycling, landfill, reuse, composting, incineration and deep well injection should be adopted to curb improper disposal of waste. 16.50% of the students were aware that waste can be reduced or minimised however 83.50% were unaware. 43.40% of the students were aware that waste could be recycled however 56.60% were unaware. 18% of the students were aware landfill can be used to dispose biodegradable waste however 82% were unaware. 28.30% of the students were aware that reusing the discarded items or waste can be done however 71.70% were unaware. 20.10% of the students were aware that composting for waste disposal can be

adopted but 79.90% were unaware. 8.60% of the students were aware that incineration can be used to eliminate waste however 91.40% were unaware. 14.10% of the students were aware that deep well injection can be used for waste disposal however 85.90% were unaware. The data showed that even though the secondary school students have high level of awareness on improper waste disposal method followed by the Chakhesangs yet the students have very low level of awareness on ways to dispose of waste properly except on recycling where 43.40% (low level of awareness) of the students were aware.

4.3 Analysis and interpretation of data related to objective 2 – Secondary school student’s awareness on the effects of environmental degradation on human life

5 questions were raised to the secondary school students. Listed below is the analysis and interpretation of the data as per objective.

Figure 4.3.1 Secondary school student’s awareness on diseases caused due to pollution

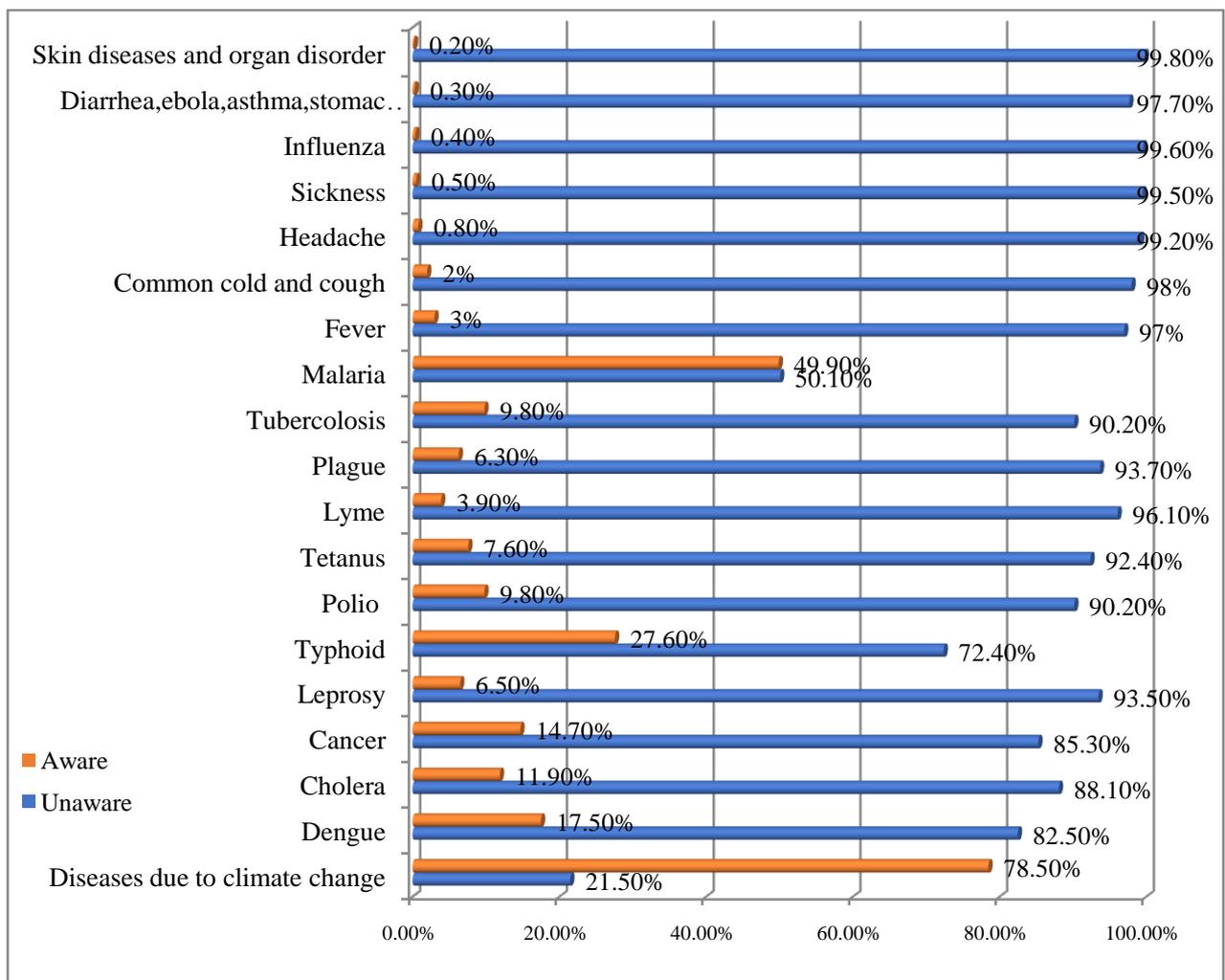
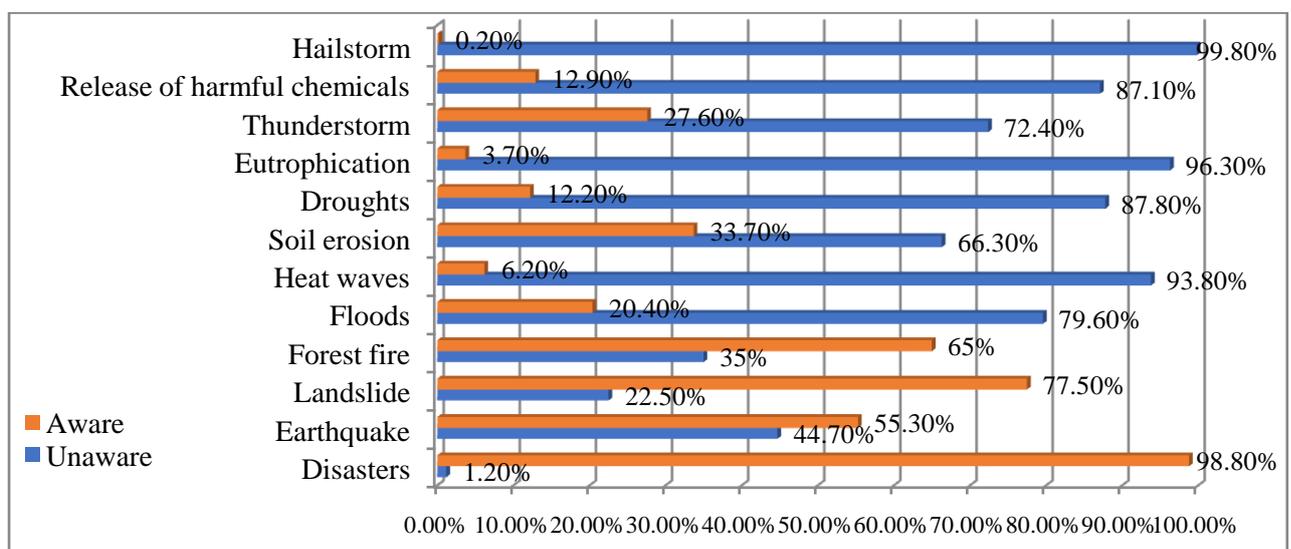


Figure 4.3.1 showed that the students have very high level of awareness on diseases caused due to pollution. 98.20% of the students were aware about diseases however 1.80% of the students were unaware about negative effects of pollution on human life. The students have moderate level of awareness on cancer. 50.80% of the students were aware that pollution leads to cancer whereas 49.20% were unaware. The students have very low level of awareness on allergies, typhoid, jaundice, asthma, diarrhea, organ disorder, weaker immune system, heart/cardiovascular problems, brain, liver and kidney damage caused as a result of pollution. 29.40% of the students were aware about allergies whereas 70.60% were unaware. 31.3% of the students were aware about typhoid whereas 68.70% were unaware. 8.70% of the students were aware about jaundice whereas 91.30% were unaware. 26% of the students were aware about asthma whereas 74% were unaware. 21.50% of the students were aware about diarrhea whereas 78.50% were unaware. 14.90% of the students were aware about organ disorder whereas 85.10% were unaware. 25.30% of the students were aware about weaker immune system whereas 74.70% were unaware. 16.40% of the students were aware about heart/cardiovascular problems whereas 83.60% were unaware. 30.30% of the students were aware about brain, liver and kidney damage whereas 69.70% were unaware. The students have low level of awareness on deafness/hearing damage. 34.70% of the students were aware about deafness/hearing damage whereas 65.30% were unaware. 0.10% of the students mentioned that pollution causes skin diseases, dental problems, common cold, dizziness, suffocation and malaria whereas 99.90% were unaware. 0.20% of the students mentioned that pollution causes cough and headache whereas 99.80% were unaware.

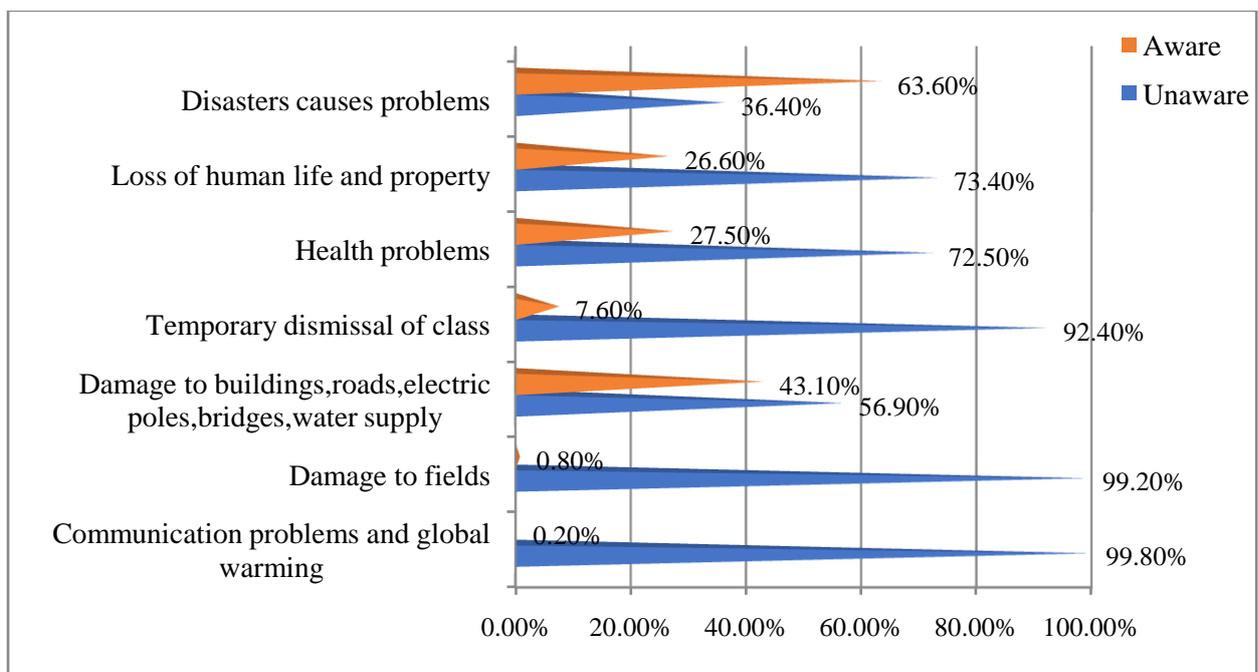
Figure 4.3.2 Secondary school student's awareness on disasters



As per figure 4.3.2 the students have very high level of awareness on disasters-natural and

man-made caused as a result of environmental degradation. 98.80% of the students were aware about disasters whereas 1.20% of the students were not aware about disasters. The students have moderate level of awareness on earthquakes. 55.30% of the students were aware about earthquakes whereas 44.70% were unaware. The students have high level of awareness on landslide and forests fires. 77.50% of the students were aware about landslide whereas 22.50% were unaware. 65% of the students were aware of forest fires caused as a result of natural causes like lightning and man-made activities like hunting, agricultural process etc whereas 35% were unaware. The students have very low level of awareness on floods, heat waves, soil erosion, droughts, eutrophication, thunderstorm and release of harmful chemicals into the atmosphere. 20.40% of the students were aware about floods whereas 79.60% were unaware. 6.2% of the students were aware about heat waves whereas 93.80% were unaware. 33.70% of the students were aware of soil erosion whereas 66.30% were unaware. 12.20% of the students were aware about droughts whereas 87.80% were unaware. 3.70% of the students were aware about eutrophication whereas 96.30% were unaware. 27.60% of the students were aware of thunderstorm whereas 72.40% were unaware. 12.90% of the students were aware about release of harmful chemicals whereas 87.10% were unaware. The students also mentioned that hailstorm also occur in Nagaland however only 0.20% of the students were aware about hailstorm whereas 99.80% were unaware.

Figure 4.3.3 Secondary school student’s awareness on problems caused due to disasters



As shown above, a moderate number of students were aware about the problems faced due to disasters. 63.60% of the students were aware about it however 36.40% of the students were of the opinion that they didn't face any problems due to disasters. The students have very low level of awareness on loss of human life and property, health problems faced during times of disasters. 26.60% of the students were aware about loss of human life and property whereas 73.40% were unaware. 27.50% of the students were aware about health problems whereas 72.50% were unaware. 7.60% of the students felt that temporary dismissal of class is also a problem faced during disasters however 92.40% didn't think so. The students have low level of awareness on damage caused due to disaster on buildings, roads, electric poles, bridges, roadways and water supply. 43.10% of the students were aware about it whereas 56.90% were unaware. The students mentioned that due to disasters, there were damages to vegetable farms and hailstorms destroying crops and vegetation however only 0.80% were aware whereas 99.20% were unaware. The students mentioned that due to disasters communication problems and global warming occurs however only 0.20% of the students were aware about communication problems and global warming whereas 99.80% were unaware.

Figure 4.3.4 Secondary school student's awareness on diseases caused due to climate change

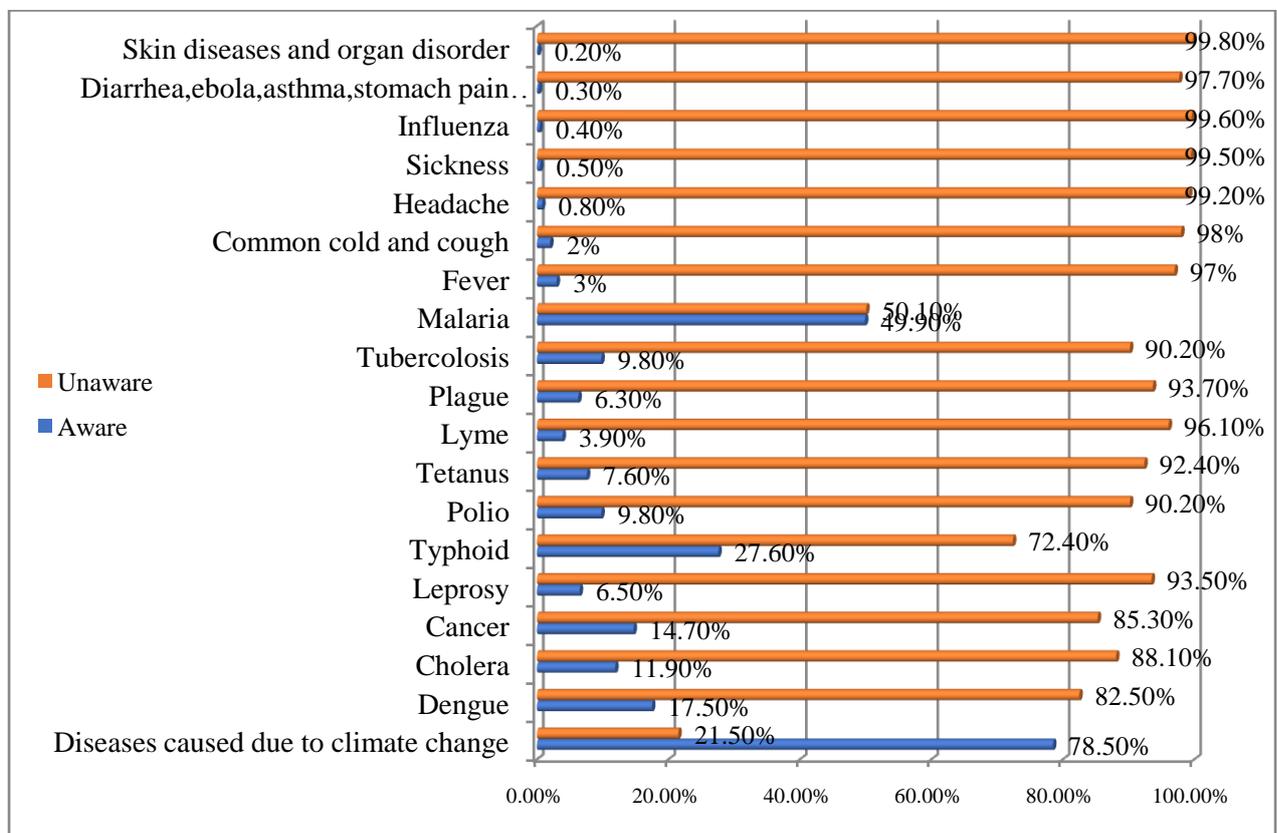


Figure 4.3.4 showed that the secondary students have high level of awareness on diseases caused due to climate change. 78.50% of the students were aware whereas 21.50% of the students were not aware about diseases caused due to climate change. The students have very low level of awareness on dengue, cholera, cancer, leprosy, typhoid, polio, tetanus, lyme, plague and tuberculosis (TB). 17.50% of the students were aware about dengue whereas 82.50% were unaware. 11.90% of the students were aware about cholera whereas 88.10% were unaware. 14.70% of the students were aware about cancer whereas 85.30% were unaware. 6.50% of the students were aware about leprosy whereas 93.50% were unaware. 27.6% of the students were aware about typhoid whereas 72.40% were unaware. 9.80% of the students of the students were about polio whereas 90.20% were unaware. 7.60% of the students were aware about tetanus whereas 92.40% were unaware. 3.90% of the students were aware about lyme whereas 96.10% were unaware. 6.30% of the students were aware about plague whereas 93.70% were unaware. 9.80% of the students were aware about tuberculosis (TB) whereas 90.20% were unaware. The students have moderate level of awareness on malaria. 49.90% of the students were aware about malaria whereas 50.10% were unaware. The students mentioned other diseases that occur as a result of climate change - 3% of the students were aware about fever whereas 97% were unaware. 2% of the students were aware about common cold and cough whereas 98% were unaware. 0.80% of the students were aware about headache whereas 99.20% were unaware. 0.50% of the students were aware about sickness whereas 99.50% were unaware. 0.40% of the students were aware about influenza whereas 99.60% were unaware. 0.30% of the students were aware about diarrhea, ebola, asthma, stomach pain and allergy whereas 99.70% were unaware. 0.20% of the students were aware about skin diseases and organ disorder whereas 99.80% were unaware.

4.4. Analysis and interpretation of data related to objective 3 - Curricular and co-curricular activities and programmes at the secondary level

11 questions were raised to secondary students and 6 questions for teachers, on curricular and co-curricular activities and programmes at the secondary level. For the leaders, 9 questions were raised on co-curricular activities. The study revealed the following:

- 100% of the secondary schools observe Environment Day. However other environmentally significant days were not observed in the secondary schools.

- 100% of the secondary schools conduct tree/flower plantation and cleanliness drives within the school campus as well as outside the school campus, conduct essay, quiz, debates and drawing competition and give project and assignments on environmental themes and rallies on Environment Day and have litter and tobacco free zone in and around the school campus. Field trips or study tours were specifically only for class 10 and 12 students.
- No seminars, conference, campaigns and workshops were conducted on environment to raise awareness among the students in the school premises. However seminars, conference, campaigns and workshops were carried in the community by NGO's, government bodies, local bodies and entrepreneurs.
- 98% of the secondary schools didn't conduct mock drills in the school campus however the mock drills were carried out in the community where students took part in it. 2% of the secondary schools conducted mock drill on disaster management.
- Documentation of wildlife and biodiversity in Phek district was done by North East Network (NEN) and other private agencies. The secondary schools have not done documentation on wildlife and biodiversity. Apart from documentation of wildlife and biodiversity NEN also hold summer farm school at Chizami village to address the growing issue of food insecurity by teaching participants/students traditional sustainable farming system.
- In case of unsound practices of garbage in unauthorised places, within the school premises, action was taken by the school authorities on the defaulters.
- Exhibitions on environmental resources were not carried out in the schools but exhibitions on resources were carried out in the community while celebrating festivals.
- The government schools have NSS and eco club members in their schools and private schools have eco-club members where all members actively participated in activities relating to environmental protection.

Figure 4.4.1 Secondary school student’s opinion on curricular program on Environmental Education/Environmental Studies at the secondary level

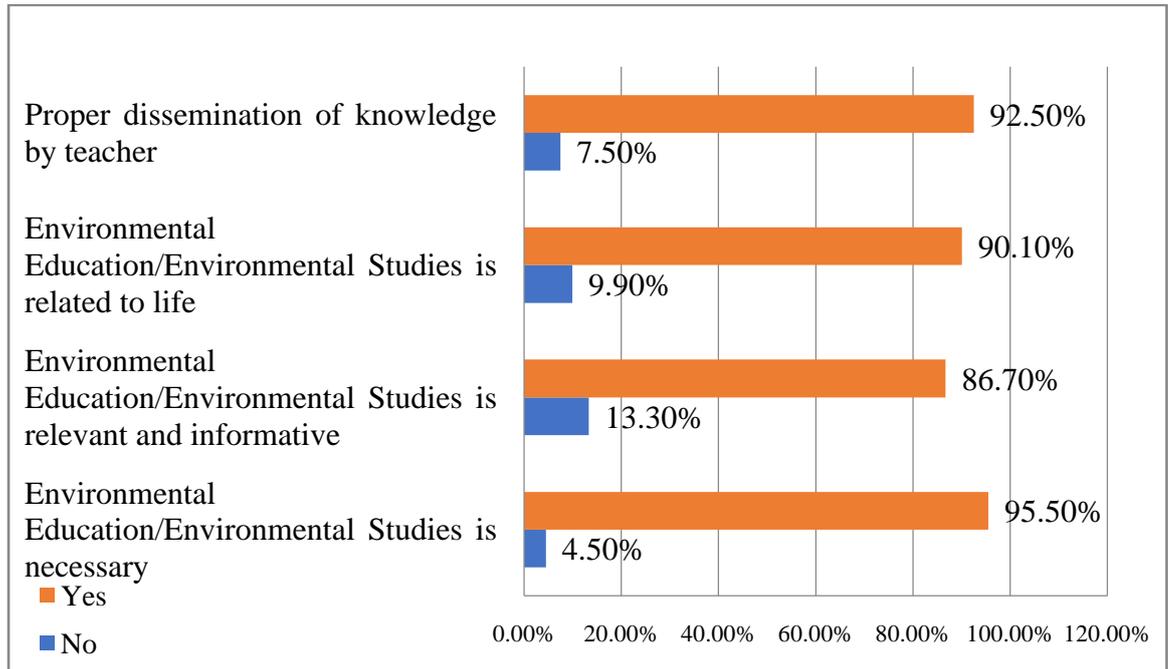
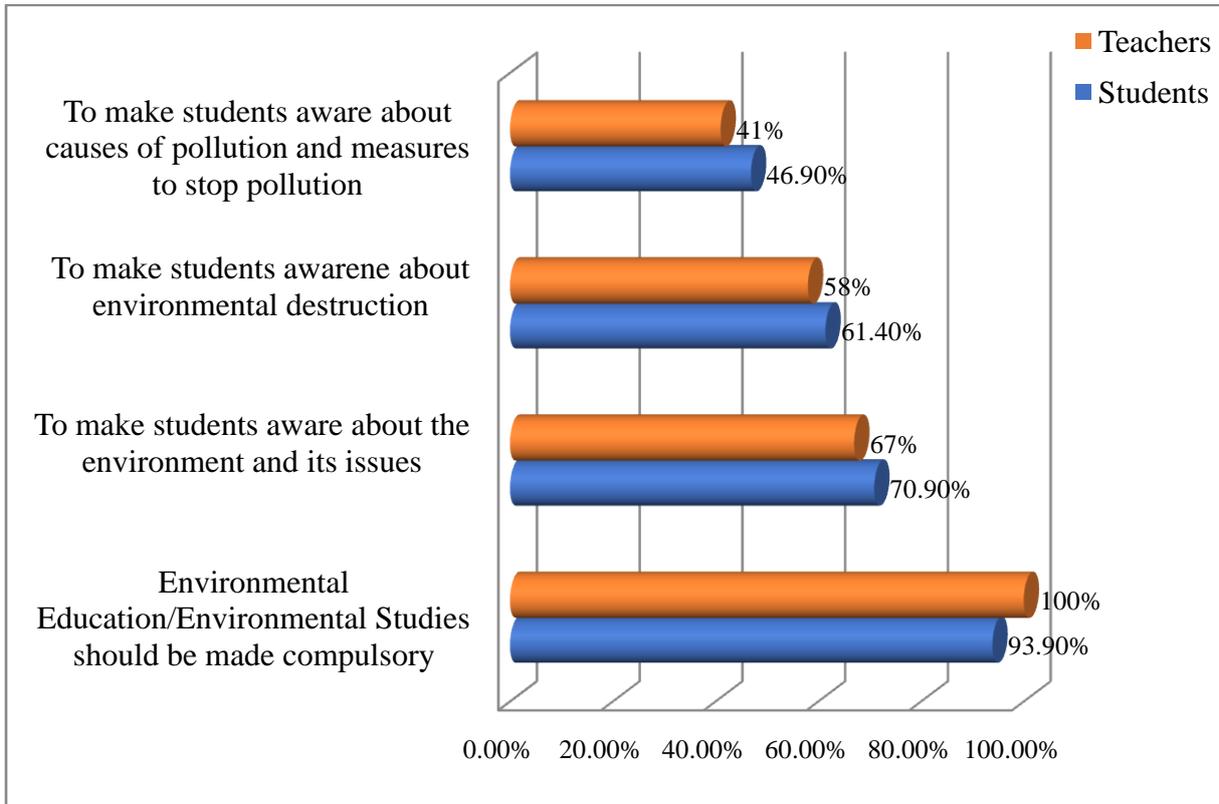


Figure 4.4.1 showed that 95.50% of the students were of the opinion that Environmental Education or studies is necessary however 4.50% of the students didn’t feel the need. 86.70% of the students found the environmental subject relevant and informative however 13.30% of the students didn’t find the subject to be so. 90.10% of the students found the subject related to their daily lives whereas 9.90% of the students didn’t find the subject relevancy to life situations. 92.50% of the students were of the opinion that their teacher taught well whereas 7.50% didn’t think so.

The secondary schools in Phek district have Environmental Education and Life Skills subject as a curricular programme of study.

No environmentalist was invited by the school authorities to give talks or advice to the students on environment and its issues.

Figure 4.4.2 Secondary school students and teacher’s opinion on why Environmental Education/Environmental Studies should be made compulsory



As shown above (Figure 4.4.2), 93.90% of the students and 100% of the teachers were of the opinion that Environmental Education/Environmental Studies should be made compulsory at all levels of education in Nagaland. 70.90% of the students and 67% of the teachers were of the view that environmental education or studies should be made compulsory to make students more aware about the environment and its issues. 61.40% of the students and 58% of the teachers were of the view that environmental education or studies should be made compulsory to make students aware about the harmful effects of environmental destruction on living things. 46.90% of the students and 41% of the teachers were of the view that environmental education or studies should be made compulsory to make students aware of the causes which lead to pollution and to adopt measures to stop pollution.

Table 4.4.3 Secondary school students other opinions on why Environmental Education/Environmental Studies should be made compulsory

Items	Total Response %
Preserve wildlife and to have knowledge about the basic life support	0.30
To know about ways to care for environment, conserve forest, take interest in environment and its studies/education, to have more knowledge about global warming and emergency medical services	0.20
To be more aware about pollution and disasters, to be motivated to love nature, to adopt good sanitation practices, maintain green and fresh surroundings, protect environmental resources and to lead a healthy lifestyle	0.10

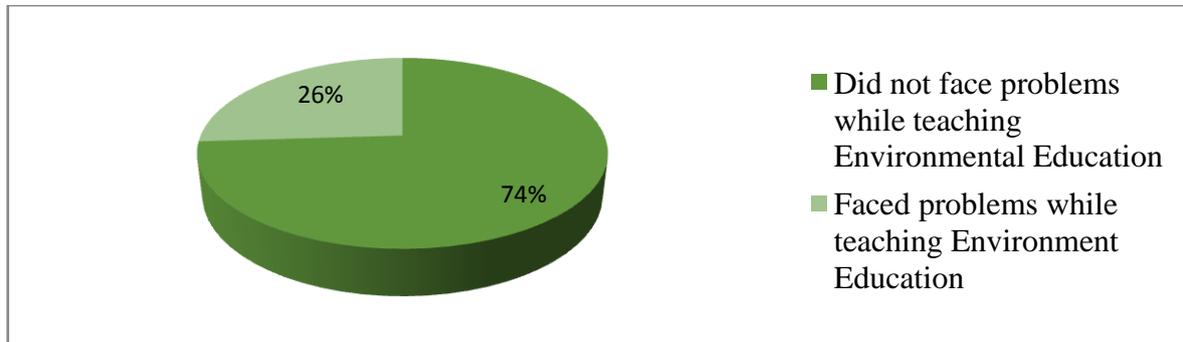
As per table 4.4.3, out of 100% of the students only the following percentage of students gave their responses. 0.30% of the students mentioned that the subject should be made compulsory to preserve wildlife and have knowledge about the basic life support system. 0.20% of the students mentioned that the subject should be made compulsory to know about the ways to care for the environment, conserve forests and take interest in the environment and its studies/education and to have more knowledge about global warming and emergency medical services. 0.1% of the students mentioned that the subject should be made compulsory to be more aware about pollution and disasters, to be motivated to love nature, to adopt good sanitation practices, maintain green and fresh surroundings and protect environmental resources and to lead a healthy lifestyle. (Table 4.4.3)

Teachers gave the following opinions on why Environmental Education or Environmental Studies should be made compulsory at all levels of education in Nagaland:

- 37% of the teachers were of the opinion that the students can educate their parents if the subject was made compulsory.
- Environmental issues concern people of all ages as such awareness about such issues should be created in the minds of the individuals at their tender ages. The subject will create awareness and give knowledge on how to manage and conserve natural resources, will make the students aware about climate change and change the mindset of the future generation so that students can become great contributors to care for environment.

- Teachers at all levels of education are required to impart the knowledge of various present environmental issues. Imparting Environmental Education among the young students will help change the adverse attitude of the people towards the environment. This will help to increase individual participation in the movement for protection of our environment which can be considered as key to successful conservation of environment. Further this will help in faster imparting of Environmental Education among older illiterate people regarding various aspects of environmental issues. The students will understand that we depend on our environment and that it's one's duty to protect and tell others about it.
- Environmental Education/Environmental Studies can help save our planet and humans and reduce the overall impact of pollution on environment because the present scenario in the earth is undergoing tremendous climatic changes and in future it will not be suitable for living beings if we keep on polluting at the present rate. It will also develop consciousness in their minds regarding environment.

Figure 4.4.4 Teachers Opinion on Dissemination of Knowledge and Information on Environment



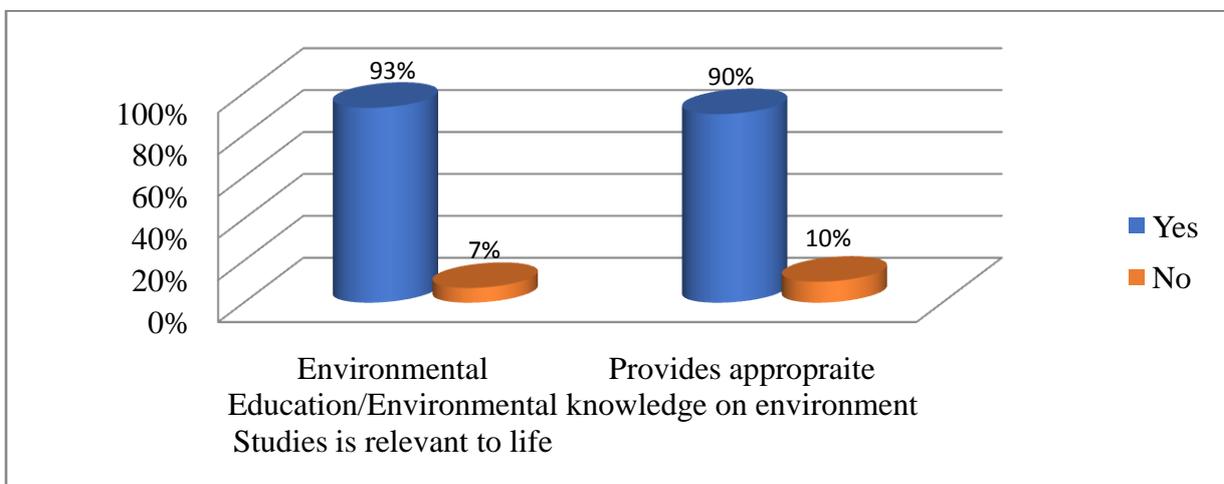
As shown in figure 4.4.4, 74% of the teachers did not face problems while disseminating knowledge and information to children on environment however 26% of the teachers faced problems whereby the problems faced are mentioned below:

- Lack of digital teaching aids/resources leads to problems while teaching and that measures and methods to mitigate the damages done cannot be done properly due to lack of teaching aids.
- Parents don't talk to children about ecological challenges.
- If students get the knowledge about environment, practically they are not equipped to implement or practice it in order to safeguard the environment. Most of the times,

children don't have much idea of what the environment is whereas some teachers were of the opinion that students were aware about environment. Due to lack of previous knowledge and practical knowledge in students, it was difficult to disseminate knowledge and information on environment to children. It was difficult to make the students understand the real causes and effects on environmental degradation as topics/subject matter are explained scientifically. Students from rural areas faced difficulty in grasping concepts. Topics which require students to have a grasp of science knowledge pose problems to most students. Except science students, all other students have no knowledge about environment. Students don't bother much since the subject matter was not given much consideration in the school and it was hard to see whether the students have learned or put their learning into effect and students never take the subject seriously. Students were unaware of the basic causes of waste and its management, pollution etc. and lack awareness on the issues relating to environment.

- Information provided in the textbooks was not up to date and most of the topics provided are outdated therefore constant revision should be done. The sheer scale of environmental destructions humans have created cannot be conveyed to students properly due to lack of statistical and graphical representation in textbooks. Issues relating to Nagaland environment should be mentioned in textbooks and while disseminating information on environment, examples of environmental issues prevalent in Nagaland should be cited as examples.
- Problem arises due to late implementation of Environmental Education in Nagaland.

Figure 4.4.5 Teachers opinion on Environmental Education/Environmental Studies



As shown in Figure 4.4.5, 93% of the teachers thought that the present syllabus of Environmental Education/Environmental Studies was relevant to life however 7% of the teachers didn't think so. 90% of the teachers thought that the contents in the syllabus of Environmental Education/Environmental Studies provided the students with appropriate knowledge for environment awareness however 10% of the teachers didn't think so.

The opinions of the teachers on method/teaching technique for dissemination of information on environment are listed as under:

- Continuous updating of latest information of the present development in all environmental issues which in turn will help make the discussions on environment more interesting. In addition, participatory type of environmental education will be more effective for dissemination of information on environment. The content should be disseminated in such a way that it is related to the present environmental condition. A statistical or graphical representation of the sheer scale of environmental degradation done by humans should be mentioned in the textbooks.
- Mass activity of afforestation should be done.
- Lecture cum demonstration method, discussion, using visual aids like charts and video clips related to environment can be adopted.
- Taking the students for field trips and educational tours to create awareness and to help them get hands on experience.
- Apart from bookish knowledge i.e., theory, students should be taught about the importance of saving energy. Theory and practical works should go hand in hand. Syllabus on Environmental Education is confined to theoretical studies therefore practical learning oriented system can be adopted by involving the students through practical teaching learning method and not just on theoretical study of the environment.
- Classroom teaching should be followed by interaction. An outdoor class/outing with the students whereby the students are involved physically and virtually should be adopted. Teaching the subject should be through surveys/practicals/learning through case studies, seminars and presentations.
- Awareness should be created by making the students conscious about the physical, social and aesthetic aspect of the environment.
- Inductive method, role play, constructive approach and project method can be used. In addition, interactive and participatory method can be applied to in all concepts.

- Students were in favour of studying environment from 1st class onwards and practical classes. Environmental Education/Studies should be made compulsory from lower section so that in later stages students don't face problems in understanding the topics.
- Explaining with examples by relating the problems faced by the people around the world due to environmental destruction. Teachers should provide eco friendly activities relating to syllabus contents, explaining topics taking simple examples from everyday life. Students should be taught about dignity of labour towards the environment. With every major topic, seminars should be done with fieldwork for understanding the topics more clearly and internship should be provided for better understanding in different areas of study. Teachers should encourage students to take part in all activities related to the environment and teachers should frequently remind the students about the environmental problems and ways to care for the environment and encourage the students to plant trees wherever possible.
- Topics in the syllabus should be of relevance to our state, strategies which are applicable to Nagaland should be adopted. The nature or aims of all schools focuses on academic rather than practical teaching or trial and error. In the case of environmental studies, teachers and students should all be learning with action and not for the sake of exam alone.
- Teachers should show through their own example which is the simplest method before teaching about environment. Teachers should adopt simple and easy technique so that the students can understand and get motivated to know more about the environment.
- Activity/project group oriented learning should be adopted. Students should be given assignments/activities to be done at home by involving the family members. Teachers should initiate clubs to care for the environment. And encourage students to become protagonists to influence the neighbourhood and town about caring for the environment through activities and students should be given recognition for their work in the form of certificates. Competitions on environmental themes can be held more frequently. More focus should be on hands on activities. Activity based teaching and learning should be the basis.
- Students should be taught about topics which have practical applications in daily life which in turn can contribute positively towards the environment and teaching method should be based on real life situation.

- Observations about students behaviour revealed that doing things practically help the students retain the knowledge and information longer.
- Outreach programmes on environment. Awareness programmes can be used for dissemination of information on environment. Presenting programmes to students, local community groups and other local stakeholders, sharing information through social media or on an organisation website, discussing project activities on the local radio can be adopted. Seminars should be held frequently for the students as well as the public on environmental issues. The administration should take the initiative to conduct such programmes. Teachers may publish information or articles on environmental issues in newspapers.
- Teaching aids like visual media will be useful. Practical based learning should be introduced, exposure should be included as part of the assignment. Student centred project based learning and co-operative method should be used.
- Environmental Education should be conveyed to different categories of the people, whereby it can be done through formal, non-formal and use of mass media. Adding more topics to the curriculum on environment can also be done basing on relevance to our state.
- Organizing field trips/visits to ruined cities, devastated areas, wasteland etc. Students should be taken to affected places and areas to see the reality.
- Inculcating in students social awareness. Awareness must be created in students regarding the degradation of the environment by conducting various awareness programmes in schools and in the classroom teaching, student based techniques must be used. Classroom teaching should be incorporated with action plans. Presenting of facts and focussing more on practical like field researches.
- Collaborative teaching for dissemination of information on environment can be adopted. Teaching with the use of examples from real life situations. Subjects should be taught based on local environmental issues. Educate the students on the harmful effects of environmental degradation and how to preserve the environment. The general public should be educated on practical grounds.
- Teachers should be well versed in their subject. Thorough studies should be done before dissemination of information on environment. The students should be engaged in classroom activities provided with relevant topics on environment.

Figure 4.4.6 Teachers Co-curricular Activity on Environment

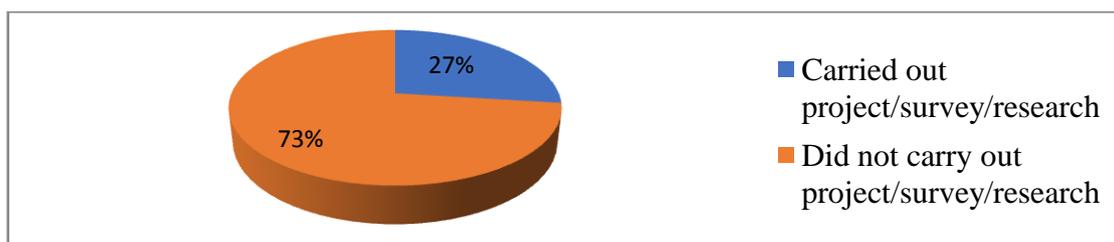


Figure 4.4.6 showed that 27% of the teachers carried out project/survey/research on environment whereas 73% of the teachers did not carry out any project/survey/research on environment. The teachers carried out project/survey/researches on air pollution, assessment of fish and plankton species vulnerability to climate change, assessment of plastic waste management, deforestation, effects of different fertilizers on the growth of algae in pond water, environment awareness among secondary students in Nagaland, floods, forest and wildlife conservation, fostering climate resilient update farming system in the Northeast (Focus Nagaland), impact of invasive plant species on the local plants, jhum cultivation, metal pollution of nanoparticles and heavy metal pollution and microplastic pollution, over population and its effects on environment, pollution and construction of proper drainage, traditional agro forestry and its ecological implications, tree plantation and causes of deforestation, stone quarrying, merits and demerits, study of common plants and methods for saving electricity and fuel, study of common plants and medicinal plants; waste disposal system in vegetables and fruits market, sanitation and cleanliness drives and plantation drives, village water resources, livestock resources, central schemes which have directly and indirectly impacted their environment and their life, waste management and pollution and harmful effects of burning plastics.

Table 4.4.7 Environment friendly code of behaviour/activities of leaders

Items	Response %
Becoming a vegetarian	3
Eating home cooked meals from one's own kitchen garden	36
Visiting environmentally important places	23
Special/short term training course on environment	7
Encourage people to get involved in projects that promote environmental awareness	52
Organise competitions on environmental themes	12
Encourage use of re-useable products	34
Encourage use of public transport, bicycle and walking on foot	22

Table 4.4.7 showed that 3% of the leaders were vegetarians, 36% of the leaders ate home cooked meals and maintained kitchen garden, 23% of the leaders went sightseeing or tours to environmentally significant places, 7% of the leaders gave special/ short term courses on environment to interested individuals, 52% of the leaders encouraged people to get involved in action projects that promote environmental awareness, 12% of the leaders organised competitions on environmental themes, 34% of the leaders encouraged the use of re-useable products and 22% of the leaders encouraged use of public transport, plying by bicycle and walking on foot. The leaders were of the opinion that the pro-environmental behaviour and activities should be adopted and promoted by all in order to preserve the environment.

Figure 4.4.8 Leader’s response on activities/programmes on environment

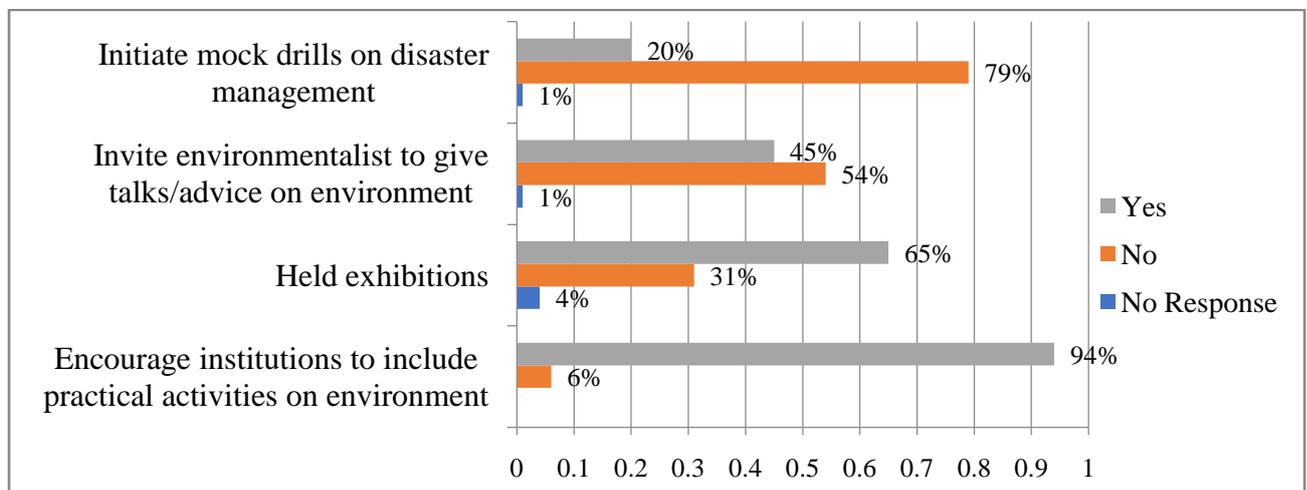


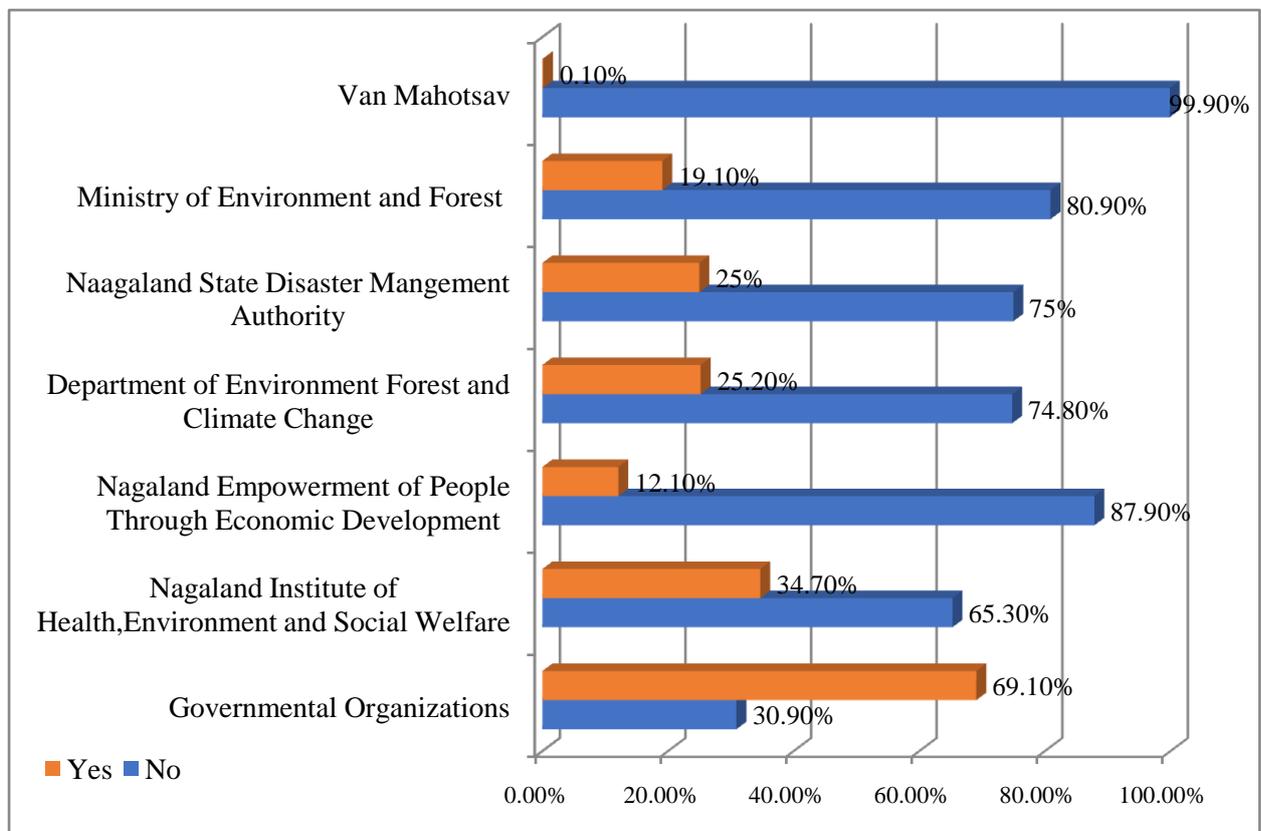
Figure 4.4.8 showed that 94% of the leaders encouraged educational institutions to include co-curricular or practical activities on environment in the curriculum however 6% of the leaders didn’t do so. 65% of the leaders held exhibitions on environmental resources in their own community whereas 31% of the leaders didn’t do so and 4% of the leaders didn’t respond. 45% of the leaders invited environmentalist/subject experts to give talks or advice to the public on environmental issues whereas 54% of the leaders didn’t do so and 1% of the leaders failed to respond. 20% of the leaders initiated mock drills on disaster management however 79% of the leaders didn’t do so and 1% of the leaders didn’t respond. Mock drills were not carried out in school campus however it was carried out in every community. Pre-job training on disaster management was given to government officials. The activities performed during the mock drills were-giving advice to the public on ways to tackle fire outbreak and earthquake through demonstrations, providing first aid to the injured, excavation procedure and emergency escape triage, categorising and sorting patient by degree

of severity, to provide first aid on priority basis, first aid during disaster management to prevent fatalities etc and safety administration to those who drown.

4.5 Analysis and Interpretation of Data Related to Objective 4 - Measures and programmes undertaken by the Government and NGO's to achieve global objectives of environment awareness

3 questions were raised to the secondary school students and 1 question was raised to the leaders. The following is the analysis and interpretation of the data.

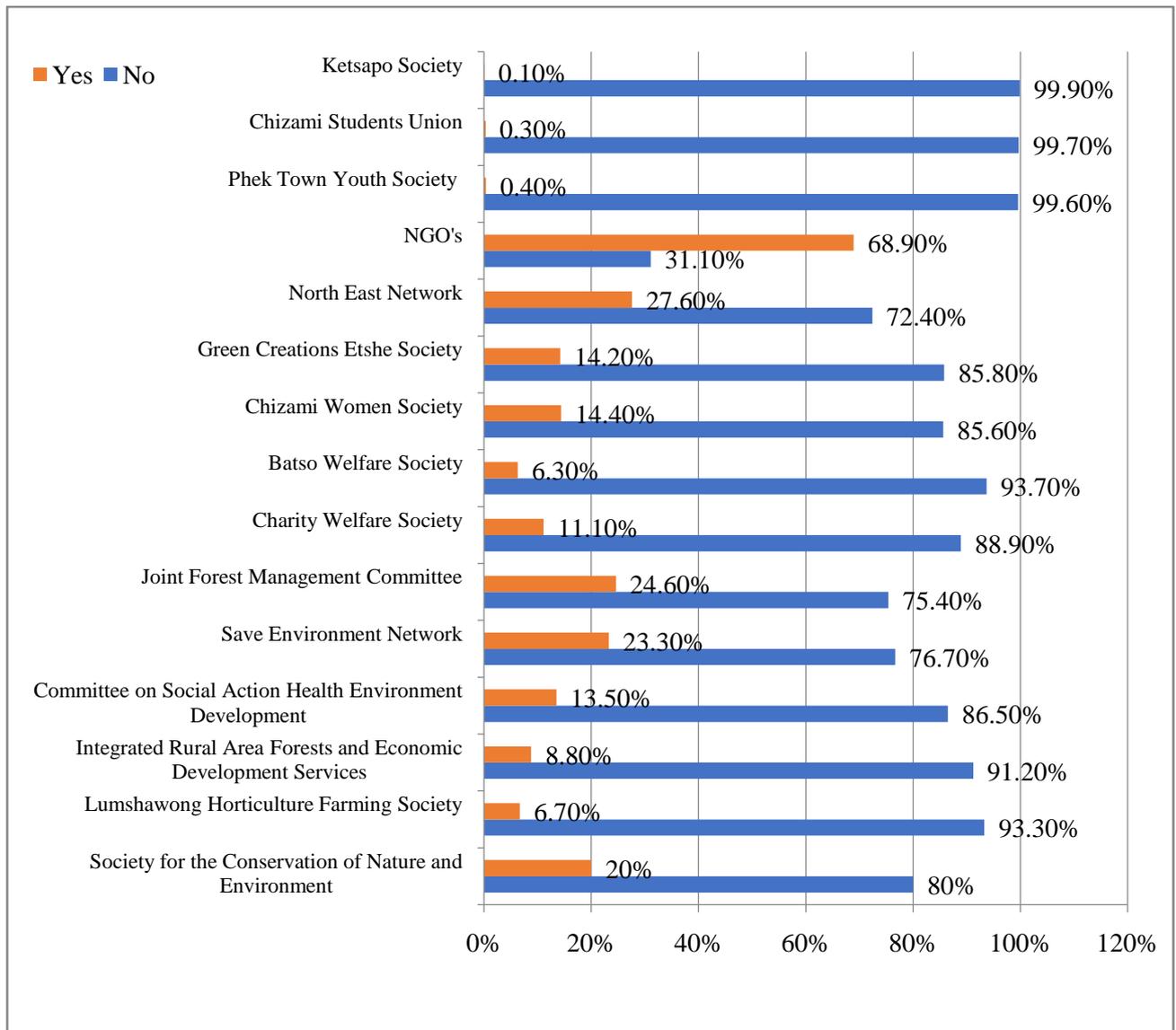
Figure 4.5.1 Secondary school student's response on governmental organization working on environmental preservation in Nagaland



As per the responses shown in figure 4.5.1, 69.10% of the students know about governmental organizations working on environmental protection and preservation in Nagaland whereas 30.90% of the students did not know. 34.70% of the students know about Nagaland Institute of Health Environment and Social Welfare (NIHESW) whereas 65.30% did not know. 12.10% of the students know about Nagaland Empowerment of People through Economic Development whereas 87.90% did not know. 25.20% of the students know about Department of Environment Forest and Climate Change whereas 74.80% did not know. 25% of the students know about Nagaland State Disaster Management Authority whereas 75% did not

know. 19.10% of the students know about Ministry of Environment and Forest (MoEF) whereas 80.90% did not know. The secondary school students mentioned Van Mahotsav which is an annual tree planting movement, however only 0.10% of the students know about it while 99.90% did not know.

Figure 4.5.2 Secondary school student’s response on NGO’s working on environmental protection and preservation in Nagaland



As per the responses from figure 4.5.2, 68.90% of the students know about NGO’s working on environmental protection and preservation in Nagaland whereas 31.10% of the students did not know. 27.60% of the students were aware about North East Network (NEN) whereas 72.40% did not know. 14.20% of the students know about Green Creations Etshe Society whereas 85.80% did not know. 14.40% of the students know about Chizami Woman Society

whereas 85.60% did not know. 6.30% of the students know about Batso Welfare Society whereas 93.70% did not know. 11.10% of the students know about Charity Welfare Society whereas 88.90% did not know. 24.60% of the students know about Joint Forest Management Committee (JFMC) whereas 75.40% did not know. 23.30% of the students know about Save Environment Network (SEN) whereas 76.70% did not know. 13.50% of the students know about Committee on Social Action Health Environment Development whereas 86.50% did not know. 8.80% of the students know about Integrated Rural Area Forests and Economic Development Services whereas 91.20% did not know. 6.70% of the students know about Lumshawong Horticulture Farming Society whereas 93.3% did not know. 20% of the students know about Society for the Conservation of Nature and Environment whereas 80% did not know. 0.40% of the secondary school students mentioned that Phek Town Youth Society, works for the progress and development of a peaceful ecosystem as well as beautifying the environment however 99.60% did not know. 0.30% of the secondary school students mentioned that Chizami Students Union works on environmental issues however 99.70% did not know. 0.10% of the secondary school students mentioned that Ketsapo Society works on environmental issues however 99.90% did not know.

Figure 4.5.3 Secondary school student’s response on measures and programmes undertaken by various organizations

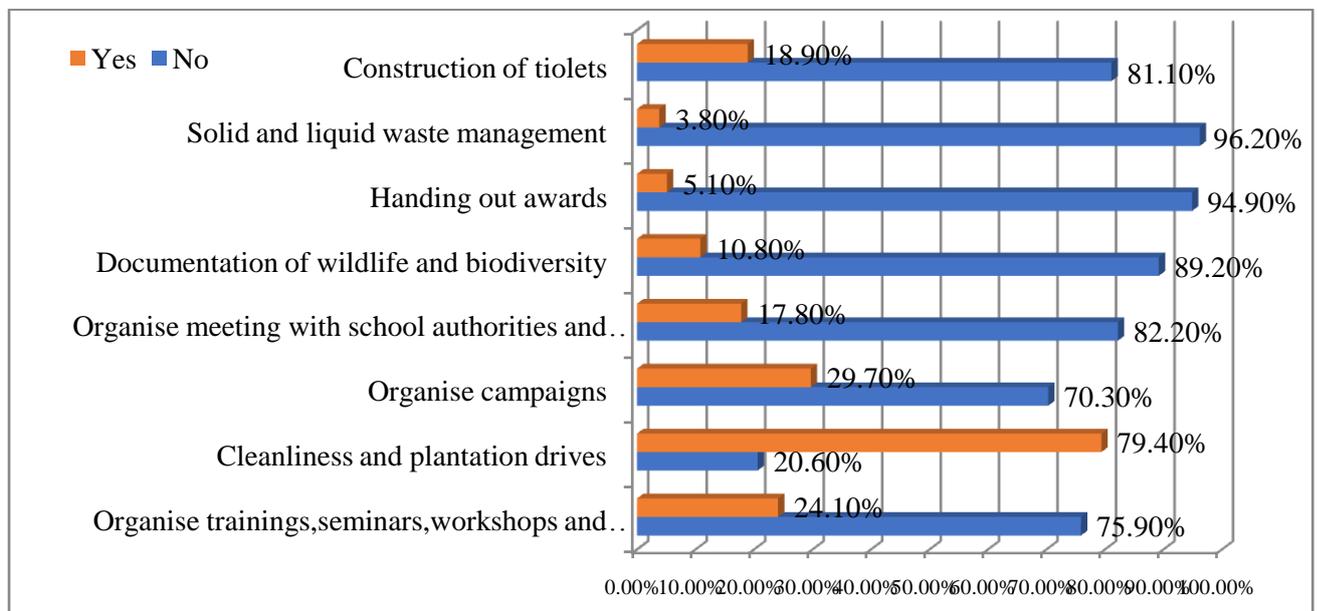


Figure 4.5.3 showed that a low number of the students know about trainings, seminars, workshops and rallies on environmental themes conducted by the government and NGO’s in the community. Only 24.10% of the students know about it whereas 75.9% did not know.

Trainings, seminars and workshops were not conducted in the secondary schools however rallies were conducted in all secondary schools. A very high number of students were aware about the cleanliness and tree plantation drives. 79.40% of the students know about the cleanliness drives and tree plantation whereas 20.60% did not know. 100% of the secondary students actively participated in cleanliness drives and tree plantation drives in the schools as well as in the community and all secondary schools carried out cleanliness and plantation drives. A very low number of the students were aware about environment awareness campaigns and meetings conducted by various organisations to discuss on environmental issues, documentation of wildlife and biodiversity, awards handed out to individuals who have contributed in raising awareness on environment, solid and liquid waste management and construction of toilets. Only 29.70% of the students know about the environment awareness campaigns initiated by various organisations whereas 70.30% did not know. However in Phek district, North East Network (NEN) hold summer camps to address the growing issue of food insecurity by presenting traditional sustainable farming system. Only 17.80% of the students know about the meetings conducted by various organisations with school authorities, community and church leaders to discuss on environmental issues whereas 82.20% did not know. Only 10.80% of the students know about the documentation of wildlife and biodiversity carried out by various organisations whereas 89.2% did not know. In Phek district documentation of wildlife and biodiversity is done by North East Network (NEN). Only 5.10% of the students know about awards handed out to those individuals who have contributed in raising awareness among community members whereas 94.9% did not know. Only 3.80% of the students know about solid and liquid waste management carried out by various organisations whereas 96.2% did not know. Only 18.90% of the students know about funds/ building materials provided by the government for construction of toilets in the villages whereas 81.1% did not know.

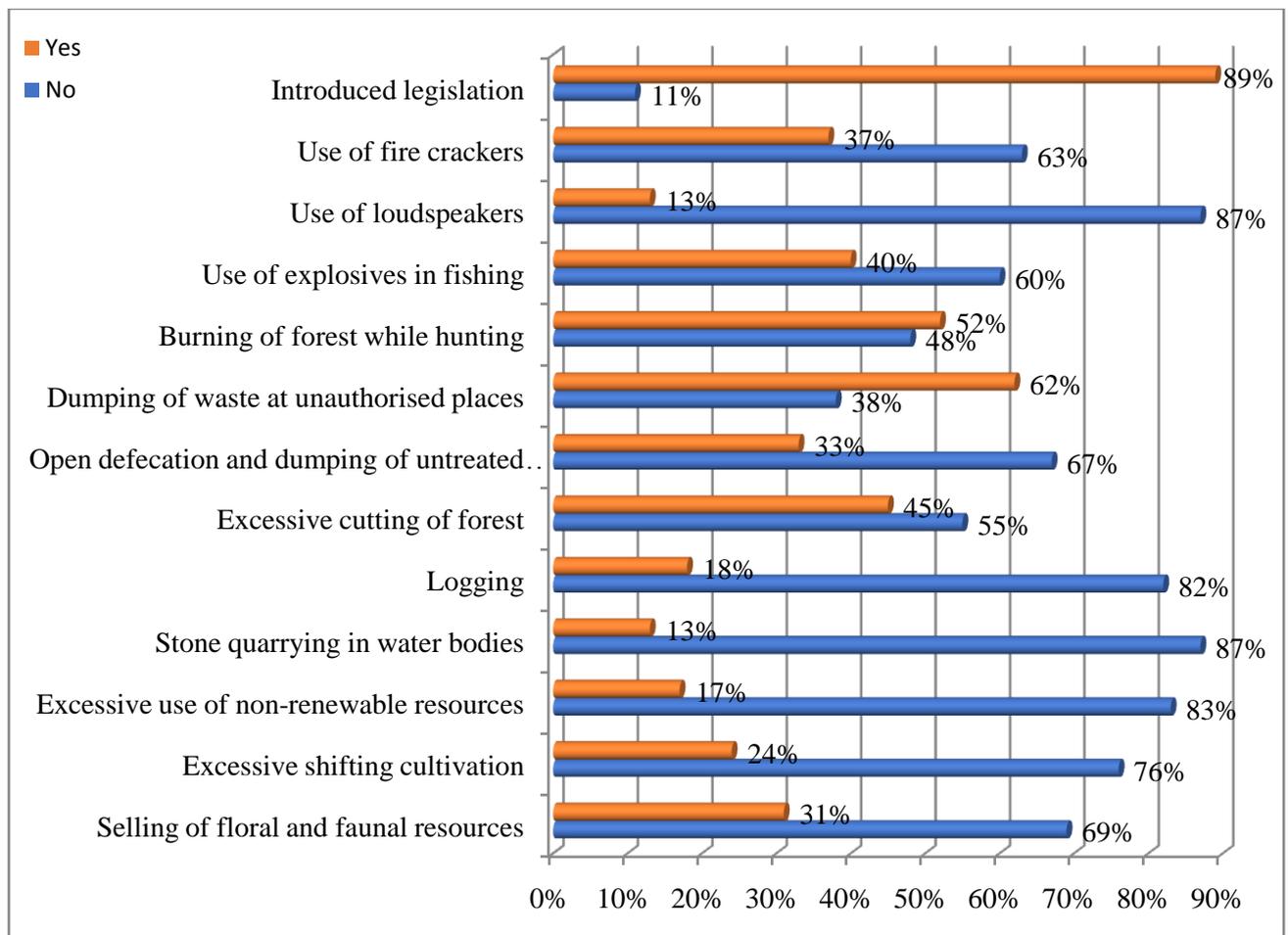
Table 4.5.4 Initiatives taken by various organizations to raise environmental awareness as mentioned by the secondary school students

Items	Response %
NSS on environmental preservation, irrigation channels, ban on use of plastic, conducting mock drills, pollution management and observation of sanitation day in the community	0.20
Vaccination programmes and free dental check up in the villages/community	0.10

0.20% of the students mentioned that National Service Scheme (NSS) also works on environmental preservation, irrigation channels constructed by the government in villages, ban on use of plastic by the government, mock drills as well as pollution control carried out in the community and observation of sanitation day. 0.10% of the students mentioned that the health care department also carries out vaccination programmes and free dental check-ups for the students and community members.

Mock drills were conducted in the community but not in schools except Chetheba Government High School, on disaster management especially on earthquakes, landslide and fire. The students who participated were taught on how to use fire extinguishers, use bandage, help injured, tie ropes etc and the experts gave talks on disaster management.

Figure 4.5.5 Leader’s response on environmental legislations



As shown from the figure above, 89% of the leaders introduced regulations/legislations to make people stop environmentally harmful activities while 11% of the leaders didn't do so. The regulations/legislations made by leaders were - 37% on use of fire crackers during important events or occasions however 63% didn't do so, 13% on use of loudspeakers during

important events or occasions however 87% didn't do so, 40% on use of explosives in fishing however 60% didn't do so, 52% on burning forest while hunting however 48% didn't do so, 62% on dumping of waste at unauthorised places however 38% didn't do so, 33% on open defecation and dumping of untreated sewage in water however 67% didn't do so, 45% on excessive cutting or clearing of forest however 55% didn't do so, 18% on logging however 82% didn't do so, 13% on stone quarrying in the water bodies however 87% didn't do so, 17% on excessive use of non-renewable resources however 83% didn't do so, 24% on excessive jhum cultivation however 76% didn't do so, 31% on selling of floral and faunal resources however 69% didn't do so.

Figure 4.5.6 Leader's response on framing and implementation of environmental laws

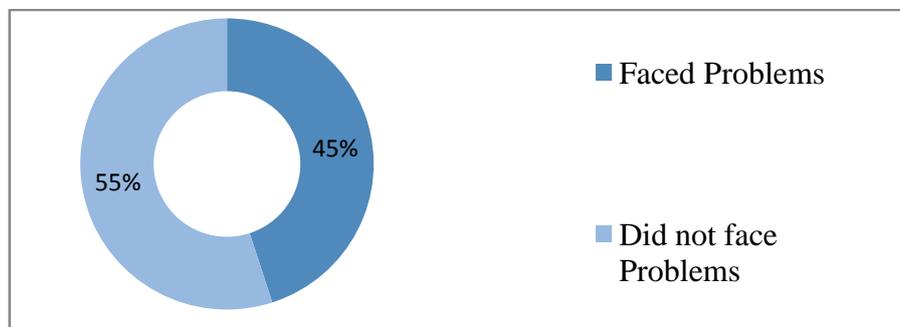


Figure 4.5.6 showed that 45% of the leaders faced problems while framing environmental protection laws and implementing it whereas 55% of the leaders mentioned that they did not face problems. The problems faced are listed below:

- Deforestation and practice of shifting cultivation still remains uncontrollable. Land is privately owned whereby landowners have authority, hence landowners cannot be bonded by laws and there is lack of specific NGO's for dealing with this issue.
- Due to financial constraints some goals on environmental conservation were not achieved. Other reasons were presence of defaulters, uncooperative attitude among members of the public, exploitation of loopholes in policy by some deviant individuals, non- obedience by public mainly urban dwellers, theft and while making environmental laws people are always full of opinions. Need for governmental help arises as locals don't obey the rules laid down on hunting and fishing. Illiterate locals find it difficult to cop up while some people are against the action plans on environmental laws. If environmental laws are strictly enforced, it affects some economic development. There is lack of general awareness on environmental issues among the public and lack of adequate facilities. It's not easy to sensitize common

people on environmental issues. People have different thoughts and choices. Some people don't follow rules on use of dustbins. School children have less civic sense. Traditional ways or methods are always best: attitude of the locals. People are ignorant. Use of fertilizers- land became hard the following year and hence use is continued. And according to leaders, teachers were not active in environmental affairs.

- Members of political parties attempt to frame issues in a way that makes a solution favouring their own political leaning as it appears as the most appropriate course of action for the situation at hand.
- Practice of jhum cultivation because most of the people depend on it for their livelihood and ignorant villagers are reluctant to do away with the traditional and age old practice as they have conservative nature and lack other modern method to apply to situations. Hunting also a cultural practice, people are not willing to do away with.
- Providing site or area for disposal of waste becomes a problem as huge amounts of waste are generated every year. Uncooperative attitude of some section of the people or society. Community elders ignore environmental issues. Laws and regulations on environment are taken lightly. Implementation becomes a problem as some people are not willing to step back or forward for improving the environment.

4.6 Analysis and interpretation of data related to objective - 5, Measures for environmental protection and awareness

2 questions were raised on secondary students and leaders, and 4 questions were raised on teachers and 2 questions were raised to leaders to get suggestions for environmental protection and awareness.

4.6.1 Measures given by secondary school students

- Set up committees/societies where students can be active members in order to protect and preserve the environment.
- Plant trees in places not fit for agriculture. Plant trees in landslide prone areas.
- Control jhum cultivation and deforestation. Excessive cutting down of trees or logging should be punished. Educate public on benefits of forest.
- Plant fruit trees or flowers and maintain one's own kitchen garden. Educate the students on benefits of eating healthy.

- Make it compulsory for every student to take part in plantation drives whereby even young children can be made to take part in it.
- Do not spoil the pristine beauty of picnic spots-river banks, lakes etc. Conserve the natural habitat of plant and animal and leave nature pure.
- Control use of chemicals, fertilizers-ban its use. Use bio-fertilizers and manures instead. Educate the students on harmful effects of using explosives or over fishing.
- Educate the students and the public on benefits of rainwater harvesting and encourage every household to harvest rainwater.
- Organisations should conduct meetings with school authorities and teachers, village leaders to discuss on environmental issues to find solutions.
- Preserve and protect the school environment and make the students take active part in cleaning the school environment and beautifying it. Proper sanitation facilities should be provided. Impose fines for those students who litter the school campus.
- Introduce more activities in the school on environment. The school authorities should see to it that dustbins are kept in every class. Conduct Socially Useful and Productive Work (SUPW) weekly. Engage the students in sanitation works or cleaning the school campus as well as the whole community. Give students responsibility to take care of the school environment. Make the students work in groups-provide activities like gardening, project work, assignments, brainstorming etc basing on environmental themes. Organise mass social work in schools weekly. School authorities should conduct mock drills on disaster management to make the students more aware about disasters and preventive and proactive measures. Observe environmentally special days and make the students take active part in it. Schools should organise study camps and field trips. Students should be taught about proper waste management strategies in the schools.
- Make sign boards on community laws on environment and place it in various parts of the villages or fields. Funds should be given so that community wells can be constructed.
- Educate students and adults about environmental issues so that they can be catalyst in environmental protection.
- Educate the students on use of eco-friendly tools and methods of farming so that they in turn can teach their parents on eco friendly tools of farming.

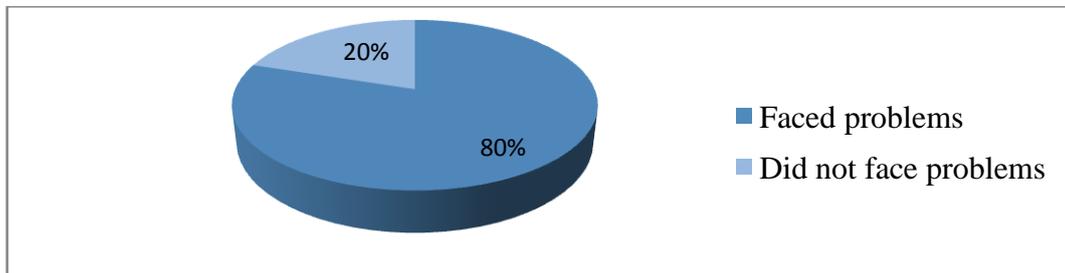
- The teachers who teach the subject matter should set examples, live an exemplary life and provide proper up to date information about eco-friendly ways of living in harmony with nature.
- All secondary schools should introduce litter and tobacco free campus. At the village level, community leaders should enforce litter and tobacco free village.
- Introduce National Service Scheme (NSS) and eco clubs in schools which don't have members so that change can be brought about in the environmental state of affairs.
- Use other means of cooking instead of using firewood as fuel.
- Ban disposing of waste at unauthorised locations as well as burning of plastics. Create awareness among the students and the public about the harmful use of plastics.
- Educate the students about watershed management. Educate students on not polluting the water bodies and water conservation methods.
- Make the students aware of deforestation and educate them on how to curb it.
- Make proper toilets, drainage and irrigation channels.
- Every household should practice composting.
- Protect the habitat of wildlife. Put more areas under reserved forests.
- Government should provide proper health care and welfare facilities, environment friendly technology. Government should provide proper public means of transport.
- Schools should imbibe in students the attitude to protect and preserve species from a young age.
- Reduce waste and over-consumption of resources. Segregate waste before disposing off. Government should contribute incinerator or waste disposal machines to every community so that proper sanitation can be maintained.
- Waste from small scale factories should be disposed of properly. Dispose of toxic chemicals, plants properly.
- Organise public social work. Keep the community clean. Educate the students on proper use of dustbins.
- Mass media should be used to educate the students as well as the public on environment. Environmental scientist/subject experts should be invited in schools, churches, community gatherings to give talks on environment and its issues. Schools should organise study tours/field trips to environmentally sensitive areas.
- Communities should start afforestation/reforestation programmes. Strict adherence to the rules and regulations lay down by the government and local and semi-urban bodies should be done on environmental laws.

- Teachers/subject experts, community leaders should work together to address environmental grievances.
- Trees/flowers/shrubs should be planted on both sides of the road.
- Documentation of wildlife and biodiversity should be done in every school, village or towns.
- Open parks, wildlife sanctuaries to protect/preserve forest and wildlife.
- Every school, house, office, village, town, should have their own compost pit.
- Schools authorities and village leaders should promote schemes framed by the government and educate the people about the various schemes available.
- Dispose of hospital waste properly.
- Use recycled products. Recycle non-biodegradable items/objects. Use only biodegradable products/substances/eco-friendly products.
- Raise awareness among the students and public on sanitation and hygienic practices. Make the public aware about the harmful effects of disposing of sewage in water bodies and educate them on treating domestic waste before disposal. Store water in clean tanks. Proper water treatment should be done before distribution to the khels or communities. Every community must work together to protect water resources and clean the water bodies or tanks regularly. Construct proper water treatment facilities and water tanks for every khel.
- Adopt the 4 “R’s”- Refuse, Reduce, Reuse and Recycle.
- Students and public should be made aware about the harmful effects of hunting/poaching.
- Students and the public should be made aware about the harmful effects of forests fires. Stop burning forests near village settlements.
- Schools should work hand in hand with organisations that work on environmental protection and preservation.
- During parties, marriage and social gatherings, disposable plastic cups and plates should be banned. Biodegradable and eco-friendly plates and cups should be used instead.
- Reduce the use of paper, water, electricity, fuel.
- Organise street plays on environmental themes. Conduct debates on environmental themes.
- Adopt sustainable development goals.

- More works/research works on environment should be published in newspapers to make the students and the public aware about the environmental scenario.
- Burning of garbage should be regulated. Segregate toxic and biodegradable waste.
- Public should be educated about the harmful effects of chemicals on environment and health. Promote bio-fertilizers and bio-pesticides for use in agriculture.
- Government should make Environmental Education or studies compulsory in all levels of education. Give more importance to environment and dissemination of proper information on environment.
- Various organisations or societies should work together with the students to work on environmental preservation. Raise funds in order to solve local environmental issues.
- Encourage people to have civic sense. Every individual should carry their own cotton, jute, basket while shopping. Use LPG, CNG and solar energy for cooking. Collection of live wood should be strictly regulated. Avoid cutting trees or forests on a large scale. Explosives and fire crackers or bombs, batteries, gun powder etc should not be used on any occasion.
- Students should be taught not to waste paper and minimise paper wastage. Recycle papers and newspapers. Donate old books to libraries. Students should be taught that cleanliness is the best way to contribute to the environment. Awareness programmes on sanitation should be conducted.
- Use fewer machines. Ban sale of medicinal plants/herbs etc.
- Government should make proper roads and drainage system in both rural areas and town.
- Institutions should take initiative to campaign for pollution free environment.
- Communities should adopt sustainable development goals. Everyone should play a pro-active role in solving community environmental issues.
- Make the students aware about the reasons that lead to pollution. Make the students and the public aware about the ill-effects of disasters, that trees retain water, restore water table, curb climate change, stop soil erosion, absorb noise and purify the air. Make students aware about pollution and the detrimental effects of pollution on health.
- Cattle grazing in the fields and forests and grasslands should be checked. Control overgrazing of cattle. Animals should not be left alone. Life-stock waste should be properly disposed off.

4.6.2 Measures for environmental protection and awareness by teachers

Figure 4.6.1 Teacher's opinion on climate change

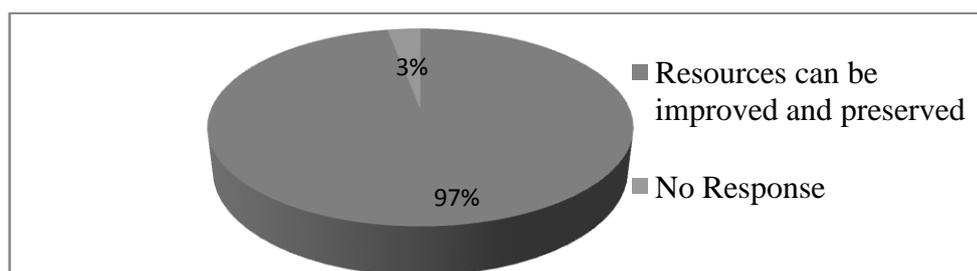


As per figure 4.6.1, 80% of the teachers were of the opinion that problems were faced due to climate change/disaster whereas 20% were of the opinion that no problems were faced.

Listed below are the teacher's suggestions on ways to curb climate change/disaster:

- Afforestation, farm to save energy, adopt 3 "R's", reduce water waste, hazardous electronic waste, stop deforestation.
- Conduct essay, quiz, debates and drawing competitions trainings, workshops, seminars, campaigns on environmental themes in the schools and community. Promote awareness among the students and community members through songs, dramas, sports etc. basing on environmental themes.
- Minimise use of water to curb the shortage of water supply, encourage biogas fuels in place of firewood and stop burning forests. Reduce consumption, recycle, adopt car pooling, use public transport and spread awareness, use energy efficient devices, use renewable energy sources. Recycle every material, reduce energy use and reuse whatever things possible.
- Tree plantation should be encouraged and every village should preserve biodiversity/forest. Plant more trees in landslide prone areas, cultivate crops according to climate change.

Figure 4.6.2 Teachers response on environmental restoration and preservation



As shown in figure 4.6.2, 97% of the teachers were of the opinion that the environment and its resources can be improved and preserved in Phek district (Nagaland in general) however 3% of the teachers didn't give any response (no response).

Table 4.6.3 Teacher's suggestions for environmental restoration and preservation

Items	Response %
Campaigns to raise awareness on the environment and its issues	49
Strict implantation of environmental laws	40
Strict punishment for violation of environmental laws	31
Encouraging community members, church, organizations, institutions, clubs etc	76

49% of the teachers were in favour of campaigns in order to raise awareness of the environment and its issues. 40% of the teachers were in favour of strict implementation of environmental laws. 31% of the teachers were in favour of strict punishment for violation of environmental laws and 76% of the teachers were in favour of encouraging community members, church, organisations, institutions, clubs etc to play an active role in improving the environment. (Table 4.6.3)

Listed below are the suggestions/ measures given by teachers to protect and preserve the environment.

- Youths should be encouraged to form clubs to protect and preserve the environment.
- Plastic bags and its use should be banned or discouraged.
- Rain water harvesting should be promoted or encouraged.
- Academic inculcation-strict study and implementation of environmental laws. Sharing information through life experiences, teachers themselves should set examples. Make the students responsible. Changing way of living/lifestyle, inculcate in students environment sensitivity through awareness programmes, conservation efforts and educate them on harmful effects of environmental degradation.
- Adopt environment friendly lifestyle, behaviour and habits. Conduct workshops and seminars at school level for greater impact among the young minds.
- Adults should follow environment friendly behaviour so that students can follow in their footsteps.
- Avoid single use plastic, reduce carbon footprint, use locally produced groceries, goods and services and spread environment awareness.
- Make each community a self supporting community.

- Be environment friendly, avoid burning of forests and educate others about the negative effects of burning forest.
- Initiate creative activities and form environmental clubs for students of all ages in the school and community.
- Better communication facility should be provided, a public library for the people in the community, uninterrupted electricity supply and establishment of night school in every community.
- In communities, societies mainly working on environmental issues should be created to tackle the issues faced by the community.
- The pros and cons should be weighed before constructions of dams.
- Stop mining, stone quarrying of the river beds.
- Sometimes classes can be taken outside in the midst of nature, let the students bask in the beauty of nature.
- More research on agriculture is needed at present.
- Students should be taught about the health benefits of eating organic vegetables. Every household should be encouraged to maintain kitchen garden.
- Make the students actively participate in awareness programmes.
- Government should provide alternative means of burning waste. Better irrigation facilities should be provided by the government so that water resources can be put to good use. The government should construct more toilets for individual households (people in villages still use public toilets) as well as schools to make it Open Defecation free (ODF), initiate more solid and liquid waste management activities, provide safe drinking water supply-water quality monitoring and surveillance and environment hygiene for the members of the community.
- Be responsible on an individual level, help the students to organise and participate in larger mass activities. Allow opportunities for students to do things practically to learn and experience at an early age.
- Exhibitions on environmental resources should be done regularly even within the school campus. Students should be taught the importance of resources and how to minimise use and wastage.
- Schools should provide proper toilets for both genders. Proper running water should also be provided.

- Girls should be taught about menstruation-proper hygiene and disposal of used sanitary pads. Schools should have incinerators to dispose of the used sanitary pads properly.
- Burn garbage around the locality, clean drainage regularly with students and local youths, planting trees where loose soil are found, encourage elders to take up plantation.
- Set up an environmental office in every locality so that everyone works for environmental restoration.
- Students as well as the public should be informed about the harmful effects of shifting cultivation. Alder trees should be planted in areas where shifting cultivation is done.
- The students should be taught properly on disaster management and mitigation efforts. Hands on experience should be given to the students.
- Community should work together towards sanitation, sustainable development, rainwater harvesting, afforestation etc.
- Environmental education should be implemented effectively. Adequate facilities/teaching aids should be provided in schools. Conduct and promote awareness outside school activities.
- Students and public should be shown to manage household waste. Video clips on the same can be shown to the students and the public to minimise waste.
- Educate the students and the public about the role played by every species and stress on the need for preservation. List the endangered species and enforce strict hunting/poaching laws.
- Videos regarding the latest scenario can be shown to students to instil in them the urgency to take care of the environment. Information about environmental issues can be made known to the students and community members through use of mass media.
- Practical lessons leaves greater impact on students therefore students should be given activities/projects such that it involves them to visit areas that are polluted or degraded which in turn will make them become more responsible towards the environment.
- Develop mechanism to monitor forest growth. Adopt scientific and eco-friendly techniques of harvesting forests resources. For the farming community, agro-forestry should be adopted.
- Tourism projects, transportation and communication projects, water projects, waste management projects etc should be given importance in every district.

- Educate students and public on detrimental effects and causes of environmental degradation -reduction in quality of environment, landslide, earthquakes, acid rain, increase in deforestation, biodiversity loss, desertification, global warming, species extinction, environmental pollution, water scarcity and decline in its quality, poverty, climate change, scarcity of natural resources, over population and over exploitation of resources, agricultural practices, landfills, improper land use planning and development, wildfires, floods etc.
- Wind mills and solar panels should be installed in every village or towns to save energy and minimise resource use.
- Communities should stop logging for commercial purpose or for other purposes. Public should be made aware about the detrimental effects of logging on environment.
- Educate the students on family planning, as less population leads to less pollution. Control pollution. Clean the drainage and public places regularly. Develop facilities for water treatment, human and life stock waste. Imbibe in students the habit of sanitation.
- Environment awareness should begin from each family/home. Create mini forest on the land under one's holding for asset management business.
- Disseminate proper information on importance of environment, create social awareness. Educate and create a sense of responsibility on students.
- Encourage use of LPG instead of firewood, minimise use of water, electricity and plastic.
- Organise competitions on environmental themes in such a way that students can learn and relate. Teachers should take initiative to care for the environment.
- Educate the local people and encourage students to put whatever they learn into practice, to use biodegradable substances, energy efficient electronics, judicious use of natural resources available.
- The environmental subject taught in school should have practical application in daily life, learning should be made fun with more activities rather than focussing too much on topics which do not have much relevance to the local geographical area.
- Make Environmental Studies/Environmental Education into a compulsory subject in order to make the students take interest in the subject and updated about the current state of environment affairs in Nagaland.
- Encourage discussions on environmental issues with students and the public so that local policies on environment will be enacted through such discussions.

- Encourage farmers to go for mixed cropping, educate the locality on waste management and to dump waste at proper sites, discourage farmers from using pesticides/herbicides/insecticides/chemical fertilizers that degrade the soil fertility and emit harmful gases, discourage burning of forests. Organise seminars engaging and environmentalists/subject expert.
- Lead the students on case studies or survey where students can relate in their locality and make them get hands on experiences from such studies or surveys.
- Encourage use of eco friendly products. Encourage students to maintain school garden or kitchen garden at home or in the school compound and to respect and protect public property.
- Seminars, workshops, surveys, field studies, sanitation and plantation drives, discussions should be made mandatory and a compulsory part of the curriculum under environmental studies.
- Generate in students awareness about the adverse effects of climate change due to human's materialistic behaviour towards nature and ways to curb it.
- Discourage hunting, create more recreation park and wildlife sanctuary.
- Make a project for students on how much waste each household produce in a month and year. Develop interest in the students by forming groups to discover the different plants and animal species available in one's locality.
- Hold orientation to the local environment by providing historic information about the very environment relating it to the present environmental status, its changes and its effects leading to climatic changes/global warming.
- Teachers should have proper legal knowledge about environmental laws and the students and the public should be educated about environment protection laws.
- Issue prohibition orders from local authorities on dumping of waste or garbage on roadside, drains, canals, river etc.
- Keep kitchen garden free from chemicals, plant pollinator friendly plants. Maintain own kitchen garden.
- Encourage people to harvest rain water and make students a part of every small change for rebuilding the environment.
- Make community members participate in plantation drives along with the students. Teachers should give proper knowledge and advice about environment. Seminars and awareness programmes should be conducted at all levels in the schools.

- Make environmental related issues as a part of the syllabus in subjects like Science, English and Social Sciences.
- Make every student submit a monthly report of any project/activity that they have done which has contributed towards environmental protection or conservation. This can be made a part of academic co-curricular activities. Students should be trained to face and mitigate the environmental problems at present and in the future. More focus must be given to conservation and pollution. Students should be taught from the roots of the environment not just for the sake of the study but for the wellbeing of his life and their future generation. Make the students carry out research on how to recycle and preserve environment locally.
- Observe environmentally important occasions and involve community leaders to contribute to such celebrations. Invite nearby villages/communities to join in social work and programmes on environment. Be an example for students to follow, lead by example, create opportunity for the students to have competitions at the school level on environment, have project/activities/clubs to inculcate interest and love for environment.
- Apply practical field studies along with theoretical understanding to the local environmental issues.
- Make effective use of dustbins and bring one's own shopping bag while shopping. Carry out field trips to model villages/towns or Community Conserved Areas (CCA). Use reusable bags instead of plastic grocery type bags and ban use of plastic bags.
- Save water and limit water usage. Adopt recycling, water harvesting and save electricity. Use renewable energy at home at work/office and provide comprehensive information for environmental protection and preservation.
- Practical demonstrations should be used for teaching learning and positive reinforcement should be given for commendable work/activity relating to environment, educate students in such a way that they in turn can educate their parents and community members.
- Preserve, conserve and protect the public property such as lakes, stream, river etc. Proper management of waste and drainage.
- Proper dissemination of environmental knowledge and information through use of examples pertaining to community like less agricultural output/ harvest due to scanty rainfall/droughts during monsoon season etc.

- Encourage the students to opt for eco-friendly job avenues for future prospects, encourage judicious and sustainable use of resources. Involve students through practical learning experiences. Syllabus should include survey or project basing on sanitation, plantation, pollution in a particular area etc whereby the same can be posted in school website or other means.
- Put more areas under reserve areas, or convert areas into biodiversity reserves.
- Educate the students through role play and setting up of botanical garden in the schools.
- Segregate waste into biodegradable and non-biodegradable waste before handing over to the municipal council or before disposal.
- Hold group discussions with students about the various environmental issues and give them field projects.
- Sensitise the students on climate change or global warming. Encourage and educate youths/students on afforestation and management of ecosystem.
- Shop locally, shop organically, plant trees, celebrate environmentally important days, conduct training for students on environmental management, conduct awareness campaign and tree plantation campaign.
- Spread knowledge on environmental issues and solutions to tackle it. Entrust the students to undertake field trips to plant trees and nurture it continually.
- Give projects relating to current environmental issues, let the student survey the nearest towns and villages with the experts, collaborate with the government department and NGO's for protecting and preserving the environment.
- Hold science exhibitions about environmental issues in the school.
- Touring in rural parts of the state and carrying out plantation and other activities.
- Reduce paper waste, use less electricity, organise community clean up once in a week, encourage people to avoid using cars as much as possible. Encourage students to switch off electronic appliances and lights when not in use.
- Encourage young students to take more interest in the various aspects of environmental issues.
- Discipline students starting from one's own classroom/ school about managing waste, organise activities and competition to come up with innovative ideas to protect the environment. Teach students to become agents and protectors of the environment and practice sustainable living.

- Use eco friendly technology, make each student self supportive as possible, disseminate proper information on rain water harvesting to students. Raise the amount of fines for defaulters who don't follow community guidelines on environmental laws. Maintain quality of the environment through strict enforcement of forest conservation laws. Minimise use of forest resources and protect faunal and floral species. Save biodiversity and wildlife. Check deforestation and bring the affected areas under afforestation areas. Educate the students and the public that afforestation is the best way to protect the environment.

4.6.3 Measures for environmental protection and preservation by leaders

- Adapt to nature instead of destroying nature.
- Educate the students and public on the importance of sustainable ecology, conduct seminars on the importance of preserving nature as human survival depends on nature and that saving trees saves lives.
- More activities on environment should be introduced in the educational institutions students along with the help of various organisations can be made to help in carrying out survey, sight-seeing, field trips or study tours. Schools should take the students for field trips/study tours to environmentally sensitive areas to make the students more aware about the rapid environmental degradation. Government should provide funding for such field trips or study tours.
- The government should provide proper water treatment facilities, proper pipe system to every community. Resources for construction of public wells should also be provided to help the villages in times of water scarcity.
- For farming purposes the public/farmers should be taught about the environment friendly ways of farming, harmful effects of using chemicals, using of domestic waste etc.
- Rallies basing on environmental themes should be done regularly. Involve the students actively.
- The schools should invite trained specialist on waste management to teach the students to manage waste.
- Communities should apply stringent rules to defaulters-unsound waste disposal practices. Government should provide proper waste management facilities.
- School curriculums on environment should focus more on practical aspect. Students should be made to take part in environmentally beneficial issues. Activities like

maintaining a school garden, nature walk, folk art competition etc can be given to students.

- Schools should with the help of the government trained professionals conduct mock drills on disaster management. In government run schools, government should provide qualified/subject experts on environment. Private schools should also employ subject experts to teach the qualified/subject matter. A separate department for environment should be set up in schools. Every educational institution should be equipped with resources to deal with disaster. Fire extinguisher should be kept in schools. The students should be taught on how to use fire extinguisher and other technology/machines when faced with disasters.
- Awareness should begin from home therefore the role of the parents are crucial.
- Ban random disposal of waste at unauthorised places. Segregate waste before disposal. Place dustbins in every colony/khel/ward.
- Stop or ban stone quarrying in water bodies.
- Be an agent of change and contribute to society through proper dissemination of information on environment.
- Save energy, ban use of plastic bags and encourage use of paper or cloth bags.
- Set up ward level or village level waste management committee to ensure proper disposal of household waste and set up community bio reserve.
- Conduct plantation competitions or plantation drives in all schools involving all students.
- Exhibitions and festivals to celebrate environment should be conducted regularly.
- Graphic representation or video clips on environmental effects of deforestation/degradation should be shown to students as well as the public. Seminars on rural and urban waste management can be conducted.
- Eco clubs, bird watching clubs and other environmental clubs should be encouraged in every village or town whereby membership can be for children of all ages and where everyone can actively participate.
- Educate people to respect public property and treat it as one's own property. Make community resolution for preservation of forests to maintain ecological balance. Distribute dustbins to all homes and khel/ward/colony. Encourage or promote local and organic products over market products.

- Give opportunity for students and youths to raise awareness as well as encourage elders to take active role in environmental affairs. Elders should hand down age old knowledge of preservation of environment to youngsters.
- Publish articles or research work on environmental issues in the community. Church can play a leading role in creating awareness among the masses.
- Factories should take special care so that the environment does not get polluted and the health and safety of the workers is maintained. A scientist having specialised knowledge of the hazardous process involved in the factory should be employed as well as a health worker to maintain accurate and up-to-date health record of the workers. Proper water connection, sanitation and drainage system should be maintained. First aid appliances, washrooms and canteens should be provided.
- Check wastage of all sources of energy, conserve energy and encourage others to do the same. Start a project for the school or community where every student or member may be a part of it.
- Conduct social work involving mass participation.
- Government should provide sufficient number of vehicles for transporting waste. Waste segregation facility should be made available. Every family should maintain one's own compost pit so that the manure can be used in kitchen garden.
- Use efficient and eco-friendly light bulbs.
- Construct and improve public toilets.
- Create awareness among the masses on environmental issues at the grass root level through Environmental Education. Educate people from grass root level about the hazardous effects of pollution on environment and human health, climate change. Mobilise people at the grass root level to start initiatives as an individual or as groups for means to protect and sustain the environment. Create a sense of responsibility upon them to save the environment for future generation.
- Create more advocacy and awareness programmes among the students and community members to curb anti-environmental behaviour and attitude and to give a sense of responsibility to maintain a clean and healthy environment.
- Create innovative technique for recycling and reusable products, initiate awareness to maintain proper disposal of waste, to bring awareness by producing organic manures and avoid use of pesticides and fertilizers. Use dustbins at all times.

- Discourage burning of forests, hunting and fishing. Adopt afforestation and educate students and the public about the harmful effects of pollution and environmental degradation.
- Discourage or minimise jhum cultivation and encourage organic farming, practice crop rotation and use of manure for better soil fertility and higher production resulting in less use of forests land for cultivation as well as practice rain water harvesting.
- Encourage fruit tree plantation along the roadways/highways, proper maintenance of water resources. Promote use of eco-friendly products. Forest department should take up more initiatives to sensitise the public on environmental issues through seminars, workshops, conference, webinars etc, make participants learn through activities.
- Participate in the community meetings and highlight issues on environmental problems faced by the community, pressure and suggest on legislating laws and regulations on ways for protecting the environment.
- Use social platforms to spread environmental awareness. Document the environmental changes taking place within the last few years and highlight the problems faced by the community at present such as water scarcity, decline of aquatic animals and natural resources etc, initiate action of various types favourable to bring solutions to the problems faced. Government should provide incentives to people who contributed to environmental health especially for the poor sections of the society.
- Educating the masses and make conscious efforts to reduce the dependence on non-renewable sources of energy etc. Educate the masses in regard to the importance of clean and healthy environment. Convince people that environmental pollution is a major threat. Educate the students about the importance of trees and the role they play.
- Stop shifting cultivation and promote alternate means of farming or agriculture. Mobilise at least one member from every household and build a sustainable environmental body/institution/club/organisation in the community.
- Encourage use of public transport.
- Maintain open defecation free area.
- Engage subject experts to give talks or advice on the environment and its issues, sensitise the public on the importance of clean sanitary practices, follow-up on action plans at regular intervals for better engagement and outcome. Organise seminars for leaders of various organizations, village council members, students, youths etc for long term preservation of the environment.

- Get proper information on Environmental Education/Environmental Studies and organise seminars by inviting resource persons/subject experts.
- The home and family should impart necessary education among its members. Leaders of the community can play a great role in influencing and motivating the public about environmental issues in the community. Conduct awareness programmes on deforestation, pollution.
- Workshops/training/seminars must be conducted for every level/stage of education as well as in the community.
- Introduce curricular and co-curricular activities in schools on healthy environment management.
- Construct roadways around the village settlements to prevent wildfires from reaching human settlements.
- Impart proper knowledge to church members to look after environment as land holdings are minimum hence all areas should be covered with vegetation or trees.
- Practice healthy lifestyle.
- Put more areas under reserve areas. Public should cooperate and follow environmental laws. Age old farming system is inefficient to serve the ever growing demand hence cash crop farming should be adopted by all farmers.
- Life skill training in handicraft and eco-friendly farming should be given to students/youngsters.
- Make proper irrigation channels for farming. Stop introduction of foreign species to community. Educate the students as well as the public on drastic changes in one's environment for example climate change, loss of old species, arrival of new species and pest etc.
- Encourage local handicrafts made from eco- friendly materials or products and for private use.
- Keep one's compound or garden or agricultural fields free from chemicals, and shop locally and organically. Use locally produced goods, groceries and services.
- Encourage community to practice sustainable farming and educate the students on sustainability.
- Make the students and the community members aware of the environmental crisis at the present scenario, work towards sustainability and being a responsible citizen.

- Encourage hydroponics, introduce and help people learn the techniques of water harvesting, economic use of forests and forests products, reservation of wildlife and biodiversity and hold seminars or webinars regarding the same.
- All organisations should work together to improve the environmental conditions in the state. Government should provide funds for such initiatives and adopt sustainable development goals because most of the locals fully depend on forest resources.
- Mobilise the community for carrying out environment preserving activities. Parents should be educated about the need to create awareness in their own families.
- Plant more trees after clearing the forests/trees and cutting of trees for commercial purposes outside the locality should be banned.
- The church should play an active role in educating the public about environmental issues.
- Proper dissemination of knowledge and information on environment should be done through classroom teaching or seminars.
- Adopt pot culture. Focus on the practical aspect in environmental studies. Develop in students and public, love and interest in the environment.
- Proper maintenance of roads.
- Encourage people to practice eco-friendly ways of living with nature. Encourage conservatory efforts from individuals, societies, organisations or clubs. Avoid unnecessary deforestation.
- Preserve trees or forests and maintain a green environment. Preserve flora and fauna. Hold more programmes on conservation of environment in the schools and communities. Let the students thoroughly study about the environmental state of affairs.
- Judicious use of electricity, petrol, diesel, firewood etc.
- Dumping of non-biodegradable materials into drainages or water bodies and burning of toxic waste should be banned. Maintain drainage system, clean drainages regularly. Educate the students and the public on how waste damage the ecosystem as well as seep underground and pollute the water reserves, causes acid rain which in turn leads to land degradation and water pollution, detrimental effects of use of chemicals in farming to health and environment, how trees purify the air etc.
- Replace rusted pipes with new rust free pipes.
- Impose heavy fines on those who don't follow environmental rules and regulations laid down by the community.

- Ban use of explosives, bleaching powder, chemicals, generator during fishing and burning forests while hunting.
- Use or promote traditional knowledge to rear trees.
- Use rallies or strikes to draw attention to environmental issues or problems faced in the community.
- Follow the 4 R's rigorously.
- Replace electrical energy with solar energy. Save electricity and water as much as possible. Try to have one's own organic kitchen garden. Properly educate students and the public and find ways to sustain their interest on environmental issues. Sensitise leaders and the public about the importance of Environmental Education in theory and deeds. Form an environmental enthusiast group and create awareness via media and also in deeds. Educate the students and the public on environmental laws.
- Set up community based green house for tree sapling and distribute the sapling on a massive scale for plantation in various locations. Promote and use local agro-products as much as possible.
- Set regular routine for cleaning the school campus and colonies or khels/wards with proper fund and supervision. VDB's should work towards environmental conservation. Environmental signboards should be set up at all places.
- Show through one's own pro-environmental example at home itself. Hand out awards to the highest plantation or areas filled with trees performed by individuals or groups.
- Stop burning of forests for agricultural practices, ban commercial sale of timber or forest resources. Government, NGO's and student union should promote different types of activities to raise awareness among the members of the community. Give awards as a sign of recognition or encouragement for commendable works on environmental affairs.
- Communities should create and maintain their own organic garden or fill one's surrounding with trees or vegetation. Encourage sustainable and organic scientific farming. Preserve flora and fauna.
- Use biodegradable products, planting trees, use public transport and bicycle as much as possible, replace use of pesticides, insecticides and inorganic fertilizers with organic manures. Check soil erosion, use gas instead of traditional cooking system, lessen vehicle use etc.
- Voluntary cleaning of the roadsides, mass cleanliness and plantation drives regularly. Volunteer to take an active part in the promotion of an environment friendly system.

- Walk the talk (action oriented). Create environmental awareness through different mediums like campaigns, cultural events, films, theatre, art, seminars, workshops, action based research and church platforms etc.
- Influence policy makers to make environmental friendly laws and adopt sustainable development goals.
- Engage young people/students or educational institutions to take initiatives to preserve the environment.
- Work vigorously on improving water quality, climate change and quality of life.
- Conserve soil resources, natural resources, human resources and reserved resources.

Figure 4.6.4 Leader’s response on eco-friendly farming technique

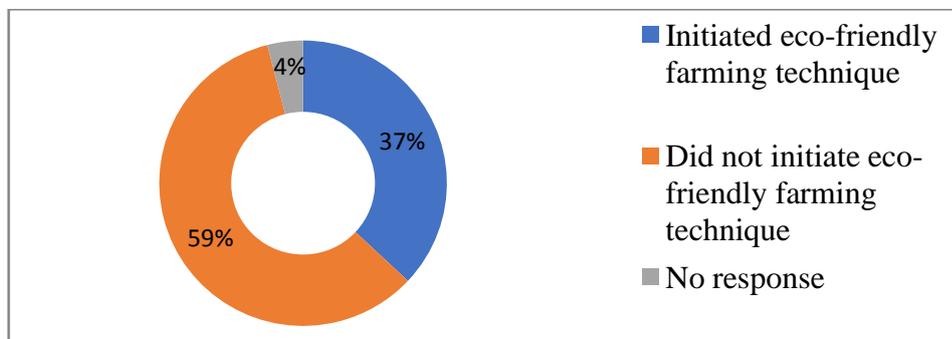


Figure 4.6.4 showed that 37% of the leaders initiated eco-friendly farming technique for their community while 59% didn’t do so and 4% didn’t respond. The eco-friendly farming techniques initiated by the leaders are listed below:

- Integration of poultry with pisciculture, integrated farming to reduce land and resource usage and commercial farming, field trenches, horticulture and crop rotation, millet based agro bio diverse farming system, mixed farming, crop rotation, natural farming, organic farming, system of rice intensification and permanent cultivation.
- Composting and use of compost manure for agriculture. Usage of locally made manure and fertilizers, animal waste and dried plants and composting it and using it for farming, bio-fertilizers and materials made of bamboo, educating the public on negative effects of use of fertilizers and spraying salt in farmed areas, planting fruit trees as well as alder trees and vegetables in jhum areas- tree plantation cum farming.
- Plum farming replaced some parts of jhum areas. Stinky beans, oranges, cardamom, kiwi are reared instead. Stressing and organising plantation drives. Promote organic

farming or kitchen garden and reuse of organic waste. Use of local seeds and manures.

- Establishing nursery for plants in the school. Schools should take initiative to start organic farming or organic gardening.

Figure 4.6.5 Leader’s response on innovative waste management

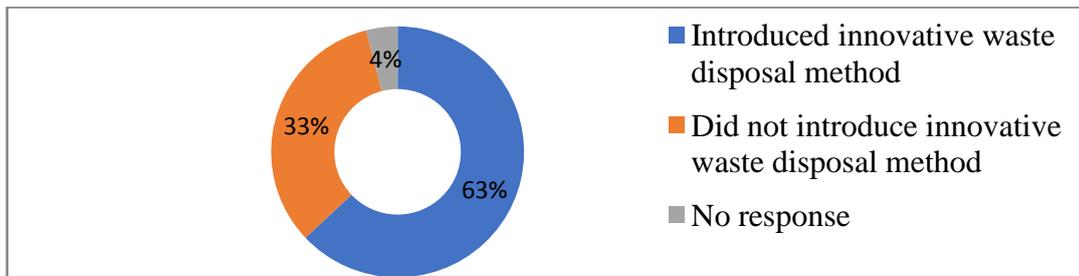


Figure 4.6.5 showed that 63% of the leaders introduced innovative means to dispose of waste in their community while 33% didn't do so and 4% didn't respond. The innovative means of waste disposal introduced by leaders were composting of organic material or biodegradable material – segregation of waste before disposal; converting biodegradable waste into manure, use of bamboo dustbins for waste disposal, incineration, landfills, dumping wells, recycling of plastic, glass bottles, newspapers, copy etc, making proper drainage, forming green club or eco club, putting up signboards/banners at strategic locations.

CHAPTER 5

MAJOR FINDINGS AND DISCUSSION, SUGGESTIONS

5.1. INTRODUCTION

This chapter is a summary and reflection of the present research work as well as the work of other researchers. Recommendations of the study were also given. It also shows new knowledge gained as a result of the research done. The major findings of the present study were summarised after detailed analysis of the data collected from three categories of respondent's viz. secondary students, teachers and leaders as per objectives.

5.2. MAJOR FINDINGS AND DISCUSSIONS OF THE STUDY

The important major findings and discussions of the study are given below as per objective.

5.2.1. Major findings and discussions related to objective 1- Environmental awareness among the secondary school students of the Chakhesang Nagas (Phek district)

- The study revealed that the secondary school students have very high level of awareness about the environmental degradation taking place in Phek district. 97.70% of the students were aware about the environmental degradation in Phek district whereas 2.30% of the students were unaware. 38.40% of the students were of the view that the environmental degradation was because of the lack of awareness among the secondary school students whereas 61.60% of the students didn't think so. The students have very low level of awareness on negative effects of pollution, burning of fossil fuels, and exploitation of wildlife, use of fertilizers and untreated sewage and destruction of habitat. The students have high level of awareness on negative effects of clearing of forests and moderate level of awareness on logging. 33.80% of the students were of the view that environmental degradation was because of the pollution of air, water and soil whereas 66.20% didn't think so. 23.60% of the students view burning or using of fossil fuels as leading to environmental degradation whereas 76.40% didn't think so. 68.50% of the students were aware that clearing of forests leads to environmental degradation whereas 31.50% were unaware. 29.70% of the students were aware that exploitation of wildlife leads to environmental degradation whereas 70.30% were unaware. 23.20% of the students of the students were aware that use of fertilizers/untreated sewage leads to environmental degradation whereas

76.80% were unaware. 27.80% of the students were aware that destruction of habitat leads to environmental degradation whereas 72.20% were unaware. 43.80% of the students were aware that logging leads to environmental degradation whereas 56.20% were unaware. Other reasons leading to environmental degradation which the students mentioned were aware were lack of proper drainage system, improper disposal of bio-medical waste and shortage of water where 0.30% of the students were aware whereas 99.70% were unaware. Improper ways of throwing waste-faulty waste management techniques also contributes to environmental degradation and 0.40% of the students aware whereas 99.60% were unaware. Excessive use of vehicles, plastics and plastic bottles-improper disposal, debris from small scale industries, hunting, domestic waste, modern agricultural practices, population explosion, overgrazing also leads to environmental degradation, however only 0.20% of the students aware about it and 99.80% were unaware. 0.10% of the students also felt that environmental degradation is taking place because proper environmental knowledge is not imparted in the schools as a result of which students are not aware about it whereas 99.90% didn't think so. The present study shows similarity to the following studies - Pareek et al (1986), whose study revealed that 98% of the students were aware about environmental degradation whereas 2% of the students were not aware; Synrem (1996) study revealed that environment awareness was good; Lalchharlini (2004) study revealed that students studying in both deficit and private colleges posses a satisfactory high level of environment awareness; Bhandwaj and Behal (2011) study revealed that students having more awareness towards environment have proper attitude towards environment; Sivamoorthy et al (2013) study revealed that the students have high environment awareness and majority of the students had moderate level of environmental practices; In Nikhat et al (2014) study, students from professional courses have high level of environmental awareness; Sharma (2014) study revealed that all students had high level of environmental awareness. Thus it can be said that students have high environmental awareness. A study by Ao Lanukumla (2018) revealed that one of the causes for gradual disappearance of forest over the years is due to logging as logging cannot be regulated. Study by Lohe Sakhoveyi (2014) revealed that the environment in Phek district have been degraded by land use mainly due to shifting cultivation, deforestation, road construction, soil erosion, landslide and dwindling water resources and that the damage to the ecological balance was due to human unscrupulous negligence or ignorance of the

delicately fragile ecosystem of the region. Findings further revealed that the whole of Phek district is under moderate to severe soil erosion and added to that is water pollution. In the present study a very high number of students were aware about the environmental degradation in Phek district however a low number of students were aware that logging leads to environmental degradation. Hence the students should be educated about the rapid environmental degradation and the negative effects of logging on ecosystem.

- The students have high level of awareness on air pollution. 74% of the students were aware about air pollution whereas 26% of the students were of the opinion that Phek district doesn't face air pollution. The students have very low level of awareness on causes of air pollution - natural, primary and secondary pollutants. The students have moderate level of awareness on negative effects of improper drainage system, untreated sewage/domestic waste. 28.60% of the students were of the view that air pollution is caused due to natural pollutants whereas 71.40% were unaware. 27.70% of the students were of the view that air pollution is caused due to primary pollutants whereas 72.30% were unaware. 12.30% of the students were of the view that air pollution is caused due to secondary pollutants whereas 87.70% were unaware. 50.10% of the students were of the view that air pollution is caused due to improper drainage system, untreated sewage/domestic wastes whereas 49.90% were unaware. 0.10% of the students also mentioned that air pollution is also caused due to burning of waste however 99.90% of the students were unaware. The present study is similar to a study by Benjongkumba (2002) which revealed that burning forest and fields mainly caused air pollution. The study also revealed that air pollution is caused due to environmental imbalance and deforestation, automobiles, factories, burning forest, jhum cultivation, adulterated petrol, use of nuclear energy, computer chips, sewage, use of chemicals, burning wood, urbanization, over-crowding in towns, improper drainage system, practice of open toiletry system and dusty roads. Study by Ao Votiba (2011) revealed that 71.42% of the students were of the opinion that air pollution would affect weather and climate, human health and plants. Studies have shown that shifting/jhum/ slash and burn cultivation causes negative effects on environment as well as on health, hence terrace cultivation, zabo farming system drip irrigation, shifting cultivation cum alder plantation and other eco-friendly farming methods can be adopted to minimise pollution.

- The students have high level of awareness on water pollution. 76.50% of the students were aware about water pollution while 23.50% of the students were unaware. The students have low level of awareness on disease causing agents and negative effects of chemicals on water bodies. The students have very low level of awareness on oxygen depleting wastes; negative effects of fertilizers run off and soil erosion leading to pollution of the water bodies. 37.50% of the students were of the view that water pollution was caused due to disease causing agents or pathogens while 62.50% were unaware. 18.90% of the students were of the view that water pollution was caused due oxygen depleting wastes while 81.10% were unaware. 17.30% of the students were of the view that water pollution was due to fertilizer run off to water bodies while 82.70% were unaware. 39% of the students were of the view that organic chemicals cause water pollution while 61% were unaware. 25.60% of the students were of the view that soil erosion leads to water pollution while 74.40% were unaware. Study by Ao Lanukumla (2018) revealed that water scarcities are a potential constraint for the people and the absence of an effective irrigation system or water harvesting practices adds to the vulnerability of the people. Menla Rasem's (1984) study also revealed that water pollution was mainly caused by improper sanitation. In the present scenario, due to climate change, the farmers in the state are most affected. Prolonged droughts and scanty rainfall have led to failure of crops as well as giving up of farmlands or agricultural lands and in addition to that is pollution of the water bodies due to faulty waste management practices. Hence students as well as the public should be sensitised about climate change, proper management of waste, benefits of afforestation and eco friendly farming methods and integrated watershed management and rainwater harvesting method.
- The students have very high level of awareness on the ill effects of deforestation. 94% of the students were aware about the ill effects of deforestation whereas 6% were unaware. The students have moderate level of awareness on desertification and species extinction. The students have very low level of awareness on soil erosion, loss of tropical rainforest, increased emission of green house gases and droughts. 53.70% of the students were aware that deforestation leads to desertification whereas 46.30 % were unaware. 53.90% of the students were aware that deforestation leads to species extinction whereas 46.10% were unaware. 29.60% of the students were aware that deforestation leads to soil erosion whereas 70.40% were unaware. 27.70% of the students were aware that deforestation leads to loss of tropical rainforests whereas

72.30% were unaware. 19.50% of the students were aware that deforestation leads to increased emission of green house gases whereas 80.50% were unaware. 11% of the students were aware that deforestation leads to droughts whereas 89% were unaware. The secondary school students were also aware of other ill effects of deforestation whereby 0.30% of the students were aware about weather change and global warming whereas 99.70% were unaware, 0.10% of the students were aware about landslide, scarcity of water and wastage of water, air pollution and increase in temperature and climate change whereas 99.90% were unaware, 0.40% of the students were aware about increase incidents of forest fire whereas 99.60% were unaware, 0.20% of the students were aware about decrease in rainfall whereas 99.80% were unaware. Study by Ao Lanukumla (2018) revealed that fuel wood is a primary source of energy for domestic purposes thus leading to forest loss especially in rural areas. Keeping piles of firewood at home is a matter of prestige and material wealth in Naga society and that deforestation has been one of the serious threats to global climate change. Study also revealed that Nagas depend mainly on agriculture for their survival and that limiting or preventing people's occupation in agriculture means the intensification of economic problems. Therefore deforestation due to agriculture cannot be avoided. Votiba's (2011) study revealed that 66.66% of the students were of the opinion that extinction of birds and animals is due to hunting for meat, skin etc by humans. Studies have shown that the major contributor to deforestation is excessive shifting cultivation and logging as well as use of wood as a primary source of fuel in a Naga kitchen, thus environment friendly farming should be adopted and collection of life wood should be strictly regulated and excessive logging should be ban.

- The students have very high level of awareness about the negative effects of shifting/jhum/slash and burn cultivation. 90.10% of the students were aware about the negative effects of shifting cultivation. The students have low level of awareness on land desertification, destruction of flora and fauna and soil erosion and that smoke from burning forests leads to air pollution due to shifting cultivation. The students have very low level of awareness on ecological imbalance, rapid drying up of water bodies, loss of productivity of the soil and disappearance of local species due to shifting cultivation. 41% of the students were aware that shifting cultivation leads to land desertification and soil erosion whereas 59% were unaware. 48.70% of the students were aware that shifting cultivation leads to destruction of flora and fauna whereas 51.30% were unaware. 49.20% of the students were aware that the whole

process of shifting cultivation leads to air pollution whereas 50.80% were unaware. 17.30% of the students were aware that shifting cultivation leads to ecological imbalance whereas 82.70% were unaware. 18.60% of the students were aware that shifting cultivation leads to rapid drying up of water bodies whereas 81.40% were unaware. 15.50% of the students were aware that shifting cultivation leads to loss of productivity of the soil whereas 84.50% were unaware. 24.70% of the students were aware that shifting cultivation leads to disappearance of local species whereas 75.30% were unaware. 0.10% of the students mentioned that deforestation also leads to burning of areas not intended for shifting cultivation however 99.90% were unaware. Study by Ao Lanukumla (2018) revealed that forest fire was a frequent and constant natural disaster in the forest ecosystem. The slash and burn cultivation or jhum, a predominant form of agriculture in Nagaland was found to be the major cause of fire. Traditionally jhum cultivation was sustainable but due to increasing population it had led to shortened cycle. Therefore the alternative is terrace or wet cultivation. Benjonkumba's (2002) study revealed that agricultural practices in the state have adverse effects on the environment and that teachers were of the opinion that destruction of forest through jhum cultivation and agricultural practices have caused many problems like ecological imbalance, poor oxygen availability, drought, bio extinction and global warming and ultimately affected the health. Votiba's (2011) study revealed that 66.66% of the students were of the opinion that soil erosion can be prevented by discouraging shifting cultivation and 30.47% of the students were of the opinion that terrace cultivation should be adopted instead of shifting or jhum cultivation. The study further revealed that loss of forest cover in the hilly and mountainous area is due to shifting cultivation. Vizo Kiyasetuo's (2007) study revealed that shifting cultivation in a hilly region with high annual rainfall was not conducive to the health of the environmental resources as well as was not the best farming method, hence the farmers should be encouraged to adopt more settled permanent agriculture or terrace cultivation and that integrated farming or mixed farming is the best method for farming. Brenda's (2015) study revealed that shifting cultivation is a way of life for the Ao Nagas, and it is deeply rooted in Naga culture, customs and beliefs. Findings further revealed that shifting cultivation coupled with high population growth has degraded the area and have led to deforestation. Human interference led to climate change, soil erosion, loss of forest cover, low yield and massive extinction of flora and fauna. Imchen Nukshienla (2015) revealed similar

findings; the state has been greatly affected by the land use change mainly due to shifting cultivation on the hill tops, deforestation, accelerated soil erosion and landslide. Population growth has aggravated the land use pattern therefore conservation and development is possible only through intergrated watershed management in Nagaland. Kinny Avitoli (2017) findings revealed that with the passage of time, production in terms of rice and other crops has witnessed changes. Though the yield of rice have remained more or less the same, other crops have decreases yields or there is crop failure. Study also revealed that traditionally preserved seeds are infested by storage grain pest which were of recent occurrence and there was increase in pest population. Use of modern weapons and tools for hunting and fishing has led to decreased wildlife. S, Alomi Cynthia (2017) revealed though considered economically inefficient and ecologically harmful to the environment, shifting cultivation continues continued to be widely practiced in the state with up to 90% of cultivable land under this form of cultivation. Studies have shown the negative impacts of shifting cultivation on the environment hence keeping in view climate change, crops should be cultivated according to the climate. Afforestation should be adopted by all communities and in areas where shifting cultivation is prevalent to plant trees or vegetation along with crops. Students and the public should be sensitised on how faulty farming and management of environmental resources can lead to climate change and further degradation of the environment as well as threaten food security.

- The students have moderate awareness level about noise pollution. 60% of the students were aware about noise pollution whereas 40% of the students were of the opinion that Phek district doesn't face noise pollution. The students have very low level of awareness on indoor and outdoor sources of noise pollution as well as sources of noise pollution in rural areas due to the use of machines and small scale industries and use of fire crackers or explosives and loudspeakers. 25% of the students were aware that indoor machines were the source of noise pollution whereas 75% were unaware. 28.50% of the students were aware that outdoor sources like loudspeakers, automobiles, traffic cause noise pollution whereas 71.50% were unaware. 28.80% of the students were aware that farm machines, pump sets, saw mill, small scale industries cause noise pollution in rural areas or villages whereas 71.20% were unaware. 21.60% of the students were aware that fire crackers or explosives, loudspeakers cause noise pollution during special occasions whereas 78.40% were

unaware. Sigler's (1973) study revealed that there was a hierarchy among pollution problems for the people of Illinois, with the pollution of rivers and lakes ranking highest, followed by air, solid waste, noise and visual pollution. Noise pollution is more prevalent in the towns than in the villages. However due to increasing population and decreased vegetative cover and use of modern technology and tools have led to increased occurrence of noise pollution even in villages. Hence the students as well as the public should be sensitised on the detrimental effects of noise pollution.

- A very high number of students were aware that fire crackers cause noise and air pollution and adversely affect the health of people/animals. 87% of the students were aware whereas 13% of the students were unaware.
- A moderate number of students were aware that trees/plants purify the air and absorb the noise level. 60.90% of the students were aware about the beneficial effects of trees and plants whereas 39.10% were unaware.
- Other types of pollution the secondary school students mentioned were land, plastic, dust, waste, radiation and light pollution. A very low number of students were aware about it. The syllabus on environment should also include graphic representation of the latest environmental scenarios especially on Nagaland.
- A very low number of students were of the view that Chakhesangs dispose of the waste properly. Only 33.50% of the students felt that waste was disposed properly whereas 66.50% students felt that waste was disposed of improperly. 6.80% of the students were of the view that Chakhesangs minimise/reduce waste. 16.20% of the students said that wastes are recycled. 10.80% of the students said that waste was disposed of properly through landfill. 7.60% of the students were of the view that waste was reused. 11.40% of the students said that waste was disposed of through composting. 5.10% of the students said that waste was disposed of through incineration. 6.70% of the students said that waste was disposed of in wells built specifically for the purpose. 0.10% of the students said that waste was disposed of in dustbins. In some villages, community members contribute money for making dustbins and distribution in every colony. In most of the villages, the waste are collected and burned. In some villages, youths of the community make dustbins which are then sold and distributed to every household. The syllabus on environment should include topic on pollution and waste management. Video clips on how to manage

waste should be shown to the students as well as the public so that waste is properly managed from home itself.

- The secondary students were aware that reduction, recycling, landfill, reuse, composting, incineration and deep well injection should be adopted to curb improper disposal of waste. 16.50% of the students were aware that waste can be reduced or minimised however 83.50% were unaware. 43.40% of the students were aware that waste could be recycled however 56.60% were unaware. 18% of the students were aware landfill can be used to dispose biodegradable waste however 82% were unaware. 28.30% of the students were aware that reusing the discarded items or waste can be done however 71.70% were unaware. 20.10% of the students were aware that composting for waste disposal can be adopted but 79.90% were unaware. 8.60% of the students were aware that incineration can be used to eliminate waste however 91.40% were unaware. 14.10% of the students were aware that deep well injection can be used for waste disposal however 85.90% were unaware. The data showed that even though the secondary school students have high level of awareness on improper waste disposal method followed by the Chakhesangs yet the students have very low level of awareness on ways to dispose of waste properly except on recycling where 43.40% (low level of awareness) of the students were aware. In a study by Tartiu (2011), majority of the students were aware about waste problems. 60.32% of the students believed that waste is a risk factor with consequences for public health and environment. Students wanted information on how to manage waste. Hence educational institutions should collaborate with organisations to educate the students on proper waste management. Sigler (1973) study revealed that pollution of rivers and lakes ranked highest, followed by air, solid waste, noise and visual pollution. The study also found that younger people were more aware. Highly educated people rated pollution as more serious. High income group rated pollution as more serious. Hadipou et al (2002) found that lack of information leads to creations and increasing environmental problems. Graham B et al (2011) also found that student's awareness on environmental issues was high and there was an increase in post-course awareness. Hence the syllabus of environmental education should cover a wide range of topics, to equip the students with necessary knowledge and skills. Althor (2014) found that students hold high environmental values. Kong D. et al (2014) found that students regarded environmental issues with a sense of urgency, urban air pollution and global warming were regarded as the most urgent problems, and 60% of the students were of

the opinion that environmental concerns should be prioritized over economic growth. Pollution is detrimental to the ecosystem as well as to human health, hence educational institutions should imbibe proper attitude and behaviour in students and equip them with necessary skills and training to deal with pollution.

5.2.2 Major findings and discussions related to objective 2 - Effects of environmental degradation on human life

- The students have very high level of awareness on diseases caused due to pollution. 98.20% of the students were aware about diseases however 1.80% of the students were not aware about negative effects of pollution on human life. The students have moderate level of awareness on cancer. 50.80% of the students were aware that pollution leads to cancer. The students have very low level of awareness on allergies, typhoid, jaundice, asthma, diarrhea, organ disorder, weaker immune system, heart/cardiovascular problems, brain, liver and kidney damage caused as a result of pollution. 29.40% of the students were aware about allergies. 31.30% of the students were aware about typhoid. 8.70% of the students were aware about jaundice. 26% of the students were aware about asthma. 21.50% of the students were aware about diarrhea. 14.90% of the students were aware about organ disorder. 25.30% of the students were aware about weaker immune system. 16.40% of the students were aware about heart/cardiovascular problems. 30.30% of the students were aware about brain, liver and kidney damage. The students have low level of awareness on deafness/hearing damage. 34.70% of the students were aware about deafness/hearing damage. 0.10% of the students mentioned that pollution causes skin diseases, dental problems, common cold, dizziness, suffocation and malaria. 0.20% of the students mentioned that pollution causes cough and headache. Pradeep K. Beyan et al (2010) study revealed that shortness of breath or dyspnoe and skin irritation were mainly shown by the tempo drivers and others in Thatipur. Sneezing, sore throat and shortness of breath was the highest in the railway station and at Gola ka mandir. Study by Kholi L (2015) revealed that students were aware that environmental destruction and pollution causes malaria, typhoid, cholera, asthma, viral fever and influenza. 86% of the students were aware about malaria, 61% were aware about typhoid, 40% were aware about cholera, 37% were aware of asthma, 75% were aware of viral fever and 55% were aware of influenza. Kinny Avitoli (2017) revealed that families that practiced jhum cultivation suffered from respiratory or chest problems which was

caused due to smoke inhalation while burning the forest, improper ventilated kitchen and dust pollution. Studies done abroad and in India also showed that pollution causes negative health impacts hence proper information on how pollution causes diseases should be conveyed to the students as well as the public. The students and the public should be encouraged to adopt healthy lifestyle and eco friendly behaviour.

- The students have very high level of awareness on disasters-natural and man-made caused as a result of environmental degradation. 98.80% of the students were aware about disasters whereas 1.20% of the students were not aware about disasters. The students have moderate level of awareness on earthquakes. 55.30% of the students were aware about earthquakes. The students have high level of awareness on landslide and forests fires. 77.50% of the students were aware about landslide. 65% of the students were aware of forest fires caused as a result of natural causes like lightning and man-made activities like hunting, agricultural process etc. The students have very low level of awareness on floods, heat waves, soil erosion, droughts, eutrophication, thunderstorm and release of harmful chemicals into the atmosphere. 20.40% of the students were aware about floods. 6.20% of the students were aware about heat waves. 33.70% of the students were aware of soil erosion. 12.20% of the students were aware about droughts. 3.70% of the students were aware about eutrophication. 27.60% of the students were aware of thunderstorm. 12.90% of the students were aware about release of harmful chemicals. 0.20% of the students were aware about hailstorm. Disasters causes tremendous damage to life, property, livestock etc and disturbs the ecological balance hence the students should be educated on how to deal with disasters especially man-made disasters and educational institutions should conduct mock drills to provide hands on experience to students in times of disaster or when calamity strikes.
- A moderate number of students were aware about the problems faced due to disasters. 63.60% of the students were aware about it however 36.40% of the students were of the opinion that they didn't face any problems due to disasters. The students have very low level of awareness on loss of human life and property, health problems faced during times of disasters. 26.60% of the students were aware about loss of human life and property. 27.50% of the students were aware about health problems. 7.60% of the students felt that temporary dismissal of class is also a problem faced during disasters. The students have low level of awareness on damage caused due to disaster on buildings, roads, electric poles, bridges, roadways and water supply. 43.10% of the

students were aware about it. The students also mentioned that other problems were faced due to disasters - 0.70% of the students were aware about damage to fields, 0.20% of the students were aware about communication problems and global warming, 0.10% of the students were aware about damage to vegetable farms and hailstorms destroying crops and vegetation. The aftermath of disasters causes untold sufferings and damage to all living organisms hence the syllabus should also contain topics on types of disasters and ways to lessen its occurrence. Organisations should conduct meeting with school authorities and conduct mock drills in the schools. Environmental scientist and subject experts should be called to educate the students and public on such matters.

- The students have high level of awareness on diseases caused due to climate change. 78.50% of the students were aware whereas 21.50% of the students were not aware about diseases caused due to climate change. The students have very low level of awareness on dengue, cholera, cancer, leprosy, typhoid, polio, tetanus, lyme, plague and tuberculosis (TB). 17.50% of the students were aware about dengue. 11.90% of the students were aware about cholera. 14.70% of the students were aware about cancer. 6.50% of the students were aware about leprosy. 27.60% of the students were aware about typhoid. 9.8% of the students of the students were about polio. 7.60% of the students were aware about tetanus. 3.90% of the students were aware about lyme. 6.30% of the students were aware about plague. 9.80% of the students were aware about tuberculosis (TB). The students have moderate level of awareness on malaria. 49.90% of the students were aware about malaria. The students mentioned that climate change also causes other diseases - 3% of the students were aware about fever, 2% of the students were aware about common cold and cough, 0.80% of the students were aware about headache, 0.50% of the students were aware about sickness, 0.4% of the students were aware about influenza, 0.30% of the students were aware about diarrhea, ebola, asthma, stomach pain and allergy and 0.20% of the students were aware about skin diseases and organ disorder. In a study by Ao Lanukumla (2018), Dimapur, Kohima, Mokokchung, Phek, Wokha and Zunheboto showed rise in temperature making a record of gradual rise for the past three years and in most of the years, rainfall shows a fluctuating rate. Studies have shown that the climate in Nagaland have undergone drastic changes as a result of which there is increased incidence of disease, hence the students should be educated about the negative effects of climate change of human health.

- The students have high level of awareness on problems faced due to climate change. 78% of the students were aware about problems whereas 22% of the students were of the opinion that they didn't face problems. The students have very low level of awareness on loss of human life and life stock, droughts and floods. 17.80% of the students were aware about loss of human life and life stock. 20.70% of the students were aware about droughts leading to acute shortage of water. 20.20% of the students were aware about floods leading to water pollution and land pollution. The students have low level of awareness on increase in human, plant and animal diseases and less production/failure of crops. 36.40% of the students were aware about increase in diseases in living things. 39.60% of the students were aware about less production in agriculture. 0.10% of the students mentioned that climate change causes loss of profit, increase in temperature, weather change as well as augmented poverty among the rural peasants and 0.20% of the students mentioned that climate change causes species extinction. Study by Kholi L. (2015) revealed that students awareness on problems faced due to climate change were - 91% on scarcity of water, 89% on rise in temperature, 50% on drought, 88% on scarcity of rainfall and 50% on health hazard.
- 80% of the teachers were of the opinion that problems were faced as a result of climate change or disaster however 20% were of the opinion that no problems were faced. 7% of the teachers were of the opinion that more trees should be planted to curb climate change or disaster. 4% of the teachers were of the opinion that the 3 "R's" should be adopted. 2% of the teachers felt that awareness should be created, deforestation should be curbed, water waste should be minimised, consumption or energy use should be reduced to curb climate change or disaster. 1% of the teachers were of the opinion that afforestation should be adopted, farm to save energy, reduce hazardous and electronic waste, use biogas instead of firewood, adopt car pooling, use public transport, use energy efficient devices, use renewable energy sources, cultivate crops according to climate change/weather pattern, preserve biodiversity/forest in respective villages and stop burning forest. Studies have shown that climate change is imminent in Nagaland as a result of which there is failure of crops or less output in the agriculture sector, and the farming community are facing hardships due to the erratic rainfall patterns and prolong drought, hence afforestation should be adopted by all communities, resource use should be minimised and the students as well as the public should be updated about the environmental issues prevalent in the state.

- 97% of the teachers were of the opinion that the environment and its resources can be improved and preserved in Phek district (Nagaland in particular) however 3% of the teachers didn't have any opinion or gave no response. 49% of the teachers favour of campaigns, 40% of strict implementation of environmental laws, 31% of strict punishment for violation of environmental laws and 76% on encouraging community members, church, organisations, institutions, clubs etc, to play an active role in protecting and preserving the environment. 1% of the teachers favoured youths forming clubs, banning of use of plastic bags, encouraging rain water harvesting, educating/encouraging students to take up activities relating to environment and mass plantation in order to improve and preserve environmental resources. The environment can be restored and preserved only through the efforts of every member of the society, government alone cannot save the environment hence the church, organisations, local bodies, clubs etc should work together to preserve the environment.

5.2.3 Major findings and discussions related to objective 3: Curricular and co-curricular activities and programmes at the secondary level (activities on environment)

- No seminars and workshops were conducted on environment to raise awareness among the students in the school premises. However seminars and workshops were carried in the community by NGO's, government bodies, local bodies and entrepreneurs. Study by Agrawal, S.P., Aggrawal, J.C., (1996) revealed that 72% conducted seminars and workshops. Study by Kholi L. (2015) revealed that 65% of the students attended environmental seminar and workshop and 40% of the students faced problems due to lack of environmental seminar and workshop. Although the present study revealed that seminars and workshops on environment were not conducted in the educational institutions, yet the students attended the workshops and seminars held in the communities. Educational institutions should therefore take initiative to conduct seminars, workshops to raise the awareness among the student community.
- Documentation of wildlife and biodiversity in Phek district was done by North East Network (NEN) and other private agencies. The secondary schools have not done documentation on wildlife and biodiversity. The students can therefore be given projects with help from the teachers or subject experts to record or document the flora and fauna of a particular region.

- 100% of the schools let the students engage in planting trees and flowers and cleanliness drives within the school campus as well as in the towns and roadsides, conduct essay, quiz, debates and drawing competition on environmental themes on Environment Day, gave assignments or project work to the students on environmental themes, rallies were carried out in the schools and have litter free zone within the school campus. In Assam, study conducted by Bhatjee et al (2003) revealed that 83% of the schools involved in tree plantation, quiz and debate competition etc and English medium schools supported more activities on environment. Study by Kholi L. (2015) revealed that 28% of the students participated in cleanliness drives, 91% in mass social work and 41% in tree plantation. In the present study every school and student took part actively in all extra-curricular activities on environmental held in the school and communities. Studies have shown that co curricular activities invoke positive response from the students hence schools should give more importance to the practical aspect of the curriculum.
- Exhibitions on environmental resources were not carried out in the schools but exhibitions on resources were carried out in the community while celebrating festivals. Schools can take initiatives to hold science exhibitions or exhibitions on environmental resources in the school campus where students can actively participate in it.
- No environmentalist was invited by the school authorities to give talks or advice to the students on environment and its issues. 92.50% of the students were of the opinion that their teacher taught well whereas 7.50% of the students were of the opinion that proper dissemination of information was not done. The present study is related to the study carried out by Sema N. Savito (2002) which revealed that there was no separate cell, fund, facilities and provisions specifically for environmental studies in the department. Under qualified teachers were made to teach the subject matter and the course neglects the practical aspects. Sharma Bidula (2002) also found that activities regarding environmental education and environmental awareness were not adequate. Bhatjee et al (2003) also pointed out that 83% of the teachers perceived that imparting Environmental Education is not possible due to limited time, lack of government support, in terms of programmes and resource materials and unwillingness of the principal (Assam), which is similar to the present study as well as Sema N. Savito (2002) and Sharma Bidula's (2002) study. At present since the Environmental Education subject is going to be incorporated into other subjects, the practical aspect

of the subject should be given more importance as studies have found that the theoretical aspect was given more importance and more co-curricular activities on environment should be introduced in the curriculum for study. Teachers should be well versed and updated in their knowledge about the subject matter on environment.

- 95.50% of the students were of the opinion that Environmental Education or studies is necessary however 4.50% of the students didn't feel the need. Kholi L's (2015) study also found that 92% of the students felt that Environmental Education is important whereas 8% said that the subject is not important. Votiba's (2011) study revealed that 51.42% of the students were of the opinion that Environmental Education creates environmental awareness and 12.38% of the students were of the opinion that environmental awareness means knowledge and understanding of the environment. Menla Rasem's (1984) study revealed similar findings that Environmental Education helps children acquire an awareness and understanding of the environment in which they live, helps children to understand the various problems associated with the environment, helps to motivate children to actively participate in environmental protection and awareness and helps children acquire skills for identifying and solving environmental problems. Benjonkumba (2002) study revealed that Environmental Education is urgently required in Nagaland. Studies have shown that Environmental Education is the need of the hour to stop wide scale environmental degradation hence even if the subject is integrated in other subjects, care should be taken so that the students are equipped with the necessary skill and knowledge to handle environmental affairs.
- 86.70% of the students found the environmental subject relevant and informative however 13.30% of the students didn't find the subject to be so. Menla Rasem (1984) study revealed contrasting findings as 50% of the teachers felt that topics are not related to the actual situation of the school, syllabus does not suit the children of certain stages, topics are not according to local needs and syllabus is hard for the child. Benjonkumba (2002) finding also revealed that Environmental Education is not relevant according to 90.74% male and 86.95% females. The topics which are of relevance to the state can be chosen as topics of study under environment subject.
- In case of unsound practices of garbage in unauthorised places, within the school premises, strict action was taken by the school authorities on the defaulters. Study by Agrawal, S.P., Aggrawal, J.C., (1996) revealed that 90% of the colleges maintained clean and hygienic environment, free from pollution in order to create awareness

about healthy environment. Schools should sensitise students on clean and hygienic practices, and the government should contribute incinerator to dispose of used sanitary pads. Female students should be taught about menstruation and proper hygiene and care. Separate toilets or washrooms with running water should be provided in educational institutions.

- 100% of the secondary schools in Phek district observe Environment Day. However other environmentally significant days were not observed in the secondary schools. Kholi L.'s (2015) study revealed that 96% of the colleges observe Environment Day. Studies have shown that although schools observe Environment Day other environmentally significant days were not observed. Hence educational institutions should observe such days to create more awareness.
- 90.10% of the students found the subject related to their daily lives whereas 9.90% of the students didn't find the subject so. Study by Kholi L. (2015) revealed that 40% of the students faced problems in learning Environmental Education whereas 52% of the students didn't face problems and 8% of the students faced problems sometimes. Qualified and experienced teachers should be employed to teach the subject matter since environmental health is of crucial importance to human survival. Teachers can teach using examples from daily life in order to help the students relate it to real life situations.
- 93.90% of the students and 100% of the teachers were of the opinion that Environmental Education/Environmental Studies should be made compulsory at all levels of education in Nagaland. 70.90% of the students and 67% of the teachers were of the view that environmental education or studies should be made compulsory to make students more aware about the environment and its issues. 61.40% of the students and 58% of the teachers were of the view that environmental education or studies should be made compulsory to make students aware about the harmful effects of environmental destruction on living things. 46.90% of the students and 41% of the teachers were of the view that environmental education or studies should be made compulsory to make students aware of the causes which lead to pollution and to adopt measures to stop pollution. 0.30% of the students mentioned that the subject should be made compulsory to preserve wildlife and have knowledge about the basic life support system. 0.20% of the students mentioned that the subject should be made compulsory to know about the ways to care for the environment, conserve forests and take interest in the environment and its studies/education and to have more knowledge

about global warming and emergency medical services. 0.1% of the students mentioned that the subject should be made compulsory to be more aware about pollution and disasters, to be motivated to love nature, to adopt good sanitation practices, maintain green and fresh surroundings and protect environmental resources and to lead a healthy lifestyle. 37% of the teachers were of the opinion that the students can educate their parents if the subject was made compulsory. Teachers opinions on why Environmental Education or Environmental Studies should be made compulsory at all levels of education in Nagaland-awareness about environmental issues should be created in the minds of the individuals at their tender ages, will create awareness and give knowledge on how to manage and conserve natural resources, will make the students aware about climate change and change the mindset of the future generation so that students can become great contributors to care for environment, will help change the adverse attitude of the people towards the environment, the students will understand that we depend on our environment and that it's one's duty to protect and tell others about it, can help save our planet and humans and reduce the overall impact of pollution on environment because the present scenario in the earth is undergoing tremendous climatic changes and in future it will not be suitable for living beings if we keep on polluting at the present rate. It will also develop consciousness in their minds regarding environment. Benjonkumba (2002) study revealed similar findings – Environmental Education should be made compulsory at all stages of education and that Environmental Education incorporating both arts and science with practical approach should be established under Nagaland University. Sema N. Savito (2002) through his study revealed that recognising environment and its importance in human life should be a priority in the state. At a time when the environment is undergoing drastic changes and climate change and global warming are happening at an alarming rate, more importance should be given to the subject.

- The secondary schools have Environmental Education, Life Skills Education subject as a curricular subject. Study by Kholi L. revealed similar findings whereby 100% of the colleges have Environmental Education as a curricular subject.
- The government schools have NSS and eco-club members in their schools whereas the private schools only have eco-club members.
- Teacher's opinions on teaching technique for dissemination of information on environment were 53% of the teachers were in favour of activity based teaching and

learning or practical learning oriented system. 5% of the teachers felt that the syllabus should be updated regularly and 3% of the teachers suggested that the latest graphical or statistical representation of the environmental destruction should be shown in textbooks. 8% of the teachers were of the opinion that the topics should be relevant to real life situations and that while teaching, teachers should explain with the help of examples relating to problems faced by people around the world due to environmental degradation. 7% of the teachers were of the opinion that mass media should be used for dissemination of information on environment. 5% of the teachers were of the opinion that lecture cum demonstration method should be used. 3% of the teachers suggested participatory and collaborative method. 2% of the teachers were of the opinion that interactive and constructive approach/ method and student centred project based learning and co-operative method should be used. 0.90% of the teachers were of the opinion that awareness should be created among the students as well as the public and suggested inductive and role play method, showing by example, encouraging student participation, use simple and easy techniques, create awareness among the students and public and incorporate action plans with classroom teaching to disseminate information on environment, and adding more topics on environment to the curriculum. In a study by Bhatjee et al (2003), books and magazines were used as major medium of instruction and generating awareness among the students on environment which is similar to the present study. In a study by Hadipou et al (2002), teachers were of the opinion that viewing training films and holding training classes for the students are the most effective means of teaching environmental education and that lack of efficient proper training and proper organisation leads to unsatisfactory levels of organisational activities. In a study by Ifegbesan Ayodeji (2002), the non-formal education students received from non-formal sources is not enough. Study by Karimi (2003) also revealed that individuals were willing to learn about environmental issues but were unwilling to pay the cost of such training, hence skilled manpower and free trainings should be provided. Study by Aminrad (2010) revealed that media positively affected the level of environmental awareness and that with increase in age and level of education, the level of awareness was improved in environmental issues. Dyehouse et al (2010) study revealed that students were most knowledgeable about global warming and that there was a significant relationship between region and resistance to change. Gokhan Bas (2010) study found that Multiple Intelligence Instructional Strategy helped in positive development in

student's environmental awareness. Day and Joanne (2011) found that direct instruction of economic information contributed to improved rating on environmental skills of students. Hence teachers should use various instructional packages to teach the subject matter. Sema N.Savito (2002) revealed that supply of learning materials by the concerned department is almost nil, which showed learning by doing methods, demonstration, devices and self help learning are deprived in the state and special facilities and provision specifically for teaching Environmental Studies is lacking. Study by Agrawal, S.P., Aggrawal, J.C. (1996) revealed that 66% of the teachers used audio visual environmental films in creating awareness. Studies have shown that use of mass media and other teaching models contributed to active learning among the students hence the teachers should use the best teaching models to arouse interest and sensitivity to environment among the learners.

- 27% of the teachers carried out projects/survey/research on environment however 73% of the teachers didn't carry out projects/survey/research on environment. 4% of the teachers carried out researches on pollution. 3% of the teachers carried out researches on waste management. 2% of the teachers carried out researches/projects on climate change, deforestation, effects of stone quarrying and energy use and resources and tree plantation. 0.90% of the teachers carried out researches on effects of fertilizers, environment awareness among secondary students, floods, forest and wildlife conservation, impact of invasive plant species on local plants, jhum cultivation, over population and its impact on environment, traditional agro-forestry and its ecological implications, effects of stone quarrying, harmful effects of burning plastics. 0.90% of the teachers conducted projects on sanitation and cleanliness drives. Study by Kholi L. (2015) revealed that teachers conducted minor research studies. 10% of the teachers carried out research however 90% didn't carry out any research. Studies carried out in Nagaland showed that majority of the teachers didn't take up research work hence teachers should carry out more surveys or research on environment which in turn will help the student community.
- Leaders were of the opinion that pro-environmental behaviour and attitude can be promoted through one's own code of conduct or activities. The leaders were of the opinion that their pro environmental code of conduct or activities can be promoted or adopted about members of the community. The leaders environmental friendly activities were 3% of the leaders were vegetarians, 36% of the leaders ate home cooked meals and maintained kitchen garden, 23% of the leaders went sightseeing or

tours to environmentally significant places, 7% of the leaders gave special/ short term courses on environment to interested individuals, 52% of the leaders encouraged people to get involved in action projects that promote environmental awareness, 12% of the leaders organised competitions on environmental themes, 34% of the leaders encouraged the use of re-useable products and 22% of the leaders encouraged use of public transport, plying by bicycle and walking on foot. Educational institutions, students, community members, organisations, club members should collaborate and work together towards restoration and preservation of the environment.

- 94% of the leaders encouraged educational institutions to include co-curricular or practical activities on environment in the curriculum however 6% of the leaders didn't do so. 65% of the leaders held exhibitions on environmental resources in their own community whereas 31% of the leaders didn't do so and 4% of the leaders didn't respond. 45% of the leaders invited environmentalist/subject experts to give talks or advice to the public on environmental issues whereas 54% of the leaders didn't do so and 1% of the leaders failed to respond. 20% of the leaders initiated mock drills on disaster management however 79% of the leaders didn't do so and 1% of the leaders didn't respond.

5.2.4 Major findings and discussions on objective 4 - Measures and programmes undertaken by the Government and NGO's to achieve global objectives of environmental awareness

- 69.10% of the students knew about the governmental organizations working on environmental protection and preservation in Nagaland whereas 30.90% of the students did not know. 34.70% of the students knew about Nagaland Institute of Health, Environment and Social Welfare (NIHESW). 12.10% of the students knew about Nagaland Empowerment of People through Economic Development whereas 97.9% did not know. 25.20% of the students knew about Department of Environment Forest and Climate Change whereas 74.8% did not know. 25% of the students were aware about Nagaland State Disaster Management Authority whereas 75% of the students did not know. 19.10% of the students knew about Ministry of Environment and Forest (MoEF) whereas 80.90% did not know. 0.10% of the students knew about Van Mahotsav which is an annual tree planting movement whereas 99.90% did not know.

- 68.90% of the students knew about NGO's working on environmental protection and preservation in Nagaland whereas 31.10% did not know. 27.60% of the students knew about North East Network (NEN) of Chizami village whereas 72.40% did not know. 14.20% of the students knew about Green Creations Etshe Society of Pfutsero Town whereas 85.8% did not know. 14.40% of the students knew about Chizami Woman Society of Chizami Village whereas 85.6% did not know. 6.30% of the students knew about Batso Welfare Society whereas 93.70% did not know. 11.10% of the students knew about Charity Welfare Society whereas 88.90% did not know. 24.60% of the students knew about Joint Forest Management Committee (JFMC) whereas 75.4% did not know. 23.30% of the students were aware about Save Environment Network (SEN). 13.50% of the students knew about Committee on Social Action Health Environment Development whereas 86.50% did not know. 8.80% of the students knew about Integrated Rural Area Forests and Economic Development Services whereas 91.2% did not know. 6.70% of the students knew about Lumshawong Horticulture Farming Society whereas 93.3% did not know. 20% of the students were aware about Society for the Conservation of Nature and Environment. 0.40% of the students mentioned that Phek Town Youth Society also works for the progress and development of a peaceful ecosystem as well as beautifying the environment however 99.6% did not know. 0.30% of the students mentioned that Chizami Students Union also works towards environmental issues however 99.7% did not know. 0.10% of the students mentioned that Ketsapo society also works on environmental issues however 99.90% did not know.
- 24.10% of the students knew about trainings, seminars, workshops and rallies on environmental themes conducted by various organizations in the community whereas 75.90% did not know. However in Phek district, trainings, seminars and workshops were not conducted in the secondary schools but it was conducted in the community where students could take part and participate. 79.40% of the students knew that various organizations carry out cleanliness drives and tree plantation whereas 20.60% did not know however 100% of the secondary students actively participated in cleanliness drives and tree plantation drives in the schools as well as in the community. Only 29.70% of the students were aware about the environment awareness campaigns initiated by various organisations. However no campaigns were conducted in the schools. Campaigns were conducted in the community only. 17.80% of the students knew that organizations conduct meetings with school authorities,

community and church leaders to discuss on environmental issues whereas 82.20% did not know. 10.80% of the students knew about the documentation of wildlife and biodiversity carried out by various organisations. 5.10% of the students knew that organizations hand out awards to those individuals who have contributed in raising environmental awareness among community members whereas 94.90% did not know. 3.80% of the students knew about solid and liquid waste management carried out by various organisations whereas 96.20% did not know. 18.90% of the students knew about the funds/ building materials provided by the government for construction of toilets in the villages whereas 81.10% did not know. 0.20% of the students knew about National Service Scheme (NSS), irrigation channels constructed by the government in villages, ban on use of plastic by the government, mock drills as well as pollution control carried out in the community and observance of sanitation day whereas 99.80% did not know. 0.10% of the students knew that the health care department also carries out vaccination programmes and free dental check-ups for the students and community members whereas 99.90% did not know. Bhattjee et al (2003) study also revealed that NGO's in Assam imparted non-formal education on environment. In the present study the government as well as the non-governmental organisations imparted non-formal education to community members where students also take active part in it. The present study as well as a study carried out by Rajakumari (1999) revealed that organisations imparting non-formal education on environment have positive impact on students. Kinny Avitoli (2017) revealed that the larger population was not aware about the various schemes initiated by the state and central government as well as other agencies on environment and many of the villagers were not aware of the environmental issues as well as the importance of conservation which is similar to the present study. Hence all agencies should work together to improve the environment.

- Mock drills were conducted in the community on disaster management especially on earthquakes, landslide and fire. The students and the community members who participated were taught how to use fire extinguishers, use bandage, help injured, tie ropes etc and experts gave talks on disaster management. Educational institutions should work together with government or NGO's to educate the students about disaster management and to equip the students with skills and knowledge.

5.3 SUGGESTIONS OF THE STUDY

Basing on the major findings of the study, the following are the measures for improved awareness among the secondary schools students and the community as a whole.

5.3.1 Measures for higher level of environmental awareness among the secondary school students

- Educating students on detrimental effects and causes of environmental degradation - reduction in quality of environment, landslide, earthquakes, acid rain, increase in deforestation, biodiversity loss, desertification, global warming, species extinction, environmental pollution, water scarcity and decline in its quality, poverty, climate change, scarcity of natural resources, over population and over exploitation of resources, agricultural practices, waste management, improper land use planning and development, wildfires, floods etc.
- Make it compulsory for every student to take part in plantation drives whereby even young children can be made to take part in it. Educate students on benefits or importance of forest reserve, on the harmful health effects of tobacco use and spitting everywhere and make the school campus tobacco free zone, burning of forests leads to depletion of flora and fauna, on benefits of rainwater harvesting and encourage every household to harvest rainwater, on use of other means of cooking instead of using firewood as fuel and on family planning as less pollution leads to less pollution. Imbibe in students the habit of sanitation.
- Educate the students on detrimental effects of disposal of waste into water bodies, on harmful effects of using explosives or over fishing and not to waste water.
- Educational institutions should impart education on harmful effects of use of chemicals, fertilizers etc on human health as well as on the environment hence bio-fertilizers and manures should be preferred over chemicals or fertilizers in farming instead.
- Give more importance to environment and dissemination of proper information on environment.
- Impose fines/ manual action for those students who litter the school campus or classrooms. Proper sanitation facilities like water, toilet, should be provided in the school campus along with proper management of garbage/waste. Infuse in students from a young age, the habit of cleanliness.

- Educate the students on the importance of energy conservation and to turn off electrical equipments when not in use, on wise use of resources. Spread awareness among the students and public on environmental crisis faced in the community. Plant trees, flowers, shrubs around the school campus and let the students play active role in gardening. The school authorities should see to it that dustbins are kept in every class. All secondary schools should introduce litter, defecation and tobacco free campus.
- The teachers who teach the subject matter should set examples, live an exemplary life and provide proper up to date information about eco-friendly ways of living in harmony with nature.
- Educate the students on use of eco-friendly tools and methods of farming so that they in turn can teach their parents on eco friendly tools of farming.
- Every student should be made to work towards a clean district and state.
- Schools should imbibe in students the attitude to protect and preserve species from a young age.
- Educate students on reducing waste and over-consumption of resources, on not polluting the water bodies and water conservation method, about proper use of resources, to preserve flora and fauna, to maintain ecological balance and to stop pollution.
- Students should be taught about the health benefits of eating organic vegetables. Every household should be encouraged to maintain kitchen garden.
- Educate the students and public to manage household waste and to follow the four 'R's'- Refuse, Reduce, Reuse and Recycle.
- Awareness should be created among the students and community members about the importance of forest and pure environment.

5.3.2 Measures to initiate more awareness among the secondary school students on effects of environmental degradation on human life

Many research studies have shown that environmental degradation leads to negative health effects. Therefore it is essential that students know about the adverse environmental consequences of daily life behaviour and ways to improve the ecological footprint. Following measures can be adopted to create more awareness among the secondary school students on negative effects of environmental degradation on human life.

- Unsafe drinking water and poor sanitation and hygiene are responsible for a variety of infectious diseases hence the students should be made aware about the negative effects of contaminated water, poor sanitation and hygiene on health.
- Environmental issues have been proven by many research studies to significantly impact human health either directly by exposing people to harmful agents or indirectly by disrupting life sustaining ecosystem therefore educational institutions should educate students about environmental issues and its impact on health, so that they can be a catalyst in environmental protection.
- Huge economic development, population growth, intensification of agriculture, industrialization and increasing energy use results in continuing environmental degradation and negative health outcomes, hence educational institutions should make the students aware about the current situation.
- At the village level, community leaders should enforce litter, open defecation and tobacco free village.
- Terrace cultivation should be given preference over shifting cultivation.
- ‘Go green’ motto should be adopted by every educational institution.
- Students and the public should be made aware about the benefits of a healthy lifestyle and pollution free environment.
- Educate students about the harmful effects of waste on health and well being as well as on environment. Educate students on segregation of waste into biodegradable and non-biodegradable waste. Ban disposing of waste at unauthorised locations and introduce eco-friendly ways of disposing of non-biodegradable waste.
- Educational institutions should provide and disseminate information on the threats that climate change and global warming presents to human health.
- Make the students aware about the negative effects of plastic pollution. Educate students on reuse of plastic bottles and containers and things made of plastic. Plastics have severe health impacts on human health as well as the ecosystem hence educational institutions should disseminate proper information about the harmful effects of plastic pollution and use of plastics. Plastic pollution in water bodies is hampering agriculture as well as aquatic life in villages and leading to pollution of water bodies and degradation of land/soil erosion hence the students and the public should be sensitised.
- Educational institutions should impart comprehensive knowledge on pollution, as pollution leads to numerous negative health effects.

- Schools authorities and communities should apply stringent rules to defaulters-unsound waste disposal practices. Proper waste treatment facilities should be provided to every village and school. In the present study, in most of the villages, waste were burnt, in semi-urban towns, domestic waste was released to water bodies in times of heavy rainfall. Since the community leaders forbid waste disposal at unauthorised places, people dispose of the household waste as well as napkins in the water bodies or in the forest while going to fields. In villages where small water bodies flow, waste were thrown by locals. Therefore the government should provide proper waste management facilities.
- Educate the students on benefits of keeping indoor plants on health. Give the students responsibilities to take care of the plants, maintain cleanliness in the classrooms and toilets. Schools should provide proper toilets for both genders and proper running water. Students should be encouraged to take up gardening and be made aware about the health benefits of gardening and eating organic food.
- Girls should be taught about menstruation-proper hygiene and disposal of used sanitary pads. Schools should have incinerators to dispose of the used sanitary pads properly.
- Every school, house, office, village, town, should have their own compost pit. Schools, community should work together to maintain clean surroundings to prevent environmental degradation and pollution and minimise negative health effects due to pollution.
- Students should be made aware about the negative health effects due to disasters and the means to curb it and that vehicles, burning of fossil fuels leads to negative health effects as well as environmental degradation and therefore usage of vehicles and fuels should be minimised.
- Dumping sites and drainages should be cleaned regularly to curb the negative effects on health and environment.

5.3.3 Measures to introduce more curricular and co-curricular activities and programmes on environment at the secondary level

Various studies have revealed that the theoretical aspect of the curriculum was given more importance; hence educational institutions should initiate and introduce more activity based learning experiences for the students to enrich their awareness. The following can be done to create awareness.

- Conduct trainings, workshops, seminars, campaigns on environmental themes in the schools and community. Trainings, workshops, seminars and campaigns on environmental themes were not organised in the schools, hence the same initiative should be taken by school authorities to raise the awareness level of the students. Awareness among the students can also be promoted through songs, dramas, sports etc with environmental themes. School authorities can also work on beautifying, preserving and protection of the school environment. School authorities should make it a priority to observe environmentally important days as at present, only Environment Day is observed in the schools visited whereby essay, quiz, debates and drawing competitions basing on environmental themes can be conducted. School authorities should also introduce more activities in the school on environment. Documentation on wildlife and biodiversity should be done whereby students can be encouraged to do the documentation with help from the teachers and experts.
- Introduce National Service Scheme (NSS) in schools which don't have members so that change can be brought about in the environmental state of affairs.
- Conduct Socially Useful and Productive Work (SUPW) weekly and make it compulsory for every student to take active part. Engage the students in sanitation works or cleaning the school campus as well as the whole community.
- Make the students work in groups - provide activities like gardening, project work, assignments, brainstorming etc basing on environmental themes. Give more projects and assignments on environment to students.
- Organise eco-clubs in schools and societies in the community to make students and the public more aware about the environmental degradation.
- The students should be taught properly on disaster management and mitigation efforts. Hands on experience should be given to the students. Mock drills on disaster management should be carried out regularly in schools to make the students more aware about disasters and have knowledge about preventive and proactive measures. Make the students actively participate in awareness programmes. Encourage students to take up case studies on environment.
- School authorities should initiate study tours regularly for students, to environmentally sensitive areas and areas of pristine beauty. Educate the students on proper use of dustbins. Environmentalist should be invited to schools to give talks on environmental issues and solutions to deal with it. In schools where eco-clubs are not formed, eco-club should be formed. Observe environmentally special days and make

the students take active part in it. School syllabus on environment should focus more on practical aspect. Students should be made to take part in environmentally beneficial issues. Activities like maintaining a school garden, nature walk, folk art competition etc can be given to students. Sometimes classes can be taken outside in the midst of nature, let the students bask in the beauty of nature. Schools should take the students for field trips/study tours to environmentally sensitive areas to make the students more aware about the rapid environmental degradation. Government should provide funding for such field trips or study tours. Rallies basing on environmental themes should be done regularly. Involve the students actively.

- The schools should invite trained specialist on waste management to teach the students to manage waste.
- Schools should organise study camps, summer camps and field trips. More activities on environment should be introduced in the educational institutions; students along with the help of various organisations can be made to help in carrying out environmental survey, field trips or study tours.
- Mass media should be used to educate the students as well as the public on environment.
- Environmental scientist/subject experts should be invited in schools, churches, community gatherings to give talks on environment and its issues. Teachers/subject experts, community leaders should work together to address environmental grievances. More works/research works on environment should be published in newspapers to make the public aware about the environmental scenario. Subject teachers should be encouraged to undertake training as well as carry out case studies or research on environmental issues faced in the community. Institutions should provide training opportunity to teachers to update their knowledge and disseminate information properly
- Strict adherence to the rules and regulations lay down by the government and local and semi-urban bodies should be done on environmental laws.
- Teachers should create awareness among the students and public as well as living an exemplary life, organise street plays on environmental themes.
- Trees/flowers/shrubs should be planted on both sides of the road.
- Make students take up gardening activities in the school campus. Institutions should take initiative to campaign for pollution free environment and raise funds in order to solve local environmental issues.

5.3.4 Measures to initiate more awareness through programmes by government and NGO's

Studies have shown that the government as well as the non-governmental organisations have contributed their part in introduction of programmes, however in the present study, 69.1% of the students were aware about governmental organisations whereas 30.9% were unaware and 68.9% of the students were aware about NGO's whereas 31.1% were unaware. Hence the students should be informed about the various programmes/schemes-specially designed for communities in Nagaland initiated by various organisations, so that they can participate and gain extra knowledge and information on environment apart from the curricular concepts. The following can be done to initiate more awareness:

- Set up a committee - Protection and Preservation of Environment Committee (PPEC) in Phek district to protect and preserve the environment.
- Excessive cutting down of trees or logging should be punished.
- Plant trees in places not fit for agriculture or large scale plantation of trees should be done.
- Stop overuse of resources and deforestation. Control destruction of forest due to excessive shifting/jhum cultivation. Save or protect nature-trees, landscape and forests.
- Stop burning forests near village settlements.
- Pass stringent laws on shifting cultivation, stop excessive shifting cultivation, and make it mandatory for those involved in this practice, to plant alder trees in areas where shifting cultivation is done, to mitigate the harmful effects of shifting cultivation.
- Introduce watershed management in the communities.
- Adopt proper pollution management strategies applicable to communities.
- Proper maintenance of public places of pristine beauty.
- Develop facilities for water treatment, human and life stock waste.
- Enforce use of less plastic and educate students and public of detrimental effects of use of plastic.
- Proper irrigation channels should be constructed.
- Organisations should conduct meetings with school authorities and teachers, village leaders to discuss on environmental issues to find solutions.

- Distribute sign boards on community laws on environment and place it in various parts of the villages or fields.
- Organise Nagaland Cleaning Society (NCS)/environment protection group and conservation society where the students can be made members of the society to make them more aware about environmental issues.
- Restrict excessive use of fuels and pass stringent rules on use of chemicals, pesticides, fertilizers, untreated domestic waste for farmers.
- The government should construct more toilets for individual households (people in villages still use public toilets) as well as schools to make it Open Defecation free (ODF), initiate more solid and liquid waste management activities, provide safe drinking water supply-water quality monitoring and surveillance and environment hygiene for the members of the community. Provide proper water sources for public urinals and toilets so that proper sanitation can be maintained.
- Government should contribute incinerator or provide an alternative means of disposing of waste, to every community so that proper sanitation can be maintained.
- Make it compulsory for every household to practice composting.
- Better irrigation facilities should be provided by the government so that water resources can be put to good use.
- Government should provide environment friendly technology for farming and pollution management.
- In communities, societies mainly working on environmental issues should be created to tackle the issues faced by the community.
- The government should provide proper water treatment facilities, proper pipe system should be provided to every community.
- Protect the habitat of wildlife. Develop mechanism to monitor forest growth. Adopt scientific and eco-friendly techniques of harvesting forests resources. For the farming community, agro-forestry should be enforced.
- Cattle grazing in the fields, forests and grasslands should be checked. Overgrazing should be checked and strict rules should be placed on graziers/herdsman to prevent them from leaving the animals alone and damaging vegetation/trees.
- Plant trees in landslide prone areas. Impose heavy fines for those who burn forests without taking precautions. Put more areas under reserved forests. Leave nature in its pristine form, the pros and cons should be weigh before carrying out any developmental activity.

- Organise public social work regularly and keep the community clean. Strict rules should be passed on disposal of life stock waste. Proper utilisation of life stock waste into biogas, compost and vermin compost should be done. Government should provide trainings so that students as well as community members' gets hands on experience on converting of life stock waste.
- Government should lay down strict legal framework on plastic production and usage as it has detrimental effects on environment, human health and organisms.
- Studies have shown that factories, power stations and traffic are the biggest contributors to air pollution, hence goods and products that are made from renewable sources should be chosen, minimise use of energy generated by power stations and limited use of vehicles.
- Use bicycle for plying short distances and use of public transport or buses for travelling.
- Factories in Nagaland should adopt sustainable business practices. Sustainable manufacturing should be adopted and innovative strategies should be employed and stakeholders should work together with community members. Before construction of factories, the health, safety and convenience of the public should be taken into consideration. Every factory should be equipped with proper waste treatment facility. Waste from small scale factories should be disposed of properly. Dispose of toxic chemicals, plants properly. Strict laws should be passed for factories. Factories should take special care so that the environment does not get polluted and the health and safety of the workers is maintained. A scientist having specialised knowledge of the hazardous process involved in the factory should be employed as well as a health worker to maintain accurate and up-to-date health record of the workers. Proper water connection, sanitation and drainage system should be maintained. First aid appliances, washrooms and canteens should be provided.
- Maintain quality of the environment by tackling pollution at the source, water management, protecting cultural heritage and natural values, adopting sustainable development goals etc.
- Make the students and the public aware about the ill-effects of disasters-man-made and natural disasters, by carrying out workshops, seminars, plays, mock drills etc in the educational institutions.
- Sustainable development, precautionary principle and polluter pays should be adopted. Raise the amount of fines for defaulters who don't follow government and

community guidelines on environmental laws and the fines paid by defaulters to be utilised for reclamation of the affected areas and rehabilitation.

- Every community/local body should set up “green benches” to deal with environmental cases and work together to protect water resources; clean the water bodies or tanks regularly, protect faunal and floral species.
- Conduct awareness programs to make the students and the public aware that trees retain water, restore water table, curb climate change, stop soil erosion, absorb noise and purify the air and reasons that leads to pollution and means to curb pollution.
- Save biodiversity and wildlife.
- Encourage people to have civic sense. Make it compulsory for every household to practice rain water harvesting. Instruct people to carry their own cotton, jute, basket while shopping. Encourage use of LPG, CNG and solar energy for cooking.
- Restrict use of explosives and fire crackers or bombs, batteries, gun powder etc on any occasion. Stop using excess fossil fuels, coal, petroleum etc.
- Promote bio-fertilizers and bio-pesticides for use in agriculture.
- Every organisation/body, individual, should make conscious effort to protect flora and fauna. Information about environmental issues can be made known to the students and community members through use of mass media. Everyone should play a pro-active role in solving community environmental issues.
- Government should make Environmental Education compulsory so that every school will give its due importance to proper dissemination of information on environmental subject and students will take more interest in the subject as well as awareness level is raised.
- Collaborate with educational institutions and send environmental scientists or environmental experts to educational institutions and community to give talks or advice on local environmental issues. Make the students responsible in handling environmental affairs.
- Tourism projects, transportation and communication projects, water projects, waste management projects etc should be given importance in every district.
- The government should provide incinerators or waste disposal machines to every community and schools to dispose of waste.
- In the present study it was found that 98% of the secondary school didn't conduct mock drills on disaster management. Schools should therefore with the help of the government trained professionals conduct mock drills on disaster management. In

government run schools, government should provide qualified/subject experts on environment. Private schools should also employ subject experts to teach the qualified/subject matter. A separate department for environment should be set up in schools. Every educational institution should be equipped with resources to deal with disaster. Fire extinguisher should be kept in all educational institutions. The students should be taught on how to use fire extinguisher and other technology/machines when faced with disasters.

- Open more parks, wildlife sanctuaries to protect/preserve forest and wildlife.
- Encourage use of only biodegradable products/substances/eco-friendly products. Educate public on recycling of paper, plastic, water etc.
- Exhibitions on environmental resources should be done regularly even within the school campus.
- Students and public should be shown to manage household waste. Video clips on the same can be shown to the students and the public to manage and minimise waste.
- Educate the students and the public about the role played by every species and stress on the need for preservation. List the endangered species and enforce strict hunting/poaching laws. Videos regarding the latest scenario can be shown to students to instil in them the urgency to take care of the environment.
- Schools authorities and village leaders should promote schemes framed by the government and educate the students and the public about the various schemes available.
- Various studies showed that hospital wastes were not disposed of properly even in the present pandemic. This will cause further environmental degradation as well as aggravate the pandemic hence government should provide means for safe disposal off hospital waste.
- Wind mills and solar panels should be installed in every village or towns to save energy and minimise resource use.
- Every member of the student community and the members of the community should practice sustainable ways of living. Communities should stop excessive logging for commercial purpose or for other purposes. Public should be made aware about the detrimental effects of logging on environment. Everyone should develop the habit to plant trees, flowers, shrubs etc not only on environmentally significant days but also the whole year round. Strict guidelines should be set to improve the overall quality of the river basin ecosystem. Collection of life firewood should be strictly regulated.

- Government should make proper roads and drainage system in both rural and semi-urban areas.
- Donate books on environment to libraries.
- Communities should store water in clean tanks before distribution. Proper water treatment should be done before distribution to the khels or communities. Provide more funds so that water tanks can be constructed in every khel and water scarcity is not faced during dry season.
- Pass strict rules on cutting trees or forests on a large scale.
- Segregate toxic and biodegradable waste. Pass stringent laws on disposal of domestic waste. Treatment should be done before disposal. Disposal into water bodies should be strictly prohibited. Ban use of chemicals/fertilizers. Public should be educated about the harmful effects of chemicals on environment and health.
- Overgrazing should be stopped to stop deforestation.
- Public should be made aware about the harmful effects of forests fires.
- During parties, marriage and social gatherings, disposable plastic cups and plates should be banned. Biodegradable and eco-friendly plates and cups should be used instead. Keep dustbins along the sides of the road.
- Schools and community members should work together to save endangered species. Students and public should be made aware about the harmful effects of hunting/poaching. Schools should work hand in hand with organisations that work on environmental protection and preservation.
- Stop mining, stone quarrying of the river beds.
- Adopt the 4 R's - Refuse, Reduce, Reuse and Recycle. Waste should not be disposed of anywhere, roadside and water bodies. Encourage innovative methods of disposing of waste. For example, Thailand have recently introduced innovative method for raising consumer awareness about separation of recyclable waste from non-recyclable waste through "Waste for eggs campaign", whereby 30 plastic waste pieces can be exchanged for 5 eggs by local people. In Nagaland Bendangwala Walling and Sowete Letro started the first 'e' waste collection centre – e-CIRCLE to deal with electronic waste.

CHAPTER 6

SUMMARY, EDUCATIONAL IMPLICATIONS OF THE STUDY, RECOMMENDATIONS FOR FURTHER RESEARCH AND CONCLUSION

6.1 INTRODUCTION

This chapter concludes the research report of the study. It is a summarised report of the previous chapters of the present study and includes the educational implications of the study, recommendations for further research and conclusion.

6.2 SUMMARY

6.2.1 NEED AND SIGNIFICANCE OF THE STUDY

The present study was undertaken because there were many environmental issues in Phek district. In order to solve the current environmental problems, the public, teachers, stakeholders, organizations, government must have a grasp of existing environmental problems. Hence the present study was undertaken for inculcating awareness about the environmental status in the district. The study would promote understanding and awareness about the environmental issues which in turn will lead to preservation of flora and fauna in the state. The study would also throw light on the negative effects of pollution on human health this in turn will lead to better management of pollution. The study will also bring to light the curricular and co-curricular activities on environment in the school curriculum this will help the teachers and educational institutions adopt better models or techniques of teaching and educating the students about environment. Thus the study is of much importance for solving the environmental issues.

6.2.2 STATEMENT OF THE PROBLEM

The problem is stated as “A Study on Environment Awareness Among the Secondary School Students of Phek District.”

6.2.3 OPERATIONAL DEFINITIONS OF THE TERMS USED

- The term environment awareness means to have awareness and sensitivity to the total environment and its allied problems and an understanding of natural systems combined with how they interact with human social system.
- The term secondary school students means students from 9th and 10th standard/class (14-16 years of age) and students from 11 and 12 standard/class (16-18 years of age).
- Phek district is situated in the south-eastern part of Nagaland. For the study the Chakhesangs of Phek district were surveyed.

6.2.4 OBJECTIVES OF THE STUDY

- To find out the environmental awareness among the secondary school students of the Chakhesangs Nagas (Phek district).
- To find out the awareness on the effects of environmental degradation on human life among the secondary school students.
- To study the various curricular and co-curricular activities and programmes at the secondary level.
- To study the measures and programmes undertaken by the Government and NGO's to achieve global objectives of environmental awareness.
- To suggests measures for environmental protection and awareness.

6.2.5 RESEARCH QUESTIONS

- What is the present status of the secondary school student's level of environmental awareness among the Chakhesang Nagas of Phek district?
- What is the secondary student's level of awareness on effects of environmental degradation on human life?
- What are the various curricular and co-curricular activities and programmes on environment at the secondary level?
- What are the roles played by the government and NGO's to achieve global objectives of environmental awareness?
- What are the measures that can be adopted to protect and preserve the environment?

6.2.6 DELIMITATIONS OF THE STUDY

- d. The study was limited to students from arts and science stream of secondary schools of Phek district.
- e. The study was limited to 1000 secondary school students, 106 teachers and 100 leaders from Chakhesang Naga tribe of Phek district.
- f. The study was limited to 22 secondary schools in Phek district of Nagaland.

6.2.7 POPULATION OF THE STUDY

The population of the study includes secondary school students from Chakhesang tribe of Phek district, teachers of Environmental Education/Environmental Studies, Life Skills and Science and leaders of various organisation and community.

6.2.8 SAMPLE AND SAMPLING METHOD OF THE STUDY

The investigator used purposive, incidental and random sampling method for selection of samples from Phek district. A sample of 1000 secondary school students; out of which 500 were male and 500 were female students and 500 were from government schools and 500 were from private schools, 106 teachers of Environmental Education/Environmental Studies, Science and Life Skills; out of which 53 were male and 53 were female teachers and 100 leaders; out of which 26 were female and 74 were male leaders were selected from Phek district.

6.2.9 TOOLS USED IN THE PRESENT STUDY

Three sets of questionnaires were constructed for the secondary school students, teachers of Environmental Education/Environmental Studies and Life Skills and community leaders from governmental and NGO`s and community leaders. The questionnaires were a mix of close ended and open ended questions.

6.2.10 PILOT STUDY

In the present study, a preliminary study was carried out in order to test the validity of the tools. The questionnaires consisted of open ended and closed ended questions for secondary school students, teachers and leaders, which were then distributed to students, teachers/leaders, to know the validity and reliability of the questionnaires. After which the results were shown to the subject experts viz. Dr. Khotole Khieya, Dr. M. Rajendra Nath Babu, Dr. Buno Legiese, Dr. Venkata Rao, Seno Tsuhah and Pupetso Wezah, for validation

and after feedbacks from experts, the tools were finalised with the approval from the supervisor.

The study consisted of 60 secondary school students (28 students from government schools and 32 students from private school) and 2 secondary school teachers (Seno Tshah-governments teacher, social worker, activist and environmentalist and Pupetso Wezah-governments teacher and community leader).

6.2.11 DATA COLLECTION

For the present study, both primary and secondary sources of data were used to collect information for the study. The primary sources of data were sourced from administering of the questionnaires on the secondary school students, teachers, leaders whereas the secondary sources of data were sourced from books, journals, Ph.D thesis etc. Online questionnaires/form (Google Form) was also used to gather data for teachers and leaders.

6.2.12 ANALYSIS OF THE DATA

The data/raw scores collected from both primary and secondary sources were arranged and converted into simple percentage (%) for analysis.

6.2.13 STATISTICAL TECHNIQUES USED

For the present study purposive and incidental sampling was adopted for the selection of schools and random sampling method was adopted for student sample, descriptive and quantitative method was used to interpret and analyse the data. Basing on the objectives of the study, the scores were converted into percentage (%) to analyse the data.

6.2.14 MAJOR FINDINGS OF THE STUDY

a) Environment awareness among the secondary school students of the Chakhesang Nagas (Phek district)

- The secondary school students have very high level of awareness about the environmental degradation taking place in Phek district. 97.70% of the students were aware about the environmental degradation in Phek district whereas 2.30% of the students were unaware about the environmental degradation
- The secondary students have high level of awareness on air pollution. 74% of the students were aware about air pollution whereas 26% of the students were of the opinion that Phek district doesn't face air pollution.

- The secondary students have high level of awareness on water pollution. 76.50% of the students were aware about water pollution while 23.50% of the students were unaware.
- The secondary school students have very high level of awareness on the ill effects of deforestation. 94% of the students were aware about the ill effects of deforestation whereas 6% of the students were unaware.
- The secondary school students have very high level of awareness about the negative effects of shifting/jhum/slash and burn cultivation. 90.10% of the students were aware about the negative effects of shifting cultivation whereas 9.90% were unaware.
- The secondary school students have moderate awareness level about noise pollution. 60% of the students were aware about noise pollution while 40% of the students were of the view that Phek district doesn't face noise pollution.
- 7.50% of the secondary school students were aware about radiation pollution whereas 92.50% were unaware. 0.20% of the students were aware about plastic pollution whereas 99.80% were unaware. Only 0.10% of the students were aware about land, dust, waste and light pollution whereas 99.90% were unaware.
- 33.50% of the students felt that waste was disposed properly whereas 66.50 % students felt that waste was disposed of improperly.
- The secondary school students were aware that reduction, recycling, landfill, reuse, composting, incineration and deep well injection should be adopted to curb improper disposal of waste.

b) Secondary school student's awareness on the effects of environmental degradation on human life

- The secondary school students have very high level of awareness on diseases caused due to pollution. 98.20% of the students were aware about diseases however 1.80% of the students were unaware about negative effects of pollution on human life.
- The secondary school students have very high level of awareness on disasters-natural and man-made caused as a result of environmental degradation. 98.80% of the

students were aware about disasters whereas 1.20% of the students were not aware about disasters.

- A moderate number of students were aware about the problems faced due to disasters. 63.60% of the students were aware about it however 36.40% of the students were of the opinion that they didn't face any problems due to disasters.
- The secondary school students have high level of awareness on diseases caused due to climate change. 78.50% of the students were aware whereas 21.50% of the students were not aware about diseases caused due to climate change.

c) Curricular and co-curricular activities and programmes at the secondary level

- 100% of the secondary schools observe Environment Day. However other environmentally significant days were not observed in the secondary schools.
- 100% of the secondary schools conduct tree/flower plantation and cleanliness drives within the school campus as well as outside the school campus, conduct essay, quiz, debates and drawing competition and give project and assignments on environmental themes and rallies on Environment Day and have litter and tobacco free zone in and around the school campus. Field trips or study tours were specifically only for class 10 and 12 students.
- No seminars, conference, campaigns and workshops were conducted on environment to raise awareness among the students in the school premises. However seminars, conference, campaigns and workshops were carried in the community by NGO's, government bodies, local bodies and entrepreneurs.
- 98% of the secondary schools didn't conduct mock drills in the school campus however the mock drills were carried out in the community where students took part in it. 2% of the secondary schools conducted mock drill on disaster management.
- Documentation of wildlife and biodiversity in Phek district was done by North East Network (NEN) and other private agencies. The secondary schools have not done documentation on wildlife and biodiversity. Apart from documentation of wildlife and biodiversity NEN also hold summer farm school at Chizami village to address the growing issue of food insecurity by teaching participants/students traditional sustainable farming system.
- In case of unsound practices of garbage in unauthorised places, within the school premises, action was taken by the school authorities on the defaulters.

- Exhibitions on environmental resources were not carried out in the schools but exhibitions on resources were carried out in the community while celebrating festivals.
- The government schools have NSS and eco club members in their schools and private schools have eco-club members where all members actively participated in activities relating to environmental protection.
- 95.50% of the students were of the opinion that Environmental Education or studies is necessary however 4.50% of the students didn't feel the need. 86.70% of the students found the environmental subject relevant and informative however 13.30% of the students didn't find the subject to be so. 90.10% of the students found the subject related to their daily lives whereas 9.90% of the students didn't find the subject relevancy to life situations. 92.50% of the students were of the opinion that their teacher taught well whereas 7.50% didn't think so.
- The secondary schools in Phek district have Environmental Education and Life Skills subject as a curricular programme of study.
- No environmentalist was invited by the school authorities to give talks or advice to the students on environment and its issues.
- 93.90% of the students and 100% of the teachers were of the opinion that Environmental Education/Environmental Studies should be made compulsory at all levels of education in Nagaland.
- 74% of the teachers did not face problems while disseminating knowledge and information to children on environment however 26% of the teachers faced problems.
- 93% of the teachers thought that the present syllabus of Environmental Education/Environmental Studies was relevant to life however 7% of the teachers didn't think so. 90% of the teachers thought that the contents in the syllabus of Environmental Education/Environmental Studies provided the students with appropriate knowledge for environment awareness however 10% of the teachers didn't think so.
- 27% of the teachers carried out project/survey/research on environment whereas 73% of the teachers didn't carry out any project/survey/research on environment.
- 94% of the leaders encouraged educational institutions to include co - curricular or practical activities on environment in the curriculum however 6% of the leaders didn't do so. 65% of the leaders of the leaders held exhibitions on environmental resources in their own community whereas 31% of the leaders didn't do so and 4% of the leaders didn't respond. 45% of the leaders invited environmentalist/subject experts to

give talks or advice to the public on environmental issues whereas 54% of the leaders did not do so and 1% of the leaders failed to respond. 20% of the leaders initiated mock drills on disaster management however 79% of the leaders didn't do so and 1% of the leaders didn't respond.

d) Measures and programmes undertaken by the Government and NGO's to achieve global objectives of environment awareness

- 69.10% of the students knew about governmental organizations working on environmental protection and preservation in Nagaland whereas 30.90% of the students did not know.
- 68.90% of the students knew about NGO's working on environmental protection and preservation in Nagaland whereas 31.10% of the students did not know.
- A low number of the students know about trainings, seminars, workshops and rallies on environmental themes conducted by the government and NGO's in the community. Only 24.10% of the students know about it whereas 75.9% did not know.
- 89% of the leaders introduced regulations/legislations to make people stop environmentally harmful activities while 11% of the leaders didn't do so.
- 45% of the leaders faced problems while framing environmental protection laws and implementing it whereas 55% of the leaders mentioned that they did not face problems.

e) Measures for environmental protection and awareness

Measures for higher level of environmental awareness among the secondary school students

- Educating students on detrimental effects and causes of environmental degradation - reduction in quality of environment, landslide, earthquakes, acid rain, increase in deforestation, biodiversity loss, desertification, global warming, species extinction, environmental pollution, water scarcity and decline in its quality, poverty, climate change, scarcity of natural resources, over population and over exploitation of resources, agricultural practices, waste management, improper land use planning and development, wildfires, floods etc.
- Make it compulsory for every student to take part in plantation drives whereby even young children can be made to take part in it. Educate students on benefits or

importance of forest reserve, on the harmful health effects of tobacco use and spitting everywhere and make the school campus tobacco free zone, burning of forests leads to depletion of flora and fauna, on benefits of rainwater harvesting and encourage every household to harvest rainwater, on use of other means of cooking instead of using firewood as fuel and on family planning as less pollution leads to less pollution.

- Educate the students on detrimental effects of disposal of waste into water bodies, on harmful effects of using explosives or over fishing and minimise water usage.
- Educational institutions should impart education on harmful effects of use of chemicals, fertilizers etc on human health as well as on the environment.
- Give more importance to environment and dissemination of proper information on environment.
- Impose fines/ manual action for those students who litter the school campus or classrooms. Proper sanitation facilities like water, toilet, should be provided in the school campus along with proper management of garbage/waste. Infuse in students from a young age, the habit of cleanliness.
- Educate the students on the importance of energy conservation and to turn off electrical equipments when not in use, on wise use of resources. Spread awareness among the students and public on environmental crisis faced in the community. Plant trees, flowers, shrubs around the school campus and let the students play active role in gardening. The school authorities should see to it that dustbins are kept in every class. All secondary schools should introduce litter, defecation and tobacco free campus.
- The teachers who teach the subject matter should set examples, live an exemplary life and provide proper up to date information about eco-friendly ways of living in harmony with nature.
- Educate the students on use of eco-friendly tools and methods of farming so that they in turn can teach their parents on eco friendly tools of farming.
- Every student should be made to work towards a clean district and state.
- Schools should imbibe in students the attitude to protect and preserve species from a young age.
- Educate students on reducing waste and over-consumption of resources, on not polluting the water bodies and water conservation method, about proper use of resources, to preserve flora and fauna, to maintain ecological balance and to stop pollution.

- Students should be taught about the health benefits of eating organic vegetables. Every household should be encouraged to maintain kitchen garden.
- Educate the students and public to manage household waste and to follow the four 'R's'- Refuse, Reduce, Reuse and Recycle.
- Awareness should be created among the students and community members about the importance of forest and pure environment.

Measures to initiate more awareness among the secondary school students on effects of environmental degradation on human life

- Unsafe drinking water and poor sanitation and hygiene are responsible for a variety of infectious diseases hence the students should be made aware about the negative effects of contaminated water, poor sanitation and hygiene on health.
- Environmental issues have been proven by many research studies to significantly impact human health either directly by exposing people to harmful agents or indirectly by disrupting life sustaining ecosystem therefore educational institutions should educate students about environmental issues and its impact on health, so that they can be a catalyst in environmental protection.
- Huge economic development, population growth, intensification of agriculture, industrialization and increasing energy use results in continuing environmental degradation and negative health outcomes, hence educational institutions should make the students aware about the current situation.
- In the villages and in the educational institutions, community leaders and administrators should enforce litter, open defecation and tobacco free village and schools.
- Terrace cultivation should be given preference over shifting cultivation.
- 'Go green' motto should be adopted by every educational institution and community.
- Students and the public should be made aware about the benefits of a healthy lifestyle and pollution free environment.
- Educate students about the harmful effects of waste on health and well being as well as on environment. Educate students on segregation of waste into biodegradable and non-biodegradable waste. Ban disposing of waste at unauthorised locations and introduce eco-friendly ways of disposing of non-biodegradable waste.
- Educational institutions should provide and disseminate information on the threats that climate change and global warming presents to human health.

- Make the students aware about the negative effects of plastic pollution. Educate students on reuse of plastic bottles and containers and things made of plastic. Disseminate proper information about the harmful effects of plastic pollution and use of plastics. Plastic pollution in water bodies is hampering agriculture as well as aquatic life in villages and leading to pollution of water bodies and degradation of land/soil erosion hence the students and the public should be sensitised.
- Educational institutions should impart comprehensive knowledge on pollution, as pollution leads to numerous negative health effects.
- Schools authorities and communities should apply stringent rules to defaulters-unsound waste disposal practices. Proper waste treatment facilities should be provided to every village and school.
- Educate the students on benefits of keeping indoor plants on health. Give the students responsibilities to take care of the plants, maintain cleanliness in the classrooms and toilets. Schools should provide proper toilets for both genders and proper running water. Students should be encouraged to take up gardening and be made aware about the health benefits of gardening and eating organic food.
- Girls should be taught about menstruation-proper hygiene and disposal of used sanitary pads. Schools should have incinerators to dispose of the used sanitary pads properly.
- Every school, house, office, village, town, should have their own compost pit. Schools, community should work together to maintain clean surroundings to prevent environmental degradation and pollution and minimise negative health effects due to pollution.
- Students should be made aware about the negative health effects due to disasters and the means to curb it and that vehicles, burning of fossil fuels leads to negative health effects as well as environmental degradation and therefore usage of vehicles and fuels should be minimised.
- Dumping sites and drainages should be cleaned regularly to curb the negative effects on health and environment.

Measures to introduce more curricular and co-curricular activities and programmes on environment at the secondary level

- Conduct trainings, workshops, seminars, campaigns on environmental themes in the schools and community. Awareness among the students can also be promoted through

songs, dramas, sports etc with environmental themes. School authorities can also work on beautifying, preserving and protection of the school environment. School authorities should make it a priority to observe environmentally important days as at present, only Environment Day is observed in the schools visited whereby essay, quiz, debates and drawing competitions basing on environmental themes can be conducted. School authorities should also introduce more activities in the school on environment. Documentation on wildlife and biodiversity should be done whereby students can be encouraged to do the documentation with help from the teachers and experts.

- Introduce National Service Scheme (NSS) and eco club in schools which don't have members so that change can be brought about in the environmental state of affairs.
- Conduct Socially Useful and Productive Work (SUPW) weekly and make it compulsory for every student to take active part. Engage the students in sanitation works or cleaning the school campus as well as the whole community.
- Make the students work in groups - provide activities like gardening, project work, assignments, brainstorming etc basing on environmental themes. Give more projects and assignments on environment to students.
- Organise eco-clubs in schools and societies in the community to make students and the public more aware about the environmental degradation.
- The students should be taught properly on disaster management and mitigation efforts. Hands on experience should be given to the students. Mock drills on disaster management should be carried out regularly in schools to make the students more aware about disasters and have knowledge about preventive and proactive measures.
- Make the students actively participate in awareness programmes. Encourage students to take up case studies on environment.
- School authorities should initiate study tours regularly for students, to environmentally sensitive areas and areas of pristine beauty. Educate the students on proper use of dustbins. Environmentalist should be invited to schools to give talks on environmental issues and solutions to deal with it. In schools where eco-clubs are not formed, eco-club should be formed. Observe environmentally special days and make the students take active part in it. School syllabus on environment should focus more on practical aspect. Students should be made to take part in environmentally beneficial issues. Activities like maintaining a school garden, nature walk, folk art competition etc can be given to students. Sometimes classes can be taken outside in the midst of nature, let the students bask in the beauty of nature. Schools should take

the students for field trips/study tours to environmentally sensitive areas to make the students more aware about the rapid environmental degradation. Government should provide funding for such field trips or study tours. Rallies basing on environmental themes should be done regularly.

- The schools should invite trained specialist on waste management to teach the students to manage waste.
- Schools should organise study camps, summer camps and field trips. More activities on environment should be introduced in the educational institutions; students along with the help of various organisations can be made to help in carrying out environmental survey, field trips or study tours.
- Mass media should be used to educate the students as well as the public on environment.
- Environmental scientist/subject experts should be invited in schools, churches, community gatherings to give talks on environment and its issues. Teachers/subject experts, community leaders should work together to address environmental grievances. More works/research works on environment should be published in newspapers to make the public aware about the environmental scenario. Subject teachers should be encouraged to undertake training as well as carry out case studies or research on environmental issues faced in the community. Institutions should provide training opportunity to teachers to update their knowledge and disseminate information properly
- Strict adherence to the rules and regulations lay down by the government and local and semi-urban bodies should be done on environmental laws.
- Teachers should create awareness among the students and public as well as living an exemplary life.
- Organise street plays on environmental themes.
- Institutions should take initiative to campaign for pollution free environment and raise funds in order to solve local environmental issues.

Measures to initiate more awareness through programmes by government and NGO's on environment

- Set up a committee - Protection and Preservation of Environment Committee (PPEC), organise Nagaland Cleaning Society (NCS)/environment protection group and

conservation society where the students can be made members of the society to make them more aware about environmental issues.

- Plant trees in places not fit for agriculture or large scale plantation of trees should be done.
- Stop overuse of resources and deforestation.
- Stop burning forests near village settlements.
- Pass stringent laws on shifting cultivation, stop excessive shifting cultivation, and make it mandatory for those involved in this practice, to plant alder trees in areas where shifting cultivation is done, to mitigate the harmful effects of shifting cultivation.
- Introduce watershed management in the communities.
- Adopt proper pollution management strategies applicable to communities.
- Proper maintenance of public places of pristine beauty.
- Develop facilities for water treatment, human and life stock waste.
- Proper irrigation channels should be constructed.
- Organisations should conduct meetings with school authorities and teachers, village leaders to discuss on environmental issues to find solutions.
- Distribute sign boards on community laws on environment and place it in various parts of the villages or fields.
- Restrict excessive use of fuels and pass stringent rules on use of chemicals, pesticides, fertilizers, untreated domestic waste for farmers.
- The government should construct more toilets for individual households (people in villages still use public toilets) as well as schools to make it Open Defecation free (ODF), provide safe drinking water supply-water quality monitoring and surveillance and environment hygiene for the members of the community. Provide proper water sources for public urinals and toilets so that proper sanitation can be maintained.
- Make it compulsory for every household to practice composting.
- Better irrigation facilities should be provided by the government so that water resources can be put to good use.
- Government should provide environment friendly technology for farming and pollution management.
- In communities, societies mainly working on environmental issues should be created to tackle the issues faced by the community.

- The government should provide proper water treatment facilities, proper pipe system to every community.
- Protect the habitat of wildlife. Develop mechanism to monitor forest growth. Adopt scientific and eco-friendly techniques of harvesting forests resources. For the farming community, agro-forestry should be enforced.
- Cattle grazing in the fields, forests and grasslands should be checked. Overgrazing should be checked and strict rules should be placed on graziers/herdsman to prevent them from leaving the animals alone and damaging vegetation/trees.
- Plant trees in landslide prone areas. Impose heavy fines for those who burn forests without taking precautions. Put more areas under reserved forests. Leave nature in its pristine form, the pros and cons should be weigh before carrying out any developmental activity.
- Organise public social work regularly and keep the community clean. Strict rules should be passed on disposal of life stock waste. Proper utilisation of life stock waste into biogas, compost and vermin compost should be done. Organizations should provide trainings so that students as well as community member's gets hands on experience on converting of life stock waste.
- Government should lay down strict legal framework on plastic production and usage as it has detrimental effects on environment, human health and organisms.
- Choose goods and products that are made from renewable sources, minimise use of energy generated by power stations and limited use of vehicles.
- Use bicycle for plying short distances and use of public transport or buses for travelling.
- Factories in Nagaland should adopt sustainable business practices. Sustainable manufacturing should be adopted and innovative strategies should be employed and stakeholders should work together with community members. Before construction of factories, the health, safety and convenience of the public should be taken into consideration. Every factory should be equipped with proper waste treatment facility. Waste from small scale factories should be disposed of properly. Dispose of toxic chemicals, plants properly. Strict laws should be passed for factories. Factories should take special care so that the environment does not get polluted and the health and safety of the workers is maintained. A scientist having specialised knowledge of the hazardous process involved in the factory should be employed as well as a health worker to maintain accurate and up-to-date health record of the workers. Proper water

connection, sanitation and drainage system should be maintained. First aid appliances, washrooms and canteens should be provided.

- Maintain quality of the environment by tackling pollution at the source, water management, protecting cultural heritage and natural values, adopting sustainable development goals etc.
- Make the students and the public aware about the ill-effects of disasters-man-made and natural disasters, by carrying out workshops, seminars, plays, mock drills etc in the educational institutions.
- Sustainable development, precautionary principle and polluter pays should be adopted. Raise the amount of fines for defaulters who don't follow government and community guidelines on environmental laws and the fines paid by defaulters to be utilised for reclamation of the affected areas and rehabilitation.
- Every community/local body should set up "green benches" to deal with environmental cases and work together to protect environmental resources.
- Conduct awareness programs on environment for students and the public.
- Save biodiversity and wildlife.
- Encourage people to have civic sense. Make it compulsory for every household to practice rain water harvesting. Instruct people to carry their own cotton, jute, basket while shopping. Encourage use of LPG, CNG and solar energy for cooking.
- Restrict use of explosives and fire crackers or bombs, batteries, gun powder etc on any occasion. Stop using excess fossil fuels, coal, petroleum etc.
- Promote bio-fertilizers and bio-pesticides for use in agriculture.
- Every organisation/body, individual, should make conscious effort to protect flora and fauna.
- Government should make Environmental Education compulsory so that every school will give its due importance to proper dissemination of information on environmental subject and students will take more interest in the subject as well as awareness level is raised.
- Collaborate with educational institutions and send environmental scientists or environmental experts to educational institutions and community to give talks or advice on local environmental issues. Make the students responsible in handling environmental affairs.
- Tourism projects, transportation and communication projects, water projects, waste management projects etc should be given importance in every district.

- The government should provide incinerators or waste disposal machines to every community and schools to dispose of waste.
- Schools should with the help of the government trained professionals conduct mock drills on disaster management. In government run schools, government should provide qualified/subject experts on environment. Private schools should also employ subject experts to teach the qualified/subject matter. A separate department for environment should be set up in schools. Every educational institution should be equipped with resources to deal with disaster. Fire extinguisher should be kept in all educational institutions. The students should be taught on how to use fire extinguisher and other technology/machines when faced with disasters.
- Open more parks, wildlife sanctuaries to protect/preserve forest and wildlife.
- Encourage use of only biodegradable products/substances/eco-friendly products. Educate public on recycling of paper, plastic, water etc.
- Exhibitions on environmental resources should be done regularly even within the school campus.
- Students and public should be shown video clips on how to manage household waste.
- Schools authorities and village leaders should promote schemes framed by the government and educate the students and the public about the various schemes available.
- Government should provide means for safe disposal off hospital waste.
- Wind mills and solar panels should be installed in every village or towns to save energy and minimise resource use.
- Every member of the student community and the members of the community should practice sustainable ways of living.
- Pass strict rules on cutting trees or forests on a large scale. Communities should stop excessive logging for commercial purpose or for other purposes. Public should be made aware about the detrimental effects of logging on environment.
- Strict guidelines should be set to improve the overall quality of the river basin ecosystem.
- Collection of life firewood should be strictly regulated.
- Government should make proper roads and drainage system in both rural and semi-urban areas.
- Donate books on environment to libraries.

- Proper water treatment should be done before distribution to the khels or communities. Provide more funds so that water tanks can be constructed in every khel and water scarcity is not faced during dry season.
- Segregate toxic and biodegradable waste. Pass stringent laws on disposal of domestic waste. Treatment should be done before disposal. Disposal into water bodies should be strictly prohibited.
- Ban use of chemicals/fertilizers. Public should be educated about the harmful effects of chemicals on environment and health.
- Overgrazing should be stopped to stop deforestation.
- Public should be made aware about the harmful effects of forests fires.
- Ban use of plastic.
- Schools and community members should work together to save endangered species.
- Stop mining, stone quarrying of the river beds.
- Adopt the 4 R's - Refuse, Reduce, Reuse and Recycle. Encourage innovative methods of disposing of waste. For example, Thailand have recently introduced innovative method for raising consumer awareness about separation of recyclable waste from non-recyclable waste through "Waste for eggs campaign", whereby 30 plastic waste pieces can be exchanged for 5 eggs by local people. In Nagaland Bendangwala Walling and Sowete Letro started the first 'e' waste collection centre – e-CIRCLE to deal with electronic waste.

6.3 EDUCATIONAL IMPLICATIONS OF THE STUDY

Awareness plays an important role in the prevention of environmental degradation. Environmental issues are growing manifold and therefore it is essential for every individual to make contributions actively. Awareness is crucial as environment is deteriorating rapidly. Environmental issues cannot be solely averted with the aid of the government, thus the people's participation is integral with regard to environmental protection.

Every individual needs to work jointly to assist in environmental protection and preservation. Individual's daily actions have a huge impact on the environment, hence it is vital to sensitise the students and community members about environmental problems and challenges faced.

Studies carried out in Nagaland have shown that there is no separate cell for Environmental Education in the primary as well as secondary level of education. In most of the schools, other subject teachers were made to teach Environmental Education and although the teachers

didn't face any problems while disseminating knowledge and information, in the present study, however trained and qualified teachers on environment and a separate cell for environmental education should be set up in schools to equipped the younger generation with pro-environmental awareness, attitude and behaviour.

Studies also showed that the curriculum of Environmental Education in Nagaland, focussed primarily on the theoretical concept and less emphasis was put on the practical aspect, hence more importance should be given to the practical aspect of the curriculum as students learn more through activity based experiences. Mass media and books along with other techniques can be used to make teaching learning experiences more productive.

Studies also showed that the Environmental Education subject given included in the curriculum was not a compulsory subject hence students show less interest in the subject matter as a result of which it affects their performance in the exams as well as in their attitude towards environment. Therefore environmental awareness plans or Environmental Education should be included in the curriculum from the elementary stage itself.

Studies have also shown that when environmental rules and high penalties follow, there is a reduction in people's anti-environment activities thus leading to lesser environmental pollution. Hence environmental rules should be strictly enforced to address community environmental issues. Students should be taught proper waste management techniques so that waste can be properly disposed of safely.

In the present study, it was found that although schools have eco-clubs, however seminars, workshops, mock drills etc were not held in the school premises. Hence school authorities should initiate such activities to promote more learning among the student community.

It is important not only to stay aware but also to raise awareness among others about the same and collectively make a contribution to the sustainability of our environment. In view of the rising environmental degradation, students should be taught properly on environmental management and the curriculum for Environmental Education should be shaped in such a manner that the subject is relevant to their daily life as well as emphasis is placed on the practical aspect.

6.4 RECOMMENDATIONS FOR FUTURE RESEARCH STUDIES

The present study was limited to studying the environmental awareness among the secondary school students of Phek district hence the following topics may also be taken as research studies:

- Comparative study on environmental awareness among the different tribes of Nagaland.
- Comprehensive study of current environmental knowledge among the students and community members to enhance decision making and safeguarding the future environment.
- Comparative study to measure the status and trends in India, with special reference to Nagaland and the world's environmental condition.
- Case study on Nagaland: Art and culture protect the environment
- Study on environment friendly agriculture and pro-environmental attitude and behaviour.
- Study to address the aggregate environmental issues facing Nagaland at present.
- Study on threats to human life due to environmental degradation.
- Study of resources in Nagaland-status of natural resources.
- Study on role of various organisations in addressing environmental issues.
- Study on pro-environmental attitude and behaviour among the students, teachers and community members of Nagaland.
- Study on impact of climate change and global warming among the farmers in Nagaland.
- Study on pollution management among the Naga community.
- Study on sustainable development practices.
- Study on impacts of shifting cultivation on environment.

6.5 CONCLUSION

The present study revealed the environment awareness level among the secondary school students of the Chakhesangs of Phek district. It was found that the secondary students have very high level of awareness on environmental degradation, ill effects of deforestation, negative effects of shifting cultivation, that fire crackers cause noise and air pollution, diseases caused due to pollution, disasters caused due to environmental degradation in Phek district. The study also revealed that secondary students have high level of awareness on air

pollution and water pollution, diseases and problems caused due to climate change. The governmental organizations and NGO's conducted trainings, seminars, workshops, campaigns, rallies, sanitation and plantation drive etc in the community but not in the schools. A moderate number of students were aware about noise pollution, that trees and plants purify and absorb noise, proper method of disposal of waste and problems faced due to disasters. The study also showed that a very low number of secondary school students were aware of radiation, dust, waste and plastic pollution. A very low number of secondary school students felt that Chakhesangs dispose of waste properly.

The study also highlighted that educational institutions observe only Environment Day, whereby quiz, debates, essay and drawing competitions were carried out on environmental themes and no exhibitions, workshops, seminars, conference, were held on environmental themes in the secondary schools. The study also showed that all schools formed eco-clubs for students and government schools have National Service Scheme (NSS) and eco-club members. Mock drills on disaster management and exhibitions on environmental resources, were not held in educational institutions, however Chetheba Government High School conducted mock drill on disaster management. Mock drills and exhibitions of environmental resources were held in the community. Documentation of environmental resources were not done by educational institutions, however documentation was carried out by North East Network (NEN). A very low number of leaders conducted mock drills in the community and a high number of leaders conducted exhibitions on environmental resources in their community. A very high number of leaders encouraged educational institutions to include co-curricular or practical activities on environment and introduced regulations or legislations to make people stop environmentally harmful activities however a low number of leaders mentioned that they faced problems while framing environmental protection laws and implementation.

All educational institutions gave assignments and projects on environmental topics however field trips/study tours were carried out only once a year for class 10 and 12 only. The study also showed that a very high number of secondary students were of the opinion that teachers disseminated information properly on environment, even though it was found that there was no separate cell for environmental education in educational institutions and other subject teachers were made to teach the subject in schools however a high number of teachers mentioned that they faced problems while teaching the subject matter.

A very high number of the secondary school students and teachers were of the opinion that Environmental Education/Environmental Studies should be made compulsory at all stages of

education. Teachers suggested child/students centric type of education, lecture cum practical approach, teaching with the help of examples, being role models, updating of the syllabus contents and making it relevant to our state, present graphical representation of the latest environmental crisis, teaching aids and use of media and collaborative teaching etc. The teachers undertook research, survey and projects on environmental themes. A very high number of teachers mentioned that they faced problems due to climate change in their community and were of the opinion that environment and its resources can be improved and preserved in Phek district by adopting measures like creating awareness, afforestation, adopting the 3 R's, conducting trainings, workshop, seminars, campaigns etc.

Leaders were of the opinion that everyone can follow, adopt and promote environment friendly behaviour. School authorities didn't invite environmentalist to give talks on environment in their institutions. The secondary schools in Phek district have Environmental Education, Home Science and Life Skills as curricular subject.

To stop further environmental degradation in Phek district, and Nagaland as a whole, a comprehensive syllabus on environmental education is the need of the hour. Organisations should educate the students as well as the public on matters relating to environmental issues. In the communities, the students and the public should be given the opportunity to participate in decision making on complex environmental issues faced by the community. Educational institutions should provide training for teachers taking environmental education to equip them with skills and competency to teach the subject matter efficiently. Studies had shown that the theoretical part of the syllabus was given more importance hence more activities relating to environment should be included in the school curriculum on environment. Educational institutions should collaborate with the church and various organisation and bodies working on environmental protection to educate the students and public on environmental pollution, climate change and global warming, sustainable development etc. Everyone must work together for a healthy environment. Hydroponics, agro-forestry, terrace cultivation, shifting cultivation cum alder plantation, rain water harvesting, zabo farming, mixed farming etc should be taught in educational institutions, and farmers should be sensitised and educated on eco-friendly farming technique. Environmental Education should be imparted at all levels of education, only then will it be possible to curb environmental degradation, pollution, climate change and global warming. The church as well as family and organizations, societies and committees should spearhead programmes or take initiatives to protect and preserve the local environment.

BIBLIOGRAPHY

- About JNV Phek - Navodaya Vidyalaya Samiti, https://navodaya.gov.in.>about_us
- Anand Utkarch (2016) HRD Ministry to ensure Environmental Education in the school curriculum: SC, <https://indianexpress.com>article>
- Andrew Pleasant et al (2013), Environmental Design and Research on the Human Health Effects and Open Spaces in Urban Areas, *Article in Human Ecology Review*, Vol. 20. No.1.
- Angelica Gutierrez (2018), The Four R's (Refuse, Reduce, Reuse and Recycle), Isn't a Slogan; It's a Guide HRD Ministry to ensure Environmental Education in the school curriculum: SC (2016)
- Ao Lanukumla (2014), Deforestation in Nagaland: A Historical Perspective (Thesis)
- Ao Votiba (2011) A Study on Environmental Education: Attitude and Awareness Among the Ao Nagas
- Assessment of the Impact of COVID-19 on Water, Environment and Related Ecological and Human System, <www.frontiersin.org>research-topics>
- Bacillus Thuringiensis (BT), National Pesticide Information Centre, <https://npic.orst.edu>ingred>bt>
- Bas Gokhan (2010), The Effects of Multiple Intelligence Instructional Strategy on the Environment Awareness Knowledge and Environmental Attitude Levels of Elementary Students in Science Course, *International Electronic Journal of Environmental Education*, Vol.1.Issue 1, <https://files.eric.ed.gov.>fullt...PDF>
- Benjongkumba (2002), Environmental Awareness Among the University Teachers and Students and Their Attitudes Towards Environmental Education in Nagaland
- B. Kate A.B, M .Suzanna Van Der, B. Jos (2013), Ecosystem services and River Basin Management/Springer Link, <https://link.springer.com>chapter>
- Brenda (2015), Impact of Shifting Cultivation on Environment in Mokokchung district, Nagaland: A Geographical Analysis
- Browsing "Nagaland University" by Title - Shodhganga – INFLIBNET Centre, <https://shodhganga.inflibnet.ac.in>...>
- B. Silver et al (2020) Iopscience.iop.org>article, The Impact of COVID-19 Control Measures on Air Quality in China

- Building upon traditional agriculture in Nagaland, India (1999), Publishers- Nagaland Environment Protection and Economic Development (NEPED) and International Institute of Rural Reconstruction
- CBSE Schools in Phek District, <https://www.prokerala.com>cbse-sc...>
- Cez Valdez(2015), <https://www.slideshare.net>mobile>, Six Main Chapters of a Research Paper-Slideshare
- Chadi Kedulhoukhro (2016), Tips to protect environment, <https://morungexpress.com>tips-pr...>
- Chapter-2, Review of Literature-dspace.hmlibrary.ac.in>0.8.chapter2 (1).pdf
- Chapter – 2, Review of Literature, 08.chapter2.pdf, <https://14.139.121.106>jspuiPDF>
- Climate Change and Health – WHO World Health Organization, <https://www.who.int>...>Detail>
- Concerns about Backyard Burning of Trash| Minnesota Pollution Control Agency, <https://www.pca.state.mn.us>waste>
- COVID-19 and the Environment-Geneva Environment Network (2021), www.genevaenvironment.network.org>...
- D. Augusta Zacarias (2020), Global Bioclimatic Suitability for the Fall Armyworm, Spodoptera Fugiperda (Lepidoptera:Noctuidae), and Potentialco-occurrence with major host crops under climate change scenarios, <https://link.springer.com>article> – Nagaland Post
- David B. Resnik et al (2015), Environment, Ethics and Human Health-The Hastings Center, <https://www.thehastingscenter.org>...>
- Descriptive Research: Definition, Characteristics, Methods, Examples and Advantages, <https://www.questionpro.com>blog>
- Directorate of Census Operation, Nagaland (2011), District Census Handbook, Phek, Series-14, Part XII, Census of India 2011, Nagaland, 1306_PART_A_DCHB_PHEK (1).pdf
- Dr. Ravindranath M. J, Dr. A. T. A. Balakrishnan, Dr. Vamadeva H.V., Kumar D. R. Prasana, Ranghadhamappa (2012), Teaching learning of EVS at the primary school level: A position paper, Karnataka D.Ed Curriculum Framework, Directorate of State Education, Research and Training Bengaluru
- Dr. Satabdi Datta (2020), India's Environmental Laws and COVID-19|Green Economy, www.green economycoalition.org>i...

- District Administration Phek district, National Informatics Centre, Ministry of Electronics and Information Technology, Government of India (2021), Blocks and Villages| District Phek, Government of Nagaland| India, <https://phek.nic.in>block-villages>
- 7 Effective Teaching Strategies for the Classroom – Blog, <https://www.quizalize.com>blog>t...>
- G.Angelica (2018), The Four R’s (Refuse, Reduse, Reuse and Recycle) Isn’t Just a Slogan; It’s a Guide, <https://www.esquiremag.ph/culture>lifestyle>
- Gante Henlam (2020), A Study of the Status and Problems of Teaching Learning of Social Sciences at Secondary School Level in Nagaland
- G. Anvita, S.A. Joya, S.M. Ambala (2020), Dynamics of Psychological Responses to COVID – 19 in India: A Longitudinal Study, <https://journals.plos.org>article>jo...>
- Geetha Rani (2007), (PDF) Secondary Education in India: Determinants of Development and Performance, <https://www.researchgate.net>2377>
- General Rules to Regulate the Grazing Cattle in Government Forest in Times of Drought (1904), <https://www.bareactslive.com>...>
- Gunde, Parit, Kholi (2015), 08.Chapter 2.Pdf
- Giorgadze T. et al (2011), Disasters and Their Consequences for Public Health – Pud Med, Georgian Med News, <https://pubmed.ncbi.nlm.nihgov>...>
- Hau Xu (2020), Possible Environmental Effects of the Spread of COVID-19 in China, www.ncbi.nlm.nih.gov>articles>P...
- H. Berwani et al (2020), Exploring Dependence of COVID-19 on Environmental Factors and Spread Prediction in India, www.nature.com...>article
- How can Factory Pollution Affect Humans? Field Air Pollution (2018), <https://www.field.org.uk>how-can-f...>
- <https://cmsenvis.cmsindia.org>...PDF>, A Comparative Study on Environmental Awareness
- <https://easternmirrornagaland.com>...>
- <https://en.m.wikipedia.org>wiki>, Agroforestry-Wikipedia
- <https://en.m.wikipedia.org>wiki> Research Design>Wikipedia
- <https://en.m.wikipedia.org>wiki> River Ecosystem
- <https://esquiremag.ph/culture>lifestyle>
- <https://gemreportunesco.wordpress.com>...>

- <https://idl-bnc-idrc.dspacedirect.org>>... PDF
- <https://kvk.phek.nic.in>>district-prof... Welcome to the Frontpage-the KVK Phek
- <https://gemreportunesco.wordpress.com>>... (2015)
- <https://indianexpress.com>>article
- <https://institutionalresearch.syr.edu>>...Analysing and Interpreting Data-Office pof Institutional Research
- <https://14.139.121.106>>jspui PDF, Chapter-2, Review of Literature, 08.Chapter 2.pdf
- <https://www.legalbites.in>>publication-a...
- <https://libguides.uta.edu>>quant
- <https://libguides.wits.ac.za>>c.php, Research Methodology – Research Support – Lip Guides at University of the Witwatersrand
- <https://medium.com>>thrive.global, 5 health benefits of having plants in your home| Ellison Kaith (2017)
- <https://npic.orst.edu>>ingred>bt, Bacillus thuringiensis (Bt), National Pesticide Information Centre
- <https://paryavaranmitra.in>>...PDF
- <https://phek.nic.in>>block-villages (2020), The Land of Tradition, Phek District, Block and Villages, Block Wise of Recognised Villages Under Phek District
- <https://phek.nic.in>, District Phek, Government of Nagaland/The Land of Tradition (2020)
- <https://phek.nic.in>>block-villages, Block and Villages| District Phek, Government of Nagaland| India (2020)
- <https://phek.nic.in>>schools, Schools| District Phek, Government of Nagaland| India – Phek District
- <https://portal.ct.gov>>DEEP>Water, Watershed Management Overview-CT.gov
- <https://publisher.uthm.edu.my>>...PDF, Investigating the Environmental Awarenesss Level of Secondary
- <https://tophat.com>>course-notes, Research: Population and Sample| Top Hat
- <https://vikalpsangam.org>>article>s...
- <https://www.bareactslive.com>>... General Rules to Regulate the Grazing of Cattle in Government Forest in Times of Drought (1904)
- <https://www.cdc.govt.healthywater>, Sanitation and Hygiene Home| Global Water, Sanitation and Hygiene (wash)

- <https://www.census2011.co.in.>613...> Phek District: Population 2011-2021 data- Corona Virus| COVID-19 Data
- <https://www.ciel.org>project-update>, Plastic and Human Health: A Lifecycle Approach to Plastic Pollution, Center for International Environmental Law
- <https://www.conserve-energy-future.com>...> Read causes, effects and solutions to environmental degradation
- <https://www.datapine.com>blog>, What is Data Interpretation? Meaning, Methods, Benefits...
- <https://www.earthreminder.com>in...>, Why Environmental Studies is important? Earth Reminder (2020)
- <https://www.enagoi.com>academy>
- <https://www.eionet.europa.eu>.
- <https://www.embibe.com>amp>, Schools in Nagaland (2020)
- <https://www.epa.gov>sustainability>, Sustainable Manufacturing| Sustainability| US EPA (2020) Environmental protection agency
- <https://www.field.org.uk>how-can-f...> How can Factory Pollution Affect Humans?/Field
- <https://www.government.nl>topics>, Safeguarding the Quality of the Living Environment/Spatial planning
- <https://www.jicrjournal.com>...>
- <https://www.journalcra.com>article> Environmental pollution and its impact on human health, *International Journal of Current Research*, Vol18. Issue, ISSN:0975-833x
- <https://www.kisgroup.net>animal-w...> Animal waste to biogas- Kis group
- <https://www.mcgill.ca>evolution>, Chapter 5: Conclusion, Interpretation and Discussion
- <https://www.milwaukeekeeper.org>...> What's a river Basin? What's a Watershed?/Milwaukee
- <https://www.nap.edu>read>chapter>, 5 Recommendations/Research to Protect, Restore and Manage the Environment (2021)
- <https://www.ncbi.nlm.nih.gov>pmc>, A Preliminary Assessment of the Impact of COVID-19 on the Environment-A Case Study of China-NCBI NIH (2020)
- <https://www.pca.state.mn.us>waste>, Concerns About Backyard Burning of Trash| Minnesota Pollution Control Agency

- <https://www.questionpro.com>clos...>, Close Ended Questions: Definition, Types with Examples| Question Pro
- <https://www.questionpro.com>blog>
- <https://wwwquestionpro.com.blog>, Sample: Definition, Methodologies, Types, Formula and Examples
- <https://www.questionpro.com>blog>, Descriptive Research: Definition, Characteristics, Methods, Examples and Advantages
- <https://www.questionpro.com>blog>, Open Ended Questions: Definition, Characteristics, Examples and Advantages
- <https://www.researchconnection.org>...>
- <https://www.research.gate.net>3408...> (2021)
- <https://www.researchgate.net>journal>, Environmental Education Research-Research Gate
- <https://www.researchgate.com.net>2591...>
- <https://www.research.gat.net>2737...>
- <https://www.research.net/publication/259105231>
- <https://www.ripublication.com>, *International Journal of Applied Environmental Sciences*, ISSN 0973-6077 Vol. 12. No.7 (2017)
- <https://www.scribber.com>category>, Research Methods| Definitions, Types, Examples – Scribber
- <https://www.scribber.com.qualitative...> Qualitative vs quantitative research/ Differences
- <http://www.the.moderneducation.com>...>, List of Schools in Phek District, Private Schools
- <https://www.voxco.com>blog>qu>
- <https://www.who.int>...>Detail>, Climate Change and Health-WHO|World Health Organization (2018)
- I. Blessing O. (2019), Harmful Effects and Management of Indiscriminate Solid Waste Disposal on Human and its Environment in Nigeria: A Review, *Global Journal of Research and Review*, <https://www.imedpub.com>articles>
- Imchen Narotola (2021), A Study on the Disruptive Classroom Behaviour Among Secondary Students of Kohima District

- I. Nukshienla (2015), Integrated Watershed Management in Nagaland - A Key to Sustainable Development
- Important peaks of Nagaland (2018), <https://nagalandgk.com>
- India Village Directory
- K. Avitoli (2017), Patterns of Socio Economic Change and their Impacts on Environment in Nagaland with Special Reference to Zunheboto District
- K. Ellison (2017), 5 Health Benefits of Having Plants in Your Home, <https://medium.com>thrive-global>
- Kaitlyn Pirie (2019), 8 Benefits of Indoor Plants-How Houseplants Improve Your Health, <https://www.prevention.com>health>
- K. Paritosh, The Health Effects of Global Warming, UN Chronicle, <https://www.un.org>article>health...>
- Kate A. Brauman (2013), Ecosystem Services and River Basin Management/Springer Link, <https://link.springer.com>chapter>
- Kartikeya Saigal (2020), How is COVID-19 Impacting the Environment Around Us, www.investindia.gov.in.>how>covi...
- Khan et al (2020), COVID-19 Pandemic and its Positive Impact on Environment: An Updated Review, *International Journal of Environmental Science and Technology*, link.springer.com>article
- K. Karunthilaki (2020), Positive and Negative Impacts of COVID-19, an Analysis with Special Reference to Challenges to the Supply Chain in South Asian Countries, <https://link.springer.com>article>
- K. Kumara (2017), Green Marketing in India: A Review of Literature-Biz and Bytes, bizandbyte.com>documents PDF
- K. Remoundoy et al (2009), Environmental Effects of Public Health: An economic Perspective, www.ncbi.nlm.nih.gov
- K. S. Guru (1999), Environmental Law in India – An Overview – CMS Law – Now, UK, Ch IV, <https://www.cms-lawnow.com>env...>
- Kvkphek.nic.in>district – profile
- K. Wolters, Public Health Impacts of Plastics: An Overview-NCBI-NIH *Indian Journal of Occupational and Environmental Medicine*, Wolters Kluwen – Medknow Publications, <https://www.ncbi.nlm.nih.gov>pmc>

- Lauren Matelskietal et al (2020), The Negative Impacts of Environmental Pollutants COVID-19, Health Outcomes, www.openaccessgovernment.org>e...
- L. Finley (2013), Literature Review on the Impacts of Environmental Protection... www.environment.gov.au>pdf
- Lindsey Conner and Anne Sliwka (2014), Implications of Research on Effective Learning Environment for Initial Teacher Education, *European Journal of Education*, <https://www.researchgate.net>>2614
- L.M. Sorathiya et al (2014), Eco-friendly and Modern Methods of Livestock Waste Recycling for Enhancing Farm Profitability, <https://link.springer.com>>article
- Lohe, Sakhoveyi (2017) Environmental management of degraded ecosystem of Phek district Nagaland (Thesis)
- M. A. Jane, (2012) Assessing the Level of Environment Awareness of Non-Science Students of Colleges of Education in Rivers State, *Journal of Educational and Social Research*, Volume 2, ISSN-2239-978X
- Mar Tainla, Professional Ethics and Development of Teachers in Higher Education in Nagaland, Ph.D Pre-submission paper
- Menla Rasem (1984) To Study the Environmental Education Programme in Some Selected Primary Schools in Mokokchung Town
- M. H. Shakil et al (2020) COVID-19 and the Environment, A Critical Review and Research Agenda, www.sciencedirect.com>article>pii
- Multiple Instruction Strategy, <https://files.eric.ed.gov>.>fullt...PDF
- Murry Nchumthung and Das Sanjoy (2021) Zabo Farming System – A Sustainable Farming Based on Traditional Knowledge for Natural Resource Management Practiced by Tribals in Nagaland India, <https://ndpublisher.in>>countp...PDF
- M. Vandana et al (2020), Environmental Impact of Quarrying of Building Stones and Laterite Blocks: A Comparative Study of 2 River Basins in South Western Ghats, India, *Environmental Earth Science Journal*, <https://www.springerprofessional.de>>...
- National Curriculum Framework (NCF 2005), <https://en.wikipedia.org>>wiki
- Neeti Rustagi et al, <https://www.ncbi.nlm.nih.gov>>pmc, Public Health Impacts of Plastics: An Overview-NCBI-NIH/*Indian Journal of Occupational and Environmental Medicine*, Wolters Kluwer-Medknow Publications

- N. Gupta et al (2020), The Effect of COVID-19 lockdown on the Air Environment in India, *Global Journal of Environmental Science and Management (GJESM)*, <https://www.gjesm.net/2020>
- Nimi Sunil (2018), Schools in Phek District of Nagaland, <https://study4sure.com>school>pl...>
- O. Blessing Ifeoluwa (2019), Harmful Effects and Management of Indiscriminate Solid Waste Disposal on Human and its Environment in Nigeria: A Review, <https://www.imedpub.com>articles>
- Paritosh Kasotia, The Health Effects of Global Warming: Developing Countries are the Most Vulnerable, UN Chronicle, <https://www.un.org>article>health...>
- Phek district in Nagaland, Wikipedia, <en.m.wikipedia.org>
- P. Homa and N. Nasreen, Status of Environmental Education at the secondary school level in India, <https://paryavarnmitra.in>...PDF>
- P. Jagadamba, Khoiyangbam R.S., G. Navindu (2015) Environmental Sciences: Scope and Importance, <https://www.researchgat.net>2737...>
- Plastic and Human Health: A Lifecycle Approach to Plastic Pollution, Center for International Environmental Law, <https://www.ciel.org>project-update>
- Radiation and Pollution| Environmental Pollution Centres, <https://www.environmentalpollutioncenters.org...>
- Raimo Streefkerk (2019), scribber.com/m, Qualitative vs Quantitative research
- 5 Recommendations| Research to Protect, Restore and Manage the Environment (2021), <https://www.nap.edu>read>chapter>
- R. David B., P.Christopher J. (2015), Environment, Ethics and Human Health – The Hastings Center, <https://www.thehastingscenter.org>...>
- Remoundou K., K.Phoebe (2009), Environmental Effects of Public Health: Economic Perspective, <www.ncbi.nlm.nih.gov>
- Rich Gordon (2018), Introducing The Alder – A Super Hero Tree Pioneer, <https://www.treesforcities.org>stories>
- River Ecosystem – Wikipedia, <https://en.m.wikipedia.org>wiki>
- R. Nigam et al (2021), Positive Effects of COVID-19 Lockdown on Air Quality of Industrial Cities (Ankleshwar and Vapi of Western India in Gujarat), <www.nature.com>...>article>

- RWJF| Random Purposeful/ Purposeful Random Sampling, <https://www.qualres.org>HomeRand...>
- Sabina Zehra Rizvi et al (2012), Environmental Concerns in the Knowledge Industry: Literature Review, Vol. 61, Issue 7, <https://doi.org/10.1108/00242531211288263> , Published by Emerald Group Publishing Limited
- S. Alomi Cynthia (2017), Women and Resource Management – A Study of Shifting Cultivation in Nagaland
- Safeguarding the Quality of the Living Environment/Spatial Planning, <https://www.government.nl>topics>
- Sema N. Savito (2002), Study on the Status and Problems of Teaching of Environmental Studies at Primary School Level in Nagaland, Thesis
- S. Guru Krishnakumar, Environmental Law
- shodganga.inflibnet.ac.in>bitstream in India-an Overview-CMS Law-Now, UK (1999), Ch IV, <https://www.cms-lawnow.com>env...>
- shodganga.inflibnet.ac.in>bitstream Chapter ii Review of literature
- shodganga.inflibnet.ac.in>pdf, 07-chapter 2
- Shona McCombus (2019), How to Write a Thesis Conclusion, <https://www.scribber.com>dissertation>
- Shreerup Goswami and Bijay K.Swain (2017), Environmental Noise in India: A Review, Springer International Publishing AG 2017, Curr Pollution Rep. (2017)- Compile with top, www.researchgate.net>publication (PDF)
- S. Nate, <https://study.com>
- Shriya Tripti, Secondary Education System in India – Psychology Discussion, <https://www.psychologydiscussion.net>...>
- Snehal Lokhanwala et al (2020), (Environmental Research) Indirect Impact of COVID-19 on environment: A Brief Study in India, ncbi.nlm.nih.govt/pmc/a...
- S. Raimo (2019), Qualitative Vs Quantitative Research, Qualitative Vs Quantitative Research/ Differences, <https://www.scribbr.com>qualitativ...>
- S.S. Kumar (2016), Environmental Pollution and its Impact on Human Health, *International Journal of Current Research* Vol. 8. Issue, ISSN:0975-833X, <https://www.journalcra.com>article>
- Sweta Pathania (2020), Public Awareness and its Contribution Towards the Prevention of Environmental Degradation in India, <https://www.legalbites.in>public-a...>

- T. Giorgadze (2011), Disasters and their Consequences for Public Health-Pud Med, <https://pubmed.ncbi.nlm.nih.gov>>..., Georgian Med News
- T. H. Chan, Corona Virus and Climate Change-Climate Change|Harvard, www.hsph.harvard.edu>subtopics
- The land of tradition, Phek district, <https://phek.nic.in>
- Tribuwan Kr. Bhartiya, www.ripublication.com>ijae12n7-07PDF Assessment of Environment Awareness Among General Public of Assam (India)
- Tripti Shriya, Secondary Education System in India-Psychology Discussion, <https://www.psychologydiscussion.net>>...
- Urbanization Causes and Impacts/ National Geographic/, <https://www.nationalgeographic.com>>ur...
- US EPA (2020), Sustainable Manufacturing, Environmental Protection Agency, <https://www.epa.gov>>sustainability
- Vizo Kiyasetuo (2007), A Study on Farming Practices in Relation to Village Level Social Institutions for Sustainable Development in Nagaland (Thesis)
- Vikalp Sangam (2014), Sustainable Form of Jhum Cultivation in Khonoma, <https://vikalpsangam.org>>article>s...
- Vandana M., J. Shiekha E., Maya K., Padmalal D. (2020), Environmental Impact of Quarrying of Building Stores and Laterite Blocks: A Comparative Study of 2 River Basins in Southern Western Ghats, India, Environmental Earth Science Journal, <https://www.springerprofessional.de>>...
- Wang Qiang and Su Min (2021), A Preliminary Assessment of the Impact of COVID 19 on the environment – A Case Study of China- NCBI NIH, <https://www.ncbi.nlm.nih.gov>>pmc
- What's a River Basin? What's a Watershed?/ Milkwaukee..., <https://www.milwaukeekeeper.org>>...
- What is Light Pollution? – Globe at Night, <https://www.globeatnight.org>>light...
- wikipedia.org/wil Metarhizium Anisopliae
- Wikipedia.org/wil Entomopathogenic Fungus
- www.Indiaeducation.net
- www.nfe.gov.nz>sites>filesPDF , A literature Review on Environment and Health
- www.osti.gov>servlets>purIPDF Review of Recent Literature Relevant to the Environment.

- www.researchtrend.net> PDF, Analysis of Air Pollution in Indian Cities – A Literature Review
- www.sciencedaily.com>2020/12, Environmental Impacts of the COVID-19 Pandemic, as Observed from Space, with special reference to India, {Nasa/ Goddard Space Flight Center, United States Geological Survey (USGS), European Space Agency (ESA) Earth Observing Satellite and others
- wikipedia.org/wi], Entomopathogenic Fungus
- wikipedia.org/wi], Metarhizium Anisopliae
- worldfish.org>PPA>PDF's- literature review, G. Talero
- www.researchtrend.net>[pdf](#), Analysis of Air Pollution in Indian Cities- A Literature Review
- www.researchgate.net>...>[Poverty](#), PDF (Poverty and Environmental Degradation: A Literature Review and Analysis (1996) Anantha Duraippah
- Y. L. Niutoli (2021), A Comparative Study Between Practice Teaching and Internship (Thesis)
- Z. Abu Hassan (2006), Doing a Pilot Study: Why it is essential? – NCBI –NIH, <https://www.ncbi.nlm.nih.gov>>[pmc](#)
- Z. D. Augusta (2020), Global Bioclimatic Suitability for the Fall Army Worm, Spodoptera Frugiperda (Lepidoptera: Noctuidae) and Potential Co-occurrence with Major Host Crops Under Climate Change Scenarios, <https://link.springer.com>>[article](#)

APPENDIX - I

Questionnaire for Students

Please fill in the following information:

Name (Optional): _____ Age: _____

Gender: Boys [] Girls []

Academic Qualification: a) Class IX b) Class X c) Class XI d) Class XII

Stream: Arts [] Science [] Commerce []

1. Are you aware about the environmental degradation in Phek district? Yes [] No []

If yes, please tick (✓) the reason (s) for environmental degradation in Nagaland.

- a. Lack of environmental awareness []
- b. Environmental pollution of air, water and soil []
- c. Burning of fossil fuels – coal, petrol, diesel etc []
- d. Clearing of forests for firewood, agriculture - shifting/jhum cultivation, trade, construction of houses []
- e. Exploitation of wildlife for food, trade, medicine []
- f. Use of fertilizers/ untreated sewage for agriculture []
- g. Destruction of habitat due to increasing population, trade, unsustainable development and agricultural activities []
- h. Logging – cutting of trees []
- i. Any other, please mention _____

2. Are you aware about the various types of pollution in Phek district? Yes [] No []

If yes, please tick (✓) the various types of pollution you are aware of?

- a. Air pollution [] d. Noise pollution []
- b. Water pollution [] e. Radiation pollution []
- c. Soil pollution [] f. Any other _____

3. Do you think that Phek district suffers from air pollution? Yes [] No []

If yes, please tick (✓) the reason (s) for air pollution in Phek district?

- a. Natural pollutants - decay of organic material, particles from wild fire, dust storms etc []
- b. Primary pollutants – use of fuels in engines, domestic purposes, release of carbon dioxide, sulphur dioxide etc []

- c. Secondary pollutants – release of ozone gas, smog etc due to chemical reactions []
 - d. Improper drainage system, untreated sewage/ domestic wastes []
4. Do you think the water bodies (rivers, ponds, lakes, streams etc) in Phek district are polluted? Yes [] No []

If yes, please tick (✓) the cause (s) of water pollution in Phek district.

- a. Disease causing agents (pathogens) – bacteria, virus, parasitic worms that enter water bodies from domestic sewage and untreated human and animal wastes []
 - b. Oxygen depleting wastes – organic wastes that are decomposed by aerobic bacteria, produces foul odour and unpleasant taste which is harmful to human health and aquatic animals []
 - c. Excess fertilizers run off into water bodies which causes eutrophication, destruction of aquatic life forms []
 - d. Organic chemicals – oil, gasoline, plastic, pesticide, etc, harmful to human and animal life []
 - e. Soil erosion []
5. Are you aware of the ill effects of deforestation? Yes [] No []

If yes, please tick (✓) the ill effects of deforestation.

- a. Desertification due to over cultivation, deforestation []
 - b. Species extinction due to hunting and wildlife trade []
 - c. Soil erosion []
 - d. Loss of tropical rainforests []
 - e. Increased emission of green house gases []
 - f. Droughts []
 - g. Any other, please mention _____
6. Are you aware of the negative effects of shifting/jhum/slash and burn cultivation? Yes [] No []

If yes, please tick (✓) the negative effects of shifting/jhum/slash and burn cultivation.

- a. Land desertification due to cutting down of forests for agriculture, trade, medicines []
- b. Destruction of flora (plants) and fauna (animals) []
- c. Soil erosion leading to landslides/loss of quality of the soil []
- d. Smoke from burning of forest leads to air pollution []
- e. Ecological imbalance []

- f. Rapid drying up of small water bodies – streams, brooks, ponds, lakes []
- g. Loss of productivity of the soil causing reduction in family income and enhancement of poverty []
- h. Disappearance of local species []
7. Do you think that Phek district suffers from noise pollution? Yes [] No []
- If yes, please tick (✓) the source (s) of noise pollution in Nagaland.
- a. Indoor sources - radio, television, generators, electric fans []
- b. Outdoor sources – loudspeakers, automobiles, traffic []
- c. Rural areas – farm machines, pump sets, saw mill, small scale industries []
- d. During festivals/ marriage – fire crackers, loudspeakers []
8. Are you aware that fire crackers cause noise and air pollution and adversely affect the health of the people/animals? Yes [] No []
9. Are you aware that trees/plants purify the air and absorb the noise? Yes [] No []
10. Do you think Chakhesangs dispose off their waste properly? Yes [] No []
- If yes, please tick (✓) the way (s) in which wastes are disposed.
- a. Reduction [] d. Reuse [] g. Deep well injection []
- b. Recycling [] e. Composting [] h. Any other _____
- c. Landfill [] f. Incineration []
- If no, please tick (✓) the way (s) in which wastes can be disposed properly.
- a. Reduction [] d. Reuse [] g. Deep well injection []
- b. Recycling [] e. Composting [] h. Any other _____
- c. Landfill [] f. Incineration []
11. Have your school initiated any programmes/ practical or co-curricular activities for raising awareness about environment? Yes [] No []
- If yes, please tick (✓) the programmes/ practical or co-curricular activities initiated by your school to raise awareness on environment during the last three years.
- a. Organise Eco - Club/ society involved in environmental protection []
- b. Organise field trips/ study tours to environmentally important sites, parks, sanctuary, polluted and degraded ecosystem []
- c. Organise rallies, marches at public places to spread awareness []
- d. Mobilise action against environmentally unsound practices of disposal of garbage in unauthorised places []
- e. Tree plantation and cleanliness drives []

- f. Conduct seminars and workshops on environment to raise awareness []
- g. Documentation of wildlife and biodiversity []
- h. Any other, please mention _____

12. Does your school celebrate Environment Day/Earth Day? Yes [] No []

If yes, please tick (✓) the activities and programmes generally done on the occasion.

- a. Tree/flower plantation drives []
- b. Essay/Quiz/Debates/Drawing competition on environment []
- c. Cleanliness drives []
- d. Exhibitions on environmental resources []
- e. Workshops/Seminar []
- f. Any other, please mention _____

13. Does your school celebrate Wildlife Day? Yes [] No []

If yes, please tick (✓) the activities and programmes generally done on the occasion?

- a. Conducting Workshops/Seminars on animals and plants in their natural environment []
- b. Conducting Essay, Quiz and Debates, Drawing competitions basing on plants(flora) and animals (fauna) []
- c. Campaigns to create awareness on wildlife []
- d. Documentation of wildlife and biodiversity []
- e. Any other please mention _____

14. Have your school invited any environmentalist/subject experts to give talks or advice to the students on environment and its issues? Yes [] No []

15. Have the school authorities initiated mock drill on disaster management?

Yes [] No []

If yes, please mention the various activities performed during the mock drill.

- a. _____
- b. _____
- c. _____
- d. _____

16. What are the programmes and initiatives taken by the Government and NGO's for environmental protection and preservation in your community?

- a. Organise trainings, seminars, workshops and rallies on environment in the school and locality []

- b. Cleanliness drives and tree plantation with students, community members, eco- club members []
- c. Organise environment awareness campaigns []
- d. Organise meetings with school authorities, community and church leaders to discuss on environmental issues []
- e. Documentation of wildlife and biodiversity []
- f. Handing out awards to school authorities, students, leaders, people who have contributed in raising environment awareness among community members []
- g. Solid and liquid waste management []
- h. Construction of toilets in villages to make it defecation free []
- i. Any other, please mention _____

17. Are you aware that pollution causes diseases on human beings? Yes [] No []

If yes, please tick (✓) the diseases caused due to pollution?

- a. Cancer [] g. Deafness/hearing damage []
- b. Allergies [] h. Organ disorder []
- c. Typhoid [] i. Weaker immune system []
- d. Jaundice [] j. Heart/cardiovascular problems []
- e. Asthma [] k. Brain, liver, kidney and damage []
- f. Diarrhea [] l. Any other _____

18. Are you aware of the fact that disaster causes great damage to human beings/plants/animals/environment? Yes [] No []

If yes, please tick (✓) the various types of disasters – natural and man-made that occur in Nagaland?

- a. Earthquake [] f. Droughts []
- b. Landslides [] g. Eutrophication []
- c. Floods [] h. Thunderstorm []
- d. Heat waves [] i. Forest fires []
- e. Soil erosion [] j. Release of harmful chemicals []

19. Have you ever faced any problems due to disasters? Yes [] No []

If yes, please tick (✓) the problems faced in times of disasters.

- a. Loss of human life and property []
- b. Damage to buildings, roads, electric poles, bridges, roadways and water supply []
- c. Health problems []

- d. Temporary dismissal of classes []
- e. Any other, please mention _____
20. Are you aware that climate change affects human health? Yes [] No []
- If yes, please tick (✓) the diseases caused due to climate change.
- a. Dengue [] e. Leprosy [] i. Lyme []
- b. Malaria [] f. Typhoid [] j. Plague []
- c. Cholera [] g. Polio [] k. Tuberculosis []
- d. Cancer [] h. Tetanus [] l. Any other _____
21. Does your community face any problems due to climate change? Yes [] No []
- If yes, please tick (✓) the problems faced due to climate change.
- a. Loss of human life and life stock []
- b. Droughts leading to acute scarcity of water []
- c. Floods leading to contaminated water, lack of fresh/clean water for drinking, cooking, washing, soil erosion, landslide etc []
- d. Increase in human, plants and animals diseases []
- e. Less production/failure of crops []
- f. Any other, please mention _____
22. Do you think that studying Environmental Education/Environmental Studies is necessary to make you aware of the significance of the environment in your life?
Yes [] No []
23. Is the present Environmental Education/Environmental Studies subject relevant and informative? Yes [] No []
24. Is the syllabus on Environmental Education/Environmental Studies related to your daily life? Yes [] No []
25. Is the knowledge contained in the books on environment properly taught by your teacher? Yes [] No []
26. Do you think that Environmental Education/Environmental Studies should be made a compulsory subject at all levels of education in Nagaland? Yes [] No []
- If yes, please tick (✓) the reasons why Environmental Education/Environmental Studies should be made a compulsory subject at all levels of education in Nagaland.
- a. To be more aware about the environment and its issues []
- b. To know the harmful effects of environmental destruction on human life/plants/animals []

- c. To know the causes which leads to pollution and to adopt measures to stop pollution []
- d. Any other, please mention _____
27. Have you done any assignment/project work on environment? Yes [] No []
28. Are you aware of any Governmental organization (s) that work on environmental protection/preservation in Nagaland? Yes [] No []
- If yes, please tick (✓) the various organization (s) that work on environmental protection/ preservation in Nagaland.
- a. Nagaland Institute of Health, Environment and Social Welfare (NIHESW)[]
- a. Nagaland Empowerment of People through Economic Development []
- b. Department of Environment Forest and Climate Change []
- c. Nagaland State Disaster Management Authority []
- d. Ministry of Environment and Forest (MoEF) []
- e. Any other, please mention _____
29. Are you aware of the NGO's working on environmental protection/preservation in Nagaland? Yes [] No []
- If yes, please tick (✓) the organization (s) that work on environmental preservation?
- a. North East Network (NEN) []
- b. Green Creations Etshe Society []
- c. Chizami Woman Society []
- d. Batso Welfare Society []
- e. Charity Welfare Society []
- f. Joint Forest Management Committee (JFMC) []
- g. Save Environment Network (SEN) []
- h. Committee on Social Action Health Environment Development []
- i. Integrated Rural Area Forests and Economic Development Services []
- j. Lumshawong Horticulture Farming Society []
- k. Society for the Conservation of Nature and Environment []
- l. Any other, please mention _____
30. The Government and NGO's have their own roles to play in contributing to environment. As an individual how can you contribute to your environment?
- a. _____
- b. _____
- c. _____

d. _____

31. Please suggest some measures for bringing environmental awareness among the secondary school students so that everyone works for the protection and preservation of the environment.

a. _____

b. _____

c. _____

d. _____

APPENDIX - II

Questionnaire for Teachers

Please fill in the following information:

Name (Optional): _____ Age: _____

Gender: Male [] Female []

Academic Qualification: _____

Teaching Experience: _____

- 1) Do you think that Environmental Education/Environmental Studies should be made a compulsory subject at all levels of education in Nagaland? Yes [] No []

If yes, please tick (✓) the reasons why Environmental Education/Environmental Studies should be made a compulsory subject?

- a. To make the students more aware about the environment and its issues []
- b. To make the students aware about the causes and harmful effects of environmental destruction on human beings/plants/animals []
- c. To make the students aware of the causes of pollution so that they will adopt measures to stop pollution []
- d. If Environmental Education/Environmental Studies is taught to the children, they in turn can educate their parents []
- e. Any other, please mention _____

- 2) As a teacher have you ever faced problems while disseminating knowledge and information to children relating to environment? Yes [] No []

If yes, can you please mention the problems faced while disseminating knowledge and information to the children on environment.

- a. _____
- b. _____
- c. _____
- d. _____

- 3) Do you think that the present syllabus of Environmental Education/ Environmental Studies is relevant to life? Yes [] No []

4) Do you think the contents in the syllabus of Environmental Education/ Environmental Studies is providing the students appropriate knowledge for environment awareness?

Yes [] No []

5) Please give your opinion on what should be the method/ teaching technique for dissemination of information on environment?

a. _____

b. _____

c. _____

d. _____

6) Have you done any project/survey/research on environment? Yes [] No []

If yes, can you please mention the project/survey/research you had done?

a. _____

b. _____

c. _____

d. _____

7) Does your community face any problems due to climate change/disaster?

Yes [] No []

If yes, please suggest some ways to curb climate change/disaster.

a. _____

b. _____

c. _____

d. _____

8) Do you think that the environment and its resources can be preserved and improved in Phek district? Yes [] No []

If yes, please tick (✓) the ways in which the environment and its resources can be improved and preserved.

a. Campaigns to raise awareness of the environment and its issues []

b. Strict implementation of environmental laws []

c. Strict punishment for violation of environmental laws []

d. Encouraging community members, church, organisations, institutions, clubs etc to play an active role in improving the environment []

e. Any other, please mention _____

9) As a teacher, please mention some ways in which you can contribute towards the improvement of the environment in your locality?

- a. _____
- b. _____
- c. _____
- d. _____

10) Please suggest some measures for bringing environmental awareness among the students so that everyone works for the protection and preservation of the environment.

- a. _____
- b. _____
- c. _____
- d. _____

APPENDIX - III

Questionnaire for Leaders

Please fill in the following information:

Name(Optional): _____ Age: _____

Gender: Male [] Female []

Academic Qualification: _____

Occupation: _____

1. As a leader have you initiated any project/programme/activity to raise environmental awareness among the public? Yes [] No []

I. If yes, please tick (✓) the project/programme/activity initiated by you to raise awareness among the public?

- | | |
|--|-----|
| i. Organise Eco - Club/ society involved in environmental protection | [] |
| j. Organise field trips/ study tours to environmentally important sites, parks, sanctuary, polluted and degraded ecosystem | [] |
| k. Organise workshop, seminar, conference and rallies, to spread environmental awareness | [] |
| l. Mobilise action against environmentally unsound practices of disposal of garbage in unauthorised places | [] |
| m. Tree/flower plantation and cleanliness drives | [] |
| n. Documentation of wildlife and biodiversity | [] |
| o. Creation of public awareness on clean sanitary practices | [] |
| p. Toilet construction | [] |
| o. Recycling | [] |
| q. Rainwater harvesting | [] |
| p. Waste management | [] |
| r. Climate change | [] |
| q. Organic garden | [] |
| s. Pollution management | [] |
| r. Bamboo | [] |
| t. Sustainable development | [] |
| s. Disaster management | [] |
| u. Solar energy | [] |
| t. Aforestation | [] |
| v. Energy conservation | [] |
| u. Any other _____ | |

II. Please tick (✓) the objective (s) of the project/programme/activity you have initiated.

- a. To make people aware of the harmful effects of environmental pollution and degradation []
- b. To help people acquire knowledge about the environment []
- c. To help people develop skills to participate in solving problems and managing the environment []
- d. To provide people with opportunities to be actively involved at all levels in the environmental decision making []
- e. To make people develop a sense of responsibility towards improvement of the environmental condition []
- f. To employ the best available and economically accessible technology []
- g. Any other, please mention _____

III. Please tick (✓) the outcomes achieved as a result of the project/programme/activity.

- a. Increased environment awareness among the public []
- b. Supply of organic food []
- c. Improvement in waste management and recycling []
- d. Development of environment friendly tools/availability of tools or products in the market []
- e. Protection of environmentally sensitive areas []
- f. Reduced consumption of electricity and paper []
- g. Reduced emission of harmful gases []
- h. Use of renewable resources []
- i. Sustainable use of non-renewable resources []
- j. Trained/skilled manpower on disaster management []
- k. Rainwater harvesting []
- l. Increased plantation of plants-trees/flowers []
- m. Decreased hunting and fishing activities []
- n. Any other, please mention _____

2. As a leader, what are the environment friendly activities that you follow and which can be promoted among the members of the community?

- a. Becoming a vegetarian []

- b. Eating home cooked meals from one's own kitchen garden []
 - c. Visiting environmentally important places []
 - d. Special/short-term training courses in environment to interested people []
 - e. Encourage people to get involved in action/projects that promote environmental awareness []
 - f. Organising competitions on environmental themes []
 - g. Encourage use of re-useable products []
 - h. Encourage use of public transport, bicycle and walking on foot []
 - i. Any other, please mention _____
3. Have you ever faced problems while framing environmental protection laws and implementing it? Yes [] No []
- If yes, please mention the problems faced while framing and implementing laws.
- a. _____
 - b. _____
 - c. _____
 - d. _____
4. As a leader have you initiated any eco-friendly farming technique for your community? Yes [] No []
- If yes, please mention the eco-friendly farming technique you have initiated.
- a. _____
 - b. _____
 - c. _____
 - d. _____
5. Have you introduced any regulation/legislation to make people stop environmentally harmful activities? Yes [] No []
- If yes, please tick (✓) the regulation/legislation made on environmentally harmful activities.
- a. Use of fire crackers during festivals/birthdays/marriage []
 - b. Use of loudspeakers during festivals/birthdays/marriage []
 - c. Use of explosives in fishing []
 - d. Burning forest while hunting []
 - e. Dumping/throwing of waste at unauthorised places []
 - f. Open defecation/dumping of untreated sewage in water bodies []
 - g. Cutting/clearing of forests []

- h. Logging []
 - i. Stone quarrying in the river/streams/brooks beds []
 - j. Excessive use of non-renewable resources []
 - k. Excessive jhum/shifting/slash and burn cultivation []
 - l. Selling of floral resources (plants) and faunal resources (animals) []
 - m. Any other, please mention _____
6. As a leader have you introduced any innovative means to dispose of the waste in your community? Yes [] No []
- If yes, can you please mention the method introduced by you for safe disposal of waste in your community?
- a. _____
 - b. _____
 - c. _____
 - d. _____
7. Do you encourage educational institutions to include co-curricular/practical activities in the curriculum, relating to environment? Yes [] No []
8. Are exhibitions on environmental resources carried out by your organisation/community? Yes [] No []
9. Have you invited any environmentalist/subject experts to give talks/advice to the public on environment and its issues? Yes [] No []
10. As a leader have you initiated mock drill on disaster management? Yes [] No []
- If yes, please mention the various activities performed during the mock drill.
- a. _____
 - b. _____
 - c. _____
 - d. _____
11. As a leader, please mention some ways in which you can contribute towards the improvement of the environment in your locality.
- a. _____
 - b. _____
 - c. _____
 - d. _____

12. Please suggest some measures for bringing environmental awareness among the members of the community so that everyone works for the protection and preservation of the environment.

- a. _____
- b. _____
- c. _____
- d. _____