

**A STUDY OF THE
CONCEPTS ON SUSTAINABLE DEVELOPMENT
IN THE CURRICULUM OF TEACHER
EDUCATION AT THE SECONDARY SCHOOL LEVEL IN KERALA**

**Thesis
submitted to the University of Calicut
for the Award of Degree of
DOCTOR OF PHILOSOPHY**

Stephen T A

**Department of Education
University of Calicut**

DECLARATION

I, Stephen T A., do hereby declare that this report entitled '***A Study of the Concepts on Sustainable Development in the Curriculum of Teacher Education at the Secondary School Level in Kerala***', has not been previously formed the basis for the award of any Degree, Diploma, Title or Recognition.

Calicut University

Date: 09-12-2009

Signature of the candidate

Stephen T A

Dr. (Prof) R. Sukumaran Nair

Chairman, National Institute of Cultural and Educational Research & Studies

Formerly Professor and Head, Dept. of Education and Dean, Faculty of Education of Calicut University

& Head, Dept. of Education and Controller of Examinations Sree Sankaracharya University of Sanskrit, Kalady

Santha Sadan

Chempakassery Road,

Vallakkadavu P.O.

Thiruvananthapuram

Kerala State

Ph.: 0471 2453084

CERTIFICATE

I, **Dr. R. Sukumaran Nair** do hereby certify that this thesis entitled "***A Study of the Concepts on Sustainable Development in the Curriculum of Teacher Education at the Secondary School Level in Kerala***", is a record of bonafide study and research work carried out by **Mr. STEPHEN T. A.** under my supervision and guidance and that this thesis has not been previously submitted by him for the award of any Degree, Diploma, Title or Recognition before.

Calicut University

Date: 09-12-2009

Dr. R. Sukumaran Nair

(Supervising Teacher)



Dedicated to

***My beloved parents
(Late) Mr. Abraham
& Mariamma***



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Research Scholar

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Chapter 1

INTRODUCTION

1.1 Introduction

In the middle of twentieth century, we saw our planet from space for the first time. Historians may eventually find that this vision had changed the concept of the universe compared with the Copernican revolution of the sixteenth century, when the human self-image was upset by revealing the fact that earth is not the centre of the universe. From space we see a small and fragile ball dominated not by human activity and edifice but by a pattern of clouds, oceans, greenery and soil. Humanity's inability to fit its doing in to that pattern is changing the planetary systems, fundamentally. Many such changes are accompanied by life threatening hazards. This new reality, from which there is no escape, must be recognized and managed. (*Our Common Future* by the World Commission on Environment and Development (Brundtland Commission) 1987).

Today, progress itself is becoming a misnomer. Little attention is paid to the suitability and sustainability of the so-called developmental activities. Not only are we in the danger of losing our precious natural resources but also the sylvan beauty of the countryside. Perhaps the day is not far when there will be no abode of tranquility to rest hurried minds, no escape from this dehumanizing activities.

Understanding of the multidimensional problems of depleting resources, ever-increasing populations, and long term planning is vital to the survival of human species. Since the publication of *Our Common Future* by the World Commission (Brundtland Commission) on Environment and Development in 1987, the idea of improving the quality of life for all the inhabitants of earth has been essentially connected to the idea of sustainable development.

1.2 What is Sustainable Development?

In 1987, the concept of sustainable development was first brought into the international arena by the World Commission on Environment and Development in their report ‘Our Common Future’ (also known as ‘The Brundtland Commission Report’). The report contained the most commonly used definition of sustainable development:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Thus, while development may be necessary to meet human needs and improve the quality of life, it must happen without depleting the ability of the natural environment to meet present and future needs. This protects both the interests of future generations and the earth’s capacity to regenerate.

Following the Earth Summit in Rio de Janeiro in 1992, one hundred and seventy eight UN countries committed, under the title of Agenda 21, to take action globally and locally to promote sustainable development, focusing on such issues as addressing poverty, protecting the environment, maintaining biological diversity, promoting human health and equality, as well as strengthening the role of farmers, workers, businessmen and the scientific community to achieve these objectives. The Earth Summit also gave high priority in Chapter 36 of Agenda 21 to the role of education in promoting sustainable development and improving capacity of the people to address environment and development issues. Peace, health, democracy and human rights are also important prerequisites for sustainable development.

This broad approach to sustainable development was reaffirmed in a further World Summit in Johannesburg in 2002. At that stage, it was considered that education systems throughout the world should play an important role in promoting the knowledge, skills and values among youth and adults who would help to shape a sustainable future for all.

Accordingly, the UNECE (the United Nations Economic Commission for Europe) one of the five regional commissions in the United Nations for promoting co-operation on economic, environmental and energy issues was asked to draw up an overall strategy for Education for Sustainable

Development (ESD) in 2005. Accordingly the suggested strategy of ESD was adopted by the United Nations by declaring 'Decade for Education for Sustainable Development' from 2005 to 2014. (DESD 2005 - 2014)

The goal of the overall approach is to move society towards sustainable development, taking into account the complex interactions between the three pillars of Sustainable Development, namely environment, society and economics which need to reinforce one another to ensure sustainable development :-

1. The concept of society means an understanding of social institutions and their role in change and development, as well as the democratic and participatory systems which give opportunity for the expression of opinion, the selection of governments, the forging of consensus and the resolution of differences.
2. The concept of Environment is an awareness of the resources and fragility of the physical environment and the effects on it of human activity and decisions, with a commitment to factoring environmental concerns into social and economic policy development.
3. The concept of Economy means a sensitivity to the limits and potential of economic growth and their impact on society and on the environment, with a commitment to assess personal and societal

levels of consumption out of concern for the environment and for social justice.

The economic, social and environmental consequences of all policies thus need to be examined in a co-ordinated manner and taken into account when those policies are being drawn up and adopted.

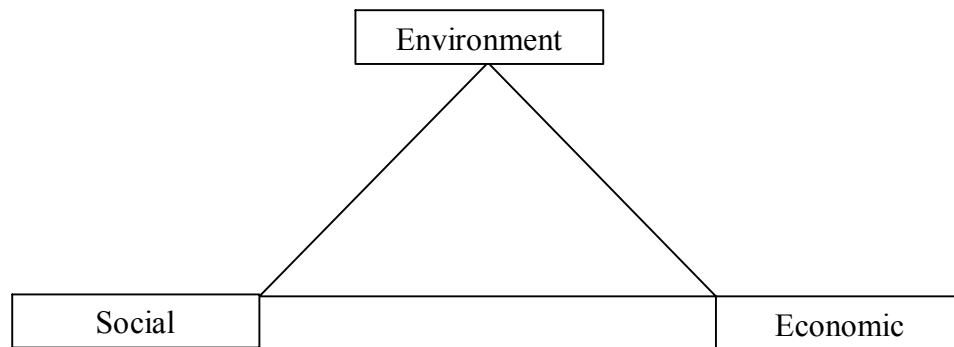
1.3 Conceptual Framework of Sustainable Development

Sustainability is a well articulated goal for management based on the explicit abandonment of the assumption that natural resources are limitless (World Commission on Environment and Development 1987; Lubchino et al. 1991). Sustainable development, which is a complex concept, has its origin in the natural and social sciences that has been developed through international dialogue in response to the challenges facing the world today. According to Brundtland commission, sustainable development is “development which meets the needs of the present without compromising the ability of future generations to meet their own needs.”

A core principle behind sustainable development is the idea that economic, social and environmental conditions play a major role towards development. Without a proper ecosystem it is impossible to maintain a better society and economic development for our own and future generations. Thus environmental dimension can be regarded as the ultimate basis for sustainable development. The social dimension is to meet the basic

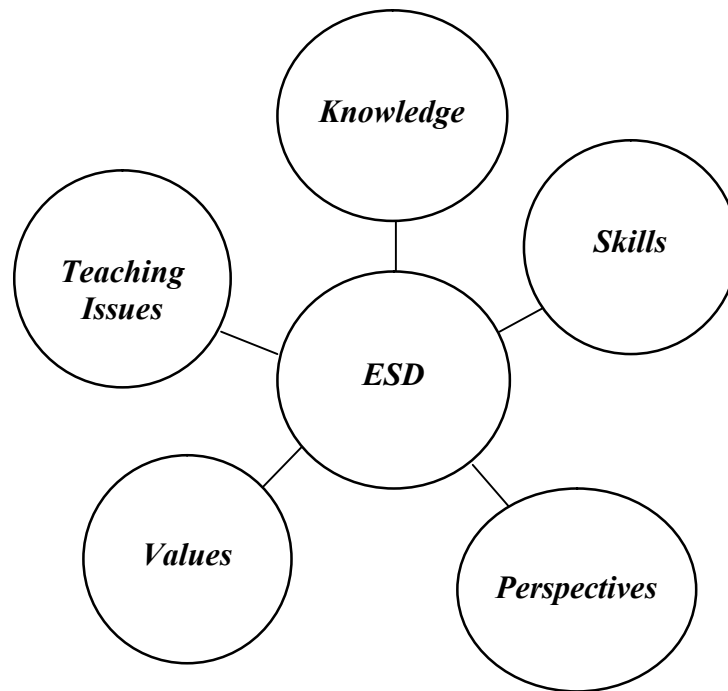
needs of all the people without exceeding the boundaries of the ecosystems. The economic dimension is a means to realize the goal within the limits of a socially and environmentally sustainable manner. So education for sustainable development (ESD) cannot be considered as having link only with environment, it is a development of social and economic aspect also.

The concept of sustainable development can be depicted in a triangular model as,



Education for sustainable development is more than a knowledge base related to environment, economy and society. It also addresses learning skills, perspectives and values that guide and motivate people to seek sustainable livelihood, participate in a democratic society and live in a sustainable manner. Education for Sustainable Development involves studying local and global issues appropriately.

Education for Sustainable Development has five components; knowledge, skills, perspectives, values and teaching issues which are to be addressed in a formal curriculum for sustainable development.



As sustainable development encompasses environment, economics and society, people need basic knowledge from the natural science, social science and humanities to understand the principles of sustainable development. People should know the values involved and ramifications of their implementation. Education for Sustainable Development focuses largely on the major social and environmental issues that threaten the sustainability of the planet. Understanding and addressing these issues are the heart of Education for Sustainable Development, and locally relevant issues should be included in any program related in the education for sustainability. To be successful, Education for Sustainable Development must go beyond teaching about these global issues. People should develop the practical skills that will enable them to continue learning after they leave

school, for livelihood and apply these in their actual life. These skills will differ with the conditions of community which fall in to one or more of the three realms of sustainable development - environmental, economic, and social. Education for Sustainable Development carries with it perspectives that are important for understanding global issues as well as local issues in a global context. Every issue has a history and a future. Looking at the roots of an issue and forecasting possible futures based on scenarios are part of Education for Sustainable Development, as these are linked with many global issues. Values are also an integral part of Education for Sustainable Development. Understanding one's own value, the values of the society, and the values of other societies around the world is a central part of education for a sustainable future. Two common techniques - value clarification and value analysis - are useful to the value component of Education for Sustainable Development.

Pollution, de-forestation, loss of biodiversity, ozone hole, global warming and climate change are some of the environmental problems that are faced by the world today. From where did they come? All the basic resources required for living come from the environment. It is the environment that provides raw materials to industries, food for people, fuel for transport etc. The environment also absorbs the waste that developmental activities generate. That is, the environment is both a source

and a sink for developmental activity. The way the people interact with the environment influences its health and well being. Overusing environmental resources causes environmental degradation. Many of today's environmental problems have emerged because of this overuse and/or misuse of our natural resources. All of these problems have an impact on human well being. Environmental problems may have both short term and long term impacts. For eg. The short term impact of deforestation may be that local communities find it harder to find fuel, wood and fodder. The long term impacts may be soil erosion, loss of watershed etc.

Solving existing environmental problems and preventing new ones from arising require an understanding and appreciation of the linkage between environmental well being and human well being. However, many of these linkages are not apparent at the first instance. This is where education is crucial. The concerns of environment and development should be brought to the attention of the people through education to enable them to understand the linkages between the two, to encourage them to take appropriate action, and to equip them with the skills necessary for taking the appropriate action.

1.4 Education for Sustainable Development

The goal of the United Nations Decade of Education for Sustainable Development (2005-2014, UNDESD), for which UNESCO is

the lead agency, is expected to integrate the principles, values, and practices of sustainable development into all aspects of education and learning.

This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations.

The vision of education for sustainable development emphasizes a holistic and interdisciplinary approach to develop the knowledge and skills needed for a sustainable future. It encompasses both formal and non-formal education and alternate delivery systems. Education for Sustainable Development should equip people with knowledge and skills in sustainable development, making them more competent and confident and increasing their opportunities for acting for a healthy and productive life in harmony with nature and with concern for social values, gender equity and cultural diversity. It is not simply about raising awareness and providing information and knowledge, but rather creating the values, understanding and convictions which will result in participative democratic actions and changes in behaviour to promote a more sustainable society.

The Report of the subcommittee of the Finnish National Commission in 2006 on Sustainable Development on Education describes this as:-

‘Building the future on ecologically, economically and socio-culturally sustainable grounds necessitates the ability to perceive and understand things in their entirety. It calls for a wide knowledge of how society, trade and industry and the natural environment work, how decisions are made, and what opportunities a citizen has to influence in decision-making. It also requires the ability and courage to assess current practices critically and change practices in private life, educational institutions, public affairs, work and free-time engagement on the basis of these principles. The builders of a sustainable future need to have insight into the extent of the need for change and an ethical responsibility for national and global equality and distribution of well being. Diverse skills in information acquisition, problem solving, communications, critical and innovative thinking, and the ability to reconcile different interests and handle conflicts are required’.

Education at all levels and in all its forms should help people of all ages better understand the world in which they live and the complexity and inter-relationships of problems such as poverty, wasteful consumption, environmental degradation, urban decay, population growth, gender inequality, health, conflict, and the violation of human rights that threaten our future.

The concept of sustainable development continues to evolve i.e. the values and approaches to be adopted to Education for Sustainable Development in different regions of the world will be communicated by the priorities, cultures and specific national contexts applicable in various countries.

Education for Sustainable Development is fundamentally concerned with values, with ‘respect’ at the centre; respect for others, including those of present and future generations, for difference and diversity, for the environment, for the planet’s resources. Education enables us to understand ourselves and others and our links with the wider natural and social environment, and this understanding serves as a durable basis for building respect. Along with a sense of justice, responsibility, exploration and dialogue, Education for Sustainable Development aims to move us to adopting behaviours and practices, which enable all to live a full life without being deprived of basics.

1.5 Key elements in an Education for Sustainable Development Strategy

Education for Sustainable Development demonstrates characteristics such as:

- **being interdisciplinary and holistic:** learning for sustainable development embedded in the whole curriculum, not as a separate subject

- **being values-driven:** sharing the values and principles underpinning sustainable development
- **requiring the skills for critical thinking and problem solving:** leading to confidence in addressing the problems and challenges of sustainable development
- **involving multi-method approaches:** word, art, drama, debate, experience, and other different teaching methods which model the processes
- **requiring participatory decision-making:** learners participate in decisions on how they are to learn
- **being locally relevant:** addressing local as well as global issues, and using the language that learners most commonly use.

The four priority areas of action for the Decade of Education for Sustainable Development aim to

- promote and improve basic education
- reorient and revise existing education programmes
- develop public understanding and awareness of sustainability
- provide practical training

The Decade pursues a global vision:

The vision of education for sustainable development is a world in which everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive social transformation.

Promoting a strategy for Education for Sustainable Development covers such areas as: poverty reduction, citizenship, peace, ethics, responsibility in local and global contexts, democracy and governance, justice, security, human rights, health, gender equity, cultural diversity, production and consumption patterns, corporate social responsibility, climate change, environmental protection, natural resource management and biological and landscape diversity.

The strategy requires that Member States look at education in schools and at further and higher level, the non formal sector, including youth work and adult and community based learning media awareness, training of business people and professionals, and education across the population generally, particularly for workers, farmers, and employers. Issues such as training of teachers, development of curriculum materials, research, awareness promotion, and policies and actions to promote sustainable development need to be examined. The strategy also requires a partnership between statutory bodies and agencies and nongovernmental organizations. The objective of the Strategy is to

incorporate the key themes of sustainable development in all education systems.

1.6 Sustainable Development – The Indian Tradition

Nature has a rhythm of itself, which no technology can substitute. As man is part and parcel of nature and his intelligence is within the limits of time and space, no product of his intelligence can surpass these limits. Only when human intelligence is in perfect harmony with laws of nature that, it would be able to penetrate into the secrets of the nature. When we understand these secrets, we become one with nature and certainly this oneness is the goal of human life. Sustainable Development which directs man to live in harmony with nature should be able to reduce the distance between man and nature.

The concept of environmental education and sustainable development however, is at the root of India's rich cultural heritage. Right from the Vedic age, education was considered as the basic training in life. Indian cultural tradition teaches values of conservation and emphasizes the identification and adjustment of the individual to live in harmony with all the elements of the earth (Sustainable Biosphere). In the 'gurukula' system of education the teacher and the students lived together in isolated localities, very often in deep forests in adjustment with the natural environment, such as climatic factors, plant and animal life and with the society. Resources were used with

least disturbance on the natural system. It was laid down that ten trees are to be planted before cutting one tree. Trees and rivers were even worshipped. This paved the way for purification of air, adoption to climatic variations and for satisfying household needs like food, fuel, furniture, etc. (Sustainable Forestry) . Even houses were constructed in consonance with the natural environment (Sustainable Architecture).

In short man lived in identification and adjustment with the NATURE in total. Great educators such as Plato, Comenius, Rousseau, Dewey, Tagore, Aurobindo, Gandhiji and St. Francis have also emphasized the need for environmental education for sustainability for the proper development of the individual and the society.

The Vedic statements such as ‘Loka Samastha Sukhino Bhavanthu’ (Let the whole world be happy) and ‘ Vasudhaiva Kudumbakam’ (the whole world is a family) reveal the importance of Environmental Education which emphasizes that man only an individual, who has to fit in with the total system of the universe to lead a happy life. The ignorance regarding the importance of the harmony of the individual with nature is paving the way for the total destruction of the world. In the words of Bertrand Russell “at this rate if man interferes with nature the earth will be reduced to a heap of ashes and even then it will rotate and revolve around the sun and a better developed beings from other planets may come here and examine the ashes

and find out that here lived a foolish race called homo-sapiens who destroyed themselves because of their ignorance”.

1.7 Teacher Education – its Significance

A sound programme of professional education of teachers is essential for the qualitative improvement of education. The importance of the teacher playing a vital role to relate education to national development and positive social change is to be highlighted. He is responsible to guide and inspire his students to maintain discipline and to inculcate values which are in consonance with our social heritage and our social objectives. This involves the transmission of knowledge from one generation to another and extension of boundaries of knowledge through research, investigation and enquiry. Various educational innovations like the restructuring of courses, introduction of examination reforms, making programmes relevant to social environment and community needs, developing new areas of studies can be brought about successfully only if the teacher accepts a progressive outlook on education.

Though technological tools today have greatly facilitated the work of the teacher, the best of these tools can never replace the caring and inspiring of an innovative teacher. But the crux of the problem is that a teacher cannot transform someone unless he himself undergoes transformation in favour of change and innovation. “Enlightened, emancipated and empowered teachers

lead communities and nations in their march towards better and higher quality of life” (N.C.T.E 1998).

National Policy on Education 1986 says that no nation can rise above the level of its teachers. Therefore teacher education to produce teachers of high quality is of utmost importance. But detailed studies undertaken in recent years have shown that quality of pre-service and in-service teacher education programme in our country is deteriorating due to lack of professional commitment and the outdated curriculum which fails to reflect the contemporary issues. Therefore conscious initiatives are necessary to influence the quality of teacher education at various levels.

The alarming gap between the needs of the changing social and occupational world and the existing traditional pattern of instruction creates dissatisfaction and unrest among students. Therefore the urgent need is to closely scrutinize both structure and content of teacher education to make it relevant to the changing needs of the society. Teacher education being an integral part of the total school system cannot remain conventional and static while education itself is dynamic in character. Therefore it has to transform itself to a progressive, dynamic and responsive system.

The newer avenues of teacher education have therefore welcomed all disciplines to come under the fold of education as a science. Admittedly, the role of the teacher in the context of efflorescence of teacher education has

been looked upon as a matter of greater importance in moulding the wishes and expectations of the immediate community and the global community.

The teacher education curriculum in India is subject to much criticism. Very often it is reduced to a formal and ritual training intended to acquiring a degree enabling one merely to get an appointment as teacher.

Of all the different factors which influence the quality of education and its contribution to National Development, the quality, competency and character of teachers are undoubtedly the most significant. The National Commission Report of 1964-66 points out “the destiny of India is being shaped in her class rooms and teacher is the pivot of the whole educational system. So investment in teacher education can yield rich dividends because the financial resources required are small when measured against the resulting improvements in the education of millions”.

As part of systemic reforms in teacher education, the National Curriculum Framework (2005), emphasis that ‘teacher education programmes need to provide the space for engagement with issues and concerns of contemporary Indian society, its pluralistic nature, and issues of identity, gender, equity, livelihood and poverty. This can help teachers in contextualizing education and evolving a deeper understanding of the purpose of education and its relationship with society.’

1.8 Education for Sustainable Development and Teacher Education

Sustainable development emphasizes the need to reconcile economic development and conservation of the environment, and a consideration of environmental issues within a social, economic and political context. This concern with sustainability links with education for the environment, and gave a new impetus globally to environmental education. The Brundtland Report had itself emphasized the crucial role which teachers all over the world have to play to achieve the social need for sustainable development'. Agenda 21 of the programme for action in the UN Conference on Environment and Development (UNCED) in Rio in 1992 point out the need for urgent attention to education for sustainability. 'Education is critical for promoting sustainable development, and improving the capacity of the people to address environmental and development issues' (UNCED 1992 Ch.36 p2). Such perspectives on environmental education for sustainability is linked naturally with the rising concern for development education, with its integrative approach to global issues committed to experiential styles of learning, and developing the culture of co-operation in the classroom.

Such approaches to environmental education for sustainability embody a number of challenges to teachers and to teacher educators. At the basic level, there has been a fundamental shift in public attitudes to the environmental issues. Studies reveal that there is gap in the knowledge

relating to greenhouse effect, the ozone layer and acid rain. The awareness and knowledge of environmental concepts of the student teachers are very often superficial. Many experienced teachers, responding to such issues mainly from a subject-specific perspective, feel underprepared to tackle issues which are so complex, multifaceted and subjective.

It is in defining the essential nature of Environmental Education for Sustainability (EEFS), however, that we expose the full extent of the challenge to teachers. EEFS is not only concerned with generating an understanding of the concept of global interdependence of a global ecosystem in which the future of all species, is inextricably interlinked, but also creating an attitude of commitment to action based on such understanding – a commitment to change. There is concern within society, that the preservation of environmental quality is important; but few extend this to a consideration of how their own need has to be restricted if environmental sustainability is to be achieved. In this connection, it is very relevant to remember the famous statement of Mahatma Gandhi that ‘the world has all the resource for satisfying the needs of men, but not their greed’. The challenge to EEFS is to translate a generalized concern for the environment into an understanding to which involves personal costs and constraints, and this means developing both understanding and commitment. This point is well developed by Tilbury: “In order to contribute EEFS

environmental work will need to be relevant to the student, through increasing their understanding of themselves and the world around them. It must encourage pupils to explore links between their personal lives and wider environmental and development concerns, by dealing with issues such as consumerism, and how the practices of banking and industry effect their lives. (Tilbury 1995 p. 199)

Similarly, Fien in outlining an environmental and development education project for teacher educators in Australia identifies the fundamental questions which are to be faced regarding issues of environment, social justice and sustainable development. Those involved in environment and development education need to activate the socially critical or deconstructionist tradition and promote approaches to curriculum planning and pedagogy that can help to integrate social justice and ecological sustainability into a vision and a mission of personal and social change. (Fien 1995. p. 25)

EEFS gives legitimacy to concern with affective, value - based responses, as well as with cognitive understanding. Such teaching acknowledges that children are to be given opportunities to develop their own value-based responses, and recognizes that we are concerned with teaching about issues which may engender conflict and controversy. Handled skillfully by experienced teachers, this might not be too

problematic, but at another level, such a focus for environmental education, with the central concern on values and attitudes, is complex and challenging, and many teachers feel ill-equipped, in terms of their own teaching strategies, to cope with such issues. Even for experienced teachers, a major concern is the lack of extensive teacher support materials with activities to boost confidence in handling controversial issues in the classroom.

EEFS does not merely hope that learning activities will lead to the development of an (environmental) ethic. Instead it sets out positively to develop environmental awareness and concern to a level which will result in the acquisition of a personal environmental ethic. Teachers should actively promote the consideration of values required for the development of sustainable lifestyles and avoid a neutral stance. (Tilbury 1995, p 201-202)

1.10. Need and Significance of the study

“The key to successful environmental education is the classroom teacher. If teachers do not have the knowledge, skills and commitment to environmentalize their curriculum, it is unlikely that environmentally literate students will be produced” (UNESCO, 1977).

The role of teacher education in environmental improvement is well documented. In Tbilisi Intergovernmental Conference (UNESCO, 1977) the importance of EEFS is specifically highlighted by maintaining that the future of the environment may depend upon the ability of teacher education

to incorporate and practise an effective environmental education curriculum. It recognizes that the success of environmental education in schools is greatly depended on the extent of training which teachers receive in this field. It points out that: “It is obvious that even the best curricula and the best teaching materials cannot have the desired effect if those with responsibility for them have not fully understood the objectives of environmental education and if they are not capable of directing the learning activities and experiments comprising such education or of effectively using the materials available to them.” (Tilbury 1992, p 267-280)

The need for teacher training in EE and SD has been emphasized repeatedly in many international forums since Rio summit and UN declared 2005 - 2014 as Decade of Education for Sustainable Development. This is due to the fact that EE is basically interdisciplinary. Dealing with interdisciplinary problems is something new and it requires different kinds of skills. Perhaps it will require a different kind of teacher training programme for the new teachers and an orientation programme for those already in service. In this type of programme, first of all a kind of sensitivity towards environment is to be aroused. Secondly, the teachers are to be exposed to the kinds of environmental problems they are likely to be raised by the learners in the classroom.

Meeting this challenge depends on reorienting curriculum to address the need for more-sustainable production and consumption patterns. Every nation will need to re-examine curriculum at all levels (i.e. pre-school to professional education). While it is evident that it is difficult to impart environmental literacy, economic literacy or civics without basic literacy, it is also evident that simply increasing basic literacy, as currently practised in most countries, will not support a sustainable society.

While the effort can begin with the current teaching professionals around the globe, steps should be taken to include Education for Sustainable Development in pre-service teacher education urgently. Teacher education programmes need to produce professionals who not only teach sustainability themes but also can ‘pull together’ the various disciplinary strands that will give their students a holistic understanding of a sustainable future and the role of individuals, communities, and nations in a sustainable world. The development of this cadre of experts will profoundly affect rapid movement of nations towards sustainability.

Institutions of teacher education should play a central role in educational reform, and teacher educators should play the key role as agents of change. Teacher educators should train new teachers, promote professional development for practising teachers, consult with local schools, and render expert opinion to regional and national ministries of education.

Teacher educators should prepare pre-service teacher-education curriculum, for primary and secondary education. The faculty members of teacher education institutions can bring about far-reaching educational reforms through their guidance and leadership in implementing the curriculum effectively. The question is who will work with the teacher educators to develop their expertise?

Much needs to be done at all levels to foster the development and environment education. The central role of the teacher in the diffusion of any innovation means that reforms in teacher education, at both the pre-service and the in-service levels, are vital. The UNESCO-UNEP International Environmental Education Programme has clearly outlined the preparation of teachers as ‘the priority of priorities’. (UNESCO-UNEP 1990 p.1)

In the Indian Context, the National Policy of Education, 1986 (NPE) states that “Protection of the Environment” is a value which , along with certain other values , must form an internal part of the curriculum at all stages of education. In response to a petition filed in 1991, the Supreme Court of India passed a judgment requiring the University Grants Commission (UGC) to offer courses on the environment at all levels of higher education. The UGC has subsequently recommended the introduction of a compulsory foundation course at the undergraduate level at all

universities. The Centre for Environment Education (CEE) is developing a textbook for the proposed course, at the request of the UGC.

Although school textbooks of languages, science and social sciences , which were written after the National Policy on Education (1986/1992) contained environmental concerns, the teaching by and large has been bookish and the above objectives have remained elusive. The problem can be traced to the neglect of teacher education programmes in this area. Teacher education till very recently has remained unregulated in India. In order to encourage the role of teachers in reorienting education towards sustainable development it is necessary to understand the teacher education with more seriousness.

The urgency of reorienting the teacher education for sustainable development is to be attempted by highlighting that the life on Earth is under threat and the responsibility of teacher educators to face this challenge with sincere commitment will contribute to a great extent to the very existence of life. The common impression about teacher education is that it has remained unchanged for a very long time and is not found relevant to the social needs at the national and the global contexts. The principal concern of the human race now is that earth has come under threat because of the lifestyles of its six billion human inhabitants.

In this context it is the basic necessity of the society that teacher education should adopt a curriculum and programmes for implementation of a sustainable lifestyle. In operational terms the children at the school might have to be made aware of the threat to their life and that of other species because of the environmental degradation, and social inequality and poverty caused by the attitude and conduct of their elders.

Unless every one accepts wholeheartedly the necessity of living in harmony with all forms of life and adopts a lifestyle that will leave the world a better place than what one inherited, the beautiful process of evolution of life on Earth will receive an adverse setback. This can be prevented through the process of infusing environment education with the conventional school subjects such as languages, core subjects and co-curricular activities.

Teachers have to adopt pedagogy of ‘learning through thinking’. It is a process of learning in which learners construct their own knowledge by individual and group activities such as asking questions, solving problem through project works and taking decisions based on their own judgment. Children may be helped to internalize the concern for adopting sustainable lifestyle on the basis of clear understanding of the basic concepts developed through student centered activities.

There are over 60 million teachers in the world. Each one is a key agent for bringing about the changes in values and life in consonance with

the demands for sustainable development. For this reason, innovative teacher education is an important part of educating for a sustainable future.

In India strategies for supporting 4.6 million teachers who are in service have to be worked out. Also, there are about 30,000 teacher educators in the country who are involved in pre-service education of teachers. They will have to be given support for reorienting pre-service education for preparing such teachers who will be able to make their pupils appreciate the concern regarding sustainable development and influence their lifestyle.

So, teacher education has to give top priority for E.S.D. The contents related to Education for Sustainable Development in the existing curriculum in all the universities of Kerala, are limited to few concepts of environmental education and do not include other dimensions of Education for Sustainable Development. The investigator being a teacher educator decided to conduct a study regarding this aspect, by comparing the Environmental Education Curriculum of different universities of Kerala and suggest a relevant module on Education for Sustainable Development for incorporating in the teacher education curriculum.

1.11. Statement of the Problem

‘A Study of the Concepts on Sustainable Development in the Curriculum of Teacher Education at the Secondary School Level in Kerala’.

1.12. Objectives of the Study

1. To compare the existing curriculum in teacher education at the secondary school level in the different universities of Kerala with respect to various dimensions of Education for Sustainable Development.
2. To evaluate how far the existing teacher education curriculum reflects the concepts of Sustainable Development.
3. To assess the awareness of teacher educators and student teachers towards the concepts of education for sustainable development.
4. To develop a relevant module on Education for Sustainable Development to be incorporated into the curriculum of teacher education.
5. To suggest and recommend strategies for improvement of the existing curriculum towards Education for Sustainable Development.

1.13. Definition of Terms

Sustainable Development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (Brunt land Commission 1987)

Teacher Education at the Secondary School Level

Courses conducted for the Bachelor of Education Degree (B.Ed degree) recognized by the National Council of Teacher Education (NCTE).

Curriculum

Refers to the totality of experience the student is expected to gain from a course. This may include syllabus, text books, hand books, reading materials, activities inside and outside the class rooms related to the topic and evaluation.

1.14. Limitations and Scope of the Study

The proposed investigation ‘A study of the concepts on Sustainable Development in the curriculum of teacher education at the secondary school level in Kerala’ involves a comprehensive and comparative study of teacher education curriculum of different countries representing developed nations, developing nations and under developed nations in detail. It also involves a comparative study of the teacher education Curriculum of different universities of Kerala and other states in India. The historical perspective with its social and psychological impact has also to be studied. The teacher education in the broad sense includes the pre-service training for teachers at the pre-primary and for special schools. All these involve rich resources, a body of experts and a longer time which are beyond the scope of this investigation. So the study is limited to an analysis of teacher education

curriculum at the Secondary School level in the different universities in Kerala, and to suggest and recommend strategies for incorporation of concepts of Education for Sustainable Development at the B. Ed level.

CHAPTER II

REVIEW OF RELATED LITERATURE

Several studies and publications are available regarding education for sustainable development. These are summarized below

Brutdland commission (1987) concluded their thought towards sustainable development in 'our common future' as 'in its broadest sense, the strategy for sustainable development aims to promote harmony among human beings and between humanity and nature. In the specific context of the development and environment crisis of the 1980's, when current national and international political and economic institutions have not and perhaps cannot overcome, what the pursuit of sustainable development requires". The main requirements are:

- A political system that secures effective citizen participation in decision making
- An economic system that is able to generate surpluses and technical knowledge on a self-reliant and sustained basis
- A social system that provides for solutions for the tensions arising from disharmonious development
- A production system that respects the obligation to preserve the ecological base for development

- A technological system that can search continuously for new solutions
- An international system that fosters sustainable patterns of trade and finance and
- An administrative system that is flexible and has the capability for self-correction

These requirements are more in the nature of goals that should be underlined in national and international action plan on development. What matters is the sincerity with which these goals are pursued and the effectiveness with which departures from them are corrected.

Games on sustainable Development (Meadows, Dennis, L., Van-der Waals, Barbara, 1989) contain a collection of educational games that can be used by teachers to convey the ideas related to environmental protection and sustainable development. The games accommodate participants of all ages and require little preparation by the teacher, up to 30-40 players with only one operator, minimal materials (many of which can be reproduced from the manual), and involving 10 minutes and two hours to play. Short games can be used as warm-up exercises before the start of more elaborate games.

Trainer –Ted (1990) discusses the overproduction of industrialized nations and the condition of developing nations. It deals with

the global revolutions, systems, values, and lifestyles necessary to implement sustainable development. It depicts a world of decentralized, self-sufficient communities, and describes the potential role of education in establishing and perpetuating that society.

Slocombe-D Scott; Van-Bers, -Caroline (1991) presents various ways to transform sustainable development into individually recognizable alternative that may contribute to achieving sustainable societies. It also discusses geographic, historical, human-ecological, and simulation approaches and provides detailed examples of reorientation of current human activities towards a sustainable society using “design criteria and includes suggestions for teaching techniques”.

Annual review of Environmental Education, edited by Sterling, Stephen-R. (ed.) (1991) is an informative one in the field of Environmental Education. The purpose of this annual publication is to report, evaluate, encourage, help and guide progression in Environmental Education (EE) in the United Kingdom and to provide information on important initiatives and comparative international developments. Issues and priorities are identified with an emphasis on current philosophy of EE rather than practice and methodology.

A resource book prepared by Brown-Jeffery L. and others (1991) provides methods and resources for teachers to global issues and sustainable

development concepts for a high school curriculum focussing on world history, world cultures, world geography and the resource book contains twelve chapters.

Ameyaw-Stephen (1992) examines the Kang Self Help Association (KASHA) project in Botswana to illustrate the characteristics of sustainable developments as manifested in localized contexts and situations. It also suggests the need to document, share, describe, and discuss successful programmes like KASHA.

In an article Tilbury D. (1992) stressed the urgency of developing Teacher education programmes and research in Environmental Education. He describes a great number of both international and intergovernmental organizations and agencies have recognized the urgent need to develop environmental education in teacher education programmes since 1970. This has been documented in many conferences, such as the International Union for the Conservation of Nature and Natural Resources (IUCN), Environmental Education Conference (1971), the International Belgrade Workshop (1975), the Tblisi Conference (1977), the Bergen Conference (1990), and the more recent 'Earth Summit' (1992). Its importance was also attested to, when it was seen as the most intense Environmental Education need and priority by nations of every region of the world in their response to a UNESCO questionnaire preceding the Belgrade Workshop.

Despite the recognized need to address effectively environmental education within pre-service teacher training courses, research indicates that provision is unsatisfactory. The lack of a firm research base in Environmental Education accounts for such an inadequate provision.

Gough –Annette –Greenall (1992) express the concern that national planning groups do not address the ideological framework in which they operate as they work for sustained growth in environmental education and traces the growth of environmental education in Australia since 1970. It also discusses the role of women and individuals in sustaining environmental education growth.

A User's Guide to Sustainable Development for Canadian Colleges (1992) provides an overview of the steps involved in creating an environmentally sustainable college. In drawing together reports from members of the Association of Canadian Community Colleges (ACCC) which have taken various initiatives to 'green' their campuses, it focuses on the principles, strategies, and goals which underline the objective of reducing or eliminating the negative impact. The guide contains four chapters.

Bhasin and Kamla (1992) concluded that the present curriculum has the following deficits. 1) Mainstream development is obsessed with material goods, 2) considers humans superior to nature, 3) disempowers

women, 4) centralizes resources and reduces diversity. Hence Sustainable Development seeks harmony with nature, is people oriented, focuses on basic needs of all, decentralizes resources, and requires participatory rather than representative democracy.

The United Nations Conference on Environment and Development (UNCED), otherwise known as the 'Earth Summit', was held in Rio de Janeiro, Brazil, in 1992. The Earth Summit generated Agenda 21, a global action plan for the environment and development. Education, public awareness and training are among the priorities contained in Agenda 21. The plan recognizes that "education is the social institution entrusted with the main responsibility for passing on to succeeding generations the wisdom, knowledge and experience gained from the past. It represents a guided path which helps individuals to understand their own societies and to take their right place in them" (Agenda 21). The need for education is highlighted more than 600 times throughout the action plan.

One of the key reference points for the advancement of education for a sustainable future is Chapter 36 - promoting education, public awareness and training - of Agenda 21 which states a basis for action.

Education, including formal education, public awareness and training should be recognized as a process by which human beings and societies can reach their fullest potential. Education is critical for promoting sustainable

development and improving the capacity of the people to address environment and development issues. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning. Both formal and nonformal education is indispensable to change people's attitudes so that they have the capacity to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviours consistent with sustainable development for effective public participation in decision making. To be effective, environmental development education should deal with the dynamics of both the physical/biological and socio-economic environment. It should also include human (which may include spiritual) development integrated with all disciplines, and should employ formal and non-formal methods and effective means of communication.

Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years. This should be done in cooperation with all sectors of society. The strategies should set out policies and activities.

Hren – Benedict – J (1998) prepared a workshop guide which is the second in the Conservation Issues Forum Series produced by the Izaak

Walton League of America's Sustainability Education Project. The guide, a tool for discussing critical topics with conservationists and community leaders, describes a series of six activities through which community members may work together to develop strategies to address community sustainability issues.

T.S. Anurag (1998) while stressing the importance of promoting Sustainable Architecture says that India ranks amongst the largest consumption market in the world. Energy cost is bound to rise and the pressure on non renewable resources, there is certainly a need for an energy conscious design i.e. sustainable architecture which make use of non- conventional and sustainable resources like sun, wind, biomass, water energy etc. should be scientifically utilized. On the whole we definitely need a sustainable environment, if new generation is to survive on earth.

Learning for Sustainable Future (2000), by Environment Canada showed that Environmental Education was taught as part of the science and social studies curricula, not as a separate subject, and also teachers had few resources and little experience in exploring environmental issues. Today, some provinces have courses directly focussed on the environment. The concept of sustainable development has been embedded as a learning outcome in several provincial and territorial curricula. Thousands of

teachers across the countries have been exposed to workshops in the methodologies of exploring complex environmental social and economic issues.

There are many examples of teachers, students and parents cooperating in environmental and sustainable development projects at the community level with the support of school administrations and local boards. The Wetlands project of the Eco-Scope Programmes of the Demeter Foundation is one example of a school/ community project. Some provinces have developed incentive programmes to increase students' knowledge and encourage positive attitude toward the environment.

Michael Younger and Angela Webster (2000) reveal the status of Environment Education for Sustainability (EEFS) in Britain. They conclude that “during the last decade, an increasing national and international prominence has been given to issues of sustainability. Educational policies within the United Kingdom have been at odds with these environmental policies. However, despites the efforts of a number of radical educationalists, teaching for environmental education still focuses heavily upon educationalists and didactic and knowledge oriented approaches. There remains the challenge of developing effective and flexible teaching resources and strategies which allow students to consider value – and issue – based environmental challenges in a critical way. Such approaches will

have the potential to reduce the sense of powerlessness and frustration which are often generated by a study of environmental problems, and sustain a continuing interest and involvement in environmental issues.

Centre for Environmental Education (CEE) Annual report (2000 – 2001) describes about work carried out for the introduction of Environmental Education in Pre-service Teacher Education in Kerala.

Kerala has conceived a collaborative venture of CEE and Kerala Sastra Sahithya Parishad, (KSSP). The project involved organizing workshops for faculties from Colleges of Education (affiliated to Universities of Kerala, Calicut, Kottayam and Kannur) in

- 1) developing broad guidelines for incorporating EE into the B.Ed , curriculum and arriving at the course content
- 2) developing appropriate teaching learning materials for effectively gaining the course
- 3) working out strategies for training teacher educators in the implementation of the course

As part of this initiative, a workshop was organized for three days in November 2000, at Thrissur to identify and develop course contents in EE for B. Ed students in Kerala.

Subsequently, a workshop was organized for five days at Thiruvananthapuram in March 2001 to develop teaching learning materials for teaching the contents arrived at in the earlier workshop.

During the workshop, the participants critically examined the Environmental Education modules developed in Karnataka and several other publications of CEE and adapted them for transacting the course contents. In addition, the participants also formulated fresh activities and case studies based on the environmental issues of Kerala.

At present, the materials developed are being edited at Kerala Sastra Sahithya Parishad to bring out the final prototypes for dissemination among all the colleges of education in the state.

Attempts have also been made to discuss the potential of the project with the Vice – chancellors of the four universities in Kerala and seek necessary support for its incorporation in the curriculum.

The Institute for Global Environmental Strategies (IGES) (2001) began its first phase of Strategic Research (1998-2000) in 1998. The Environmental Education Project is one of its six research projects. In this phase, the Environmental Education (EE) project prepared a comprehensive strategy on environmental education in the Asia – Pacific region. As an initial step, the Project has assembled reports from thirty four countries and two special areas of the region. The objective of the project is to report on

the overall status of EE activities across the region, especially the issues, initiative, success stories and gaps in EE, as well as the role of other organization in promoting EE.

Project analysis shows the general trends and patterns of formal EE in the Asia and Pacific region. They are

1. Incorporation of EE into all forms of education;
2. Writing of greener curricula;
3. Creation of new initiatives such as green accounting, eco- clubs , eco- farming , green press and green banking;
4. Perception of EE as a new approach to education ;
5. Development of composite courses at the primary level;
6. Expansion of focus from Physical and Natural sciences to Social science courses as well;
7. Increase of emphasis, Environmental Education in formal education
8. Establishment of successful eco- business activities ;
9. Emphasis on extra - curricular and co- curricular activities to supplement school curricula; and
10. Professional development of environmental educators and facilitators.

The finding indicates that countries of the Asia – Pacific region are aware of the need for EE, to improve the quality of human life. They have shown interest by incorporating environmental concerns into formal, as well as non- formal, education programmes. Governments, NGOs, educational institutions, the media and other organizations have taken concerted efforts to meet the growing environmental challenges. The media has raised many environmental issues and accordingly some pioneering activities have been initiated. Despite resource constraints, persistent poverty, rising population and developmental problems, the countries of Asia and the Pacific have demonstrated promising leadership in the field of EE.

Environmental Education ‘status report India’ (2001) had given the following suggestions for the future in order to strengthen environmental education in a systematic way. The approaches include

1. Decide the content
2. Make it holistic
3. Build synergies
4. Train Teachers
5. Review the evaluation system
6. Make resource materials and facilities accessible
7. Create an environmental education inventory and data base.

At present the concept of sustainability is so relevant that number of sub/parallel concepts is co- existing with sustainable development and still emerging, for example – sustainable agriculture, sustainable biosphere, sustainable forestry, and sustainable architecture.

Kumar (2002) mentioned the importance and effective role of community participation in conservation by citing the ‘Kolavipalam’ experience regarding the protection of Olive Ridley (*lepidochelys olivacea*) one of the endangered species of marine turtles by forming an NGO. ‘Theertham Prakrithi Samarakshana Samithi’ was organized in 1998 at ‘Kolavipalam’(near Payyoli in Kozhikode district) beach area.

According to Parameswaran (2002) sustainability has the following characteristics.

1. Sustainable development is not for decades or centuries, but for million of years.
2. Only a totally renewable economy is sustainable – a solar economy.
3. In the meantime the industrialized nations have to bring down their consumptions of resources and emission of pollutants to less than half or even ten percent of the present levels.

4. People of the less developed countries will have to mount a massive boycott campaign of all goods and services, from the developed countries and their collaborators in their own countries.
5. We ourselves will have to be wise enough to distinguish needs from greed.
6. The official Indian Delegation should be requested to take such a line of approach.
7. The parallel NGO front can organize support from all less developed countries.

Teaching and Learning for a Sustainable Future (2002) is a multimedia teacher education programme published, by UNESCO. It contains 25 modules with a total of 100 hours for use in pre-service as well as in the in-service education of teachers which is developed by education policy makers, curriculum developers and authors of educational materials.

Chauhan (2002) summarises the review of the current status of the Rio Declaration, Agenda 21, 1992 points out “In order to achieve the goal of sustainable development, mobilizing financial resources and their effective use is a prerequisite. For this purpose, restructuring of the financial institutions and transparent functioning of mechanisms are absolutely essential. In addition, the principles of good governance such as accountability, stakeholder involvement and transparent regulatory

measures are also necessary. Natural resources management must be undertaken with an 'ecosystem approach' with full involvement of local stakeholders. In the case of global issues such as the sea, biodiversity and atmosphere, an international institutional mechanism with financial mechanism needs to be created urgently with the full support and access to new technologies and their appropriate use, needs to be encouraged. This, in association with traditional knowledge, innovations, and technologies, must become the basis of improving the quality of life for the poor. Lastly, a firm political resolve beyond deliberations will pave the way for achieving the desired goal of sustainable development, the concept of which was conceived at the Stockholm Conference in 1972.

In the article 'Man Made Climate Change and Ozone Depletion' Joseph (2002) emphasized the consequences of ozone depletion and the need of joint effort by the nations to reduce emission or green house gases especially Carbon dioxide. He has also mentioned some of the milestones regarding green house effect and ozone depletion.

An article in 'Down to Earth' January (2002) describes the emission of 2 stroke motorcycles causing higher degree of environmental pollution and the need to opt four stroke engines which have low emission rate than two stroke engines.

In the article 'Global Warming' Srinivasan (2002) also stressed the impact of green house gases and suggested preventive models against this threat.

In his article Raghunandan (2002) dealt with different aspects of waste disposal of organic and inorganic waste of households in the city, and preparing bio fertilizers and composts from this.

Highlighting the importance of sustainable development, Ramboojh (2003) emphasized that the need to integrate sustainable development concerns in the educational system at all levels in order to utilize education as a key agent for change. There were efforts to promote education as the basis for sustainable human society and to strengthen international cooperation toward the development of innovative policies, programmes and practices of Education for Sustainable Development (ESD). The National Policy on Education (1986) stresses the need to integrate environmental concerns at all levels of education and all sections of the society.

Education is a State subject in India. The central government, however, guides the policy initiatives in the area of education in the country. The need of infusion of environmental education in educational programmes should be emphasized.

An Internet article highlighting some perspective and approaches towards achieving a sustainable future in the Indian context are as follows:-

- a) Poverty Eradication and sustainable livelihoods
- b) Changing unsustainable patterns of consumption and production
- c) Protecting and managing the natural resource base for economic and social development
- d) Sustainable development in a globalizing world
- e) Health and sustainable development
- f) Science and education.

In a talk and discussion by Dathye (2003) on 'Sustainable Development in India and Why' emphasized the need of using traditional resources to meet our energy needs by properly using modern knowledge. While expressing his views towards the reorientation of education systems of India he says that we need to have programmes such as 'education at work place' and option such as Open University. In fact if we have a lifetime partnership between producers and students with real world experience, we can hope to train students better equipped to handle these activities. 'Adding value without a value system is not socially or ecologically desirable'.

Maheswari (2003) analyzed the present need to reorient education towards sustainable development and how it can be implemented by using education as an instrument. He further says that the radical shift in schooling process will take place, though gradually the changed role of teachers will determine the specific profiles of teachers. The next step will be to design suitable curricula for teacher education courses for preparing teachers as per the identified profiles. The logical implication of such a bold step on teacher education will be that curricula of teacher education programmes will now be determined by the requirement of the changed concerns of schooling. It should not cause surprise if the desired content and process of teacher education are found not to resemble much with what is familiar to most of us.

In 1993, the Canadian Province of Ontario mandated that local school boards should create outcomes based curriculum. The intention was to create a new curriculum for students from junior kindergarten to grade 9. This will cater to the needs of children of the age group 4 to 15+. The provincial government gave broad guidelines; however, each community was to develop locally relevant curriculum to achieve provincial and appropriate education in consultation with the community to build a new vision of an education appropriate for the twenty first century and review the existing programmes.

Knowing that a massive rewriting of the curriculum was necessary, the Toronto Board of Education undertook a large-scale community consultation. In preparation for the community consultation, the central office trained 200 people to lead focus groups. Any teacher could volunteer to become a focus group leader. The prospective leaders worked with staff, developing the facilitation techniques and processes for use in the consultation. Notice was sent out to the three major newspapers and more than 70 ethnic newspapers of Toronto. Efforts were made to contact the corporate sector and representatives from the corporate world were invited to specifically address community based meetings.

The essence of the Toronto reform is that the curriculum is no longer focussed exclusively on the traditional core subject of language, mathematics, history etc. The new vision of what the community felt regarding what students of tomorrow would need and be able to do, these disciplines underwent major revision. Mathematics, for example, now includes the skill of comprehending extremely large and extremely small numbers, eg. ppm and ppb – which are essential to environmental literacy and understanding relative risk factors, both in personal life and at work. Health now includes Environmental issues such as cancer, allergies and food additives as well as ‘Consumerism’.

Building a new curriculum does not ensure its implementation. Several efforts are to be coordinated. Teachers who prepared the new curricular material led in pre-service and in-service training. Teams of senior officials met in schools to search for even more refinements and suggestions. Finally, the Toronto Board revised report cards to reflect the suggested changes. Again, parents were deeply involved in developing a new report card. The new card was very detailed, and teaching the new material was essential because it included in evaluation and awarding marks for grades.

Much of the success of the Toronto reform is due the fact that it was not seen to be an effort to change education to meet goals set by an elite group or unduly influenced by outside pressures. The impetus to change came from within. The new curriculum had equal or greater academic rigour, but far greater relevance to life outside school walls. In its implementation, respect for teachers, parents and students was a key ingredient. The Board tried to model the changes they wanted in the system. What it demonstrates is that education for sustainable development is simply good education, and good education makes children aware of the growing interdependence of life on Earth, interdependence among peoples and among natural systems in order to prepare them for the future.

This experience showed that reorienting education to address sustainability can be based on a community's desires and strengths. The traditional approach was to have experts develop new materials and then perceive the teaching staff as in "need" of such expertise and training. The experience of the Toronto Board is a case of identifying commonly developed existing personnel to achieve the communal goals. This was an early example of what is now being seen as working from a 'strengths Model' as opposed to trying to reorient based on a 'needs model' where outside expertise is seen as necessary for local growth. Undoubtedly there is need for some outside help. However, once the community agrees upon a common vision, which includes respect for the best of the past and present, it can make tremendous strides by existing academic strength in a democratic fashion.

Richard and White (1993) discuss the goal of sustainable development among South East Asian countries in relation to aspects pertaining to coastal management efforts. It provides examples of the lack of inter agency cooperation between relevant agencies, the problems with democratization, and unrealistic government expectation in Thailand, the Philippines, Indonesia and Malaysia.

Department of Education and training Manitoba, prepared a curriculum package; 'Sustainable development grades 5 to 8 caring for the

world, Curriculum support for social studies and science teachers.’ (1993). This is indented to assist teachers of grades 5 to 8 in Manitoba to start the process of integrating and implementing sustainable development in the courses for science and social studies. It contains four sections; first section briefly outlines the origin of sustainable development, how it evolved, why it should be taught, what it is and how it should be defined. The second section suggests the units and topics in social studies and science courses where sustainable development may be induced and integrated. The third section is made up of three parts: part 1 outlines and introductory strategy on sustainable development for teachers and students at the grades 5-8 level. Part 2 suggests several teaching and learning strategies that grade specific and part 3 describes concluding participatory hands on strategy for teachers and students at the 5-8 level. The fourth section outlines an annotated sustainable development resource list.

A project ‘Teaching for a Sustainable World, Environmental and Developmental Education Project for Teacher Education’ developed by Australian Association for Teacher Education edited by Fien John (1993), is an ideal curriculum for pre service teachers. It attempts to illustrate how environmental education and development education are related and to provide practical assistance for teacher educators who would like to include these important fields in their programmes. The project provides a focus for

discussion of environmental and development education issues in teacher education in Australia. This project is prepared particularly for pre-service teacher education.

While emphasizing the significance of teacher education programmes in environmental education, John Fien (1993) narrates the status of teacher education in Australia and USA. He says that in the United States of America despite a lack of national responsibility for teacher education, several states have stipulated mandatory pre service teacher education studies in environmental education as a requisite for teacher registration. The first of these was in Wisconsin beginning in 1985. The number of states mandating environmental education as a condition for registration has so expanded that council of state governors established a task force in 1992 to draft a model environmental education act for all the states to follow (NAAEE 1993 p.13).

Recently there has been some attempts in three states of Australia to consider and promote the role of environmental education in teacher education. A two day seminar on environmental education in teacher education was held in July 1992 at Queensland. A report from the seminar to the Board of Teacher Registration led to the establishment of the Environmental Education Working team which has drafted guidelines for pre-service teacher education programmes. In New South Wales, the

Legislative Assembly unanimously passed a private member's bill in April 1992 to frame an Environmental Education Act. The provisions of this act will create structure 'to identify needs for teacher training and advise tertiary education and organise environmental education workshops and consulting services to teacher training institutions' (New South Wales 1992). The Victorian Environmental Education Council released its State Environmental Education Strategy in 1992. The important strategies outlined as the responsibilities of universities in relation to teacher education are to

- ensure that all teacher education programmes includes environmental education and that high quality courses for specialist environmental education should be provided to teachers who are already in service
- support teachers to help to develop environmental education philosophy and practice (Victorian Environmental Education Council 1992 p.15)

'Citizen's guide to sustainable development', edited by Croson Walter H., (1993) is a working guide for the citizens interested in understanding global environmental issues and taking action to minimize the adverse effect arising from them. Fourteen chapters document major changes resulting from the rapid growth of human numbers and their impacts on earth resources. Each chapter concludes with a resource section

that contains books, articles, pamphlets, brochures, periodicals, films other audiovisual materials and teaching aids. An introduction summarizes causes and impacts of each of the problem.

A publication edited by Peter and Martin (1993) is one of the tangible responses of the African Social and Environmental Studies Programme (ASESP) to the challenges of sustainable development which are presented to the world by the United Nations Conference on Environment and Development (UNCED). It seeks to increase the chances of attaining sustainable development by building capacity for it through environmental education. The content and method of this book aims to enhance the knowledge and pedagogical competencies of teachers, student teachers and Tutors to effectively deal with environmental education, learning and training.

Peter (1993) describes the overall aims of environmental education programmes to produce changes towards sustainable development. He discusses the role of the sciences, the arts, religious education, history, geography and languages in integrating the environmental education curriculum and presents curriculum management strategies for improving the design and content of the school environment.

Kathleen (1993) developed a curriculum guide as an attempt to tackle difficult environmental issues through familiar and realistic outdoor

teaching formulas. It presents activities that combine experience-based techniques with complex global issues and involves a step-by step process that an instructor may walk through in order to find the location in their curriculum in to which they may incorporate these unique teachable moments.

Andrew (1994) discusses the role of the World Bank's Global Environmental Facility and the UN Commission on Sustainable Development in the process of moving human society towards a more equitable and environmentally sustainable form of development as promised at the United Nations Conference on Environment and Development in 1992.

Bishnodat (1994) describes the factors that affect the capability of small island nations to achieve sustainable development. The study discusses the impact of population size, aspects that threaten the fragile environment of small islands, support needed to achieve sustainable development and the call for an international centre for sustainable development of small islands.

In their study report, Gagliardy and Alfthan (1994) says that the increasing awareness of environmental issues and the implementation of environmental programmes have spurred the need for education and training for sustainable development in many countries. Analytical

concepts and practical tools necessary for formulating environmental training policies are discussed in this publication. It also raises the major education and training issues in 'Agenda 21, The Plan of Action adopted by the United Nations Conference on Environment and Development.'

Jickling (1994) concluded the incompatibility between educating for sustainable development and the broader concept of education pointing out the impression of the term 'Sustainable Development'. Alternative and more educationally justifiable approaches for studying environmental education and development are to be explored.

Stuart (1994) emphasizes the importance of environmental education for small island states and examines some of the prerequisite for its successful development. It also discusses the difficulties of developing cross curricular, interdisciplinary educational programmes with the environment as an integrating theme.

Enns et al. (1994) developed a video tape through interview with farmers, agricultural experts and students to create students' awareness. This video raises students' awareness of sustainable development issues in modern agriculture and food production. The video explores the following themes: (1) agriculture and sustainable development, (2) different approaches to farming, (3) evaluation of farming practices in the context of

sustainable development and (4) the effect of consumers on trends in food production.

Paden ed. (1994) 'Teacher's Guide to World Resources' contains a series of lesson plans which are designed for secondary students but also can be used at the middle school and college levels. The lessons focus on the environment and development, both globally and locally. Each unit contains objectives, a lesson plan, student handouts, OHP material, student enrichment activities, suggestions for further reading, and suggested audio visual resources. The units are inter-disciplinary in nature.

Fien (1995) describes the rationale behind the "Environmental and Development Education Project for Teacher Education" and the renewed agenda for environmental education which links very closely with development of education.

Waddel (1995) suggests that environmental communication has been one of the fastest growing areas within scientific and technical communication. It poses four models for public participation and presents a case study of the application of one model to regional deliberations about environmentally sustainable development.

Plant (1995) explores the meaning of sustainable development from the economic and ethical perspectives. He argues that education for sustainability programmes ought to acknowledge and address questions rose

by these two perspectives and concludes that the goal of environmental education needs to be conceptualized continually and reflexively, in response to the globalization of industrialized risks.

Harvey (1995) presents a strategy and accompanying methodology for establishing environmental education as a major force for implementing Agenda 21. He proposes the establishment of an education programme and the designation of the educational community as a new Rio major group.

Hansen (1995) describes environmental projects completed by Worcester Polytechnic Institute students in Bangkok, Venice and Guayaquil as part of a programme studying the interactions of science and technology and society. The lessons provide a model for environmental education at other institutions. These interdisciplinary projects promote environmental awareness among students and provide assistance to regions for developing strategies for sustainable development.

The International Conference on Reorienting Teacher Education to Address Sustainability, Hockley Highlands, Ontario, Canada, (October 2000) has also contributed to the improvement of EE for S.D.

Alkis, and Ozturk (2007) studied the opinions regarding sustainable development among teachers in Turkey. The study viewed the learning experiences of primary teachers and social studies student teachers with regard to the concept of sustainable development (SD) through their pre-

service programmes of social studies student teachers to conceptualize SD with regard to geography in Turkey. Sustainable development has increasingly become an indispensable concept that in any discussion of human impact on the environment and development. In this respect, there has been a growing interest regarding the knowledge to be created on sustainable development from the view of different disciplines. In Turkey the general principles of SD are applied to geography education because there is very little literature available in Turkey in terms of sustainable development. Based on the data collected through questionnaires and in-depth interviews with student teachers, this paper examines for the first time the ways and the role of the programmes in defining and disseminating knowledge on SD in terms of content, structure, culture and discourse in two universities of Turkey. The coverage of SD in both universities is usually quite superficial with very limited inquiry opportunities and usually without any references to critical and social aspects of sustainable development. Then, it goes on to examine student teachers' reflections and opinions about the concept of sustainable development and compare the social studies teachers at the primary level with the student teachers in terms of their understandings regarding SD. The majority is not sure about what the term SD means and associates the issue mainly with more technical terms and tends to ignore various dimensions of sustainable development. Finally, the paper concludes that teaching sustainable

development in Turkish elementary schools based on student teachers' opinions is an urgent need.

Baccini (2007) reports on the cultural evolution and the concept of sustainable development. Evolution of life is a scientific concept. The notion "Sustainable Development" stands for a social concept in the construction of a new society. On a global scale there is neither a uniform model on the origin and destination of life, due to the diversity of religious beliefs, nor a broad agreement on the concrete contents of a concept on sustainability, due to the variety of culture and economy. In the 20th century two new phenomena have risen in the process of cultural evolution: the environmental consciousness and a new type of urbanization.

The normative concept of sustainability is a consequence of the two factors namely the social concept named 'Sustainable Development' and the 'Environmental Protection', based on the results of environmental research, in two areas, namely the anthroposphere, where urbanization takes place, and the geosphere, where nature develops without man-made disturbances. Urbanization depends upon socio-economical processes, in which the political design and boundary conditions are crucial. Sustainable Development is not just an upshot of environmental protection. It calls for a new paradigm in designing the anthroposphere. This hypothesis is

illustrated with examples on global, regional and local scales and the interdependence between them.

Barinova and Yakovleva (2007), mentions regarding the implementation of the concept of ESD within the professional training system. Unlike any other academic concept, the notion of sustainable development has become a high-profile issue related to the world economy, environment and education. The study points out that Russia requires a high level quality education for achieving their target. For this education should be modernized in line with the ongoing changes in the national science, technology, social sphere, and economy. Environmental education is playing a key role in the implementation of the sustainable development concept within the Russian educational system.

The education for sustainable development envisages a transition to a people- and economy-oriented model of education, which should be based on interdisciplinary knowledge and a comprehensive approach to the development of the society, economy, and environment. The unique feature of the education for sustainable development lies in the fact that the education of this type does not present a special 'vertically' arranged system of education, as are, for instance, the chemical, biological, geographical, economic and other systems of education. The education in the interests of sustainable development is a methodology designed to create the education

of new type; this is a new form of education that would actually embrace all the data domains of natural sciences, humanities, and technical sciences.

Russia possesses a great potential for successful implementation of the concept of education for sustainable development. Textbooks have been published and elective courses are devised on SD. The Moscow Education Department is planning to incorporate the course “Environment and Sustainable Development” (for the 10th grades) into the curriculum. This would create a serious problem of who teach and how would be taught this new high-priority course? Despite all the achievements in the area of new computer technologies, the teacher still remains a central figure in the current educational process. Therefore, the system of teachers’ retraining should be viewed as the first step in implementing the programme on SD. For this purpose, the institute has developed and implemented special programmess.

Battisti (2007) points out the importance of conveying to the would be teachers regarding environmental issues. The great attention nowadays paid to environmental catastrophies makes the topic unavoidable to geography teachers. The issue is particularly burning due to its strict relationship with the life of human beings in their respective environments. In fact, while for phenomena normally brought about by nature – volcano eruptions, floods, tornadoes, tsunamis and the like – the disciplines

challenged are mostly within area of natural environment. There is an increasing trend to underline man's responsibility in the genesis of the events in the last decades.

Some examples are DDT and the depletion of the ozone layer or the greenhouse effect with the ensuing global warming of the planet and the depletion of resources. The highly technical character of such topics, encompassing several disciplines, makes it quite difficult for teachers to acquire a real competence. Even more difficult is to come to a synthesis which may be easily handed down to students over normal didactic activity.

On the other side, the huge mass of information available through mass media, often masterly presented by journalists, allures teachers to bring this kind of literature directly into the classroom. The truth is, however, that such topics are often of a controversial nature, so that it is absolutely necessary that in the courses held to form future teachers some guidelines are provided in order to help them to attain a personal vision of things. These general guidelines in turn will support their efforts to face any other issue which might become relevant in the future

Gorbanyov (2007) studied the peculiarities of Russian secondary education for sustainable development in the country's transition from an industrial to a post-industrial (informational) development model. This

transformation is realized very unevenly, and is impeding the process of transition to sustainable development.

The practice showed that in the former communist countries centralized economy was to a great extent a resources exhausting one. The economy of the Soviet Union was misbalanced to the utmost due to its fast industrialization, priority development of the primary sector to the prejudice of the high-tech branches and non-manufacturing business.

Iyengar (2007) suggested that re-orienting education towards Education for Sustainable Development is a proposal that is useful, but require consideration in each country and differently. One will have to consider whether Education for Sustainable Development should become part of curriculum or it should be taught separately. There is a danger for instance that if it is incorporated in the curriculum, then its teaching would be left to the whims and fancies of the teacher.

Nakum P., and Rachana Patel (2007) has stressed the importance of structuring and placing Education for Sustainable Development in the curriculum

Padmini (2007) highlights the importance of environmental awareness for sustainable development.

Deopuria (1984) compared the traditional and environmental approach and had very similar results. He found that primary students did

better than middle and secondary level students and both male and female teachers show a positive attitude towards environmental approach to learning.

Joshi (1981) also found that environment outside the class is sufficient enough to initiate learning and hence environmental education should be considered essential at least at primary level. Unfortunately, teachers and syllabii are responsible for limiting the growth of this approach.

Kumar and Ram (2006) while studying about the awareness of environmental education among students, found that in science stream, PG students were more aware of EE than the students of arts and commerce stream. The study also revealed that the female students of science and commerce stream were more aware of EE compared with male students. In arts stream, male students were more aware than female students towards EE, and no interaction between sex and subjects were found towards EE among PG students.

Suresh and Kadhivanan (2007) conducted a study on the influence of personality and environmental awareness ability of college students and found that it is affected by demographic variables like subject specialization, residential area, parental income and parent's level of education.

Kalimuthu T (1991) in his study on developing a video programme on environmental pollution in biology for higher secondary students found that the higher secondary students taught through video programmes learnt more concepts on environmental pollution than those who were taught by the lecture method. The higher secondary students improved their achievements on understanding of environmental pollution after viewing the video programme.

Chatopadhyaya and Sharma (1998) highlighted the following observations regarding Sustainable Development.

‘The document, *Our Common Future* called for application of sustainability as criteria for all developmental activities, sustainable development cannot be achieved in the short run, it is based on equity and justice, its approach is balanced and integrative, it has common goals but different routes, it accepts nature not only as a resource for development but also as the earthly womb for survival and development of human kin and it is participatory in nature

He has also pointed out the four dimensions of equity as: Equity among nations, Equity within countries - regions, social classes and genders, Equity between generations, Equity between economics and ecology, and science and spirituality

While suggesting Sustainable Development as an alternative to conventional development (Muralivallabhan T. V. 2005) specialy mentioned about Environmental Economics. He says many of the free gifts (free goods) of nature like water, soil, and to a certain extent air are becoming economic goods due to their depletion and degradation. The money value of the environmental damages are essential to estimate the loss and suggest remedial measures and for solving the environmental problems. Environmental Economics has a role to play in this regard especially with the cost- benefit analysis of the environmental policy options. Moreover, in the case of global environmental issues while devising mechanism for sharing the cost and benefits among nations while implementing policies for solving them, environmental economics is useful. The economy is actually a subsystem of the environment. Human beings produce necessary things (cars, various consumer items) out of ecosphere, using minerals, oil, timber, crops etc. with the help of human labour and manufactured capital. This produces wastes (pollution) that the environment can absorb up to a point. Thus all economic activity is a part of the ecosystem.

The need of sustainable development is evident form the following global statistics as proposed by Indira Gandhi National Open University (2005)

1. There will be two billion more people on the planet over the next quarter of a century, nearly two thirds of the world's population living in water scarce or water stressed areas.
2. Food production needs to double over the next forty years at a time when almost twenty three percent of the world's agricultural land has been degraded.
3. Almost twelve million hectares of forest are lost each year; there has been over exploitation and decline of more the 60% of the world's marine fisheries.
4. Small island nations are threatened with drowning from raising sea levels due to climate change

Dixit (2006) in an article; children are environmental ambassadors, made out the point that the youth should come forward in protection of environment that is facing greater challenge due to rapid urbanization. One should be able to make a cleaner and greener Delhi only with constructive contribution of the younger generation who would also become role model for the entire city.

Mwaura (2007) studied the awareness about sustainable development among the faculty of education at Catholic University of Eastern Africa. The target population was 81 students and 13 lecturers. Questionnaire included questions pertaining to four key concerns in teacher education in

line with ESD; demonstration of ESD knowledge, Community engagements, relevance of research carried out and proposal of ESD relevant studies. The data findings revealed that the university averagely offered ESD relevant studies as part of its holistic approach to teacher training. However, the studies offered were to relevant to ESD were not comprehensive and were mostly lecture based.

Ravindranath (2007) reports on the need and importance of environmental education in India. Though various efforts have been made to reorganize and reorient school curriculum, the efforts of these curriculum revisions will not be sustained if they are not coupled with appropriate changes in teacher education curricula, especially in the relevance of UNDES.D.

Chapter 3

METHODOLOGY

3.1. Introduction

This chapter deals with research approach, design, selection of sample, research instruments, administration of research instruments/data collection and methods of statistical analysis.

In the present study both qualitative and quantitative aspects are employed in order to complement each other. Qualitative research typically entails in-depth analysis of relatively few subjects for which a rich set of data is collected and organized. Quantitative research entails the proper application of statistics to typically a large number of subjects.

3.2. Research Design

The study used the descriptive survey design. Descriptive survey besides finding facts may also result in the formulation of important principles of knowledge and solution to significant problems (Kerlinger, 1969).

Using the survey design, followed with the questionnaire approach the researcher was able to establish the present state of Education for Sustainable Development in terms of awareness, knowledge, attitudes and practices of student teachers undergoing the teacher education programme in

different colleges of Kerala. In order to collect data regarding the awareness, knowledge and practices about Education for Sustainable Development of the teacher educators, a separate questionnaire was developed. A semi-structured interview was also conducted for the experts in the field of teacher education and Sustainable Development.

The questionnaire, survey and interview were useful in getting responses from a number of student teachers, teacher educators and experts. These designs ensured collection of wide range of data ranging from opinions/views, habits and attitudes. Due to the nature of self evaluation (especially through filled-up questionnaire) it was possible to reach a greater number of student respondents.

3.3. Research Site/Location of Study and target population

The state of Kerala has 200 colleges of teacher education with approximately 1600 faculty members offering the secondary teacher education programme for almost 20,000 students. It includes 4 government colleges, 17 aided colleges, and 146 unaided colleges and 33 university teacher education centers. This research was carried out in 21 selected teacher education colleges in the state of Kerala with representative samples of 5 colleges each from the three universities (Kerala University, Mahatma Gandhi University, University of Calicut) and six colleges from Kannur University). The list of institutions is shown in Appendix A. The survey

sample targeted 1000 students undergoing the course for the degree of Bachelor of Education during the academic year 2008-09. The study also sought opinions from 120 teacher educators from the selected colleges of teacher education. There are many reasons for choosing student teachers and teacher educators for this study. First, teachers are the pivot in the education of students on sustainability. Secondly, the teacher must educate in such a way that schools may contribute for the creation of more just, safer, peaceful and equitable societies. In addition institutions of teacher education need to be integrated with Education for Sustainable Development to create a generation of Education for Sustainable Development conscious teachers (McKeown, 2002). It is evident that teachers must play a significant role if schools have to achieve sustainability in social, economical and environmental aspects. The decision of taking this population to be sampled was based on the realization that teacher educators are the persons who instill knowledge to student teachers and help to develop policies of education including the curriculum. Hence the Faculty's awareness of Education for Sustainable Development is of great importance in promoting Education for Sustainable Development.

The study used semi-structured interviews with experts in the field of teacher education from the different universities of Kerala, and experts in the field of Sustainable Development from other parts of the country to obtain

suggestions, recommendations and criticisms to develop a model module. Thus this study hopes to raise awareness, knowledge and skills about Education for Sustainable Development and help to develop a model curricular outline for secondary teacher education programme to assure Education for Sustainable Development.

3.4. Sample and sampling procedures

The study targeted 1000 student teachers in the regular secondary teacher education programmes in the colleges of teacher education and 120 teacher educators in the respective teacher education institutions. Education for Sustainable Development being interdisciplinary, the sample population consisted of students and teachers selected from various subjects from different types of teacher education institutions including government, aided, unaided and university centers. Therefore, the researcher used stratified random sampling which is one method of Probability Sampling (Kombo and Tromp, 2006) to divide the student population into homogeneous subgroups and then took simple random sample from each subgroup. Forty to sixty student teachers were selected from each college proportionate to the total strength of students.

A sample 10% of teacher education colleges in the state was selected for the study to ensure that the sample was representative in proportion to their number in population. This is because for descriptive studies 10% of

the population is adequate for sampling. Simple random sampling ensured that each individual student had an equal chance of being selected and therefore avoided biases.

The target sample of the teacher educators consisted of 120 teacher educators selected from the 21 colleges.

The students sample and the teacher educators filled up the questionnaire. The researcher therefore distributed questionnaires to 1000 students and 120 teacher educators. Response was obtained from 920 student teachers and 102 teacher educators. Semi-structured interview was conducted with 12 experts in the field of teacher education and Sustainable Development.

Table 3.1

Details of students' sample

Institution	Number
Government	145
Aided	233
Unaided Including university centerd	542
Total	920

Table 3.2
Details of teacher educators' sample

Institution	Number
Government	20
Aided	31
Unaided Including university centre	51
Total	102

3.5. Qualitative analysis of contents of ESD in the existing curriculum

For the qualitative analysis for contents of Education for Sustainable Development in the existing teacher education curriculum, the investigator gathered the curricula of Secondary teacher education of four universities of Kerala, where there is Faculty of Education and also the curriculum framework of national bodies like University Grants Commission(UGC), National Council for Teacher Education (NCTE) and National Council for Educational Research and Training (NCERT)(Regional Institute of Education, Mysore). The curricula were analysed to evaluate the extent to which the concepts and dimensions with regard to Sustainable Development it reflected.

3.6. Description of the Instruments

In order to collect data regarding awareness, knowledge, attitudes and practices about Education for Sustainable Development from the student sample, a well structured questionnaire was used. In order to get the responses from teacher educators, a separate questionnaire was used. To obtain comments and suggestions from experts in the field of teacher education and Sustainable Development, a semi-structured interview schedule was adopted. Therefore, the following tools were developed and administered to the sample:

- Questionnaire for student teachers and teacher educators
- Interview schedule for experts

3.6.1. Questionnaire for student teachers

There were fifty five questions for students to fill up. The questions had an explanation regarding the various dimensions of Education for Sustainable Development. The questionnaires were mainly meant for the respondents to self report with little intrusion by the researcher. Closed ended (forced choice-answer choices provided) questions were used in this study where the respondents filled up themselves. Questionnaire had items seeking information about the knowledge, awareness, attitudes, and practices of students regarding the various dimensions of Education for Sustainable Development. This is given as appendix B.

3.6.2. Questionnaire for teacher educators

A questionnaire was developed for teacher educators to obtain awareness and feedback regarding the present state of affairs of Education for Sustainable Development in the existing curriculum, and the need and emphasis for incorporating various dimensions of Education for Sustainable Development in the curriculum. A copy of questionnaire is appended as C.

3.6.3. Interview Schedule

The researcher developed an interview schedule that was used to collect in-depth information from experts in the field of teacher education and Sustainable Development. The researcher employed a semi-structured interview schedule to enhance credibility and comprehensive data collection. The interview was a vital tool in gaining insights in the incorporation of Education for Sustainable Development in teacher education programmes. The interview schedule had items that sought information on the concepts, dimensions and features of curriculum to be incorporated in the teacher education programme at the secondary level. A copy of the interview schedule is appended as D.

3.7. Construction of the Questionnaires

The researcher after referring various documents relating to sustainable development and Education for Sustainable Development and with consultation with experts in the field, prepared an initial questionnaire

for students comprising of 75 questions. After the draft questionnaire was carefully designed keeping in mind the various dimensions of Education for Sustainable Development, it was sent to experts for their opinion and suggestions. Based on the suggestions obtained, the questionnaire was modified, deleting various questions, modifying a few for clarity and to avoid ambiguity and adding a few new questions.

The modified questionnaire with 60 questions was surveyed among a small sample as a trial run. Based on the responses and tabulation, a few more modifications were made and the final questionnaire with 50 questions was prepared and it was once again given to experts for their suggestions and comments.

The questionnaire for teachers was also prepared on similar lines with the initial questionnaire having 60 items. After obtaining the suggestions from experts and based on the trial run responses, the final questionnaire with 36 items were selected for the study.

For the interview schedule, eight carefully and appropriately framed questions were prepared taking into consideration, the existing status of Education for Sustainable Development in curriculum.

(The interview schedule is given as Appendix D)

3.8. Administration of Tools and Data Collection

The researcher sought permission to collect data for the research from the various teacher education institutions under the different universities of Kerala. Questionnaires were distributed to the samples. The questionnaires were collected after filling up with the responses and details of the subjects.

The responses from the teacher educators of the respective teacher education institutions were also collected similarly.

The researcher fixed appointments with the experts in the field of teacher education and Sustainable Development, and conducted personal meetings with them for gathering data on the basis of the interview schedule.

Each interview took approximately 30-60 minutes. As the researcher got a chance to explain the purpose of the study to each person it was possible to gather relevant comments and suggestions for framing a sample module. List of experts is given as Appendix L

The entire data collection took almost eight months from January 09 up to September 09.

3.9. Description of Data Analysis Procedures

Qualitative and appropriate Statistical procedures were used to analyze the data. The quantitative data were categorized into homogeneous groups, quantitative data coded and information summarized into

frequencies and percentages using Statistical Package for Social Sciences (SPSS) Version 16.

The information obtained was then reported in terms of frequencies and percentages. On the basis of the data analysis and expert opinion, the sample module and strategies for Education for Sustainable Development in teacher education was finalised. The information from the analyzed data was examined critically and inferences made on the basis of the evidence of the findings. Summary of findings, conclusions and recommendations are made on the basis of these findings.

Chapter IV

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The analysis of data and results of the study is elaborated in this chapter. The chapter includes four sections A, B, C, and D. Section A deals with the analysis of the existing curriculum of secondary teacher education programme (B. Ed.) in the different universities of Kerala. Section B deals with the analysis of the responses from students of colleges of education in Kerala, Section C deals with the analysis of responses of teacher educators. Section D deals with analysis of the interview responses from experts and preparation of the suggested module to be incorporated in the teacher education curriculum.

Section – A

Analysis of the Existing Teacher Education Curriculum in Kerala with respect to incorporation of Education for Sustainable Development

For highlighting the importance of including Education for Sustainable Development in the teacher education curriculum, the very first effort the researcher has done was to analyse the existing teacher education curriculum and evaluate, to what extent it reflects the concepts and various dimensions with regard to Sustainable Development. Since the study was confined to secondary teacher education curriculum of the Kerala and moreover due to lack of a unified scheme in teacher education curriculum in

different universities of Kerala, researcher had to collect the teacher education curriculum of the four universities of Kerala namely, Kannur, Calicut, Kerala and MG where there is Faculty of Education. Apart from that the researcher also collected the teacher education curriculum proposed by the National bodies such as UGC, NCERT, RIE Mysore and NCTE.

A detailed general analysis, revealed that concepts of Sustainable Development were included only as a subtopic, under Environmental Education curriculum in only one of the core paper III. So analysis of the Environmental Education curriculum was only needed for realizing the objectives of the study. Even though in all the four universities, some aspects which are directly or indirectly related to Sustainable Development such as human rights, values, population education, women education, equality of opportunity, education and economic development are included as a part of core papers I and III. But the treatments of these core areas are not in tune with the objectives and perspectives of Sustainable Development. However a teacher educator with sufficient awareness and commitment towards Sustainable Development can integrate or correlate these areas with the concepts of Sustainable Development. Hence a comparative analysis of the environmental education and relevant areas of teacher education curriculum in the four universities of Kerala and also the curriculum of

National Bodies regarding the reflections of concepts of sustainable developments are given below.

1. Kannur University

In Kannur University, Environmental Education Curriculum is included only as a part of the general paper III with a total of 160 hrs, out of which thirty hours were set apart for Environmental Education in the second semester. Environmental Education curriculum consists of a single unit with fourteen sub topics out of which, Sustainable Development is included only as a single sub topic, i.e. 'Concept of Sustainable Development' and no other dimensions of Sustainable Development are included. In the light of Decade of Education for Sustainable Development (DESD), it is not at all adequate. The syllabus deals with Sustainable Development only in a superficial manner without going to the depth. The various dimensions are not even mentioned in the syllabus.

In the core paper I, *Education in the Emerging Indian Society*, in unit III, *Sociological Basis of Education* in the first semester deals with topics like *relationship between culture, education and society, education in the social context and social change, factors influencing social change, role of education in promoting social change, education and economic development* are included. Unit IV, *Education Culture and Human Values* includes *universal and traditional Indian values, value oriented education,*

value crisis and role of education in resolving value crisis etc. In the second semester under the Unit V, ***Human Rights Education*** contains the topics – *Human rights, meaning, Universal Declaration of Human Rights, Convention on Rights of the Child, Indian Constitution and Human Rights, principles and objectives of human rights education* etc. are included. Though these are directly or indirectly related with the different perspectives of Sustainable Development they are treated in accordance with the objectives of the particular paper which is different from that of the objectives of Sustainable Development and its perspectives.

(Copy of Environmental Education curriculum and relevant topics of core paper I of Kannur University is given as appendix E)

2. Kerala University

In Kerala University, the Environmental Education curriculum is included as a part of Core paper III in the second semester almost the same as in Kannur University with forty hours. The only difference is that, the Environmental Education syllabus is divided in to five units with a total of fourteen sub topics, out of which, Sustainable Development is included as a single sub topic as '*Concept of Sustainable Development*'. Here also relative importance given to Sustainable Development is almost the same as that of Kannur University.

In the core paper I, ***Theoretical Bases of Education, Philosophical and Sociological-*** Unit V in the first semester deals with ***Education and***

Social change. Here topics like *factors affecting social change, how social change takes place, role of education promoting desired social change* and in unit VII, ***Education and Welfare of the Society***, topics like *education for peace and coexistence, education for economic stability, education as an instrument for intellectual property and inventions and discoveries for the welfare of the society* are included. Under unit VI ***Value and Education***, in the second semester, topics like *universal values, traditional values and role of education in promoting values* are some of the areas having close or distant relation with various dimensions of Sustainable Development. Here also the treatment is the same as in Kannur University.

(Copy of Environmental Education curriculum and relevant topics of core paper I of Kerala University is given as Appendix F)

3. Calicut University

In Calicut University also, Environmental Education curriculum is included as part of general paper III in the second semester with a total of seventy five hours, out of which fifteen hours were set apart for Environmental Education. The Environmental Education syllabus consists of a single unit with fourteen subtopics and Sustainable Development is included as a single subtopic i.e. ***‘Concepts of Sustainable Development’***. Here also the relative importance is almost the same as that in Kannur and Kerala Universities.

Other than Environmental Education curriculum, in the core paper I, ***Education in the Emerging Indian Society***, Unit IV, in the first semester deals with *National Goals and Education*. Here topics like *democracy, secularism and socialism – their meaning and implication for education, constitutional provision of education, fundamental duties and rights, education as fundamental right* and in unit VI - ***Structure and Issues of Education in India*** topics like *equalization of education, vocational education* are included. Unit III of second semester, ***Society, Culture and Education*** deals with topics like *culture, social change and social control, education for national integration and international understandings* and also in unit IV, of second semester – ***Education from Economic Perspective***, topics like *education, economic and national development, liberalization, privatization and globalization, their impact on education and teachers' role* are discussed.

In paper III, ***Trends and Developments in Modern Educational Practices***, unit III in the second semester deals with various aspects of ***Child Rights Education*** with ten instructional hours, and in unit IV ***Education and Human Values***, topics like *human needs, values relevant to human welfare, five core human values, truth, righteousness, conduct, peace, love and non-violence* are discussed. In Calicut University also, the treatment is same as that of Kannur and Kerala universities.

(Copy of the Environmental Education curriculum and core paper I and III of Calicut University is given as Appendix G

4. MG University

In MG University, Environmental Education is an elective full paper with 150 hours having six units and twenty six sub topics. Here also Sustainable Development is included as a single sub topic, i.e. '***Concept of Sustainable Development***', under the head '***Conservation of Natural Resources***'. In MG University, even though Environmental Education is a full paper, it is only elective paper. Hence all student teachers may not get the opportunity to learn about environmental concepts. It has to be pointed out, that even in MG University the weightage given is almost the same as that in other universities of Kerala.

Apart from the elective papers in the core paper I, ***Philosophical and Sociological Base of Education*** Unit VI ***Challenges of Education in India*** deals with topics like *universalisation of elementary education: problems and prospective, equality of educational opportunities, education of socially and economically disadvantaged, women education, human rights education, population education and family life education, empowerment of India through science and technology, education for national integration and international understanding, role of UNESCO and globalization – impact on Indian society and education* are included. Though the topics are

included, they are not dealt with regard to the objectives of Education for Sustainable Development.

(Copy of the Environmental Education curriculum and relevant topics of core paper I of MG University is given as Appendix H)

Apart from the National Policy on Education (NPE 1986), the Supreme Court of India in 1992 also directed that Environmental Education should be included as a compulsory subject in all levels of education including collegiate. Hence Environmental Education may be included as a compulsory paper instead of an elective one, so that all students will get an opportunity to be acquainted with the environmental concepts which may help them to educate the future generations regarding the importance of Sustainable Development.

In general, comparison of teacher education curricula of different universities of Kerala reveals that the existing teacher education curriculum is not giving due weightage to Environmental Education and Sustainable Development.

As per the updated model curriculum of University Grants Commission (March 2001) on education, Environmental Education is included as an elective paper with five units and fifteen sub topics. Out of this Sustainable Development is included as a single unit (Unit V), i.e. 'Role of schools in environmental conservation and Sustainable Development'.

(Copy of the Environmental Education curriculum of UGC is given as Appendix I)

At present Regional Institute of Education (NCERT) Mysore is not conducting B.Ed. course. But the 2 year B.Ed. course conducted till last year did not give any weightage to Sustainable Development. In the fourth semester, Environmental Education was included as 1st unit called ***‘Education for the Protection of Environment’*** in a general paper named ***‘Education and National Concerns’***, with a total of five units. The other units were units 2 – ***Population, Quality of Life and Development of Education***. Unit 3 – ***Education for Value Development***, unit4 – ***Education for National Integration and International Understanding*** and unit 5 – ***Education for Participation in National Reconstruction***.

Here unit one dealt with the various aspects of Environmental Education but Sustainable Development as such was not included. But sub topics related to Sustainable Development such as *national and international efforts in conservation of environment* were included. As part of unit II, two sub topics like *population, quality of life, and development education*. *‘Environment and Sustainable Development’* and some other dimensions of Sustainable Development like *determination of population changes and basic demographic concepts, national population education programme, issues in population education, population and quality of life,*

resources, population distribution, gender equity and equality, health and education, HIV/AIDS and reproductive health were included.

In unit-III, *Education for Value Development*, topics related to *values and value developments* were included.

In unit IV – topics like *cultural diversity, peace, co-operation, international organization, and international understanding, regional co-operation, human rights, globalization* etc. were dealt with.

Unit V – sub topics like *economic growth and measures taken to achieve economic growth, environmental importance, small family norms, women empowerment, equity and equality* were included.

In short, though Sustainable Development as such was not included, the various issues related with Sustainable Development were dealt in another way. But at the same time, it seems that the treatment is not in tune with the objectives of Education for Sustainable Development.

(Copy of the Environmental Education curriculum of RIE Mysore (NCERT) is given as Appendix J)

The course content suggested by the National Council for Teacher Education (NCTE) for inclusion in the teacher education programme at secondary level (Environmental Education Frame Work for Teacher Educators 2005) having sixteen sub topics out of which only one '*Sustainable Development Energy and waste management*', is a topic

related to Sustainable Development. The remaining was dealing with various aspects of Environmental Education.

However, in the curriculum framework, while suggesting the inherent parameters for Environmental Education (Chapter 2), Sustainable Development and its dimensions are given due weightage as specific points.

(Copy of the Environmental Education curriculum proposed by NCTE in the curriculum frame work (2005) is given as Appendix K.)

This analysis also shows that apart from Kerala, the national bodies too have not yet accepted the spirit of Education for Sustainable Development and reoriented education system for achieving the broad objectives of Decade of Education for Sustainable Development.

Only the Centre for Environmental Education (CEE) in association with UNESCO has contributed much in this area and had organized a number of seminars, workshops and international conferences in this regard. Centre for Environmental Education had produced a number of course materials as outcomes of such efforts.

In this context, it was found that the existing teacher education curriculum at the national level and especially in Kerala does not reflect the concepts of Sustainable Development to a desirable extent.

The researcher has already pointed out that reflections of Sustainable Development are seen only as part of Environmental Education. Though

Environmental Education reflects the spirit of Sustainable Development to a greater extent, it is not sufficient enough to achieve the goals of sustainability. Environmental Education highlights only the environmental factor and ignoring the other significant and integrated aspects, such as society development, economy, values, cultural diversity etc. The present approach will give an impression that Environmental Education is a knowledge area related to some disciplines like natural science, geography etc., where as Education for Sustainable Development is inter disciplinary and multi disciplinary in nature cutting across various disciplines. It has given equal importance to society and economy with environment at the centre.

From the above analysis, it can be seen that Sustainable Development is not given due importance in education in Kerala, especially in teacher education programmes. The natural calamities faced by man all over the world are due to climate change, pollution, social and economic inequalities, violence and consumerism are not given proper consideration in the present curriculum.

Section – B

Analysis of responses of student teachers regarding Education for Sustainable Development

As part of the other major objectives of the study, data on knowledge awareness, attitude and practices of student teachers related to Sustainable Development were gathered. The analysis of data pertaining to the same are presented below

Table 4.1
Frequencies and Percentages of Subjects with respect to Optional subjects

Subjects	Frequency	Percent	Cumulative Percent
Natural Science	172	18.7	18.7
Physical Science	132	14.3	33.0
Mathematics	147	16.0	49.0
English	132	14.3	63.4
Malayalam	60	6.5	69.9
Social Science	175	19.0	88.9
Hindi	32	3.5	92.4
Arabic	28	3.0	95.4
Commerce	15	1.6	97.1
Sanskrit	15	1.6	98.7
IT	3	.3	99.0
Geography	9	1.0	100.0
Total	920	100.0	

The above table shows the strata of the sample with respect to their optional subjects. Among the total of 920 student teachers, 19% belonged to Social Science optional, 18.7% belonged to Natural Science, 16% from Mathematics, 14.3% each from Physical Science and English. Student teachers from other optional were less than 10%.

Figure 4.1: The sub sample for the study with respect to Optional subjects

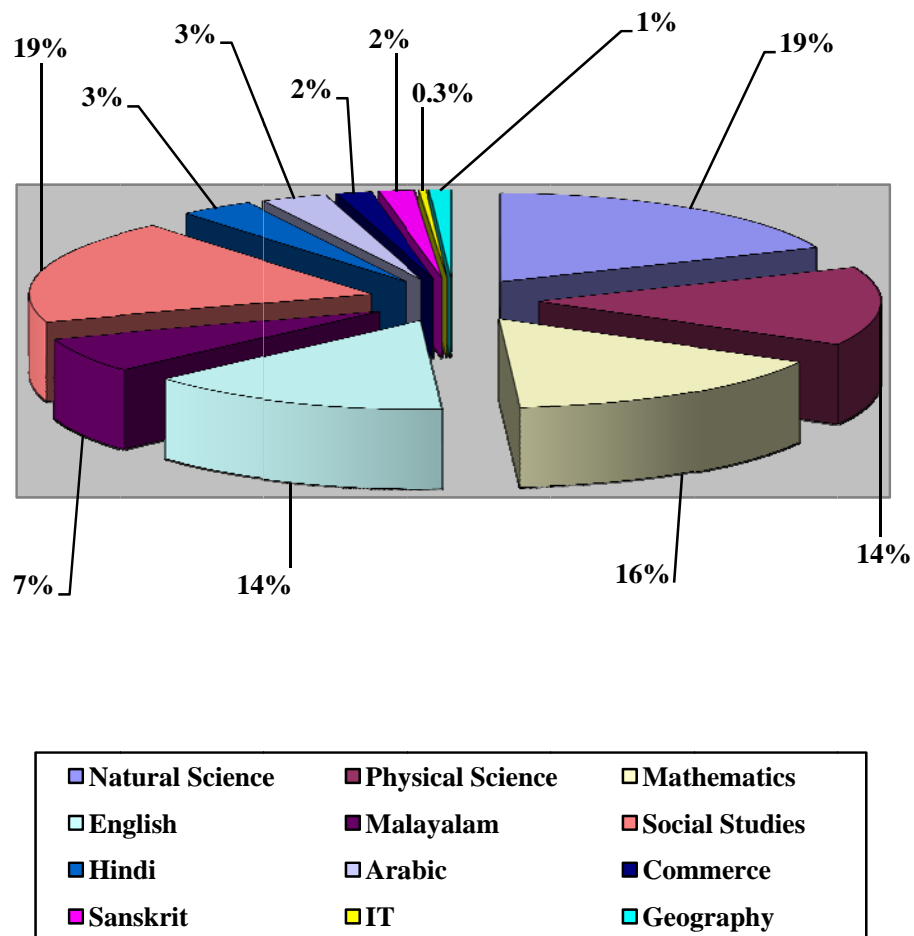


Table 4.2
Frequencies and Percentages of Subjects with respect to Type of Institution

Type of Institution	Frequency	Percent	Cumulative Percent
Government	145	15.8	15.8
Aided	233	25.3	41.1
Un Aided	542	58.9	100.0
Total	920	100.0	

The above table shows that among the sample of student teachers surveyed, 15.8% belonged to government colleges, 25.3% belonged to aided colleges and 58.9% were from unaided colleges.

Figure 4.2: The sub sample for the study with respect to Type of Institution

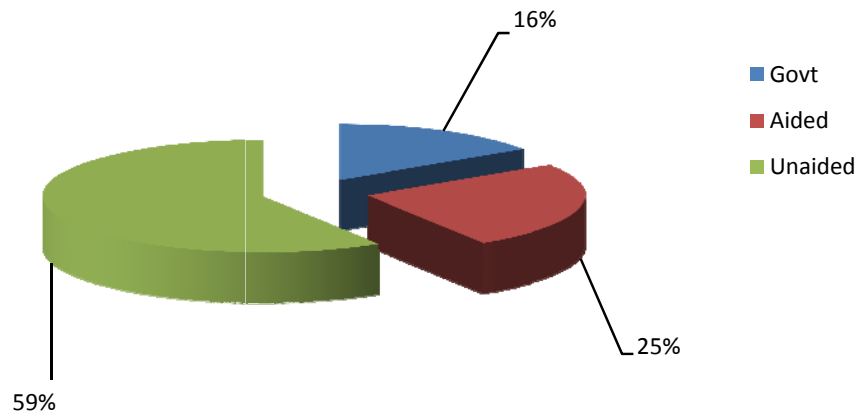


Table 4.3

Frequencies and Percentages of Subjects with respect to University

University	Frequency	Percent	Cumulative Percent
Kerala	222	24.1	24.1
MG	239	26.0	50.1
Calicut	211	22.9	73.0
Kannur	248	27.0	100.0
Total	920	100.0	

The above table on strata of student teachers with respect to universities indicates that 24.1% was from Kerala University, 26% was from MG University, 22.9% was from University of Calicut, and 27% was from Kannur University.

Figure 4.3: The sub sample for the study with respect to University

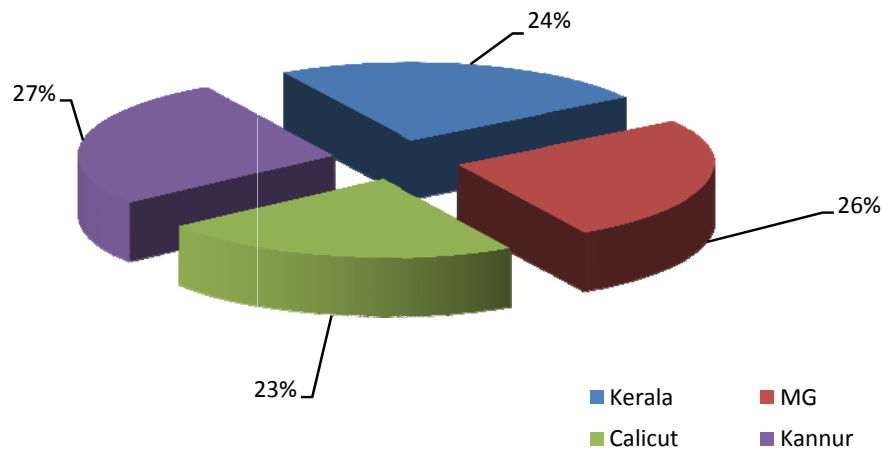


Table 4.4

Responses of the total sample for the question: How much are you aware about the concepts of sustainable development?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	102	11.1	11.1
Some Extent	206	22.4	33.5
Very little extent	549	59.7	93.2
Not at all	63	6.8	100.0
Total	920	100.0	

The above table of responses of the total sample for the question ‘how much are you aware about the concepts of sustainable development?’ 11.1% of the sample indicated that they were aware to *greater extent*; 22.4% indicated that they were aware to *some extent*. However, 59.7% of the sample reported that they were aware only to a *very little extent* and 6.8% of the sample was *not at all* aware of the concepts of sustainable development. The graphical representation of the responses of the total sample for the above question is shown in figure 4.4.

Figure 4.4: Responses for the question: How much are the subjects aware about the concepts of sustainable development

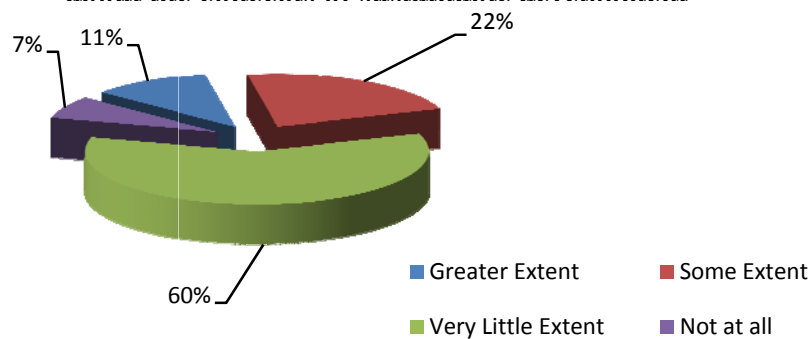


Table 4.5

Responses of the total sample for the question: To what extent you agree that an awareness of Education for Sustainable Development is relevant in present age?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	543	59.0	59.0
Some Extent	254	27.6	86.6
Very little extent	91	9.9	96.5
Not at all	32	3.5	100.0
Total	920	100.0	

It is evident from the above table of responses that for the question: ‘what extent they agree that an awareness of Education for Sustainable Development is relevant in present age?’, 59.0% of the sample agreed to *greater extent*; 27.6% agreed to *some extent*. However, 9.9% of the sample agreed to a *very little extent* and 3.5% of the subjects *not at all* agreed that Education for Sustainable Development is relevant in present age.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.5.

Figure 4.5: Responses for the question: To what extent you agree that awareness of Education for Sustainable Development is relevant in present age

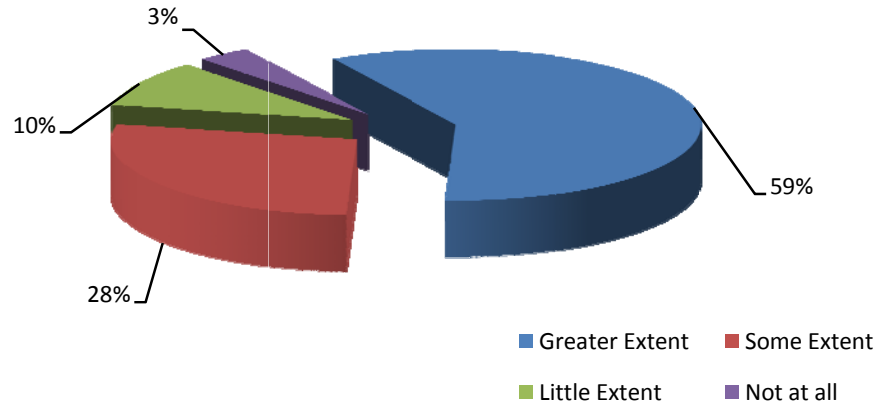


Table 4.6

Responses of the total sample for the question: To what extent are you in favour of promoting Education for Sustainable Development in teacher education?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	558	60.7	60.7
Some Extent	264	28.7	89.3
Very little extent	82	8.9	98.3
Not at all	16	1.7	100.0
Total	920	100.0	

From the above table of responses of the total sample for the question ‘to what extent are you in favour of promoting Education for Sustainable Development in teacher education’ shows that, 60.7% of the sample favoured to *greater extent* and; 28.7% favoured to *some extent*. However, 8.9% of the sample indicated that they favoured only to a *very little extent*

and 1.7% of the sample reported that they were *not at all* in favour of promoting Education for Sustainable Development in teacher education. The graphical representation of the responses of the total sample for the above question is shown in figure 4.6

Figure 4.6: Responses for the question: To what extent are you in favour of promoting Education for Sustainable Development in teacher education

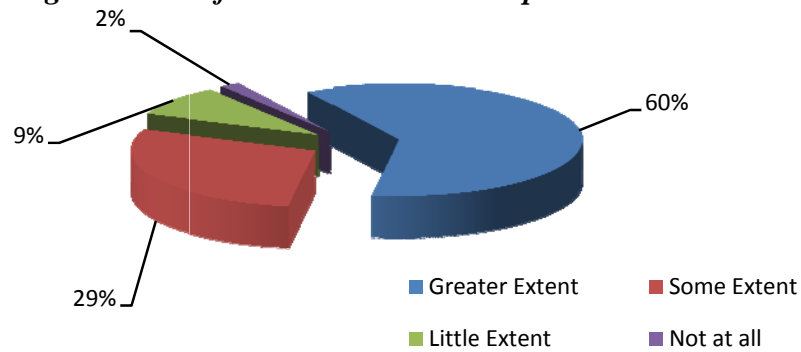


Table 4.7

Responses of the total sample for the question: How far the present policy of National development has given due consideration for environmental protection leading to sustainable development?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	140	15.2	15.2
Some Extent	445	48.4	63.6
Very little extent	296	32.2	95.8
Not at all	39	4.2	100.0
Total	920	100.0	

It has been revealed from the above table of responses of the total sample for the question ‘how far the present policy of National development has given due consideration for environmental protection leading to sustainable development?’, 15.2% of the sample responded that they agreed to *greater extent*; 48.4% agreed to *some extent*. However, 32.2% of the sample agreed only to a *very little extent* and 4.2% of the subjects responded that they did not agree at all to the statement.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.7

Figure 4.7: Responses for the question: How far the present policy of National development given due consideration for environmental protection leading to sustainable development

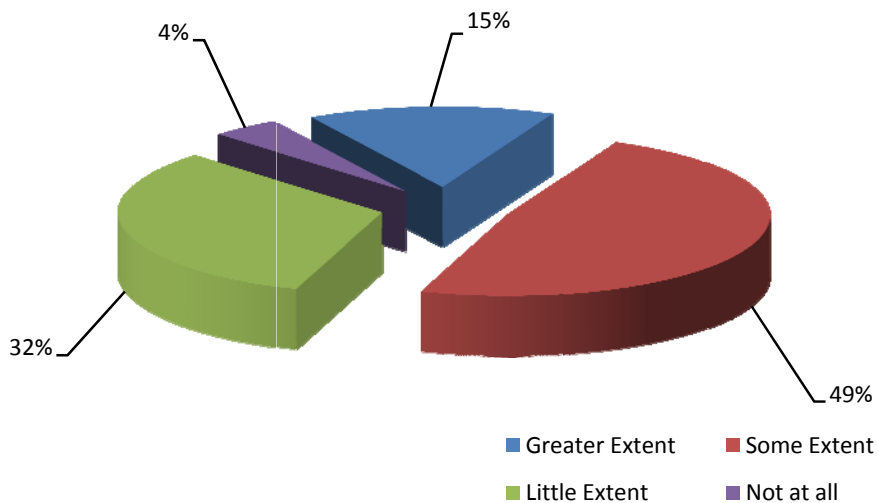


Table 4.8

Responses of the total sample for the statement: Poverty is a problem related to environment degradation.

Responses	Frequency	Percent	Cumulative Percent
Greater extent	184	20.0	20.0
Some Extent	323	35.1	55.1
Very little extent	364	39.6	94.7
Not at all	49	5.3	100.0
Total	920	100.0	

The above table of responses of the total sample for the statement ‘poverty is a problem related to environment degradation’ revealed that, 20.0% of the sample agreed to *greater extent*; 35.1% agreed to *some extent*. However, 39.6% of the sample agreed only to a *very little extent* and 5.3% of the sample *not at all* agreed that poverty is a problem related to environment degradation.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.8.

Figure 4.8: Responses for the statement: Poverty is a problem related to environment degradation

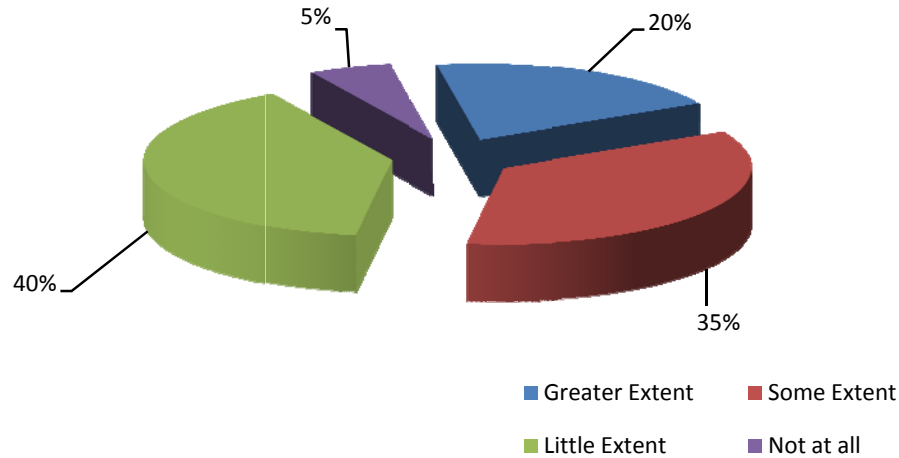


Table 4.9

Responses of the total sample for the statement: Democracy and Human rights have a role in Environmental protection and human development

Responses	Frequency	Percent	Cumulative Percent
Greater extent	66	7.2	7.2
Some Extent	582	63.3	70.5
Very little extent	258	28.0	98.5
Not at all	14	1.5	100.0
Total	920	100.0	

The table of responses of the total sample revealed that, for the statement ‘democracy and human rights have a role in environmental protection and human development’, 7.2% of the sample agreed to *greater extent*; 63.3% responded that they agreed to *some extent*. However, 28.0% of the sample agreed only to a *very little extent* and 1.5% of the subjects did not

agree at all to the statement. The graphical representation of the responses of the total sample for the above question is shown in figure 4.9.

Figure 4.9: Responses for the statement: Democracy and Human rights have a role in Environmental protection and human development

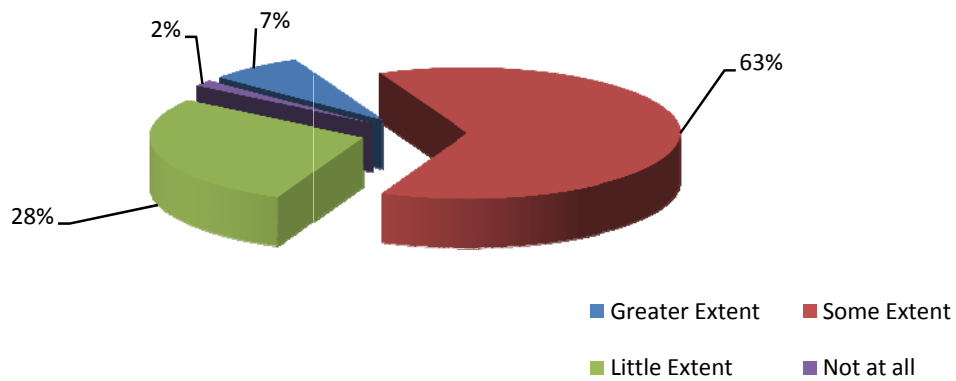


Table 4.10

Responses of the total sample for the statement: Ecosystem influences economic development and standard of living

Responses	Frequency	Percent	Cumulative Percent
Greater extent	317	34.5	34.5
Some Extent	526	57.2	91.6
Very little extent	55	6.0	97.6
Not at all	22	2.4	100.0
Total	920	100.00	

The above table of responses of the total sample reveals that, for the statement ‘ecosystem influences economic development and standard of

living’, 34.5% of the sample responded that they agreed to *greater extent*; 57.2% agreed to *some extent*. However, 6.0% of the sample indicated that they agreed only to a *very little extent* and 2.4% of the sample reported that they *not at all* agreed to the statement. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.10

Figure 4.10: Responses for the statement: Ecosystem influences economic development and standard of living

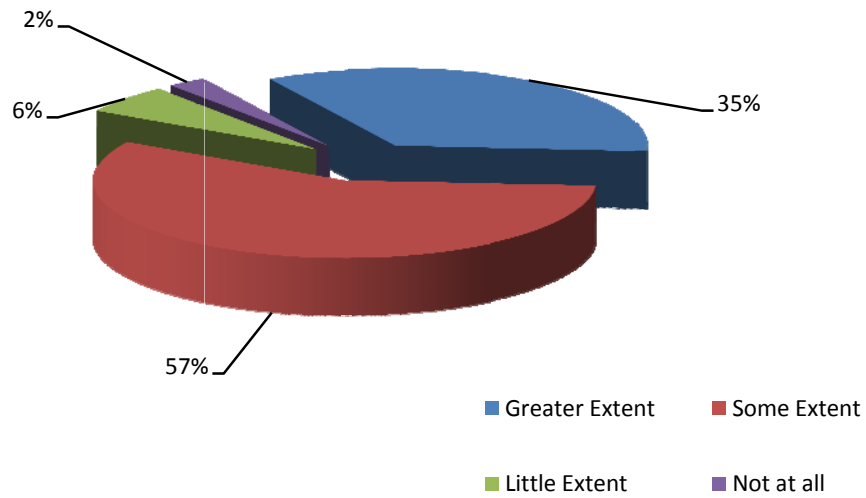


Table 4.11

Responses of the total sample for the statement: Environmental education curriculum at present deal with areas like peace, equity, gender issues, fraternity and social justice.

Responses	Frequency	Percent	Cumulative Percent
Greater extent	80	8.7	8.7
Some Extent	166	18.0	26.7
Very little extent	456	49.6	76.3
Not at all	218	23.7	100
Total	920	100.0	

The above table of responses of the total sample reveals that, for the statement ‘The environmental education curriculum at present deal with areas like peace, equity, gender issues, fraternity and social justice’, 8.7% of the sample agreed to *greater extent*; 18.0% agreed to *some extent*. However, 49.6% of the sample agreed to a *very little extent* and 23.7% of the subjects did not agree at all to the above statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.11

Figure 4.11: Responses for the statement: The environmental education curriculum at present deal with areas like peace, equity, gender issues, fraternity and social justice

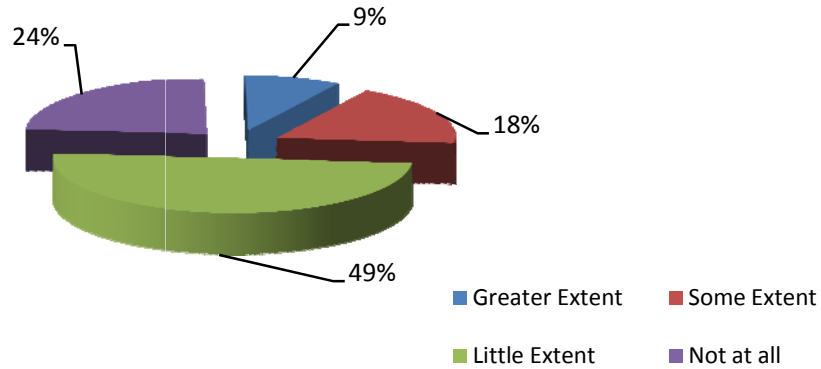


Table 4.12

Responses of the total sample for the statement: Political and economic policies influence the quality of environment

Responses	Frequency	Percent	Cumulative Percent
Greater extent	123	13.4	13.4
Some Extent	389	42.3	55.7
Very little extent	377	41.0	96.6
Not at all	31	3.4	100.0
Total	920	100.0	

Table 4.12 regarding the statement, ‘political and economic policies influence the quality of environment’? 13.4% of the sample agreed to *greater extent*; 42.3% agreed to *some extent*. However, 41.0% of the agreed only to a *very little extent* and 3.4% of the subjects did not agree at all to the

statement. The graphical representation of the responses of the total sample for the above question is shown in figure 4.12.

Figure 4.12: Responses for the statement: Political and economic policies influence the quality of environment

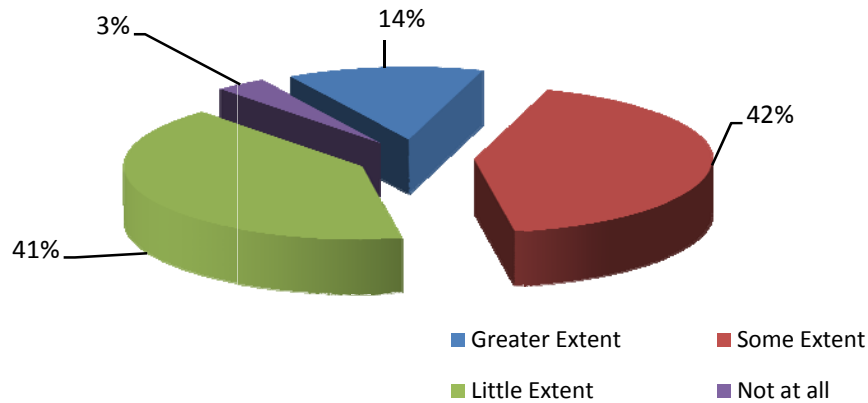


Table 4.13

Responses of the total sample for the statement: Women have a special role and responsibility in the practical application of many principles regarding sustainable development

Responses	Frequency	Percent	Cumulative Percent
Greater extent	99	10.8	10.8
Some Extent	411	44.7	55.5
Very little extent	381	41.4	96.8
Not at all	29	3.2	100.0
Total	920	100.0	

The table of responses of the total sample reveals that, for the statement ‘women have a special role and responsibility in the practical

application of many principles regarding sustainable development’, 10.8% of the sample agreed to *greater extent*; 44.7% responded that they agreed to *some extent*. However, 41.4% of the sample indicated that they agreed only to a *very little extent* and 3.2% of the subjects did not agree at all that women have a special role and responsibility in the practical application of many principles regarding sustainable development.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.13

Figure 4.13: Responses for the statement: Women have a special role and responsibility in the practical application of many principles regarding sustainable development

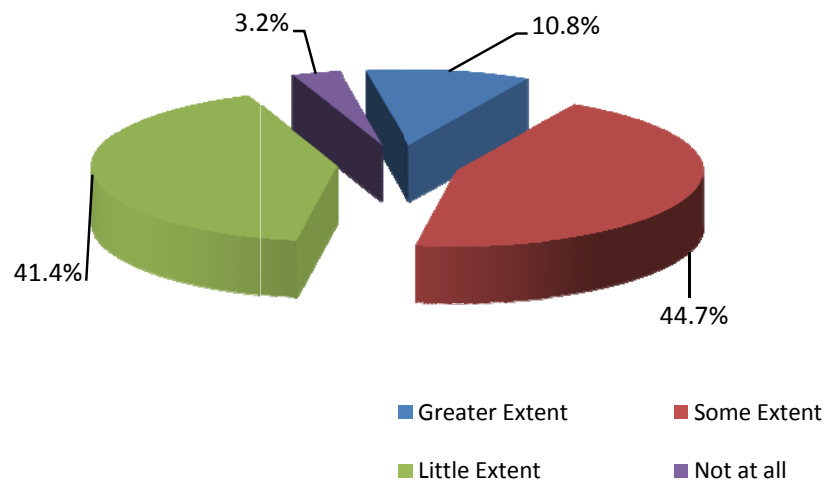


Table 4.14

Responses of the total sample for the statement: Education for Sustainable Development imparts certain skills for better living

Responses	Frequency	Percent	Cumulative Percent
Greater extent	436	47.4	47.4
Some Extent	379	41.2	88.6
Very little extent	96	10.4	99.0
Not at all	9	1.0	100.0
Total	920	100.0	

The above table of responses of the total sample reveals that, for the statement 'Education for Sustainable Development imparts certain skills for better living', 47.4% of the sample agreed to *greater extent*; 41.2% agreed to *some extent*. However, 10.4% of the sample agreed to a *very little extent* and 1.0% of the subjects did not agree at all to the statement. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.14

Figure 4.14: Responses for the statement: Education for Sustainable Development imparts certain skills for better living

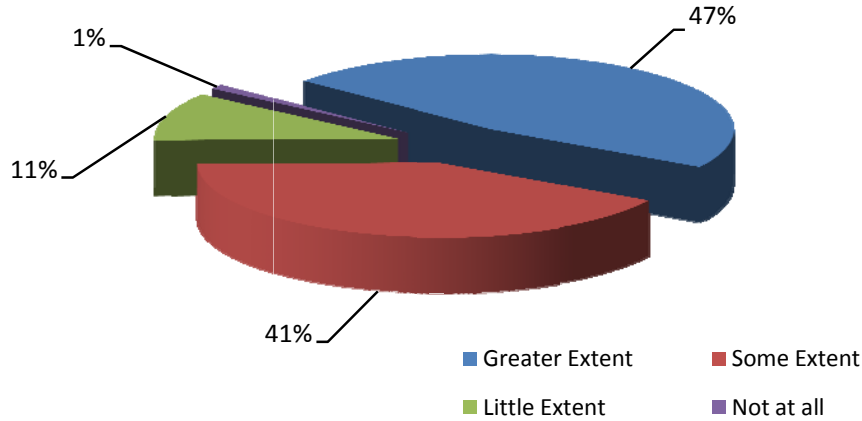


Table 4.15

Responses of the total sample for the statement: Promotion of sustainable development needs some action level programmes

Responses	Frequency	Percent	Cumulative Percent
Greater extent	448	48.7	48.7
Some Extent	338	36.7	85.4
Very little extent	111	12.1	97.5
Not at all	23	2.5	100.0
Total	920	100.0	

The above table of responses of the total sample reveals that, for the statement regarding that action level programmes are required for the promotion of sustainable development, 48.7% of the sample agreed to *greater extent*; 36.7% agreed to *some extent*. However, 12.1% of the sample

agreed only to a *very little extent* and 2.5% of the subjects did not agree at all to the above statement. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.15

Figure 4.15: Responses for the statement: Promotion of sustainable development needs some action level programmes

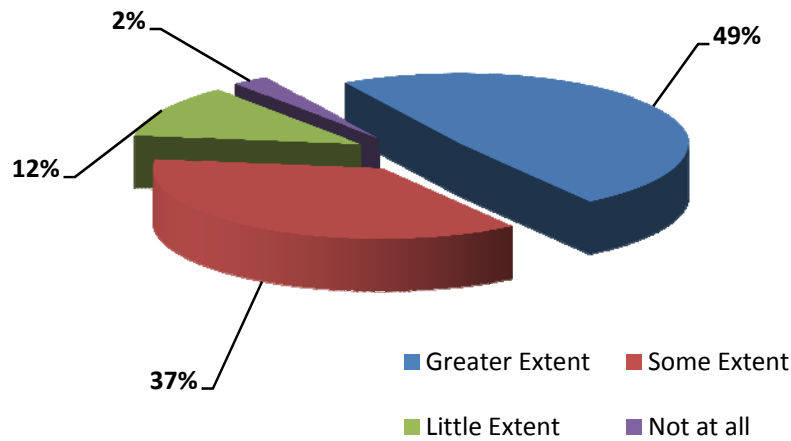


Table 4.16

Responses of the total sample for the statement: The present pattern of the development and living style is against the principles of Education for Sustainable Development

Responses	Frequency	Percent	Cumulative Percent
Greater extent	202	22.0	22.0
Some Extent	388	42.2	64.2
Very little extent	281	30.5	95.7
Not at all	49	5.3	100.0
Total	920	100.0	

The above table of responses of the total sample reveals that, for the statement that ‘the present pattern of the development and living style is against the principles of Education for Sustainable Development’, 22.0% of the sample agreed to *greater extent*; 42.2% agreed to *some extent*. However, 30.5% of the sample agreed only to a *very little extent* and 5.3% of the subjects did not agree at all to the above statement.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.16

Figure 4.16: Responses for the statement: The present pattern of the development and living styles is against the principles of Education for Sustainable Development

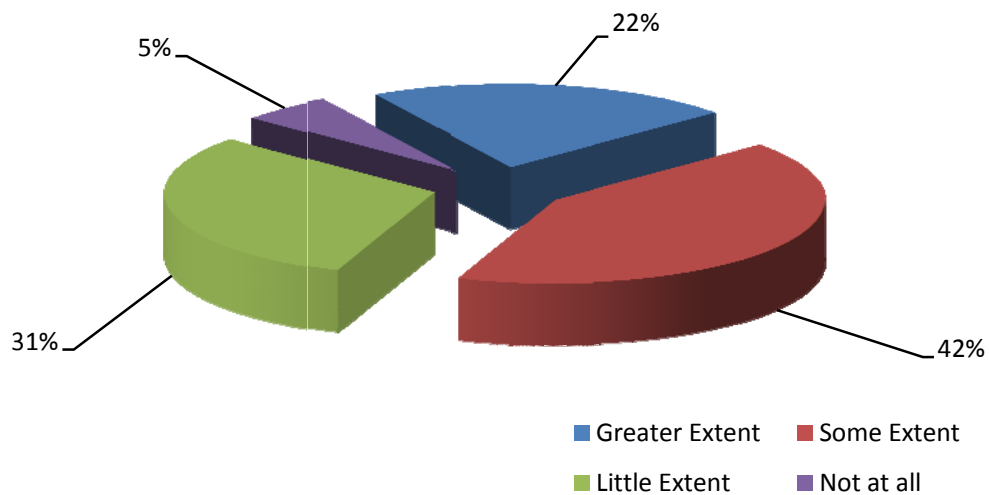


Table 4.17

Responses of the total sample for the statement: Education for sustainable development emphasizes education for culture and peace

Responses	Frequency	Percent	Cumulative Percent
Yes	787	85.5	85.5
No	133	14.5	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement that ‘education for sustainable development emphasises education for culture and peace’ indicates that 85.5 % of the sample agreed whereas 14.5% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.17

Figure 4.17: Responses for the statement: Education for sustainable development emphasizes education for culture and peace

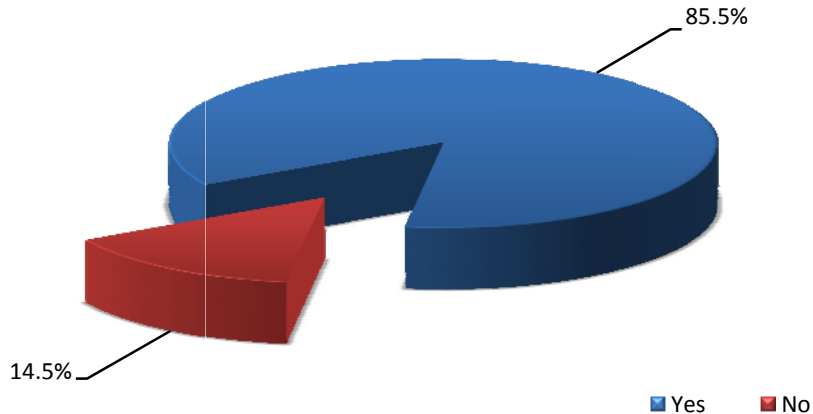


Table 4.18

Responses of the total sample for the statement: Sustainable development is as much about the children in the future as it is about what we need today

Responses	Frequency	Percent	Cumulative Percent
Yes	775	84.2	84.2
No	145	15.8	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement ‘sustainable development is as much about the children in their future as it is about what we need today’, shows that 84.2 % of the sample have agreed and 15.8% of the subjects did not agree. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.18

Figure 4.18: Responses for the statement: Sustainable development is as much about the children in the future as it is about we need today

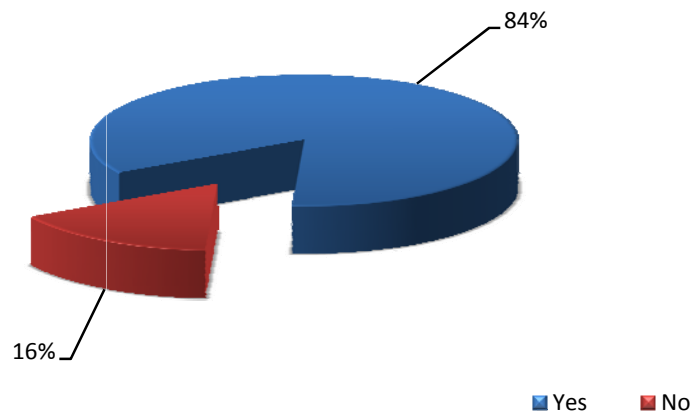


Table 4.19

Responses of the total sample for the statement: Sustainable Development has nothing to do with social justice

Responses	Frequency	Percent	Cumulative Percent
Yes	747	81.2	81.2
No	173	18.8	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement that, ‘sustainable development has got nothing to do with social justice’, indicates that 81.2% agreed, whereas 18.18% disagreed with the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.19

Figure 4.19: Responses for the statement: Sustainable Development has nothing to do with social justice

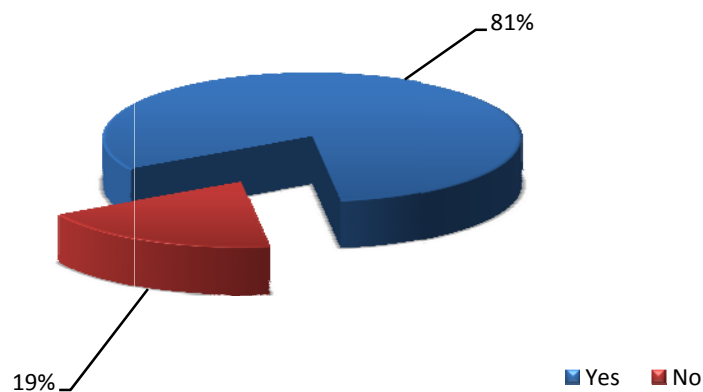


Table 4.20

Responses of the total sample for the statement: We cannot slow the rate of climate change

Responses	Frequency	Percent	Cumulative Percent
Yes	409	44.5	44.5
No	511	55.5	100.0
Total	920	100.0	100.0

The table of responses of the total sample, for the statement ‘we cannot slow the rate of climate change’, shows that 44.5% of the sample have agreed whereas 55.5% of the subjects did not agree. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.20.

Figure 4.20: Responses for the statement: We cannot slow the rate of climate change

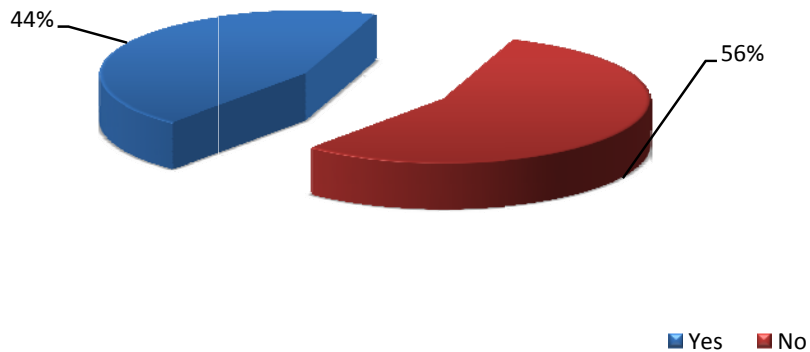


Table 4.21

Responses of the total sample for the statement: Corporate social responsibility is irrelevant to sustainable development

Responses	Frequency	Percent	Cumulative Percent
Yes	589	64.0	64.0
No	331	36.0	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement regarding corporate social responsibility is irrelevant to sustainable development, 64.0% of the sample agreed, whereas 36.0% of the subjects did not agree. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.21.

Figure 4.21: Responses for the statement: Corporate social responsibility is irrelevant to sustainable development

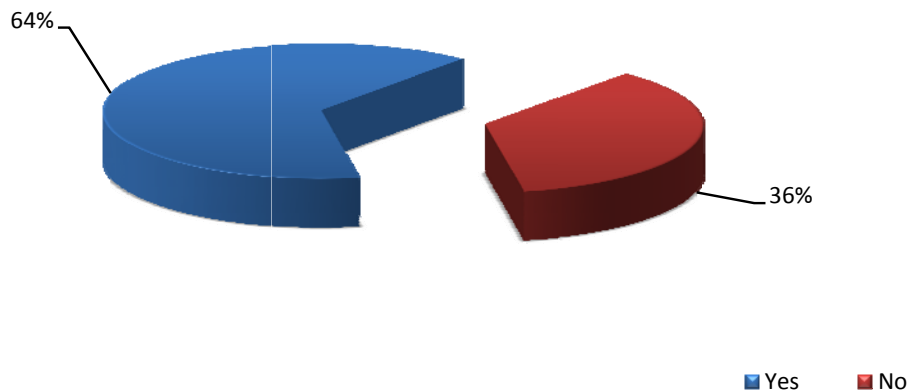


Table 4.22

Responses of the total sample for the statement: Conservation of fresh water is not a priority in Kerala because we have plenty of water

Responses	Frequency	Percent	Cumulative Percent
Yes	217	23.6	23.6
No	703	76.4	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement ‘conservation of fresh water is not a priority in Kerala because we have plenty of water’, 23.6% of the samples agreed whereas 76.4% of the sample did not agree with the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.22.

Figure 4.22: Responses for the statement: Conservation of fresh water is not a priority in Kerala because we have plenty

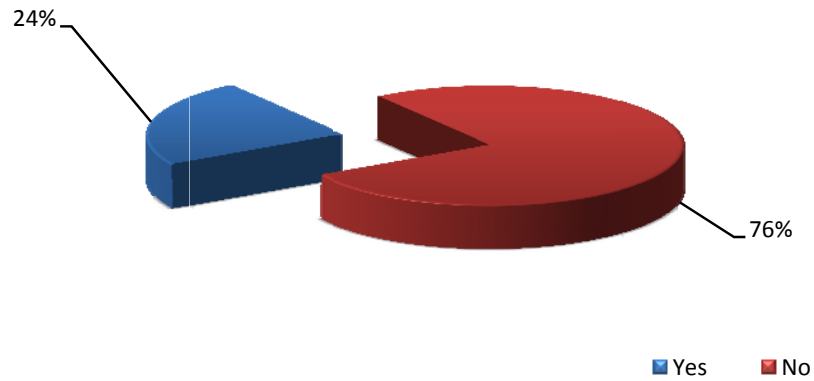


Table 4.23

Responses of the total sample for the statement: Education for sustainable development supports cultural diversity

Responses	Frequency	Percent	Cumulative Percent
Yes	168	18.3	18.3
No	752	81.7	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement ‘education for sustainable development supports cultural diversity’, 18.3% of the samples agreed to the statement, whereas 81.7% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.23.

Figure 4.23: Responses for the statement: Education for sustainable development supports cultural diversity

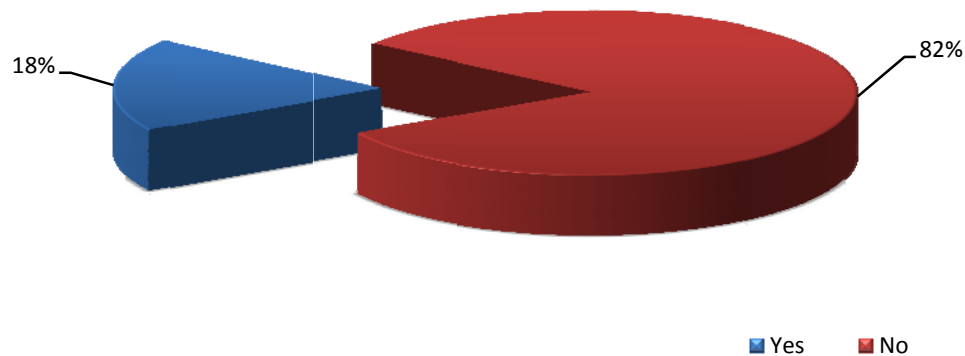


Table 4.24

Responses of the total sample for the statement: It is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water

Responses	Frequency	Percent	Cumulative Percent
Yes	762	82.8	82.8
No	158	17.2	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement, ‘it is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water’, 82.8% of the samples agreed and 17.2% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.24.

Figure 4.24: Responses for the statement: It is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water

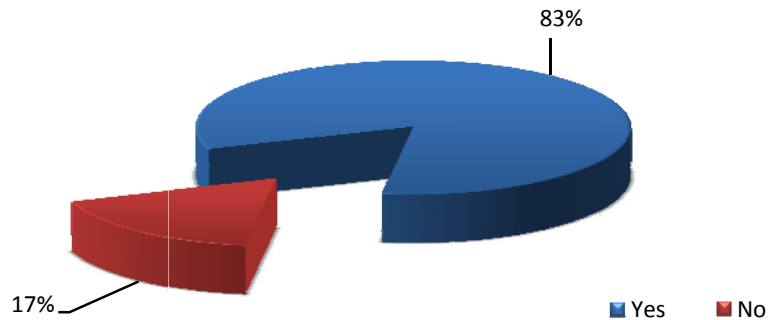


Table 4.25

Responses of the total sample for the statement: Environmental education and Education for Sustainable Development are one and same thing

Responses	Frequency	Percent	Cumulative Percent
Yes	374	40.7	40.7
No	546	59.3	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement; ‘whether environmental education and Education for Sustainable Development are one and same thing’, 40.7% of the samples agreed whereas 59.3% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 25.

Figure 4.25: Responses for the statement: Environmental education and Education for Sustainable Development are one and same thing

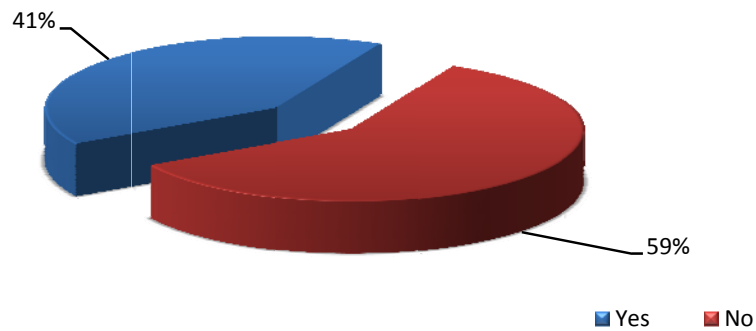


Table 4.26

Responses of the total sample for the question: Do you think that the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead?

Responses	Frequency	Percent	Cumulative Percent
Yes	486	52.8	52.8
No	434	47.2	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question: ‘Do you think that the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead?, 52.8% of the sample agreed and 47.2% of the subjects did not agree. The graphical representation of the responses of the total sample for the above question is shown in figure 4.26.

Figure 4.26: Percentage of subjects who think that the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead

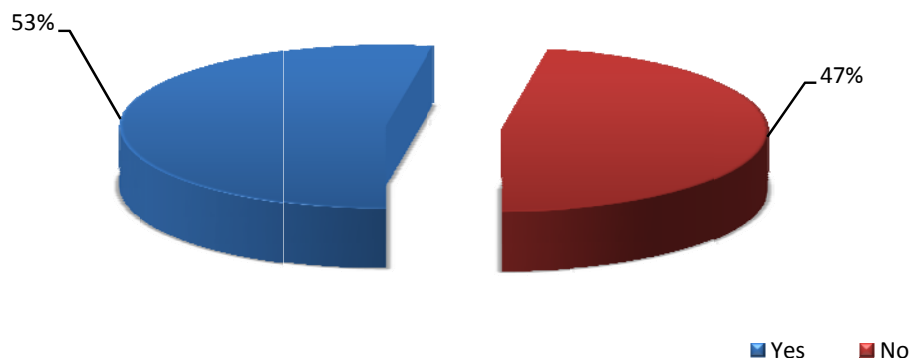


Table 4.27

Responses of the total sample for the question: Do you think that teachers are the most effective agents for the dissemination of Environmental Education?

Responses	Frequency	Percent	Cumulative Percent
Yes	757	82.3	82.3
No	163	17.7	100.0
Total	920	100.0	

The table of responses of the total sample, for the question; ‘Do you think that teachers are the most effective agents for the dissemination of Environmental Education?’ 82.3% of the samples have agreed and 17.7% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.27.

Figure 4.27: Percentage of subjects who think that teachers are the most effective agents for the dissemination of Environmental Education

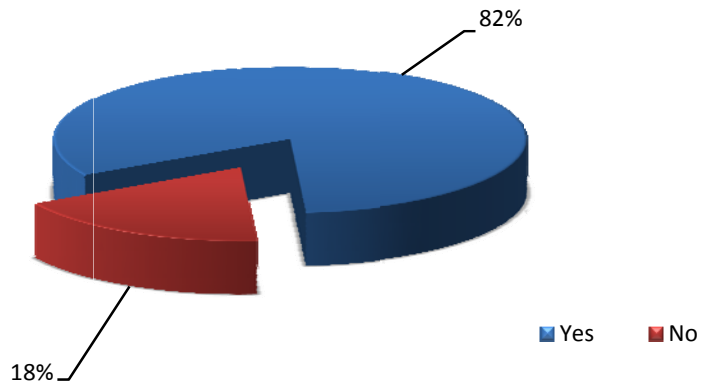


Table 4.28

Responses of the total sample for the statement: Education for Sustainable Development is interdisciplinary in nature.

Responses	Frequency	Percent	Cumulative Percent
Yes	708	77.0	77.0
No	212	23.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement: Education for Sustainable Development is interdisciplinary in nature, 77.0% of the samples agreed whereas 23.0% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.28.

Figure 4.28: Percentage of response for the statement: Education for Sustainable Development is interdisciplinary in nature.

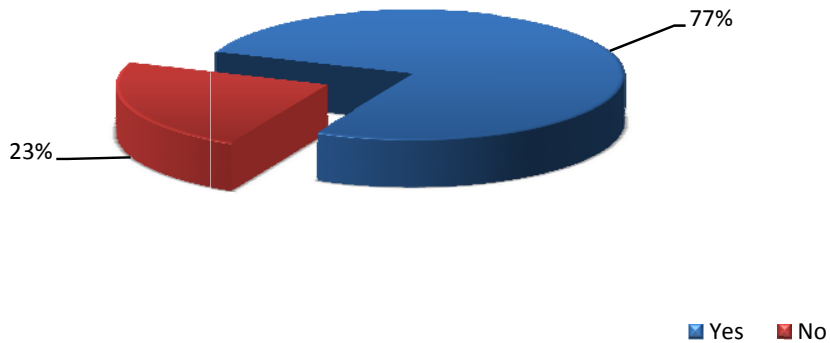


Table 4.29

Responses of the total sample for the statement: The concept of sustainable development is rooted in on the value enunciated as ‘Loka samasta sukhino bhavanthu’

Responses	Frequency	Percent	Cumulative Percent
Yes	848	92.2	92.2
No	72	7.8	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement, whether the concept of sustainable development is rooted in on the value enunciated as ‘Loka samasta sukhino bhavanthu’, 92.2% of the samples has agreed and 7.8% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.29.

Figure 4.29: Responses for the statement: The concept of sustainable development is rooted in on the value enunciated as ‘Loka samasta sukhino bhavanthu’

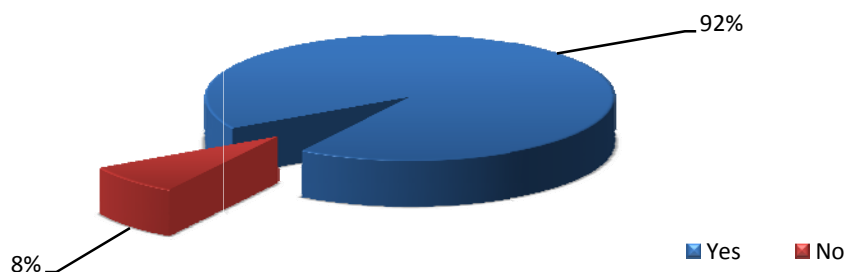


Table 4.30

Responses of the total sample for the statement: The concept of sustainable development is something to be practised in life rather than acquiring mere knowledge

Responses	Frequency	Percent	Cumulative Percent
Yes	808	87.8	87.8
No	112	12.2	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement, whether the concept of sustainable development is something to be practised in life rather than acquiring mere knowledge, 87.8.2% of the samples has agreed and 12.2% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.30.

Figure 4.30: Responses for the statement: The concept of sustainable development is something to be practised in life rather than acquiring mere knowledge

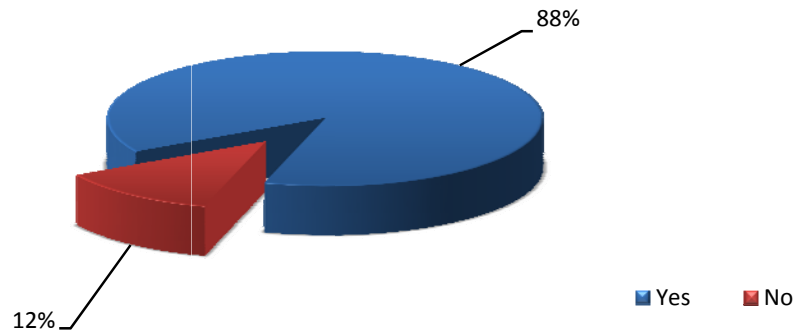


Table 4.31

Responses of the total sample for the question: Are you of opinion that the environmental problems are to be dealt with in the sequence of local, regional, national and international level

Responses	Frequency	Percent	Cumulative Percent
Yes	824	89.6	89.6
No	96	10.4	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they are of opinion that the environmental problems are to be dealt with in the sequence of local, regional, national and international level, 89.6% of the samples agreed and 10.4% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.31.

Figure 4.31: Responses for the question: Are you of opinion that the environmental problems are to be dealt with in the sequence of local, regional, national and international level?

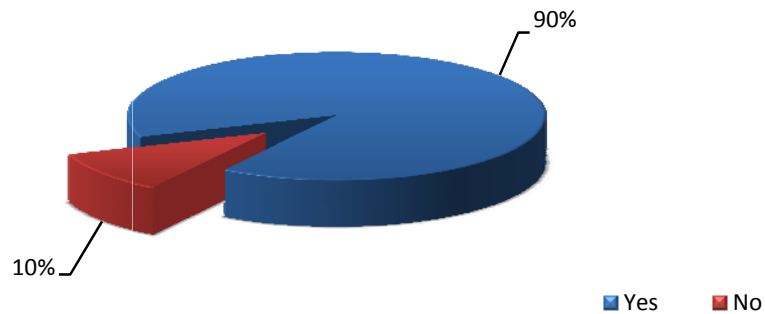


Table 4.32

Responses of the total sample for the statement: Ignorance regarding the consequences is a major reason for environmental degradation

Responses	Frequency	Percent	Cumulative Percent
Yes	793	86.2	86.2
No	127	13.8	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement whether they think the ignorance regarding the consequences is a major reason for environmental degradation, 86.2% of the samples have agreed and 13.8% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.32.

Figure 4.32: Percentage of responses for the statement: Ignorance regarding the consequences is a major reason for environmental degradation

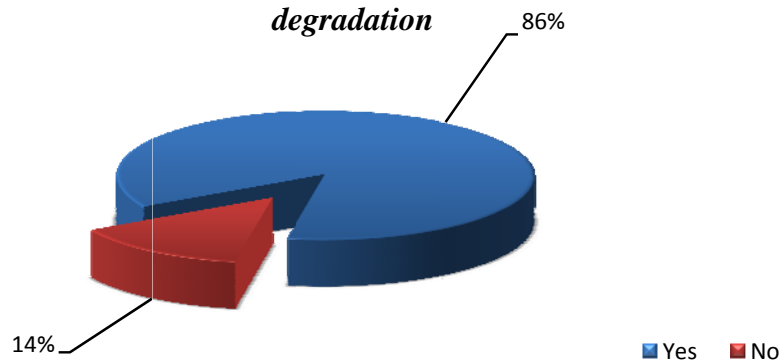


Table 4.33

Responses of the total sample for the question: Are you in favour of including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum?

Responses	Frequency	Percent	Cumulative Percent
Yes	860	93.4	93.4
No	60	6.6	100.0
Total	920	100.0	

The table of responses of the total sample, for the question whether they are in favour of including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum, 93.4% of the samples agreed and 6.6% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.33.

Figure 4.33: Percentage of subjects who are in favour of including appropriate activities and projects with regard to sustainable development in the school ad teacher education curriculum

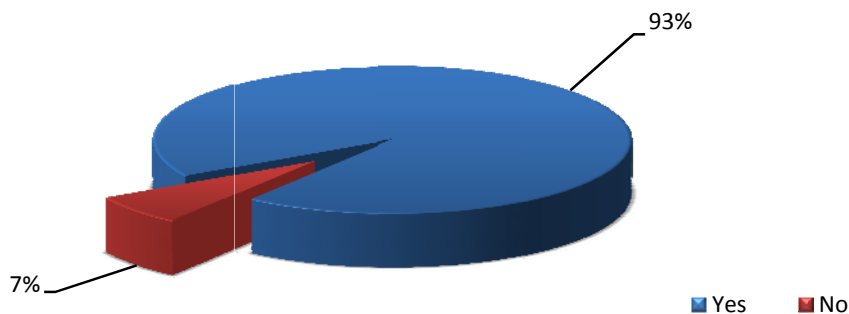


Table 4.34

Responses of the total sample for the statement: Manufactures should discourage the use of disposables

Responses	Frequency	Percent	Cumulative Percent
Yes	604	65.7	65.7
No	316	34.3	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement: ‘manufactures should discourage the use of disposables’, 65.7% of the samples have agreed and 34.3% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.34.

Figure 4.34: Responses for the statement: Manufactures should discourage the use of disposables

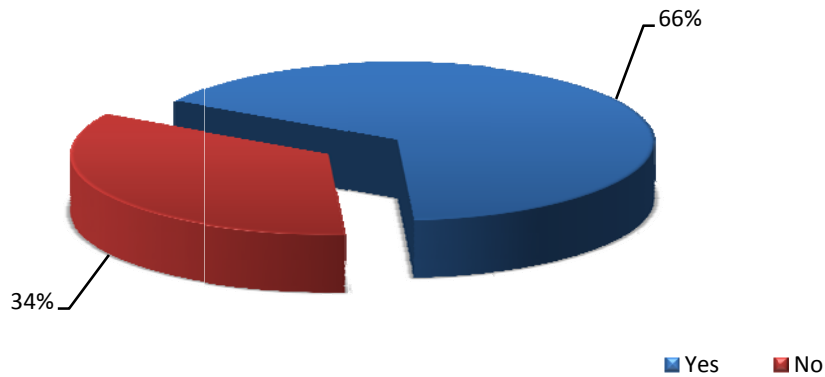


Table 4.35

Responses of the total sample for the statement: We need stricter laws and regulations to protect the environment

Responses	Frequency	Percent	Cumulative Percent
Yes	861	93.6	93.6
No	59	6.4	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement: we need stricter laws and regulations to protect the environment, 93.6% of the samples have agreed and 6.4% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.35.

Figure 4.35: Responses for the statement: We need stricter laws and regulations to protect the environment

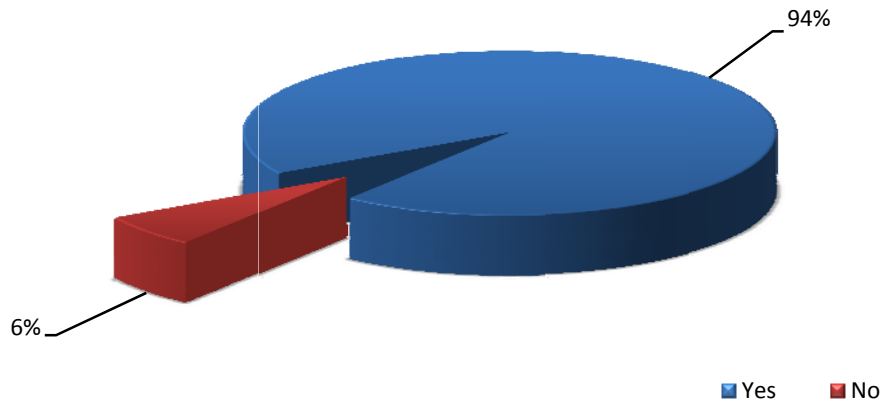


Table 4.36

Responses of the total sample for the statement: Sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries

Responses	Frequency	Percent	Cumulative Percent
Yes	586	63.7	63.7
No	334	36.3	100.0
Total	920	100.0	

The table of responses of the total sample, for the statement: ‘sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries’, 63.7% of the samples have agreed and 36.3% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.36.

Figure 4.36: Responses for the statement: Sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries

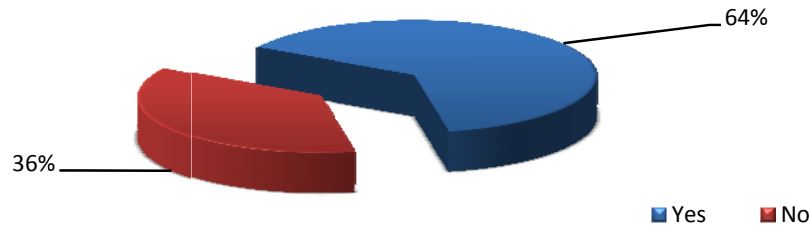


Table 4.37

Responses of the total sample for the statement: Companies that are environmentally sustainable are more likely to be profitable over the long run

Responses	Frequency	Percent	Cumulative Percent
Yes	260	28.3	28.3
No	660	71.7	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement; companies that are environmentally sustainable are more likely to be profitable over the long run, 28.3% of the samples have agreed and 71.7% of the subjects did not agree. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.37.

Figure 4.37: Responses for the statement that companies that are environmentally sustainable are more likely to be profitable over the long run

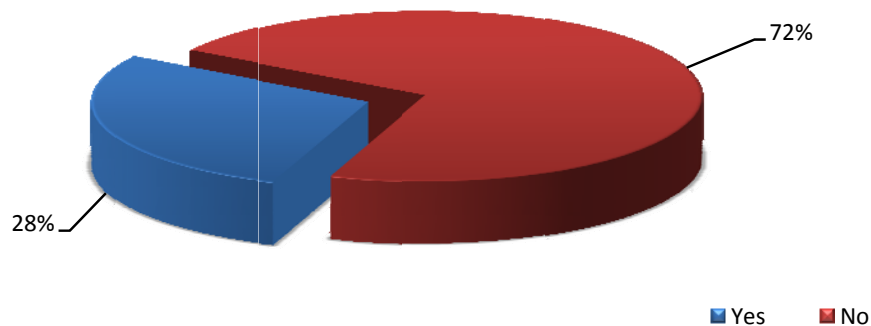


Table 4.38

Responses of the total sample for the question: Is the Education for Sustainable Development project declared by UNESCO?

Responses	Frequency	Percent	Cumulative Percent
Yes	662	72.0	72.0
No	258	28.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether the Education for Sustainable Development project is declared by UNESCO, 72.0% of the samples have agreed and 28.0% of the subjects did not agree. The graphical representation of the responses of the total sample for the above question is shown in figure 4.38.

Figure 4.38: Percentage of subjects who think that Education for Sustainable Development project is declared by UNESCO

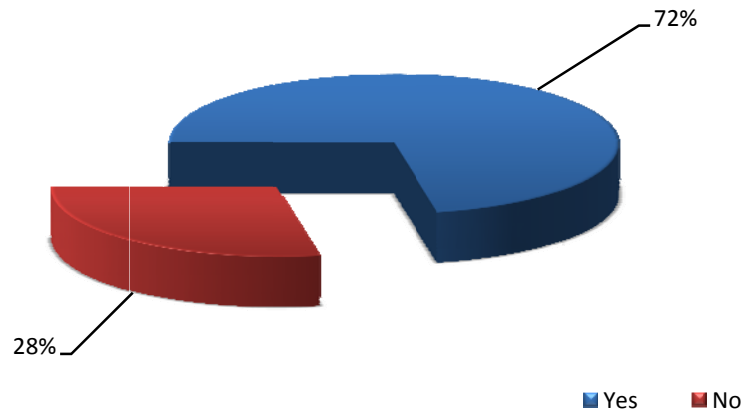


Table 4.39
Responses of the total sample for the question: Do you know about Agenda 21 of Rio Earth Summit?

Responses	Frequency	Percent	Cumulative Percent
Yes	268	29.1	29.1
No	652	70.9	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question ‘do you know about Agenda 21 of Rio Earth Summit, 29.1% of the samples had knowledge and 70.9% of the subjects did not have the knowledge regarding the same.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.39.

Figure 4.39: Responses of the subjects about knowledge regarding Agenda 21 of Rio Earth Summit

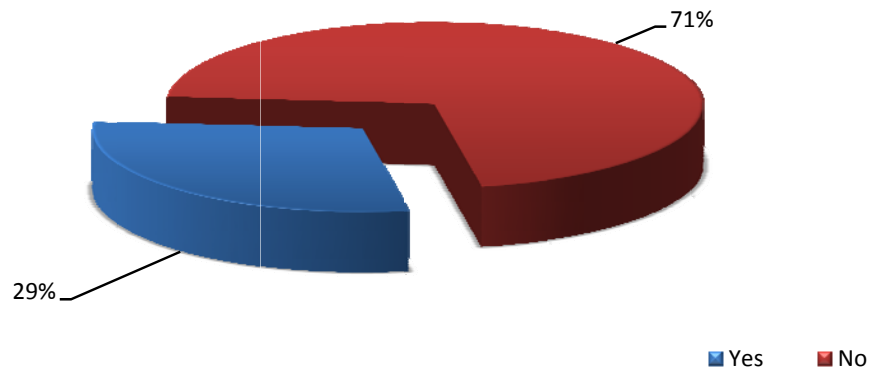


Table 4.40

Responses of the total sample for the question: Do you know about the document ‘our common future’?

Responses	Frequency	Percent	Cumulative Percent
Yes	245	26.6	26.6
No	675	73.4	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they know about the document ‘our common future’, 26.6% of the samples had knowledge regarding the above, whereas 73.4% of the subjects had no knowledge regarding the same.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.40.

Figure 4.40: Percentage of subjects who had knowledge about the document ‘our common future’

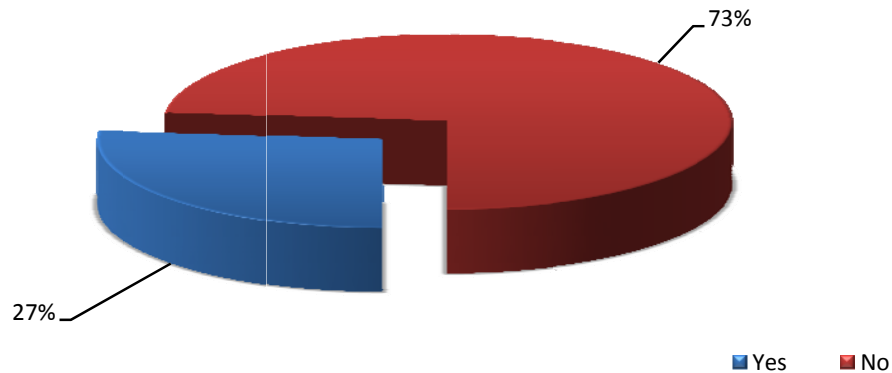


Table 4.41.

Responses of the total sample for the question: Do you think that the campus has a practical role in sustaining the ecosystem?

Responses	Frequency	Percent	Cumulative Percent
Yes	838	91.1	91.1
No	82	8.9	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they think that the campus has a practical role in sustaining the ecosystem? 91.1% of the samples have agreed and 8.9% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.41.

Figure 4.41: Percentage of subjects who think that the campus has a practical role in sustaining the ecosystem

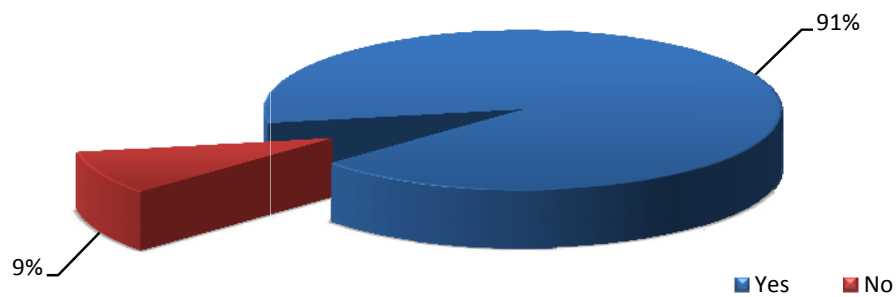


Table 4.42a

Responses of the total sample for the question: Do you have awareness about renewable energy?

Responses	Frequency	Percent	Cumulative Percent
Yes	769	83.6	83.6
No	151	16.4	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about renewable energy, 83.6% of the samples had awareness, whereas 16.4% of the subjects did not have awareness regarding the same.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.47a.

Figure 4.42a: Percentage of subjects who know about renewable energy

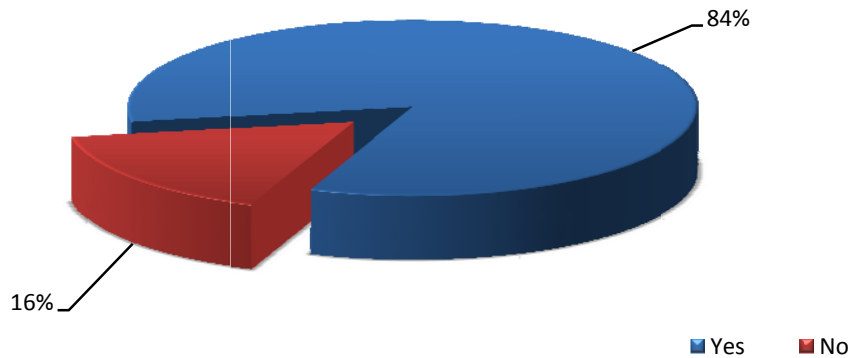


Table 4.42b

Responses of the total sample for the question: Do you have awareness about sustainable building design/green design

Responses	Frequency	Percent	Cumulative Percent
Yes	423	46.0	46.0
No	497	54.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about sustainable building design/green design, 46.0% of the samples had awareness, whereas 54.0% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42b.

Figure 4.42b: Percentage of subjects who know about sustainable building design/green design

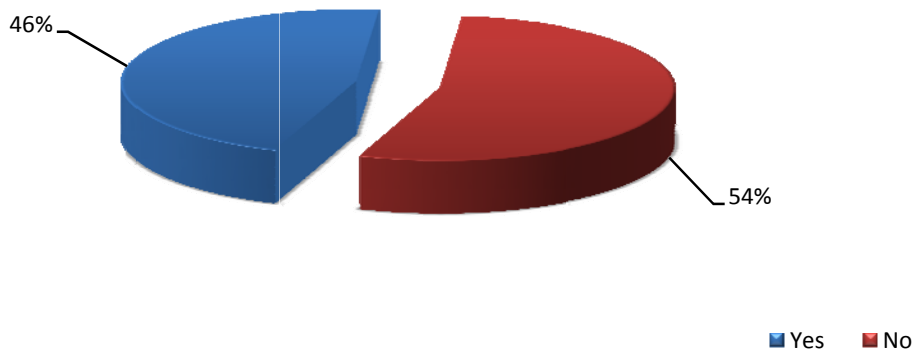


Table 4.42c

Responses of the total sample for the question: Do you have awareness about ecological economics

Responses	Frequency	Percent	Cumulative Percent
Yes	409	44.5	44.5
No	511	55.5	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about ecological economics, 44.5% of the samples had awareness, whereas 55.5% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42c.

Figure 4.42c: Percentage of subjects who had awareness about ecological economics

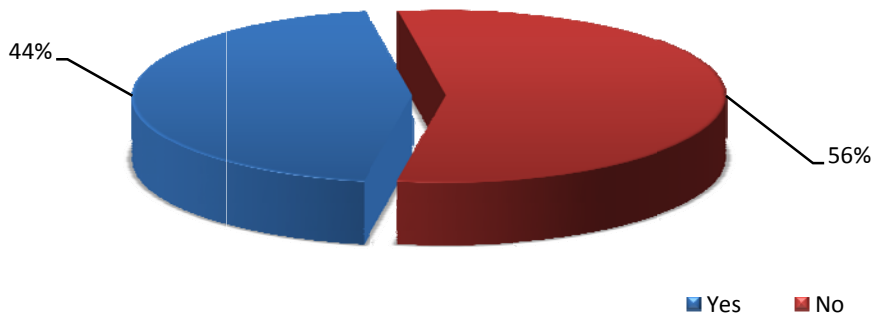


Table 4.42d

Responses of the total sample for the question: Do you have awareness about sustainable agriculture

Responses	Frequency	Percent	Cumulative Percent
Yes	736	80.0	80.0
No	184	20.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about sustainable agriculture, 80.0% of the samples had awareness, whereas 20.0% of the subjects did not have awareness. The graphical representation of the responses of the total sample for the above question is shown in figure 4.42d.

Figure 4.42d: Percentage of who had awareness about sustainable agriculture

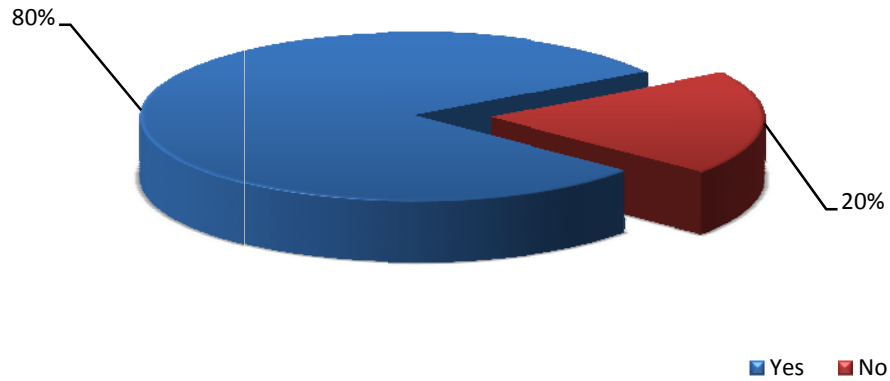


Table 4.42e

Responses of the total sample for the question: Do you have awareness about sustainable forestry

Responses	Frequency	Percent	Cumulative Percent
Yes	208	22.6	22.6
No	712	77.4	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about sustainable forestry, only 22.6% of the samples had awareness, whereas 77.4% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42e.

Figure 4.42e: Percentage of subjects who had awareness about sustainable forestry

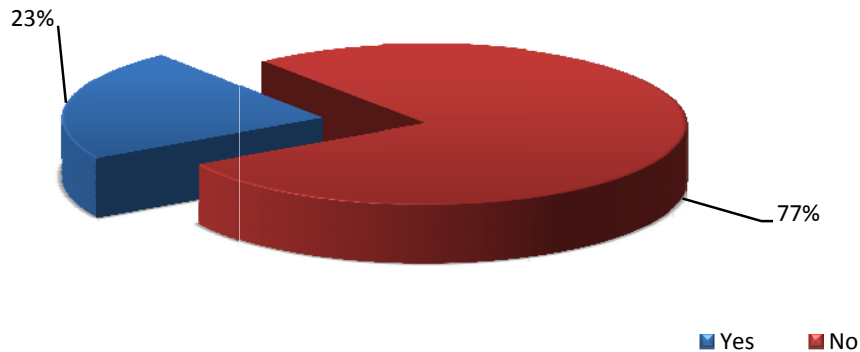


Table 4.42f

Responses of the total sample for the question: Do you have awareness about indigenous wisdom and technologies

Responses	Frequency	Percent	Cumulative Percent
Yes	385	41.8	41.8
No	535	58.2	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about indigenous wisdom and technologies, 41.8% of the samples had awareness and 58.2% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42f

Figure 4.42f: Percentage of subjects who had awareness about indigenous wisdom and technologies

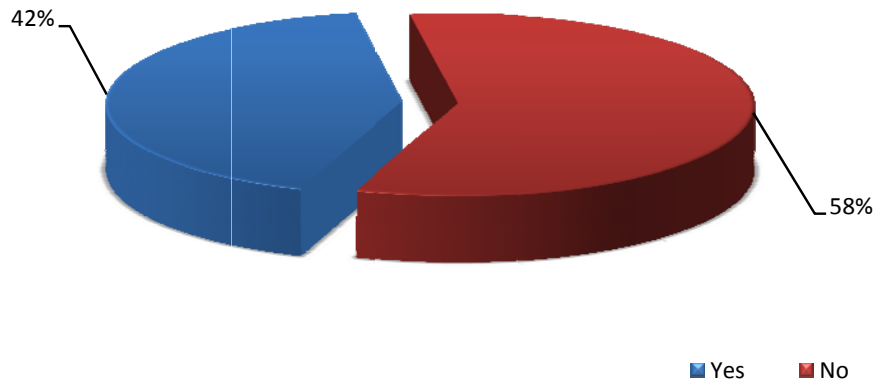


Table 4.42g

Responses of the total sample for the question: Do you have awareness about sustainable transportation

Responses	Frequency	Percent	Cumulative Percent
Yes	370	40.2	40.2
No	550	59.8	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about sustainable transportation, 40.2% of the samples had awareness and 59.8% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42g

Figure 4.42g: Percentage of subjects who had awareness about sustainable transportation

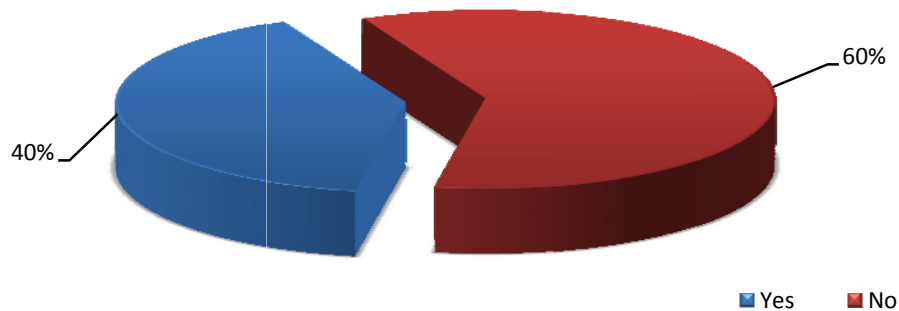


Table 4.42h

Responses of the total sample for the question: Do you have awareness about green purchasing

Responses	Frequency	Percent	Cumulative Percent
Yes	434	47.2	47.2
No	486	52.8	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about green purchasing, 47.2% of the samples had awareness and 52.8% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.42h.

Figure 4.42h: Percentage of subjects who had awareness about green purchasing

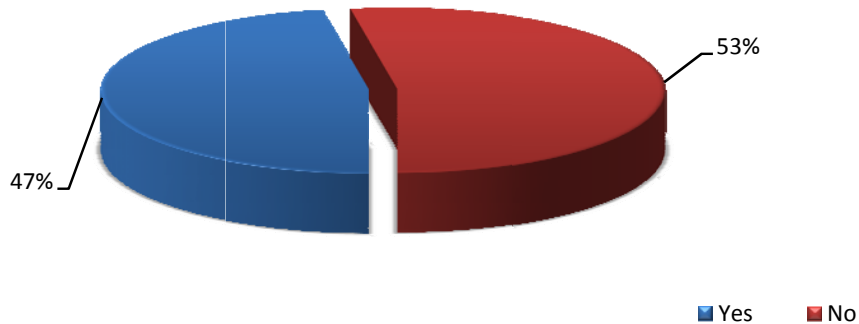


Table 4.42i

Responses of the total sample for the question: Do you have awareness about environmental audit

Responses	Frequency	Percent	Cumulative Percent
Yes	331	36.0	36.0
No	589	64.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the question whether they have awareness about environmental audit, 36.0% of the samples had awareness and 64.0% of the subjects did not have awareness.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.47i

Figure 4.47i: Percentage of subjects who had awareness about environmental audit

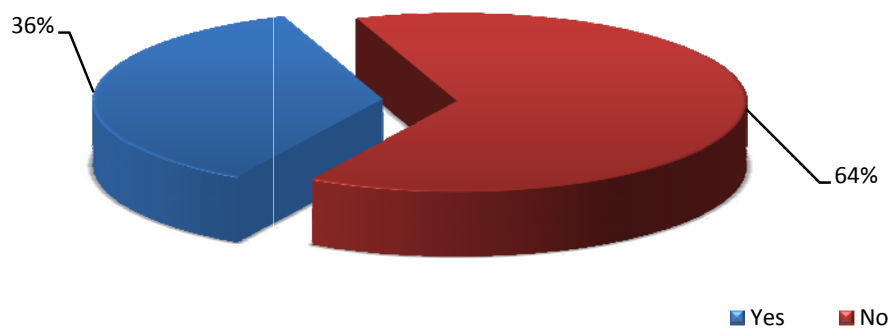


Table 4.43

Responses of the total sample for the statement: There is no point in getting involved in environmental issues, since government have all the power and can do what they like

Responses	Frequency	Percent	Cumulative Percent
Yes	335	36.4	36.4
No	585	63.6	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement, ‘there is no point in getting involved in environmental issues, since government have all the power and can do what they like’, 36.4% of the samples agreed and 63.6% of the subjects did not agree. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.43.

Figure 4.43: Responses for the statement: There is no point in getting involved in environmental issues, since government have all the power and can do what they like

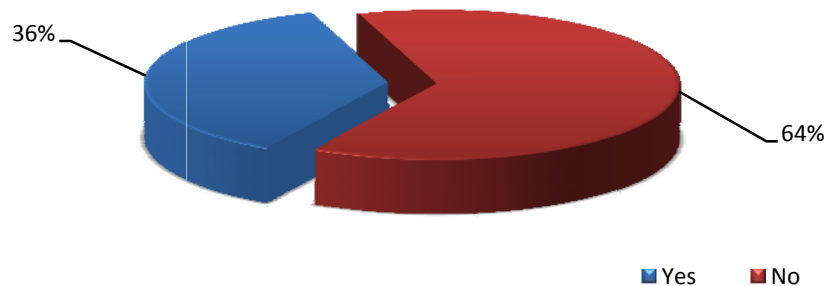


Table 4.44

Responses of the total sample for the statement: Gender equality has nothing to do with sustainable development

Responses	Frequency	Percent	Cumulative Percent
Yes	515	56.0	56.0
No	405	44.0	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement gender equality has nothing to do with sustainable development, 56.0% of the samples have agreed and 44.0% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.44.

Figure 4.44: Percentage of response for the statement gender equality has nothing to do with sustainable development

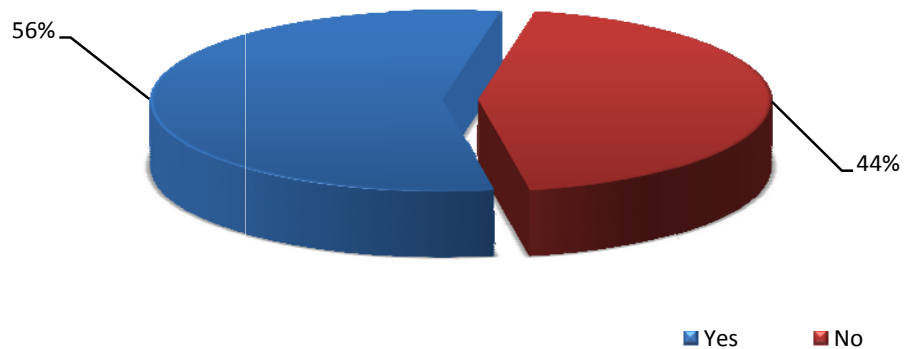


Table 4.45

Responses of the total sample for the statement: At home I try to recycle as much as I can

Responses	Frequency	Percent	Cumulative Percent
Yes	771	83.8	83.8
No	149	16.2	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they try to recycle as much as they can 83.8% of the samples responded yes and 16.2% of the subjects responded no to the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.45.

Figure 4.45: Percentage of subjects who try to recycle as much as they can

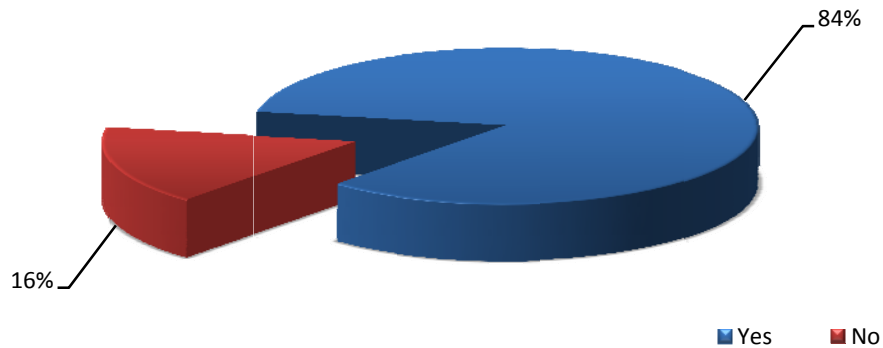


Table 4.46

Responses of the total sample for the statement: I have taken a seminar/ course, in which sustainable development was discussed

Responses	Frequency	Percent	Cumulative Percent
Yes	434	47.2	47.2
No	486	52.8	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they have taken a seminar/course, where sustainable development was discussed 47.2% of the samples responded yes and 52.8% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.46.

Figure 4.46: Percentage of subjects who have taken a seminar/ course, in which sustainable development was discussed

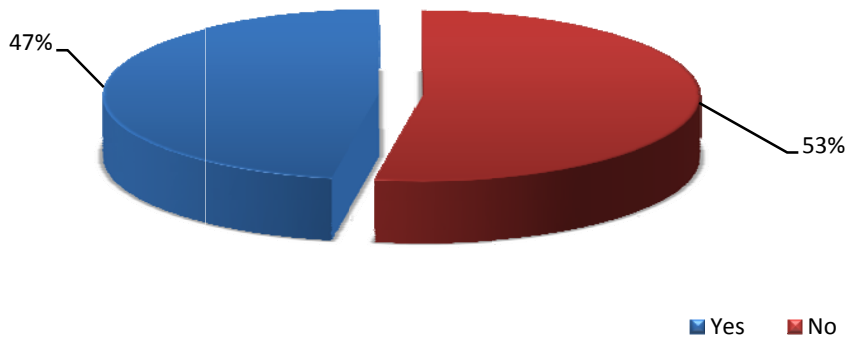


Table 4.47

Responses of the total sample for the statement: I talk to others about how to help people living in poverty

Responses	Frequency	Percent	Cumulative Percent
Yes	761	82.7	82.7
No	159	17.3	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they talk to others about how to help people living in poverty, 82.7% of the samples responded yes and 17.3% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.47.

Figure 4.47: Percentage of subjects who talk to others about how to help people living in poverty

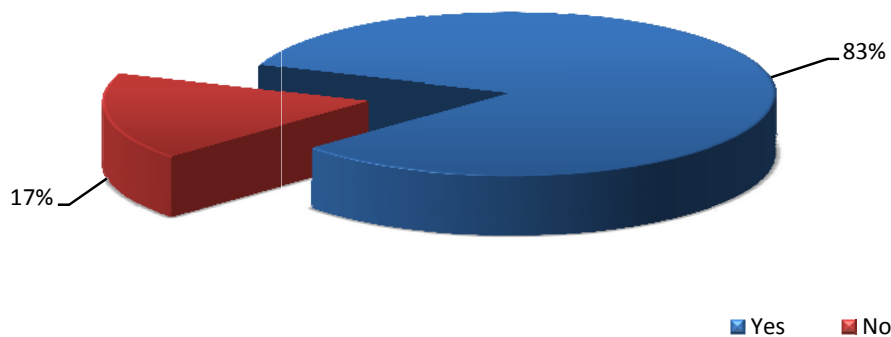


Table 4.48
Responses of the total sample for the statement: I vote in public elections

Responses	Frequency	Percent	Cumulative Percent
Yes	850	92.4	92.4
No	70	7.6	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they vote in public elections, 92.4% of the samples responded yes and 7.6% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.48

Figure 4.48: Percentage of subjects who vote in public elections

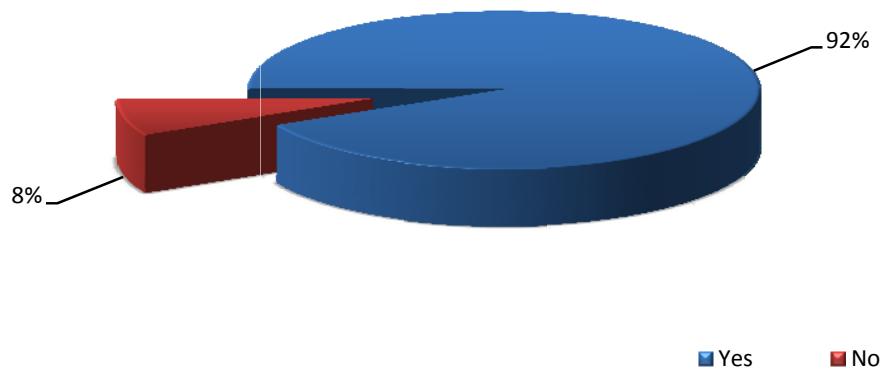


Table 4.49

Responses of the total sample for the statement: I often look for signs of ecosystem deterioration

Responses	Frequency	Percent	Cumulative Percent
Yes	303	32.9	32.9
No	617	67.1	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they often look for signs of ecosystem deterioration, 32.9% of the samples responded yes and 67.1% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.49.

Figure 4.49: Percentage of subjects who often look for signs of ecosystem deterioration

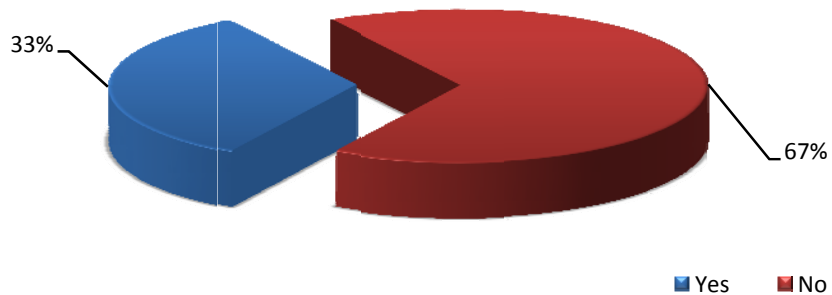


Table 4.50

Responses of the total sample for the statement: The household task in my home are equally shared among family members regardless of gender

Responses	Frequency	Percent	Cumulative Percent
Yes	746	81.1	81.1
No	174	18.9	100.0
Total	920	100.0	

The above table of responses of the total sample, for the statement whether they share household tasks equally among family members regardless of gender, 81.1% of the samples responded yes and 18.9% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.50.

Figure 4.50: Percentage of subjects who share household tasks equally among family members regardless of gender

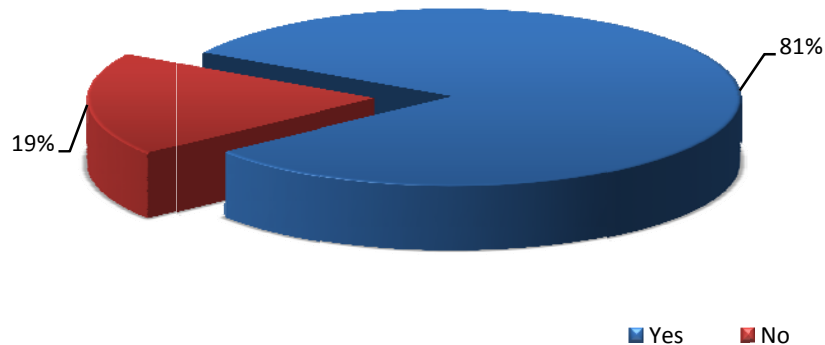


Table 4.51

Responses of the total sample for the statement: I try to avoid purchasing goods from companies with poor track record on corporate social responsibility

Responses	Frequency	Percent	Cumulative Percent
Yes	696	75.7	75.7
No	224	24.3	100.0
Total	920	100.0	

The above table of response of the total sample, for the statement whether they try to avoid purchasing from companies with poor track record on corporate social responsibility, 75.7% of the samples have agreed and 24.3% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.51.

Figure 4.51: Percentage of subjects who try to avoid purchasing goods from companies with poor track record on corporate social responsibility

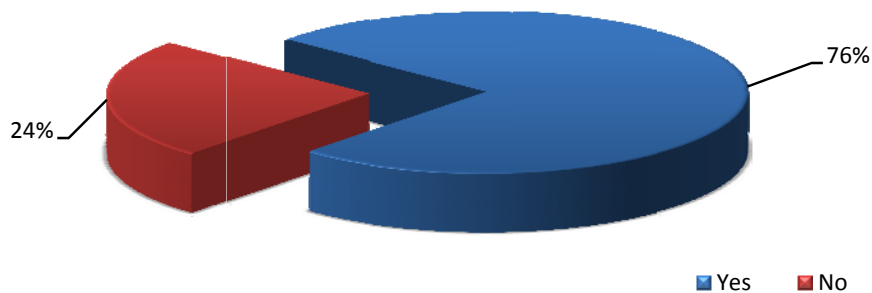


Table 4.52

Responses of the total sample for the statement: I changed my personal life style to reduce waste

Responses	Frequency	Percent	Cumulative Percent
Yes	781	84.9	84.9
No	139	15.1	100.0
Total	920	100.0	

The above table of response of the total sample, for the statement whether they changed their life style to reduce waste, 84.9% of the samples have agreed and 15.1% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.52.

Figure 4.52: Percentage of subjects who changed their life style to reduce waste

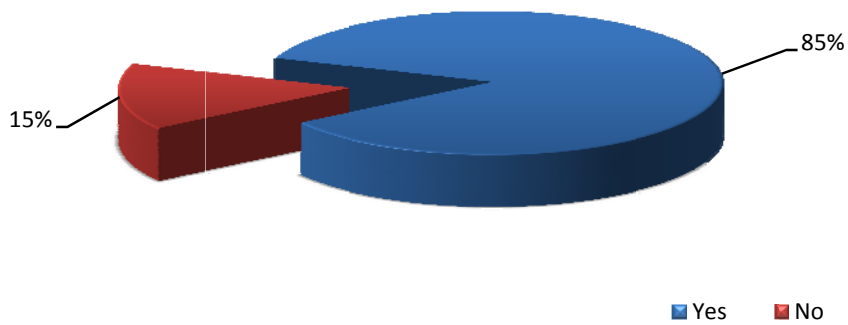


Table 4.53

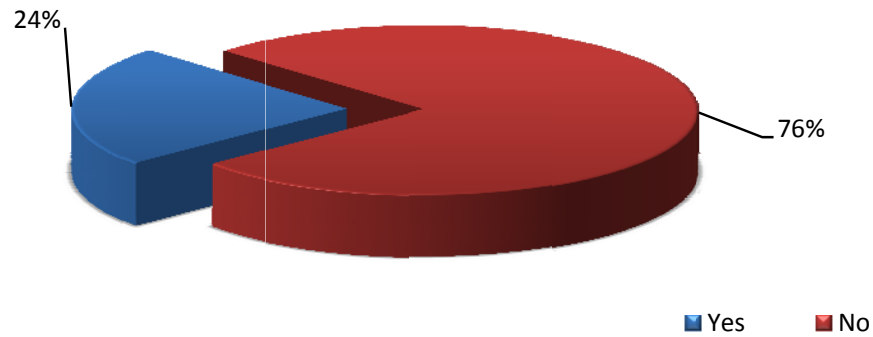
Responses of the total sample for the statement: I volunteer to work with local charities

Responses	Frequency	Percent	Cumulative Percent
Yes	221	24.0	24.0
No	699	76.0	100.0
Total	920	100.0	

The above table of response of the total sample, for the statement whether they volunteer to work with local charities, 24.0% of the samples responded yes and 76.0% of the subjects responded no.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.53.

Figure 4.53: Percentage of subjects who volunteer to work with local charities



The analysis of stream wise response categorized as science, language and arts are presented below.

Table 4.54

Stream wise responses of the sample for the question: How much are you aware about the concepts of sustainable development?

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	43	93	291	27	454
	Percent	9.5%	20.5%	64.1%	5.9%	100.0%
Language	Frequency	26	62	155	24	267
	Percent	9.7%	23.2%	58.1%	9.0%	100.0%
Arts	Frequency	33	51	103	12	199
	Percent	16.6%	25.6%	51.8%	6.0%	100.0%
Total	Frequency	102	206	549	63	920
	Percent	11.1%	22.4%	59.7%	6.8%	100.0%

The above table of responses regarding awareness about sustainable development reveals that 16.6% of arts stream students responded of having awareness to greater extent, whereas only 9.7% and 9.5% of language and science stream students respectively responded that they had awareness to *greater extent*. The relative responses stream wise indicated almost similar percentages for the awareness to some extent and *very little extent* among the sub samples. However, it was found that 9.0% of language students,

6.0% of arts students and 5.9% of science students responded as not having any awareness at all regarding sustainable development.

The graphical representation of the responses stream wise is shown in figure 4.54

Figure 4.54: Stream wise percentage of awareness about the concepts of sustainable development

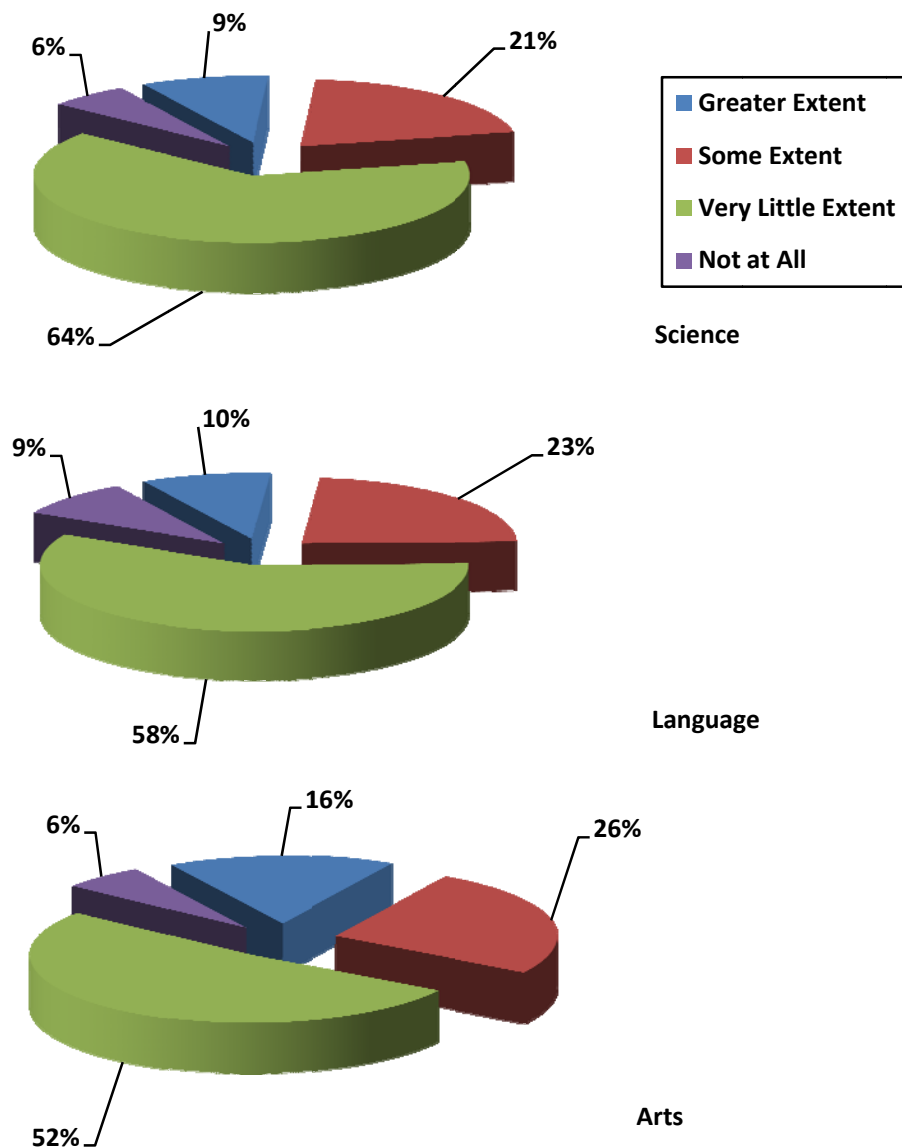


Table 4.55

Stream wise responses of the sample for the question: To what extent you agree that awareness of Education for Sustainable Development is relevant in the present age?

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	275	112	50	17	454
	Percent	60.6%	24.7%	11.0%	3.7%	100.0%
Language	Frequency	156	70	27	14	267
	Percent	58.4%	26.2%	10.1%	5.2%	100.0%
Arts	Frequency	112	72	14	1	199
	Percent	56.3%	36.2%	7.0%	.5%	100.0%
Total	Frequency	543	254	91	32	920
	Percent	59.0%	27.6%	9.9%	3.5%	100.0%

The above table of responses regarding the extent to which they agree on the awareness of Education for Sustainable Development is relevant in the present age reveals majority of the students responded to *greater extent* in all the three streams. Almost similar percentages of students belonging to the different streams responded to the other different categories viz, *some extent*, *very little extent* and *not at all*. The graphical representation of the responses stream wise is shown in figure 4.55.

Figure 4.55: Stream wise percentage of subject's agreement that awareness of Education for Sustainable Development is relevant in the present age

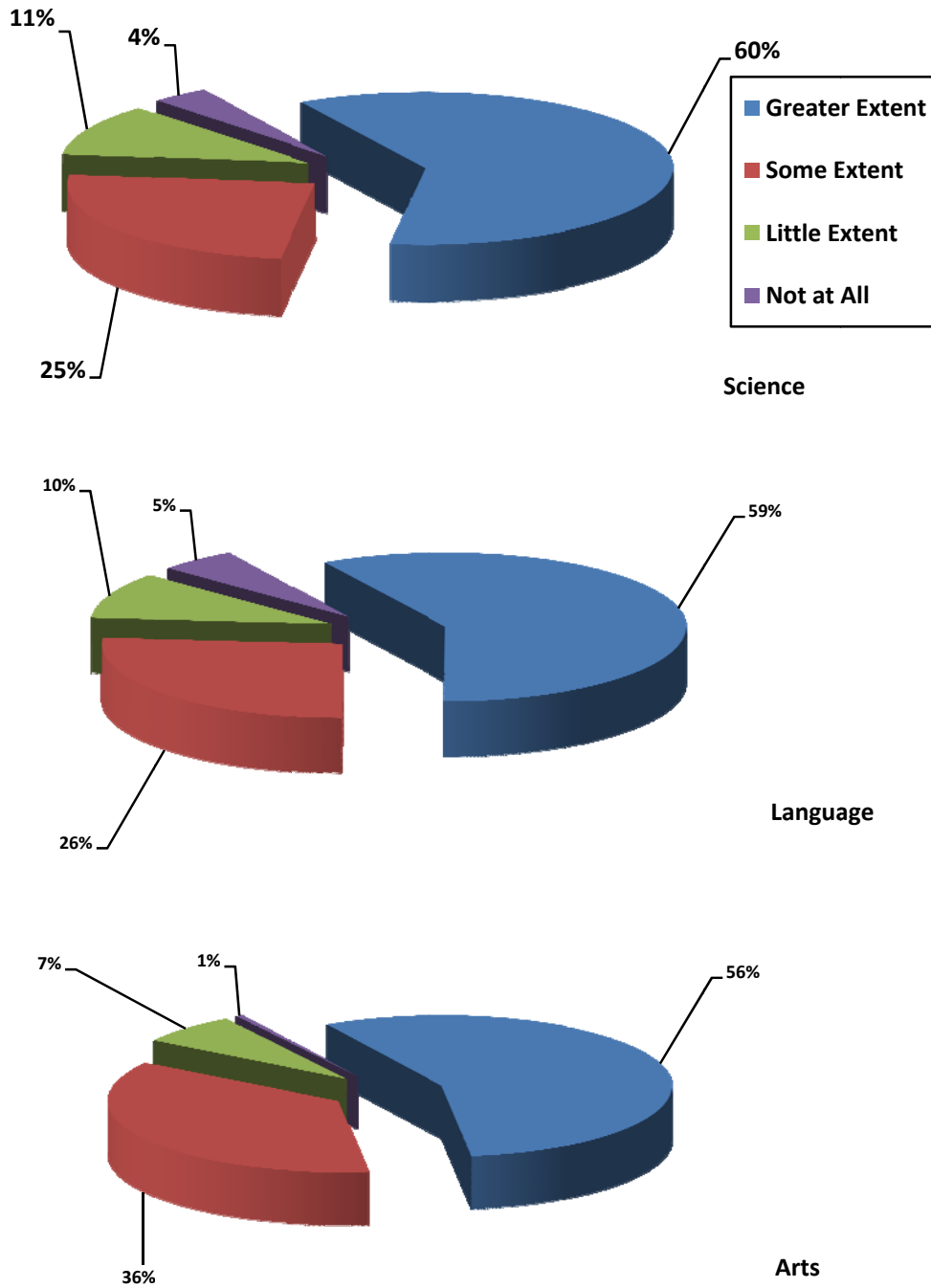


Table 4.56

Stream wise responses of the total sample for the question: To what extent you are in favour of promoting Education for Sustainable Development in teacher education?

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	276	118	53	7	454
	Percent	60.8%	26.0%	11.7%	1.5%	100.0%
Language	Frequency	154	84	22	7	267
	Percent	57.7%	31.5%	8.2%	2.6%	100.0%
Arts	Frequency	128	62	7	2	199
	Percent	64.3%	31.2%	3.5%	1.0%	100.0%
Total	Frequency	558	264	82	16	920
	Percent	60.7%	28.7%	8.9%	1.7%	100.0%

The above table of responses regarding the extent of favouring promoting of Education for Sustainable Development in teacher education reveals that majority of the students; 64.3% of arts stream; 60.8% in science stream and 57.7% in language stream students respectively responded that they favoured to *greater extent*. However, it was found that 2.6% of language students, 1.5% of science students and 1% of arts students responded as not in favour of promoting Education for Sustainable Development in teacher education.

The graphical representation of the responses stream wise is shown in figure 4.56.

Figure 4.56: Stream wise percentage of subject's who are in favour of promoting Education for Sustainable Development in teacher education

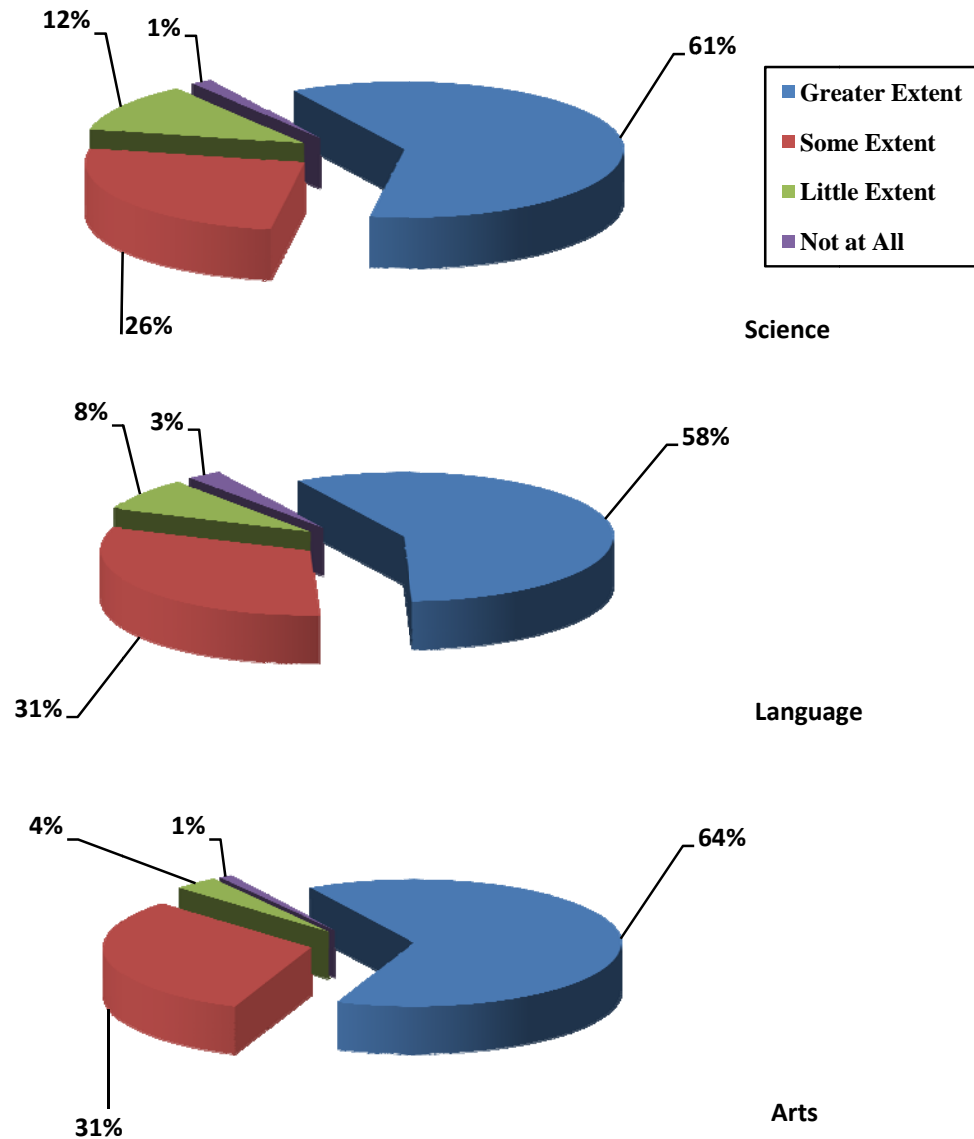


Table 4.57

Stream wise responses of the total sample for the question: How far the present policy of national development has given due consideration for environmental protection leading to sustainable development

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	66	208	155	25	454
	Percent	14.5%	45.8%	34.1%	5.5%	100.0%
Language	Frequency	39	135	83	10	267
	Percent	14.6%	50.6%	31.1%	3.7%	100.0%
Arts	Frequency	35	102	58	4	199
	Percent	17.6%	51.3%	29.1%	2.0%	100.0%
Total	Frequency	140	445	296	39	920
	Percent	15.2%	48.4%	32.2%	4.2%	100.0%

The above table of responses for the question ‘how far the present policy of national development has given due consideration for environmental protection leading to sustainable development?’ reveals that 51.3% of arts stream students responded in the category *some extent*, whereas only 50.6% and 45.8% of language and science stream students respectively responded to *some extent*. The relative responses stream wise responses indicated almost similar percentages for the opinion to *greater extent* and *very little extent* among the sub samples. However, it was found that 5.5% of science students, 3.7% of language students and 2.0% of arts students responded in the category *not at all*.

The graphical representation of the responses stream wise is shown in figure 4.57.

Figure 4.57: Stream wise percentage of subject's responses for how far the present policy of national development given due consideration for environmental protection leading to sustainable development

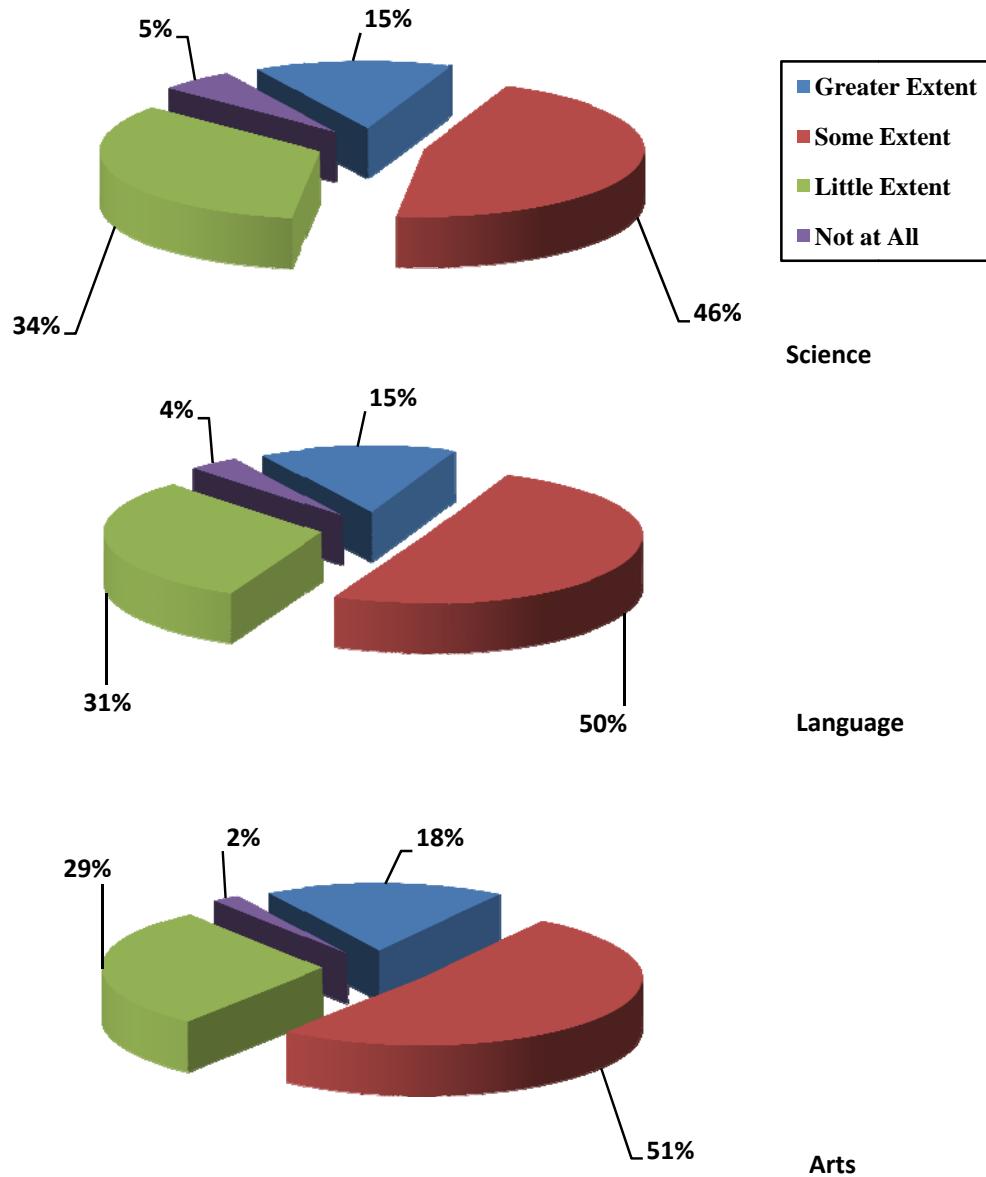


Table 4.58

Stream wise responses of the total sample for the statement: poverty is a problem related to environmental degradation

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	98	135	196	25	454
	Percent	21.6%	29.7%	43.2%	5.5%	100.0%
Language	Frequency	49	100	106	12	267
	Percent	18.4%	37.5%	39.7%	4.5%	100.0%
Arts	Frequency	37	88	62	12	199
	Percent	18.6%	44.2%	31.2%	6.0%	100.0%
Total	Frequency	184	323	364	49	920
	Percent	20.0%	35.1%	39.6%	5.3%	100.0%

The above table of responses for the statement, ‘poverty is a problem related to environmental degradation’, 21.6% of science stream students agreed to *greater extent*, whereas 18.4% and 18.6% of language and arts stream students respectively agreed to *greater extent*. The relative responses stream wise indicated that around 30 to 40% of subjects from all the streams agreed to *some extent* and *very little extent* for the above statement. However, it was found that 6.0% of arts students, 5.5% of science students and 4.5% of language students did not agree that poverty is a problem related to environmental degradation.

The graphical representation of the responses stream wise is shown in figure 4.58

Figure 4.58: Stream wise percentage of subject's agreement that poverty is a problem related to environmental degradation

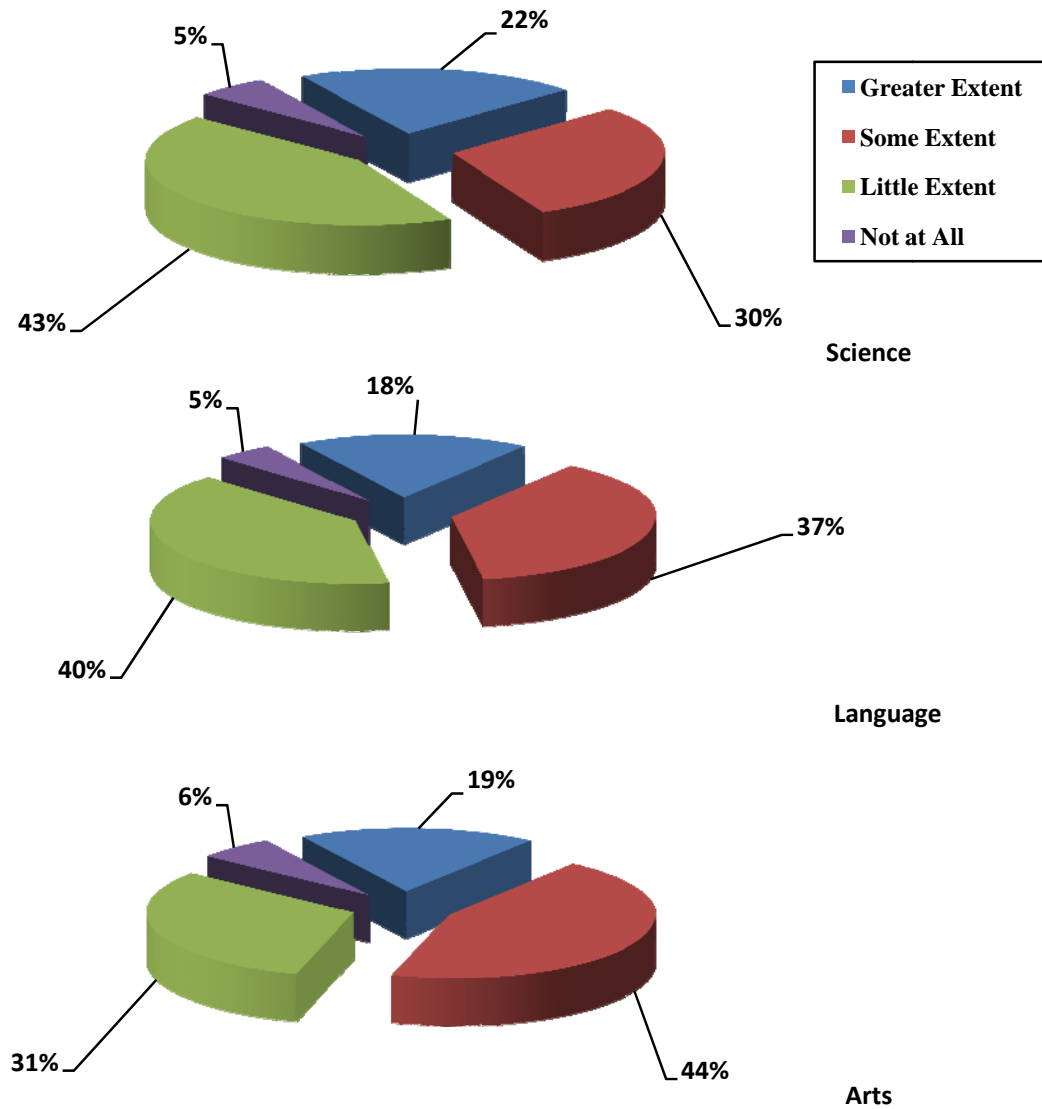


Table 4.59

Stream wise responses of the total sample for the statement: Democracy and human rights have a role in environmental protection and human development

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	40	272	139	3	454
	Percent	8.8%	59.9%	30.6%	.7%	100.0%
Language	Frequency	16	173	73	5	267
	Percent	6.0%	64.8%	27.3%	1.9%	100.0%
Arts	Frequency	10	137	46	6	199
	Percent	5.0%	68.8%	23.1%	3.0%	100.0%
Total	Frequency	66	582	258	14	920
	Percent	7.2%	63.3%	28.0%	1.5%	100.0%

The above table of responses for the statement that democracy and human rights has a role in environmental protection and human development reveals that very less percentage of subjects 8.8%, 6% and 5% respectively from science, language and arts respectively agreed *greater extent* to the statement. Majority of the sub samples 68.8% of arts, 64.8% and 59.9% of language and science stream students respectively agreed to *some extent*. The relative responses stream wise indicated almost similar percentages for the awareness to *very little extent* and *not at all* for the above statement.

The graphical representation of the responses stream wise is shown in figure 4.59

Figure 4.59: Stream wise percentage of subject's agreement that awareness of democracy and human rights have a role in environmental protection and human development

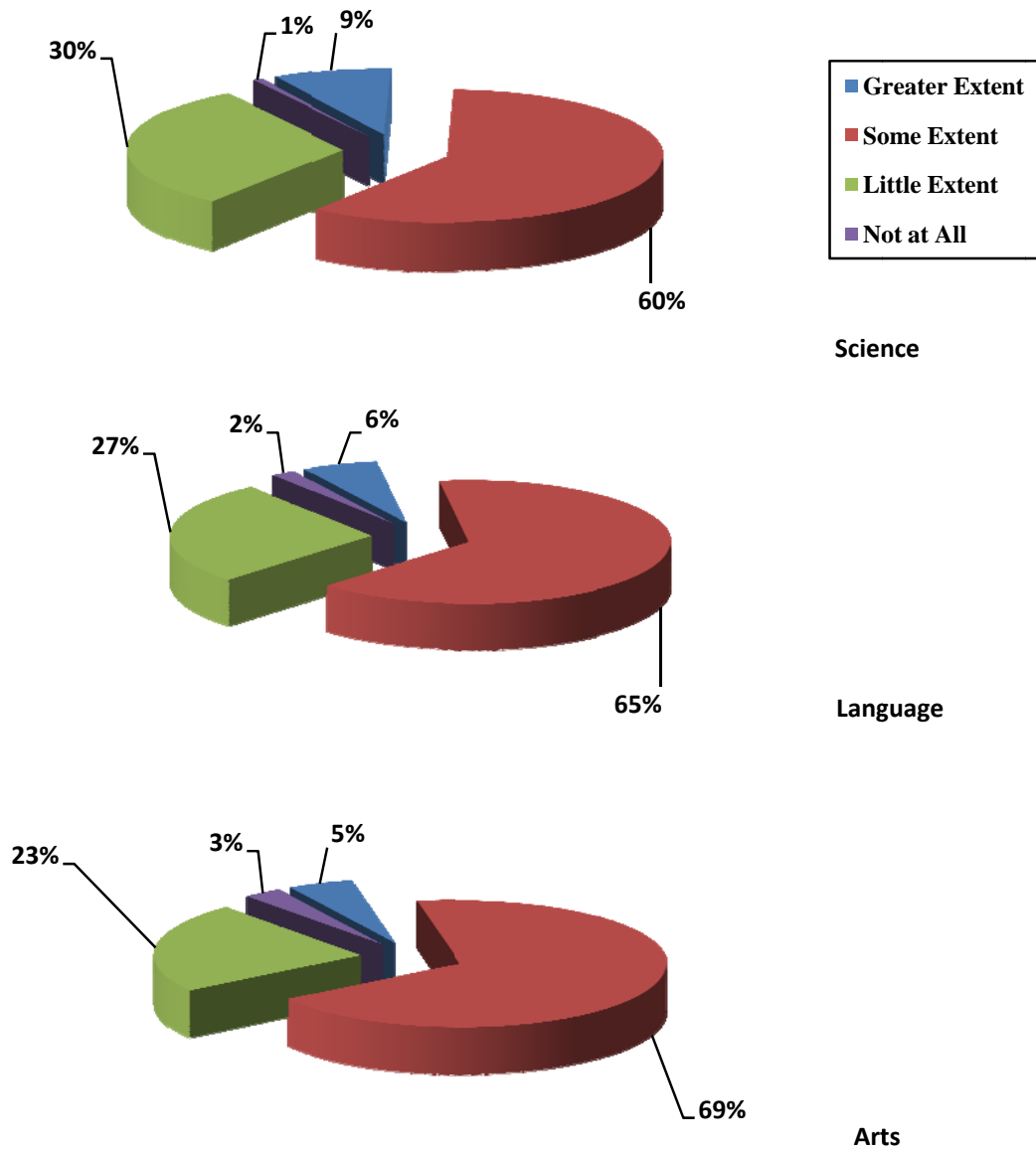


Table 4.60

Stream wise responses of the total sample for the statement: Ecosystem influences economic development and standard of living

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	168	253	29	4	454
	Percent	37.0%	55.7%	6.4%	.9%	100.0%
Language	Frequency	89	149	17	12	267
	Percent	33.3%	55.8%	6.4%	4.5%	100.0%
Arts	Frequency	60	124	9	6	199
	Percent	30.2%	62.3%	4.5%	3.0%	100.0%
Total	Frequency	317	526	55	22	920
	Percent	34.5%	57.2%	6.0%	2.4%	100.0%

The above table of responses for the statement that ecosystem influences economic development and standard of living reveals that majority of the subjects from all the streams agreed to *some extent* (62.3% of arts stream, 55.8% and 55.7% of language and science stream). The relative responses stream wise indicated almost similar percentages for the awareness to *greater extent* and *very little extent* among the sub samples. However, it was found that 4.5% of language students, 3.0% of arts students and 0.9% of science students responded *not at all* to the above statement

The graphical representation of the responses stream wise is shown in figure 4.60

Figure 4.60: Stream wise percentage of subject's responses for the statement that ecosystem influences economic development and standard of living

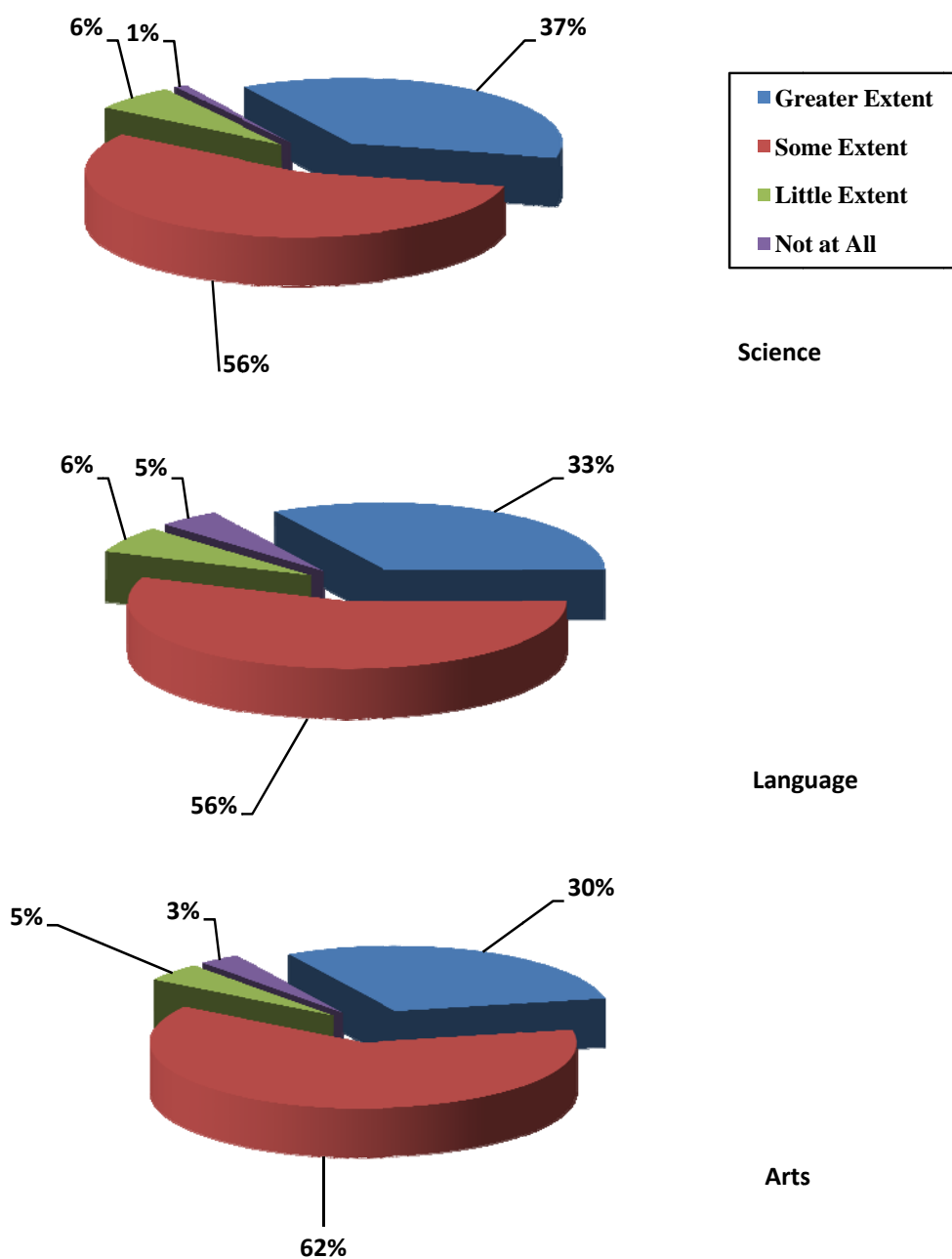


Table 4.61

Stream wise responses of the total sample for the statement: The Environmental Education curriculum at present deal with areas like peace, equity, gender issues, fraternity, social justice etc?

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	38	91	206	119	454
	Percent	8.4%	20.0%	45.4%	26.2%	100.0%
Language	Frequency	37	46	128	56	267
	Percent	13.9%	17.2%	47.9%	21.0%	100.0%
Arts	Frequency	5	29	122	43	199
	Percent	2.5%	14.6%	61.3%	21.6%	100.0%
Total	Frequency	80	166	456	218	920
	Percent	8.7%	18.0%	49.6%	23.7%	100.0%

The above table of responses regarding the statement whether Environmental Education curriculum at present deal with areas like peace, equity, gender issues, fraternity, social justice etc. reveals that majority of students in all the streams agreed to the above statement to *very little extent*. 13.9% of language students agreed to *greater extent*, whereas 8.4% of science and only 2.5% of arts students agreed to *greater extent*. The relative responses stream wise indicated almost similar percentages of to *some extent* among the sub samples.

The graphical representation of the responses stream wise is shown in figure 4.61

Figure 4.61: Stream wise percentage of subject's response to the statement Environmental Education curriculum at present deal with areas like peace, equity, gender issues, fraternity, social justice etc

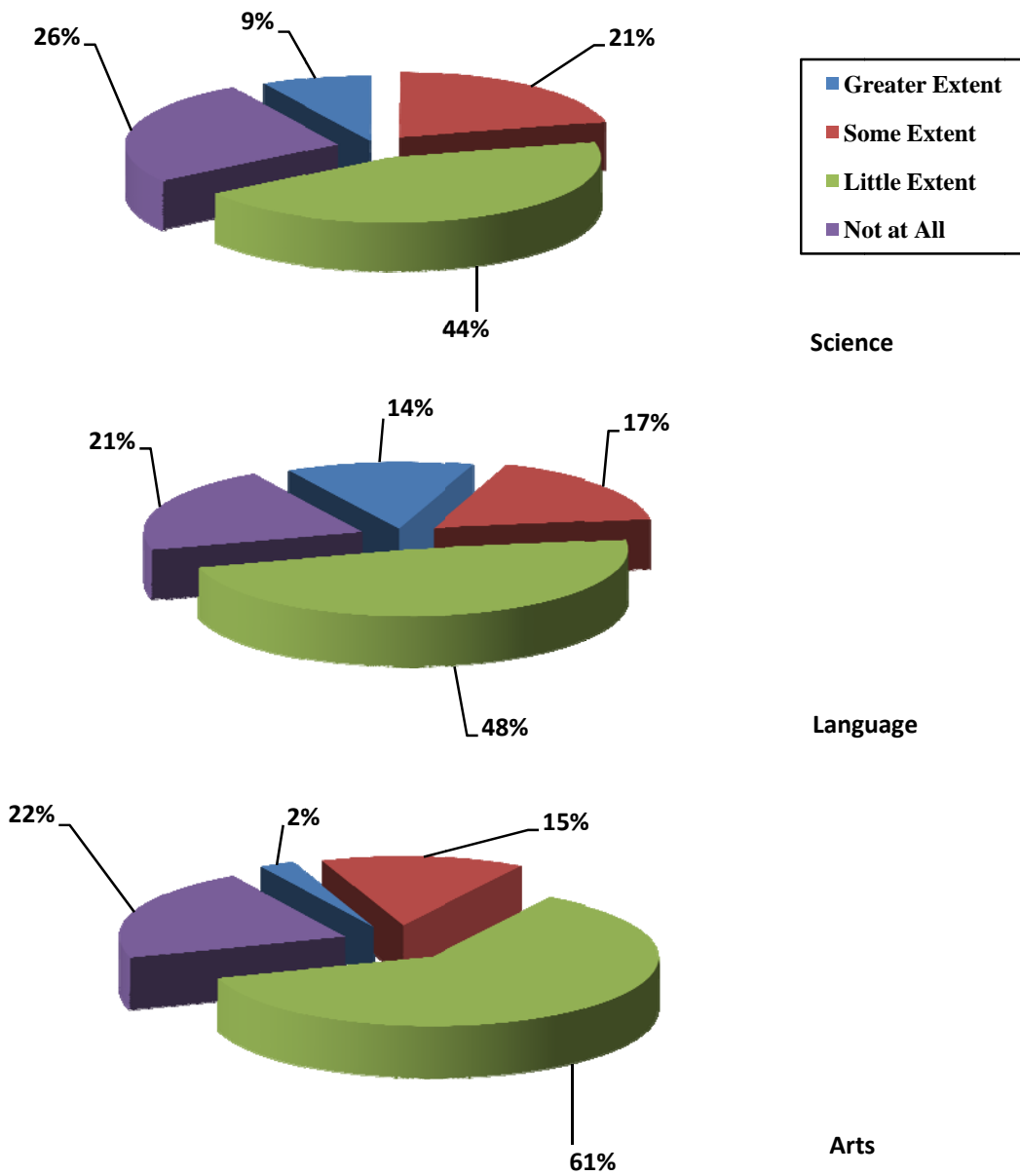


Table 4.62

Stream wise responses of the total sample for the statement: Political and economic policies influence the quality of environment?

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	73	164	197	20	454
	Percent	16.1%	36.1%	43.4%	4.4%	100.0%
Language	Frequency	26	136	101	4	267
	Percent	9.7%	50.9%	37.8%	1.5%	100.0%
Arts	Frequency	24	89	79	7	199
	Percent	12.1%	44.7%	39.7%	3.5%	100.0%
Total	Frequency	123	389	377	31	920
	Percent	13.4%	42.3%	41.0%	3.4%	100.0%

The above table of responses regarding agreement to the statement whether Political and economical policies influence the quality of environment reveals that 16.1% of science stream, 9.7% of language stream and 12.1% of arts stream students agreed to *greater extent*. The relative percentage of agreement in *some extent* and *very little extent* categories were not much differed among the sub samples. However, it was found that 4.4% of science students, 3.5% of arts students and 1.5% of language students responded *not at all* to the above statement.

The graphical representation of the responses stream wise is shown in figure 4.62

Figure 4.62: Stream wise percentage of subject's responses whether they are aware that political and economical policies influence the quality of environment

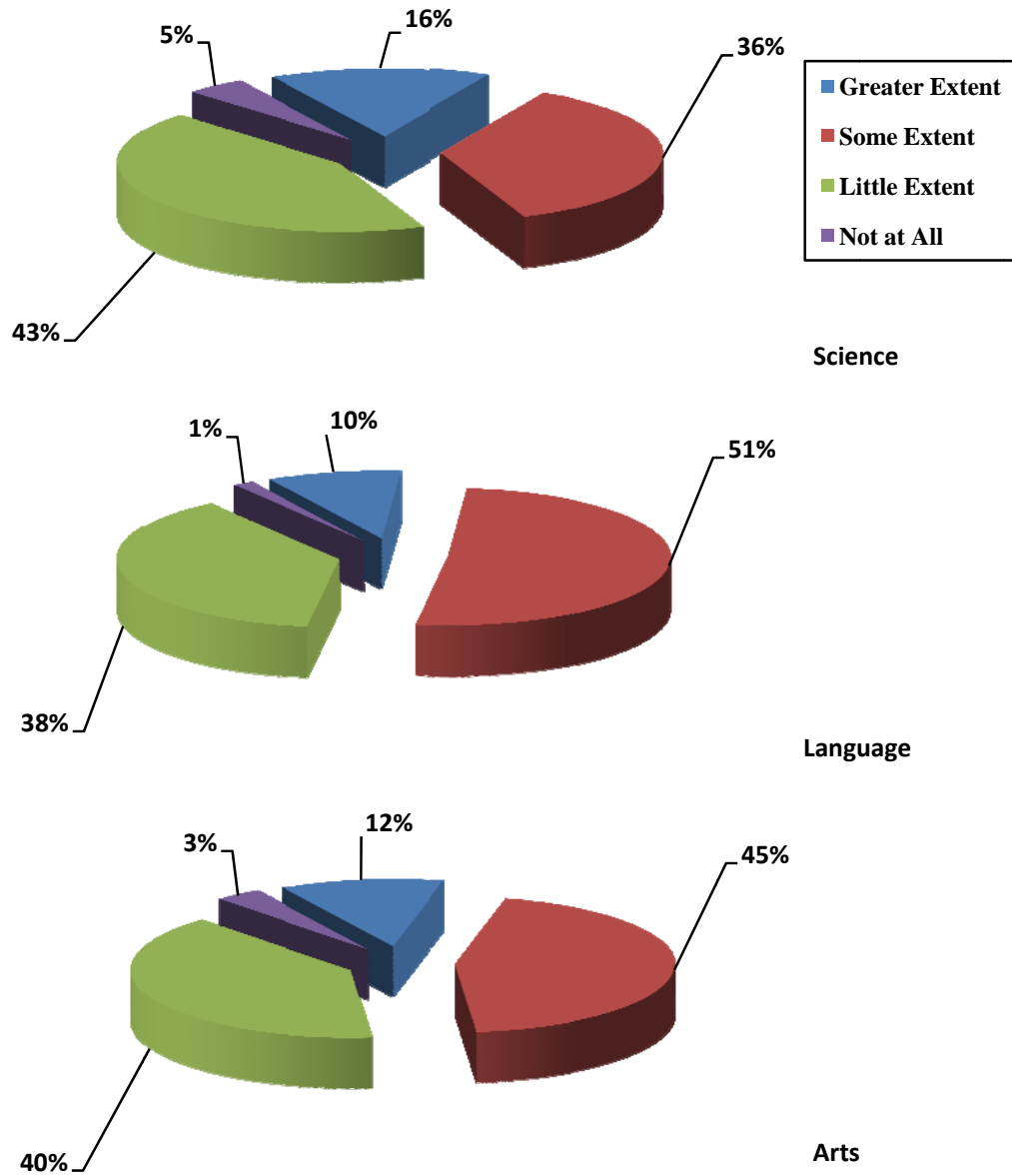


Table 4.63

Stream wise responses of the total sample for the statement: Women have a special role and responsibility in the practical application of many principles regarding Sustainable Development

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	46	200	194	14	454
	Percent	10.1%	44.1%	42.7%	3.1%	100.0%
Language	Frequency	29	126	103	9	267
	Percent	10.9%	47.2%	38.6%	3.4%	100.0%
Arts	Frequency	24	85	84	6	199
	Percent	12.1%	42.7%	42.2%	3.0%	100.0%
Total	Frequency	99	411	381	29	920
	Percent	10.8%	44.7%	41.4%	3.2%	100.0%

The above table of responses to the statement that women have special role and responsibility in the practical application of many principles regarding Sustainable Development reveals that less percentage of the students 10.1% of science, 10.9% of language and 12.1% of arts respectively agreed to *greater extent*; 47.2% of language stream, 44.1% and 42.7% of science and arts stream students respectively responded *some extent*. The relative responses stream wise indicated almost similar percentages to *very little extent* among the sub samples. However, it was found that 3.4% of language students, 3.1% of science students and 3.0% of arts students responded in the category *not at all*.

The graphical representation of the responses stream wise is shown in figure 4.63

Figure 4.63: Stream wise percentage of subject's response regarding the special role and responsibility of women in the practical application of many principles regarding Sustainable Development

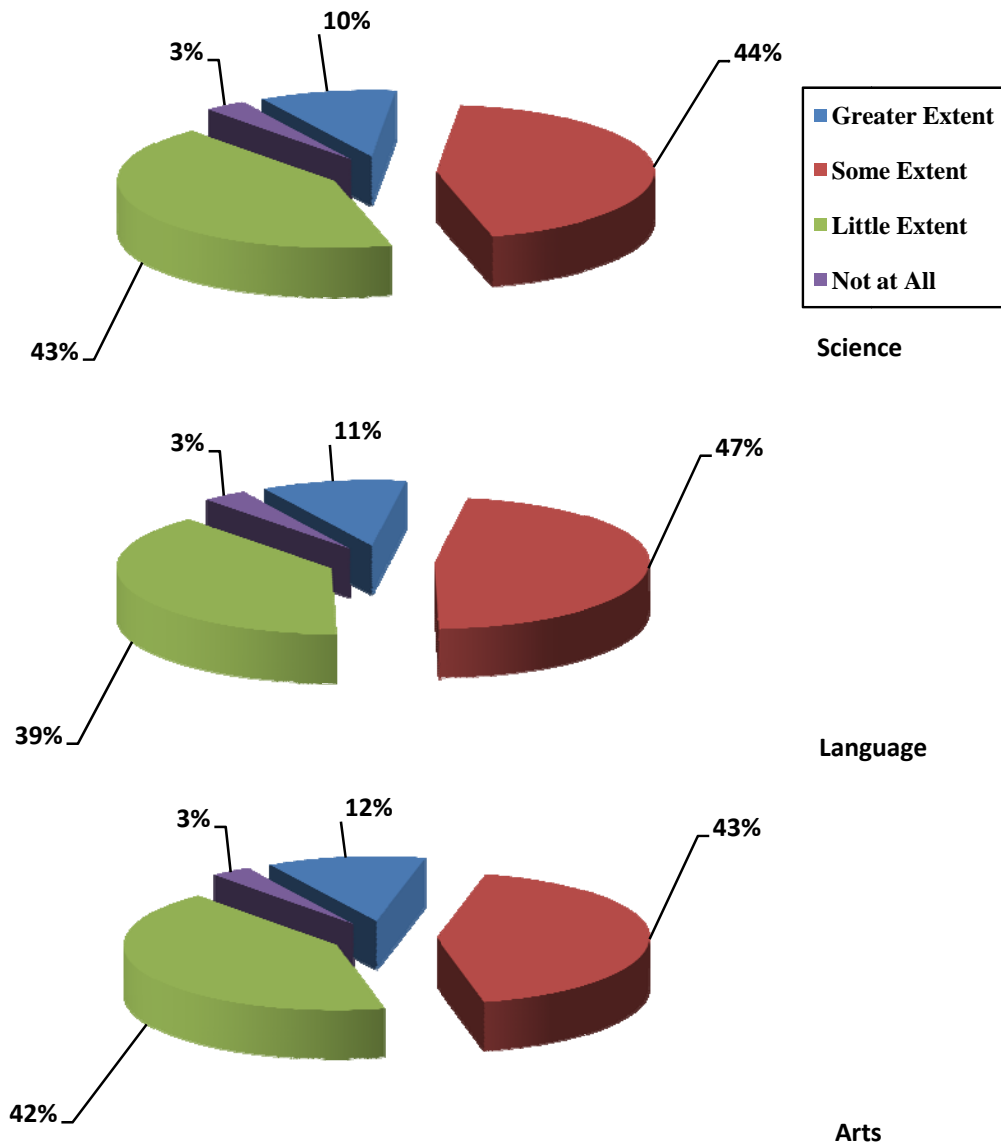


Table 4.64

Stream wise responses of the total sample for the question: Education for Sustainable Development imparts certain skills for better living

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	220	191	39	4	454
	Percent	48.5%	42.1%	8.6%	.9%	100.0%
Language	Frequency	120	115	29	3	267
	Percent	44.9%	43.1%	10.9%	1.1%	100.0%
Arts	Frequency	96	73	28	2	199
	Percent	48.2%	36.7%	14.1%	1.0%	100.0%
Total	Frequency	436	379	96	9	32
	Percent	47.4%	41.2%	10.4%	1.0%	100%

The above table of responses regarding the statement that Education for Sustainable Development imparts certain skills for better living reveals that 48.5% of science stream students responded in the category *greater extent*, whereas 48.2% and 44.9% of arts and language stream students respectively responded to *greater extent*. The relative responses stream wise indicated almost similar percentages for the responses to *some extent* and *very little extent* among the sub samples. However, it was found that 1.1% of language students, 0.9% of science students and 1.0% of arts students responded that Education for Sustainable Development does not impart certain skills for better living.

The graphical representation of the responses stream wise is shown in figure 4.64

Figure 4.64: Stream wise percentage of subject's responses to the statement that Education for Sustainable Development imparts certain skills for better living

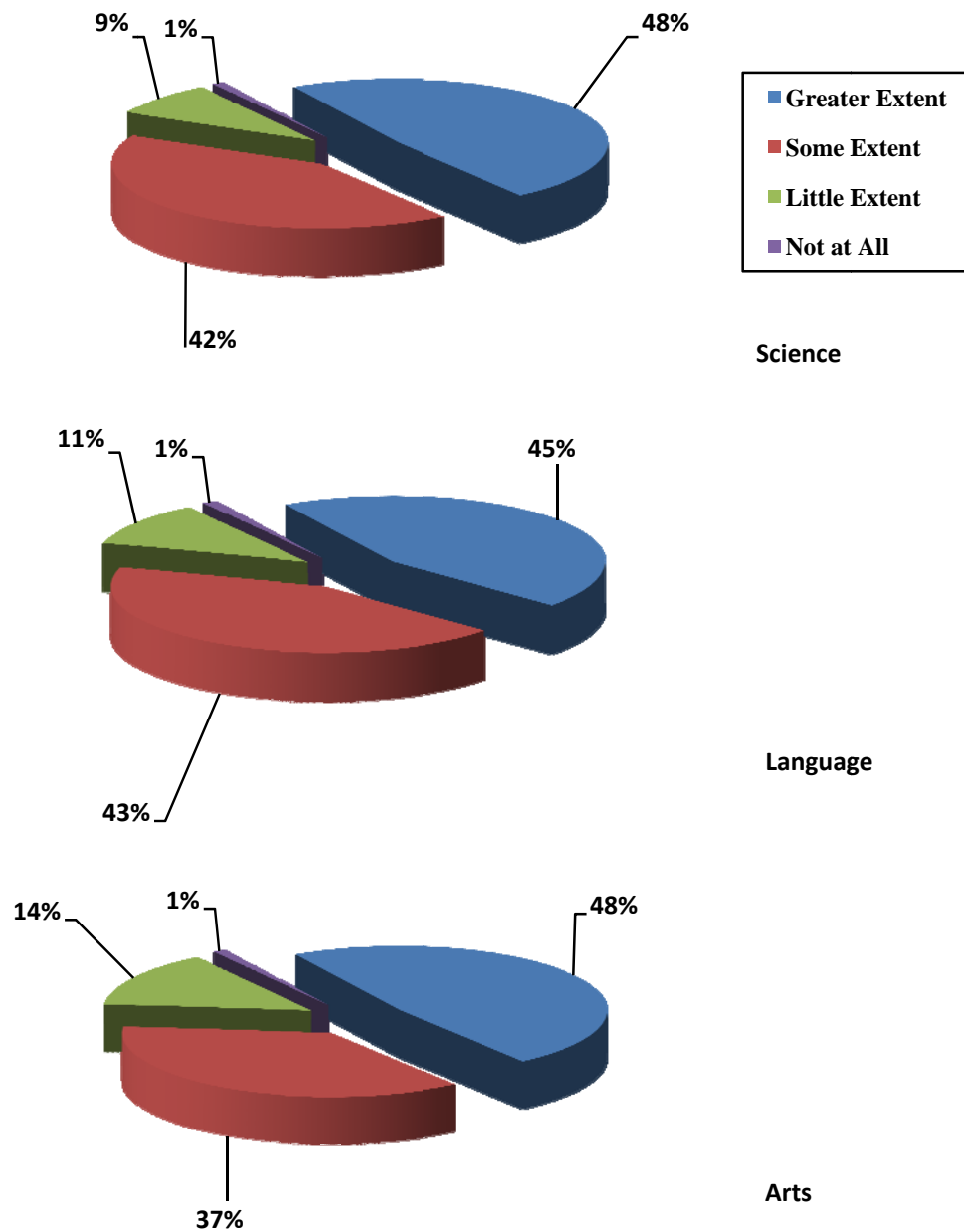


Table 4.65

Stream wise responses of the total sample for the statement: Promotion of sustainable development needs some action level programmes

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	222	164	54	14	454
	Percent	48.9%	36.1%	11.9%	3.1%	100.0%
Language	Frequency	131	96	36	4	267
	Percent	49.1%	36.0%	13.5%	1.5%	100.0%
Arts	Frequency	95	78	21	5	199
	Percent	47.7%	39.2%	10.6%	2.5%	100.0%
Total	Frequency	448	338	111	23	32
	Percent	48.7%	36.7%	12.1%	2.5%	100.0%

The above table of responses regarding whether action level programmes are required for Sustainable Development, 49.1% of language stream students to *greater extent*, whereas 48.9% and 47.7% of science and arts stream students respectively responded to *greater extent*. The relative responses stream wise indicated almost similar percentages for the opinion to *some extent* and *very little extent* among the sub samples. However, it was found that 3.1% of science students, 2.5% of arts students and 1.5% of language students responded as *not at all* to the above statement.

The graphical representation of the responses stream wise is shown in figure 4.65

Figure 4.65: Stream wise percentage of subject's awareness about promotion of sustainable development needs some action level programmes

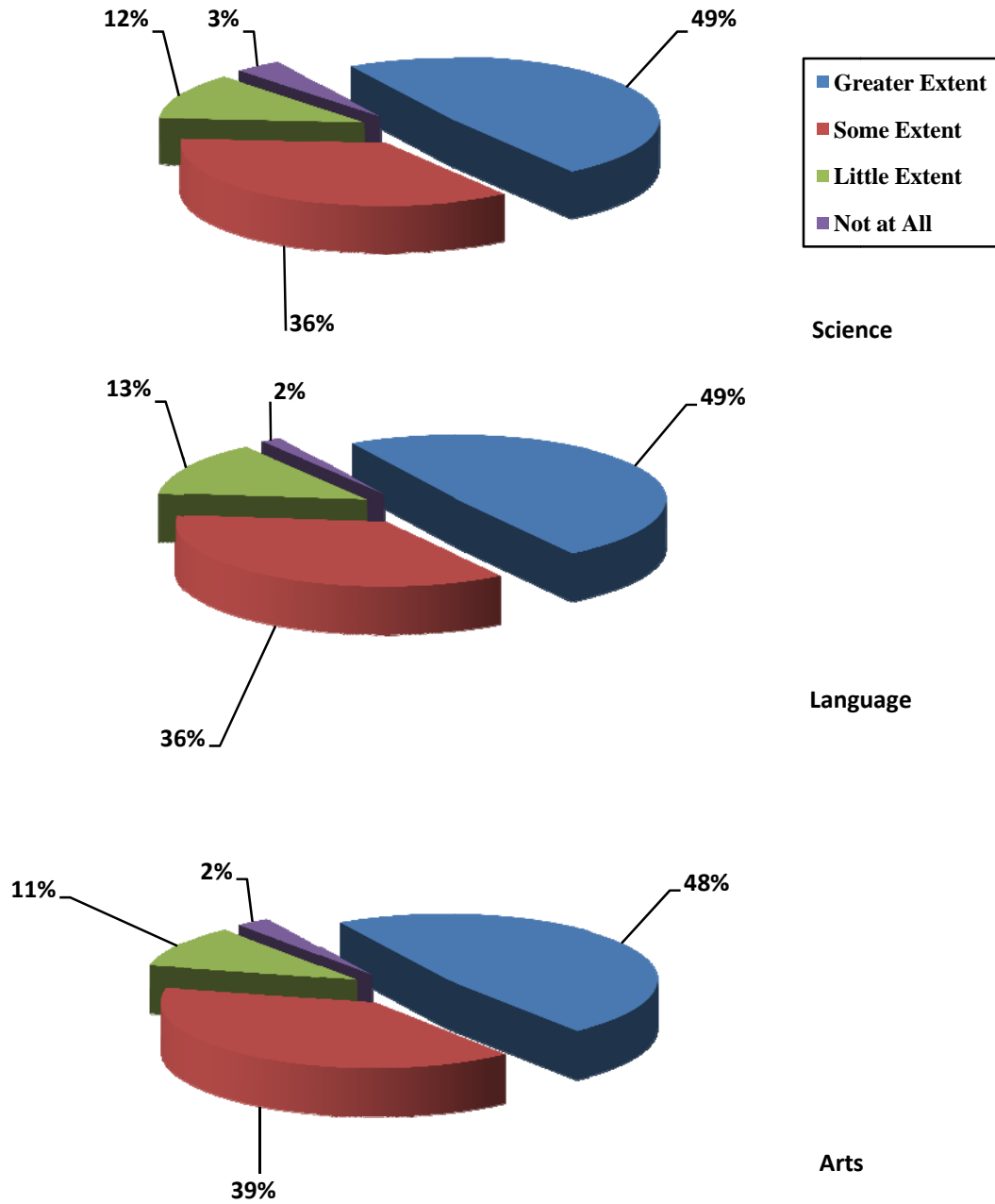


Table 4.66

Stream wise responses of the total sample for the question: The present pattern of the development and living style are against the principles of Education for Sustainable Development

STREAM		Responses				Total
		GE	SE	LE	NA	
Science	Frequency	94	187	152	21	454
	Percent	20.7%	41.2%	33.5%	4.6%	100.0%
Language	Frequency	70	101	75	21	267
	Percent	26.2%	37.8%	28.1%	7.9%	100.0%
Arts	Frequency	38	100	54	7	199
	Percent	19.1%	50.3%	27.1%	3.5%	100.0%
Total	Frequency	202	388	281	49	920
	Percent	22.0%	42.2%	30.5%	5.3%	100.0%

The above table of responses for the statement that the present pattern of the development and living style are against the principles of Education for Sustainable Development reveals that 20.7%, 26.2% and 19.1% of science, language and arts streams respectively agreed to *greater extent*. 50.3% of arts stream students responded in agreement to *some extent*, whereas only 41.2% and 37.8% of science and language stream students respectively responded to *some extent*. The relative responses stream wise indicated almost similar percentages to *very little extent* among the sub samples. However, it was found that 7.9% of language students, 4.6% of science students and 3.5% of arts students responded to the statement in the

category *not at all*. The graphical representation of the responses stream wise is shown in figure 4.66.

Figure 4.66: Stream wise percentage of subject’s response regarding the statement that present pattern of the development and living style are against the principles of Education for Sustainable Development

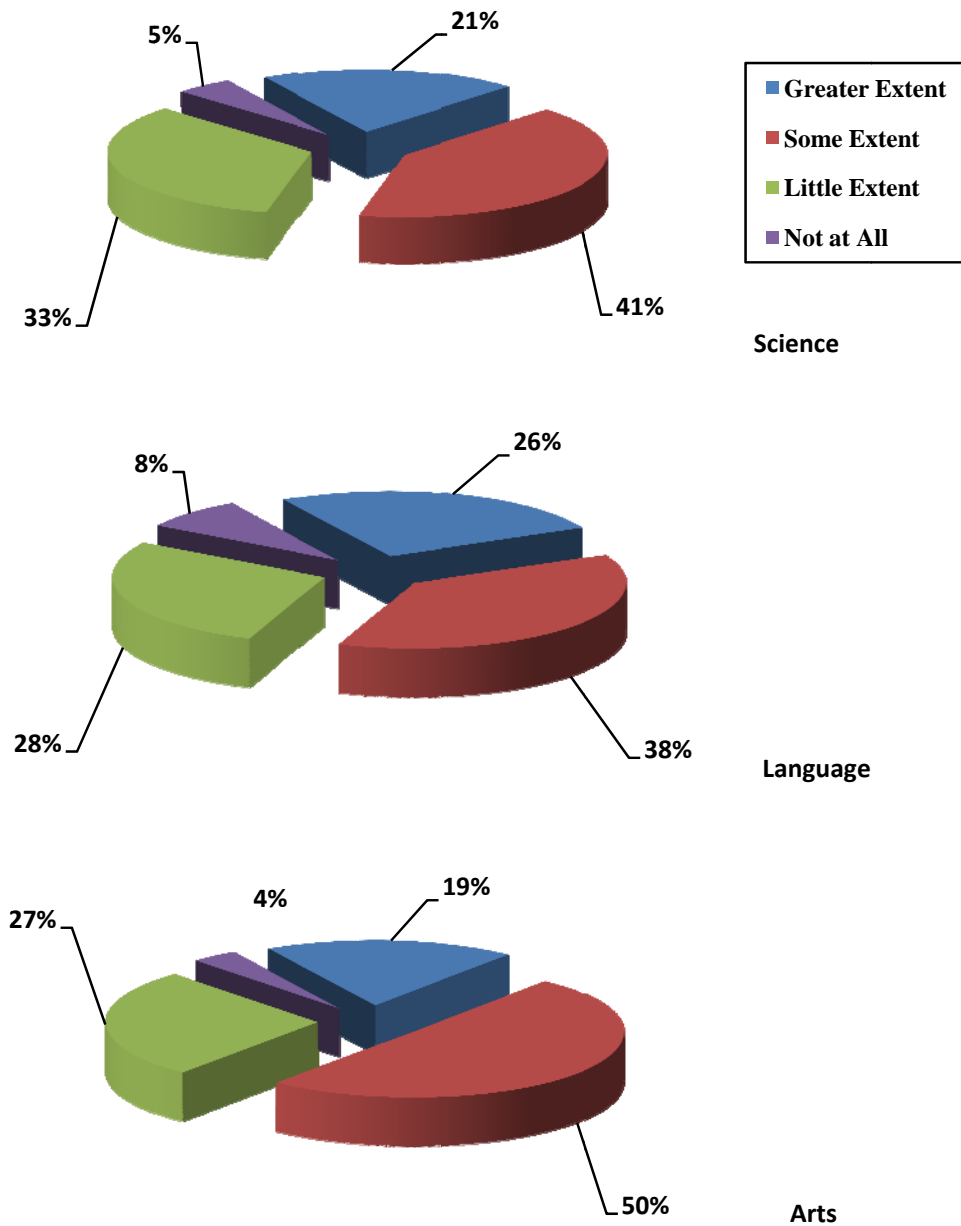


Table 4.67

Stream wise responses of the total sample for the statement: Education for sustainable development emphasizes education for culture and peace

STREAM		Responses		Total
		Yes	No	
Science	Frequency	375	79	454
	Percent	82.6%	17.4%	100.0%
Language	Frequency	233	34	267
	Percent	87.3%	12.7%	100.0%
Arts	Frequency	179	20	199
	Percent	89.9%	10.1%	100.0%
Total	Frequency	787	133	920
	Percent	85.5%	14.5%	100.0%

The above table of responses regarding agreement or disagreement about the statement, education for sustainable development emphasizes education for culture and peace reveals that 82.6% of science stream students, 87.3% and 89.9% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 17.4% of science students, 12.7% of language students and 10.1% of arts students responded as in disagreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.67.

Figure 467: Stream wise percentage of subject's agreement or disagreement about the statement education for sustainable development emphasizes education for culture and peace

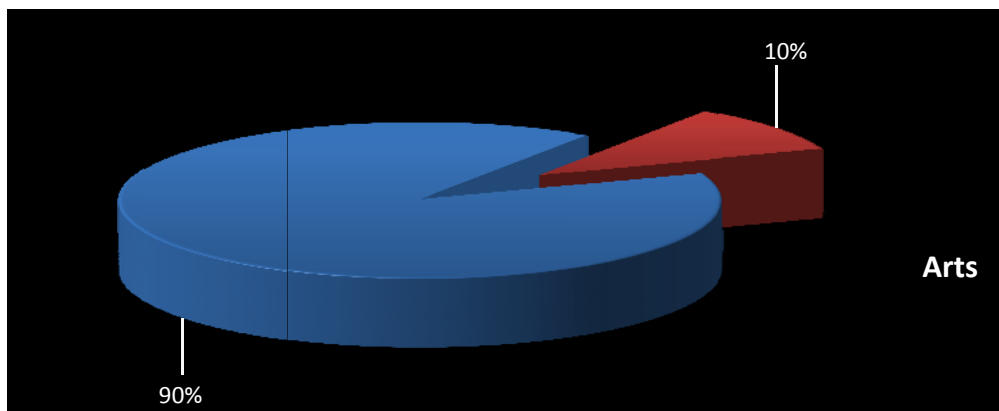
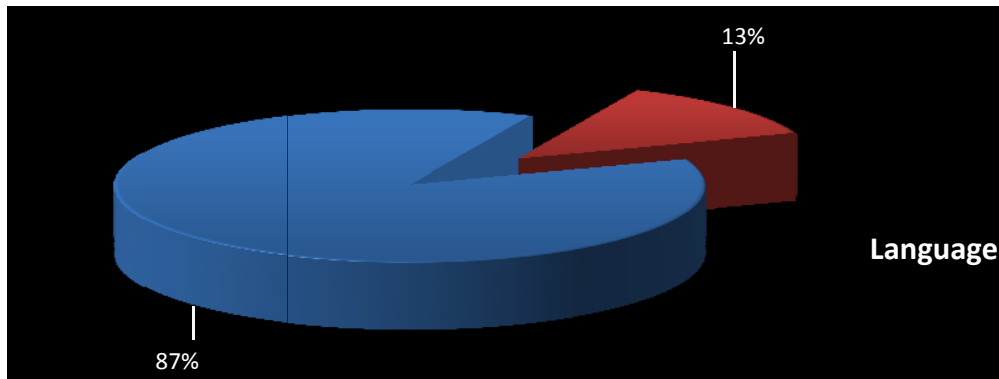
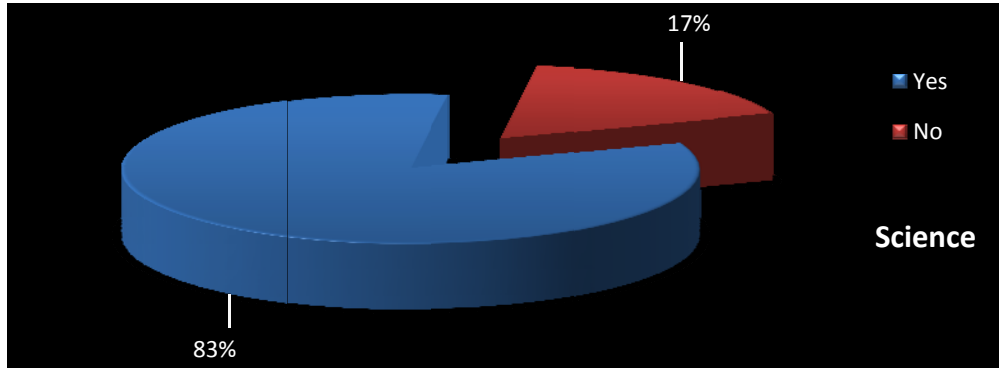


Table 4.68

Stream wise responses of the total sample for the statement: Sustainable development is as much about the children in the future as it is about what we need today

STREAM		Responses		Total
		Yes	No	
Science	Frequency	383	71	454
	Percent	84.4%	15.6%	100.0%
Language	Frequency	221	46	267
	Percent	82.8%	17.2%	100.0%
Arts	Frequency	171	28	199
	Percent	85.9%	14.1%	100.0%
Total	Frequency	775	145	920
	Percent	84.2%	15.8%	100.0%

The above table of responses regarding agreement or disagreement about the statement sustainable development is as much about the children in the future as it is about what we need today reveals that 84.4% of science stream students, 82.8% and 85.9% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 15.6% of science students, 17.2% of language students and 14.1% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.68.

Figure 4.68: Stream wise percentage of subject's agreement or disagreement about the statement sustainable development is as much about the children in their future as it is about we need today

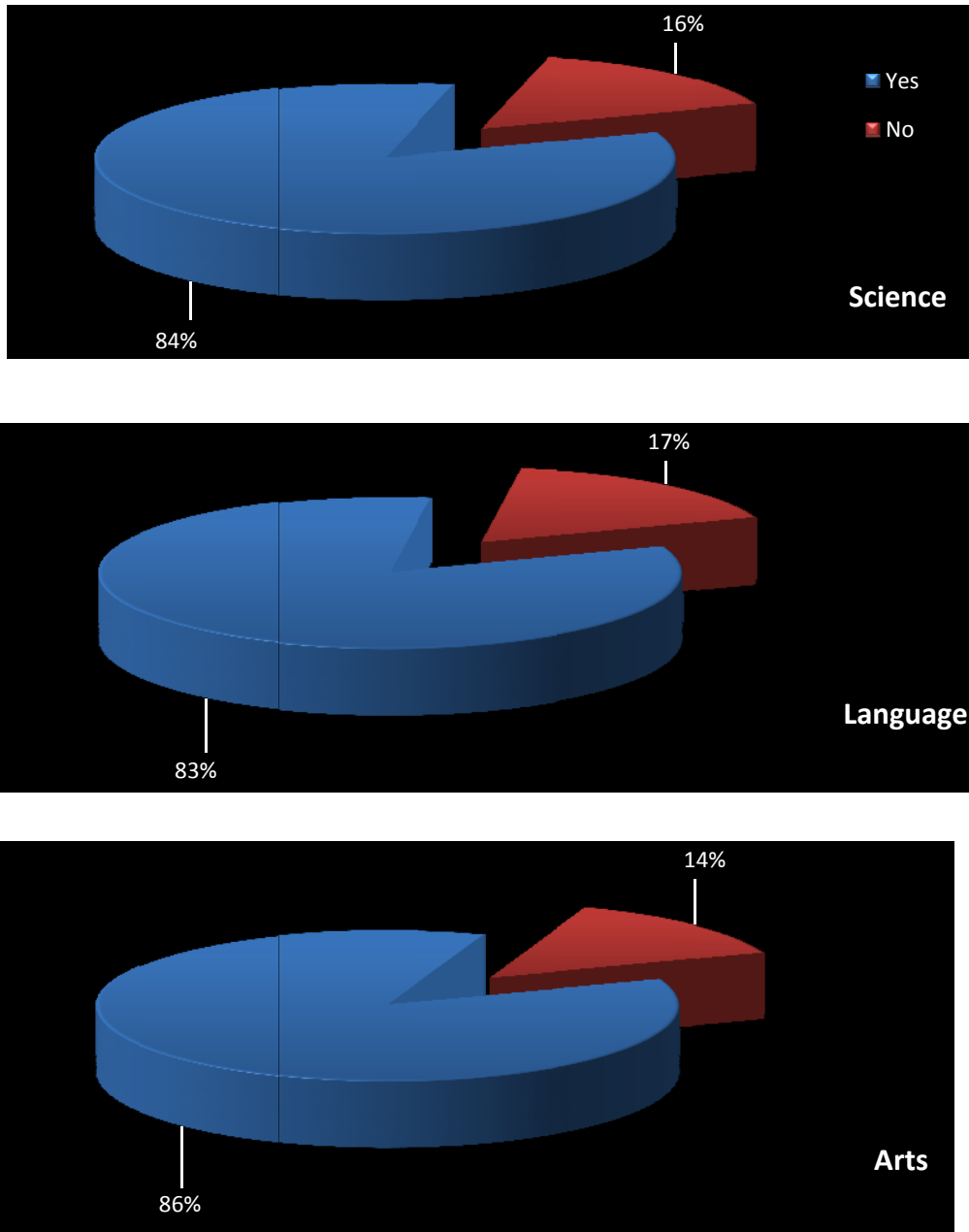


Table 4.69

Stream wise responses of the total sample for the statement: Sustainable Development has nothing to do with social justice

STREAM		Responses		Total
		Yes	No	
Science	Frequency	370	84	454
	Percent	81.5%	18.5%	100.0%
Language	Frequency	228	39	267
	Percent	85.4%	14.6%	100.0%
Arts	Frequency	149	50	199
	Percent	74.9%	25.1%	100.0%
Total	Frequency	747	173	920
	Percent	81.2%	18.8%	100.0%

The above table of responses regarding agreement or disagreement about the statement, education for Sustainable Development has nothing to do with social justice reveals that 18.5% of science stream students, 14.6% and 25.1% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 81.5% of science students, 85.4% of language students and 74.9% of arts students responded as in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.69

Figure 4.69: Stream wise percentage of subject's agreement or disagreement about the statement education for sustainable development has nothing to do with social justice

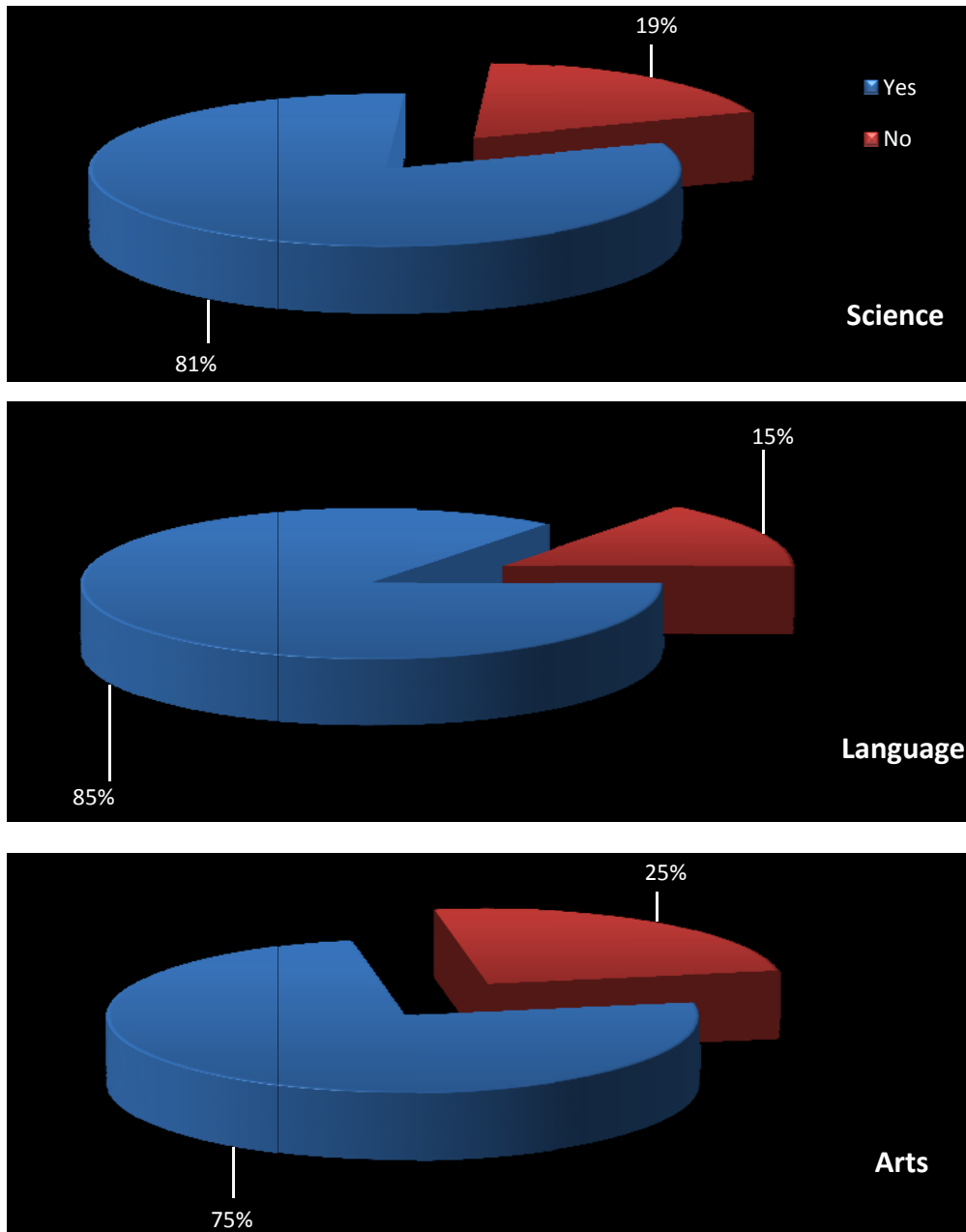


Table 4.70

Stream wise responses of the total sample for the statement: We cannot slow the rate of climate change

STREAM		Responses		Total
		Yes	No	
Science	Frequency	183	271	454
	Percent	40.3%	59.7%	100.0%
Language	Frequency	135	132	267
	Percent	50.6%	49.4%	100.0%
Arts	Frequency	91	108	199
	Percent	45.7%	54.3%	100.0%
Total	Frequency	409	511	920
	Percent	44.5%	55.5%	100.0%

The above table of responses regarding agreement or disagreement about the statement, we cannot slow the rate of climate change reveals that 40.3% of science stream students, 50.6% and 45.7% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 59.7% of science students, 49.4% of language students and 54.3% of arts students responded as not in agreement with the statement that we cannot slow the rate of climate change.

The graphical representation of the responses stream wise is shown in figure 4.70

Figure 4.70: Stream wise percentage of subject's agreement or disagreement about the statement that we cannot slow the rate of climate change

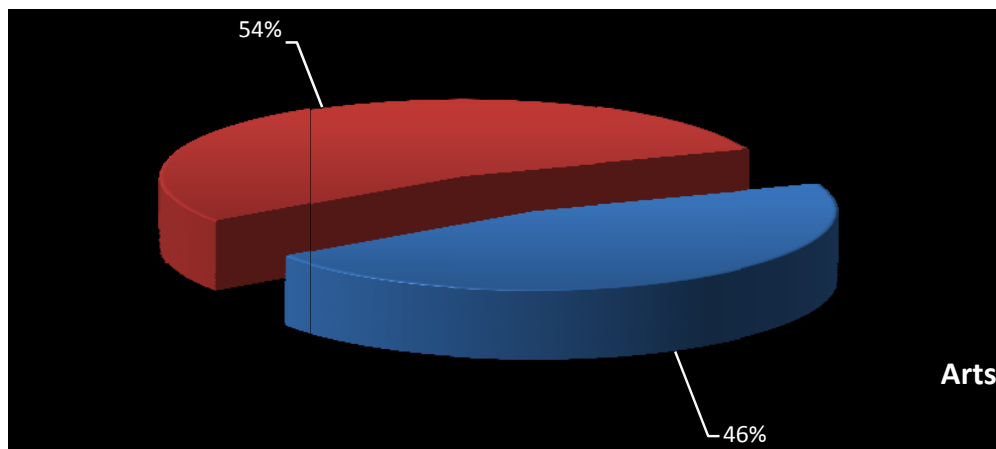
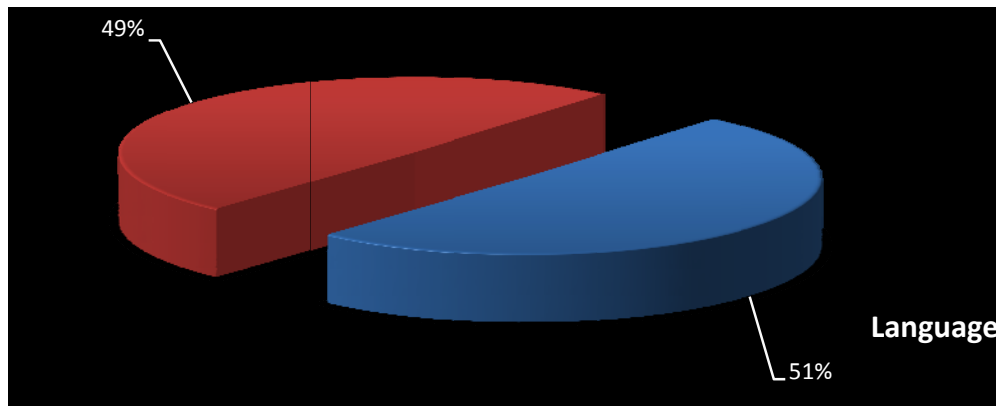
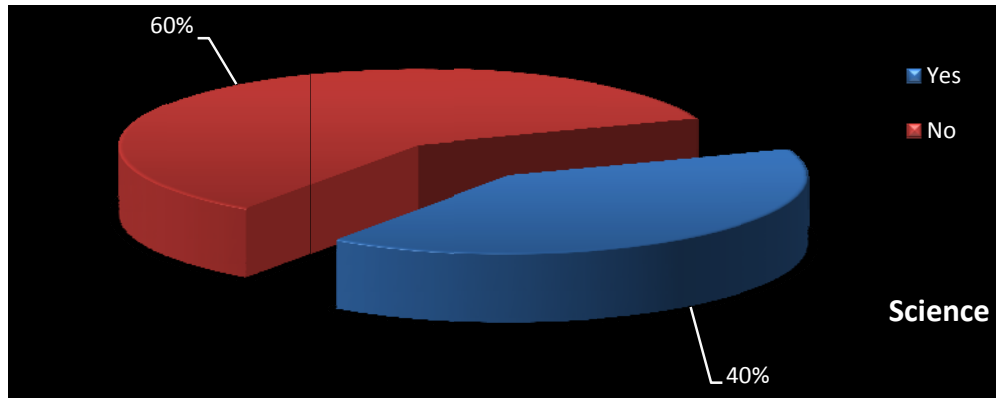


Table 4.71

Stream wise responses of the total sample for the statement: Corporate social responsibility is irrelevant to sustainable development

STREAM		Responses		Total
		Yes	No	
Science	Frequency	307	147	454
	Percent	67.6%	32.4%	100.0%
Language	Frequency	160	107	267
	Percent	59.9%	40.1%	100.0%
Arts	Frequency	122	77	199
	Percent	61.3%	38.7%	100.0%
Total	Frequency	589	331	920
	Percent	64.0%	36.0%	100.0%

The above table of responses regarding agreement or disagreement about the statement corporate social responsibility is irrelevant to sustainable development reveals that 32.4% of science stream students, 40.1% and 38.7% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 67.6% of science students, 59.9% of language students and 61.3% of arts students responded in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.71

Figure 4.71: Stream wise percentage of subject's agreement or disagreement about the statement corporate social responsibility is irrelevant to sustainable development

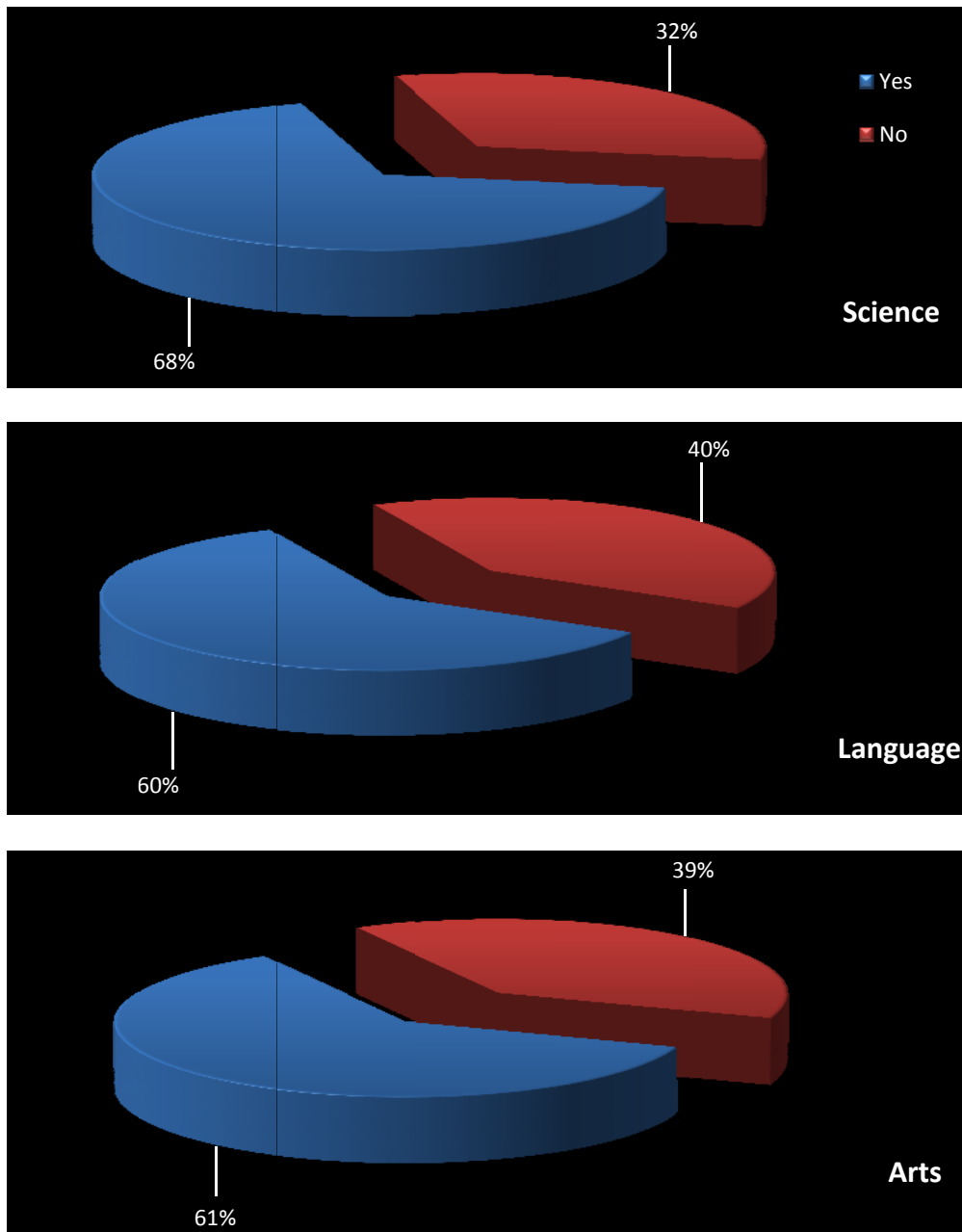


Table 4.72

**Stream wise responses of the total sample for the statement:
Conservation of fresh water is not a priority in Kerala because we have
plenty of water**

STREAM		Responses		Total
		Yes	No	
Science	Frequency	91	363	454
	Percent	20.0%	80.0%	100.0%
Language	Frequency	80	187	267
	Percent	30.0%	70.0%	100.0%
Arts	Frequency	46	153	199
	Percent	23.1%	76.9%	100.0%
Total	Frequency	217	703	920
	Percent	23.6%	76.4%	100.0%

The above table of responses regarding agreement or disagreement about the statement conservation of fresh water is not a priority in Kerala because we have plenty reveals that 20.0% of science stream students, 30.0% and 23.1% of language and arts stream students respectively responded in agreement with the statement.

Whereas, it was found that 80.0% of science students, 70.0% of language students and 76.9% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.72

Figure 4.72: Stream wise percentage of subject's agreement or disagreement about the statement conservation of fresh water is not a priority in Kerala because we have plenty of water

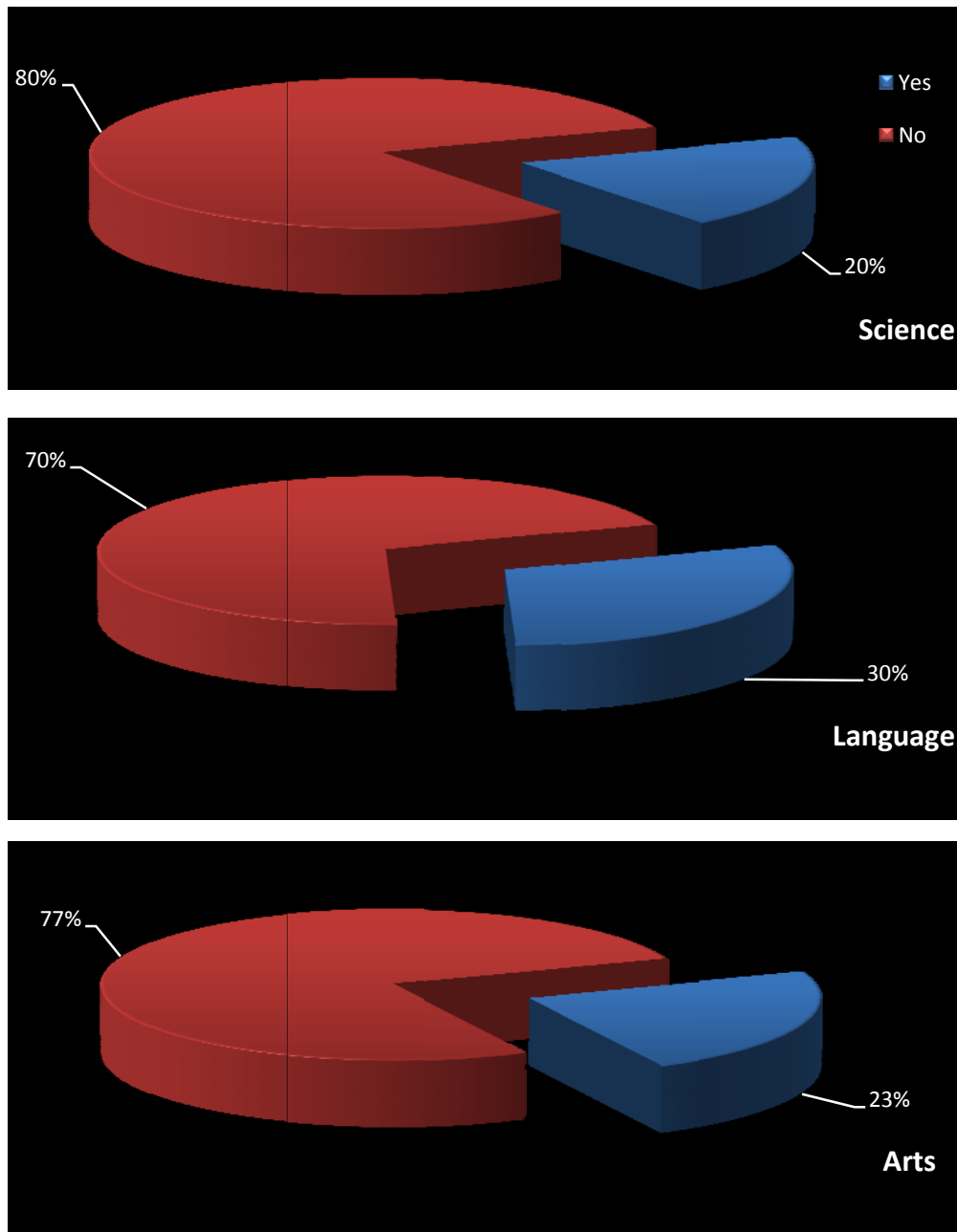


Table 4.73

Stream wise responses of the total sample for the statement: Education for sustainable development supports cultural diversity

STREAM		Responses		Total
		Yes	No	
Science	Frequency	67	387	454
	Percent	14.8%	85.2%	100.0%
Language	Frequency	70	197	267
	Percent	26.2%	73.8%	100.0%
Arts	Frequency	31	168	199
	Percent	15.6%	84.4%	100.0%
Total	Frequency	168	752	920
	Percent	18.3%	81.7%	100.0%

The above table of responses regarding agreement or disagreement about the statement, education for sustainable development supports cultural diversity reveals that 85.2% of science stream students, 73.8% and 84.4% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 14.8% of science students, 26.2% of language students and 15.6% of arts students responded in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.73

Figure 4.73: Stream wise percentage of subject's agreement or disagreement about the statment education for sustainable development supports cultural diversity

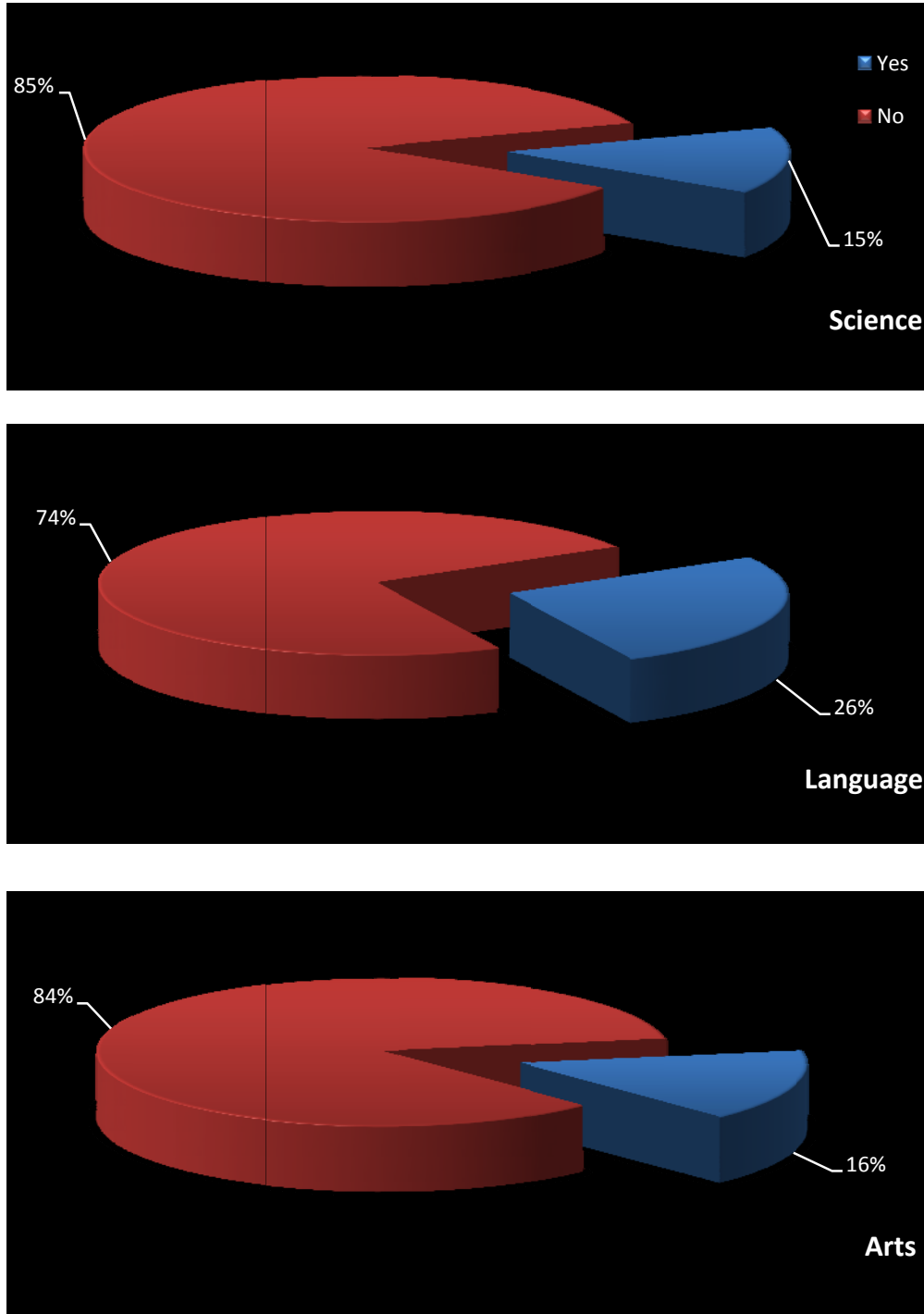


Table 4.74

Stream wise responses of the total sample for the statement: It is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water

STREAM		Responses		Total
		Yes	No	
Science	Frequency	407	47	454
	Percent	89.6%	10.4%	100.0%
Language	Frequency	217	50	267
	Percent	81.3%	18.7%	100.0%
Arts	Frequency	138	61	199
	Percent	69.3%	30.7%	100.0%
Total	Frequency	762	158	920
	Percent	82.8%	17.2%	100.0%

The above table of responses regarding agreement or disagreement about whether it is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water reveals that 89.6% of science stream students, 81.3% and 69.3% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 10.4% of science students, 18.7% of language students and 30.7% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.74.

Figure 4.74: Stream wise percentage of subject's agreement or disagreement about whether it is useful to estimate the monetary value of the services that ecosystem provide us, such as neutralizing air pollutants or purifying water

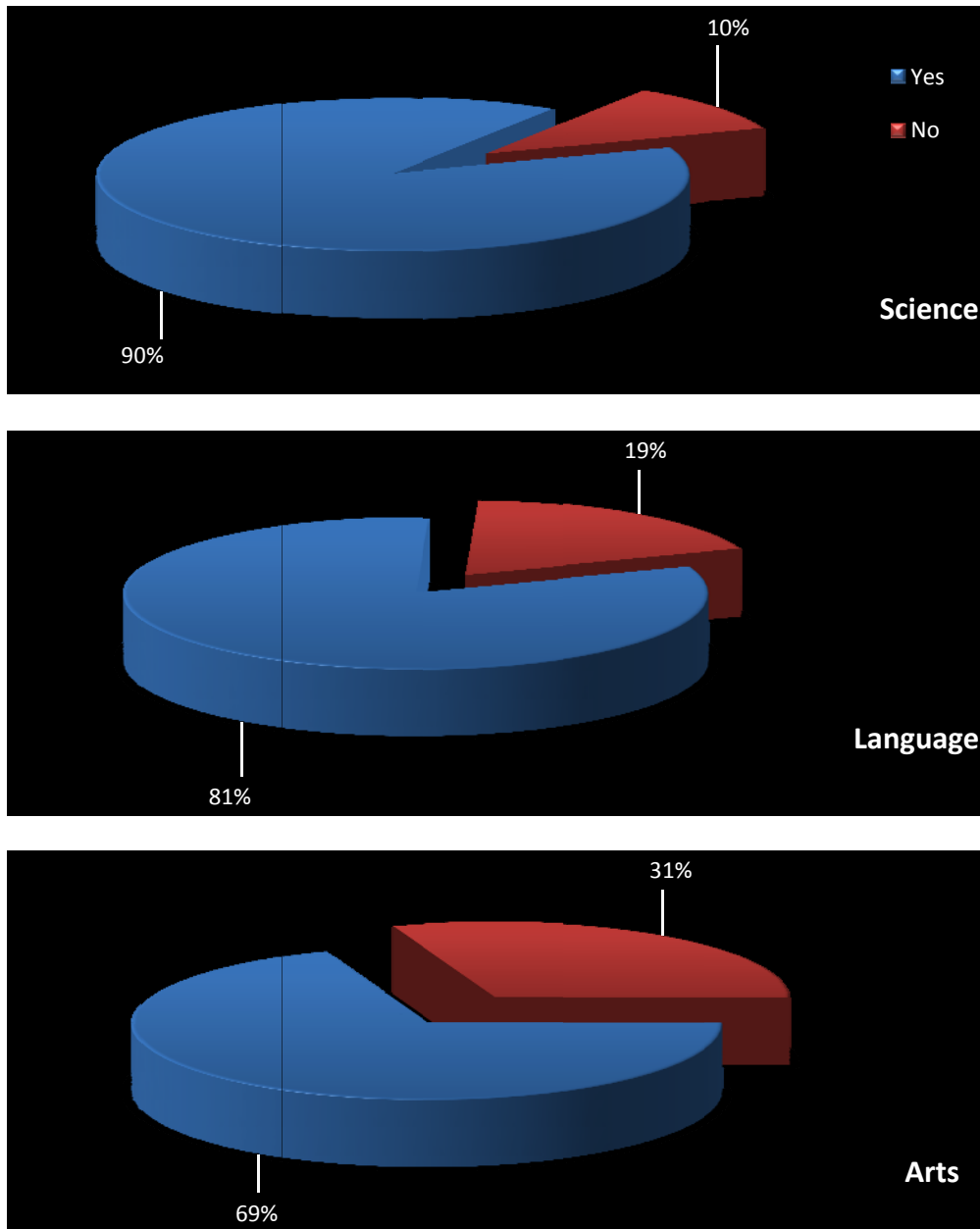


Table 4.75

**Stream wise responses of the total sample for the statement:
Environmental education and Education for Sustainable Development
are one and same thing**

STREAM		Responses		Total
		Yes	No	
Science	Frequency	168	286	454
	Percent	37.0%	63.0%	100.0%
Language	Frequency	126	141	267
	Percent	47.2%	52.8%	100.0%
Arts	Frequency	80	119	199
	Percent	40.2%	59.8%	100.0%
Total	Frequency	374	546	920
	Percent	40.7%	59.3%	100.0%

The above table of responses regarding agreement or disagreement about whether environmental education and Education for Sustainable Development are one and same thing reveals that 37.0% of science stream students, 47.2% and 40.2% of language and arts stream students respectively responded in agreement with the statement.

Whereas, it was found that 63.0% of science students, 52.8% of language students and 59.8% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.75.

Figure 4.75: Stream wise percentage of subject's agreement or disagreement about the statement, environmental education and Education for Sustainable Development are one and same thing

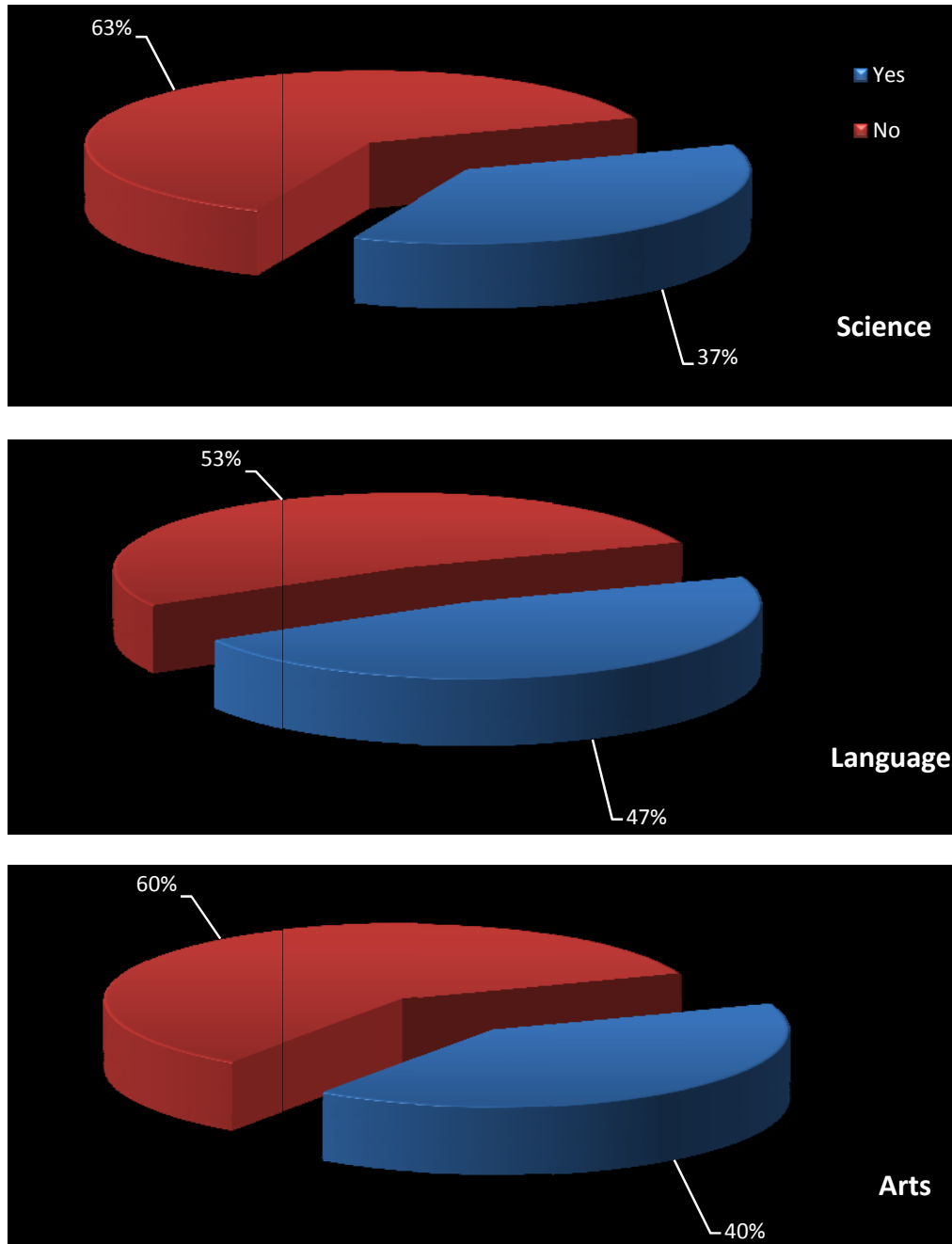


Table 4.76

Stream wise responses of the total sample for the question: Do you think that the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	229	225	454
	Percent	50.4%	49.6%	100.0%
Language	Frequency	154	113	267
	Percent	57.7%	42.3%	100.0%
Arts	Frequency	103	96	199
	Percent	51.8%	48.2%	100.0%
Total	Frequency	486	434	920
	Percent	52.8%	47.2%	100.0%

The above table of responses regarding agreement or disagreement about whether the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead reveals that 50.4% of science stream students, 57.7% and 51.8% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 49.6% of science students, 42.3% of language students and 48.2% of arts students responded as not in agreement that the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead.

The graphical representation of the responses stream wise is shown in figure 4.76.

Figure 4.76: Stream wise percentage of subject's agreement or disagreement about whether the five year planning of India should be designed with a perception of future extending 25 to 50 years ahead

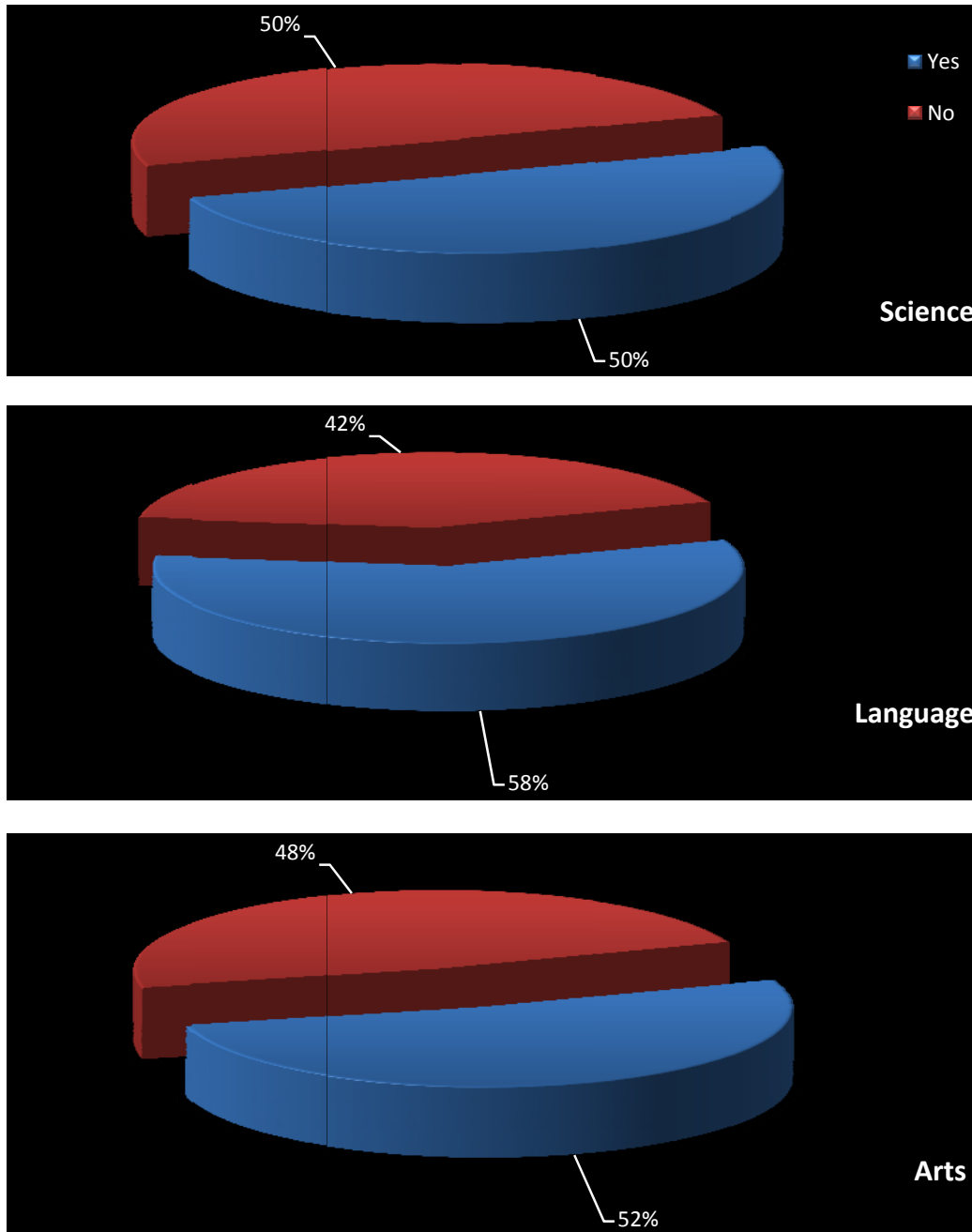


Table 4.77

Stream wise responses of the total sample for the question: Do you think that teachers are the most effective agents for the dissemination of Environmental Education?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	372	82	454
	Percent	81.9%	18.1%	100.0%
Language	Frequency	217	50	267
	Percent	81.3%	18.7%	100.0%
Arts	Frequency	168	31	199
	Percent	84.4%	15.6%	100.0%
Total	Frequency	757	163	920
	Percent	82.3%	17.7%	100.0%

The above table of responses regarding agreement or disagreement about whether teachers are the most effective agents for the dissemination of Environmental Education reveals that 81.9% of science stream students, 81.3% and 84.4% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 18.1% of science students, 18.7% of language students and 15.6% of arts students responded as not in agreement that teachers are the most effective agents for the dissemination of Environmental Education.

The graphical representation of the responses stream wise is shown in figure 4.77

Figure 4.77: Stream wise percentage of subject's agreement or disagreement about whether teachers are the most effective agents for the dissemination of Environmental Education

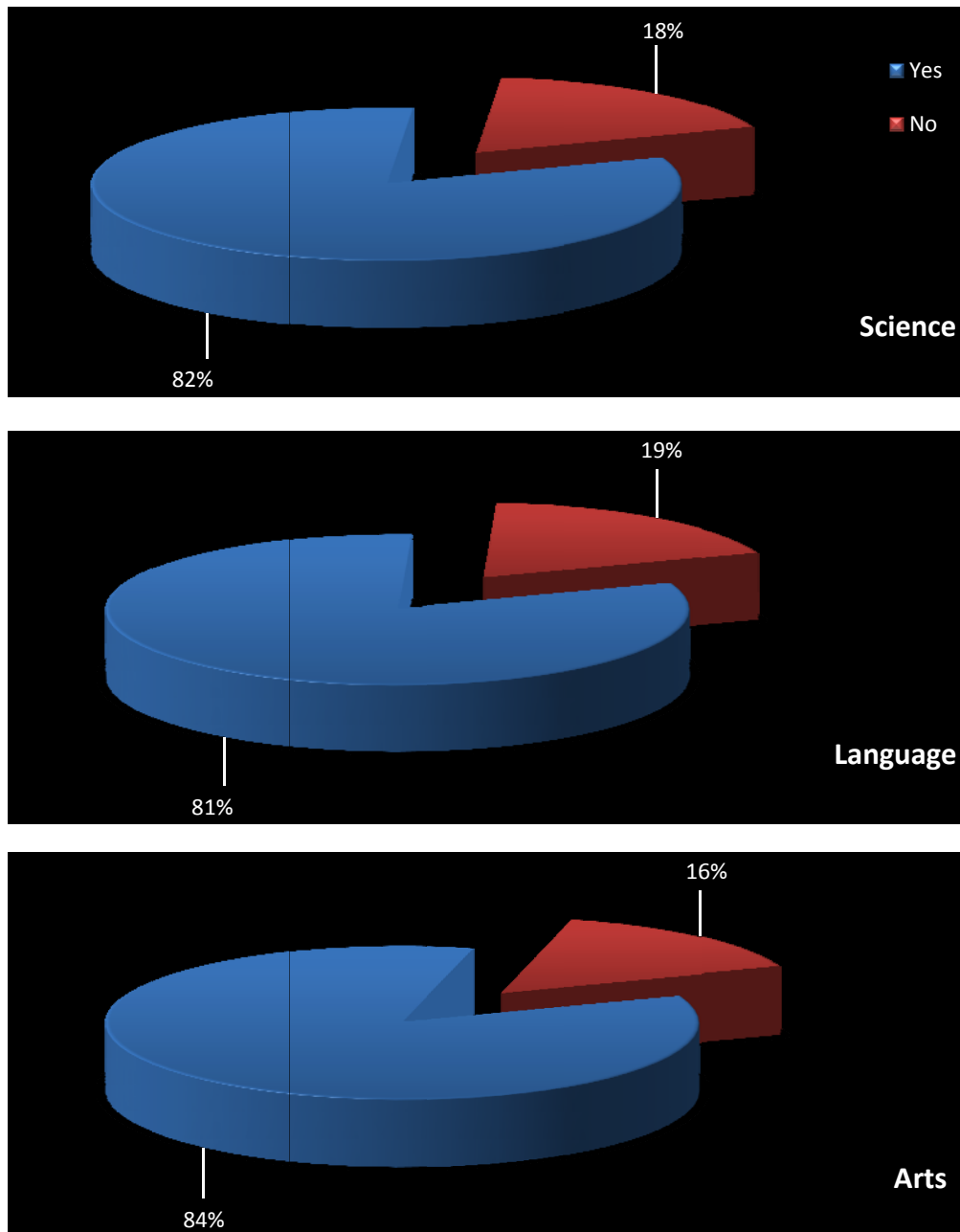


Table 4.78

Stream wise responses of the total sample for the statement: Education for Sustainable Development is interdisciplinary in nature

STREAM		Responses		Total
		Yes	No	
Science	Frequency	361	93	454
	Percent	79.5%	20.5%	100.0%
Language	Frequency	199	68	267
	Percent	74.5%	25.5%	100.0%
Arts	Frequency	148	51	199
	Percent	74.4%	25.6%	100.0%
Total	Frequency	708	212	920
	Percent	77.0%	23.0%	100.0%

The above table of responses regarding agreement or disagreement about the statement that Education for Sustainable Development is interdisciplinary in nature reveals that 79.5% of science stream students, 74.5% and 74.4% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 20.5% of science students, 25.5% of language students and 25.6% of arts students responded as not in agreement with the statement that Education for Sustainable Development is interdisciplinary in nature.

The graphical representation of the responses stream wise is shown in figure 4.78

Figure 4.78: Stream wise percentage of subject's agreement or disagreement about the statement Education for Sustainable Development is interdisciplinary in nature

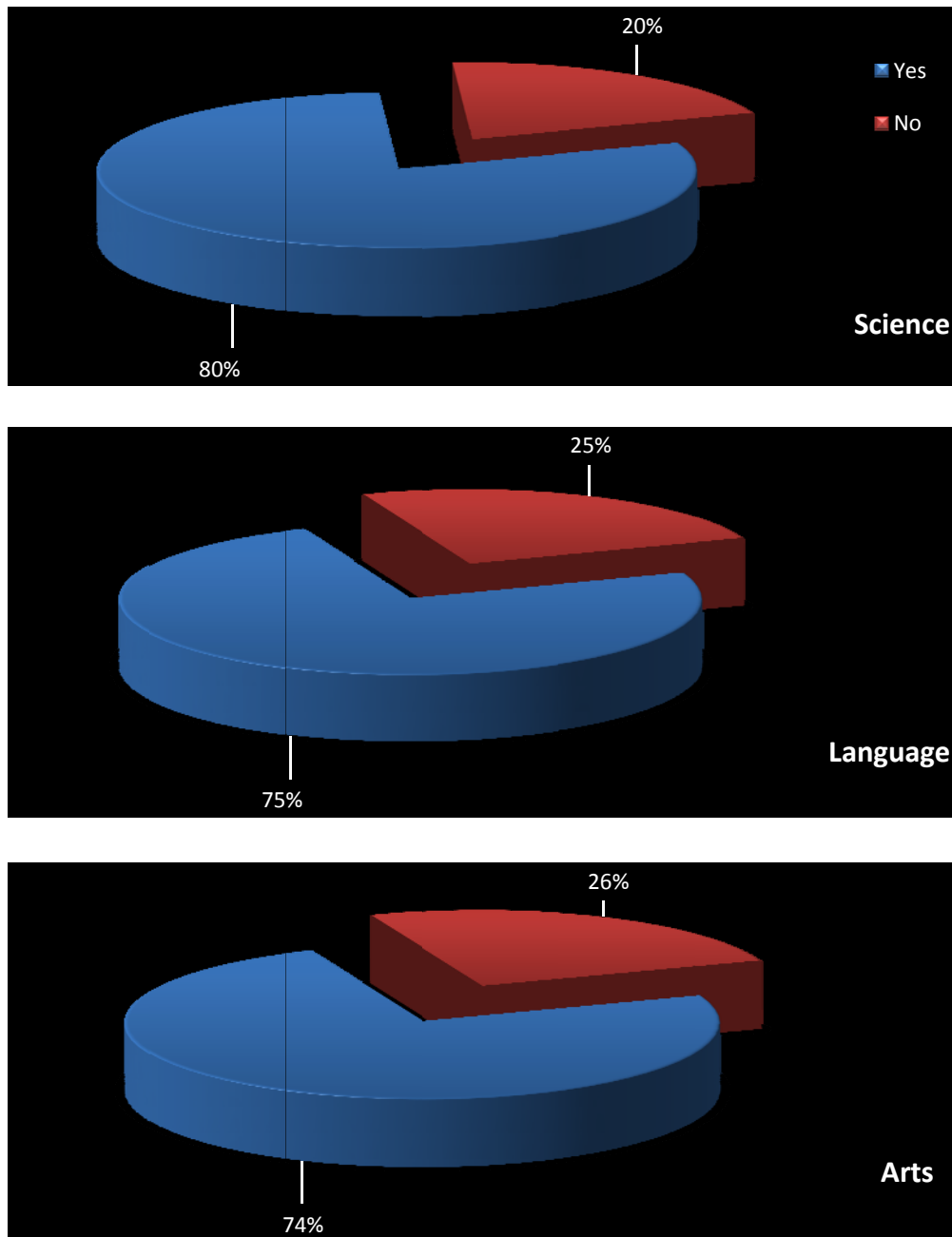


Table 4.79

Stream wise responses of the total sample for the statement: The concept of sustainable development is rooted on the value enunciated as ‘Loka samasta sukhino bhavanthu’

STREAM		Responses		Total
		Yes	No	
Science	Frequency	422	32	454
	Percent	93.0%	7.0%	100.0%
Language	Frequency	244	23	267
	Percent	91.4%	8.6%	100.0%
Arts	Frequency	182	17	199
	Percent	91.5%	8.5%	100.0%
Total	Frequency	848	72	920
	Percent	92.2%	7.8%	100.0%

The above table of responses regarding agreement or disagreement with the statement that concept of sustainable development is rooted on the value enunciated as ‘Loka samasta sukhino bhavanthu’ reveals that 93.0% of science stream students, 91.4% and 91.5% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 7.0% of science students, 8.6% of language students and 8.5% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.79

Figure 4.79: Stream wise percentage of subject's agreement or disagreement about the statement concept of sustainable development is rooted on the value enunciated as 'Loka samasta sukhino bhavanthu'

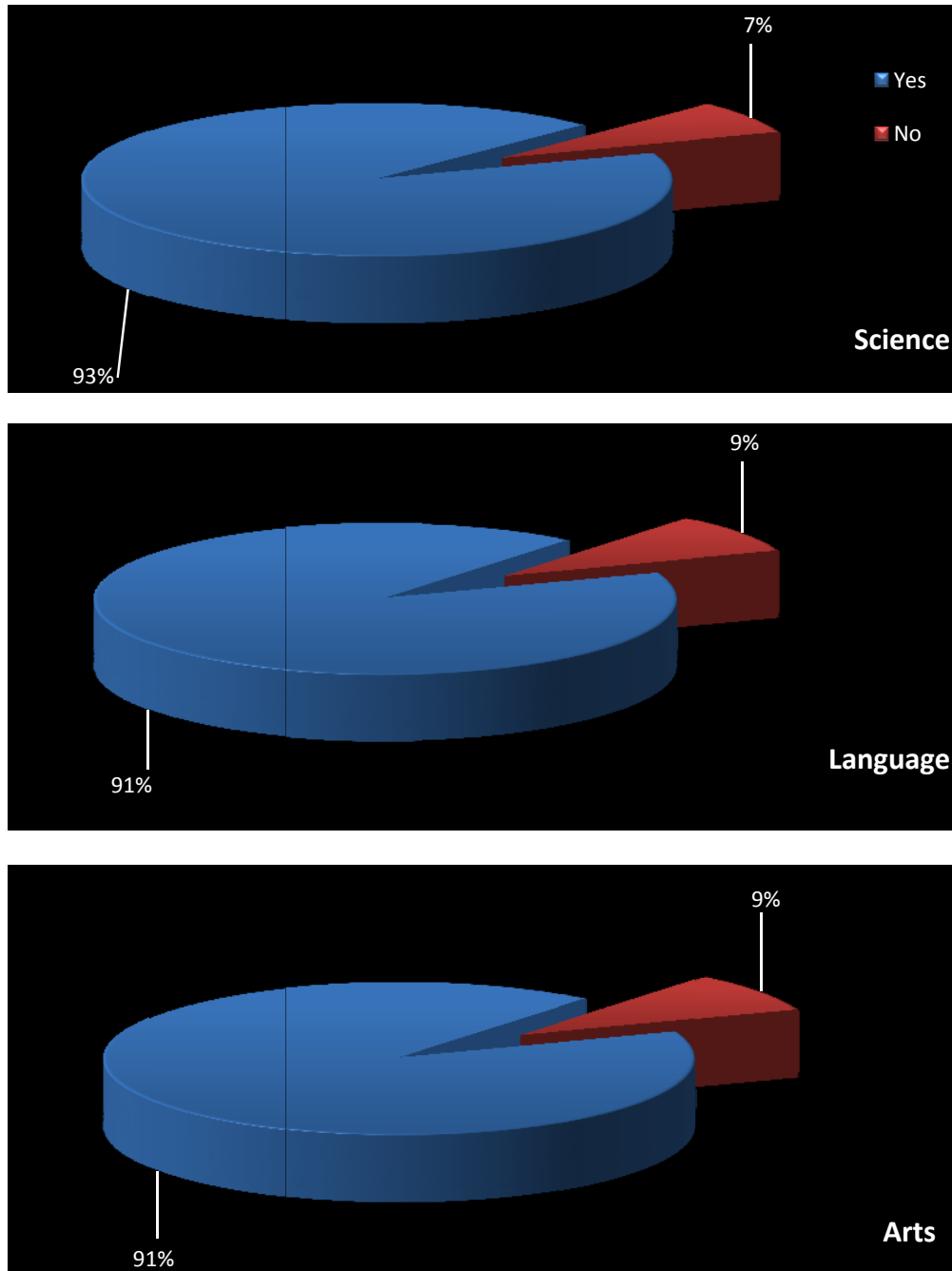


Table 4.80

Stream wise responses of the total sample for the statement: The concept of sustainable development is something to be practiced in life rather than acquiring mere knowledge

STREAM		Responses		Total
		Yes	No	
Science	Frequency	393	61	454
	Percent	86.6%	13.4%	100.0%
Language	Frequency	234	33	267
	Percent	87.6%	12.4%	100.0%
Arts	Frequency	181	18	199
	Percent	91.0%	9.0%	100.0%
Total	Frequency	808	112	920
	Percent	87.8%	12.2%	100.0%

The above table of responses regarding agreement or disagreement with the statement that the concept of sustainable development is something to be practiced in life rather than acquiring mere knowledge reveals that 86.6% of science stream students, 87.6% and 91.0% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 13.4% of science students, 12.4% of language students and 9.0% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.80.

Figure 4.80: Stream wise percentage of subject's agreement or disagreement about the statement concept of sustainable development is something to be practiced in life rather than acquiring mere knowledge

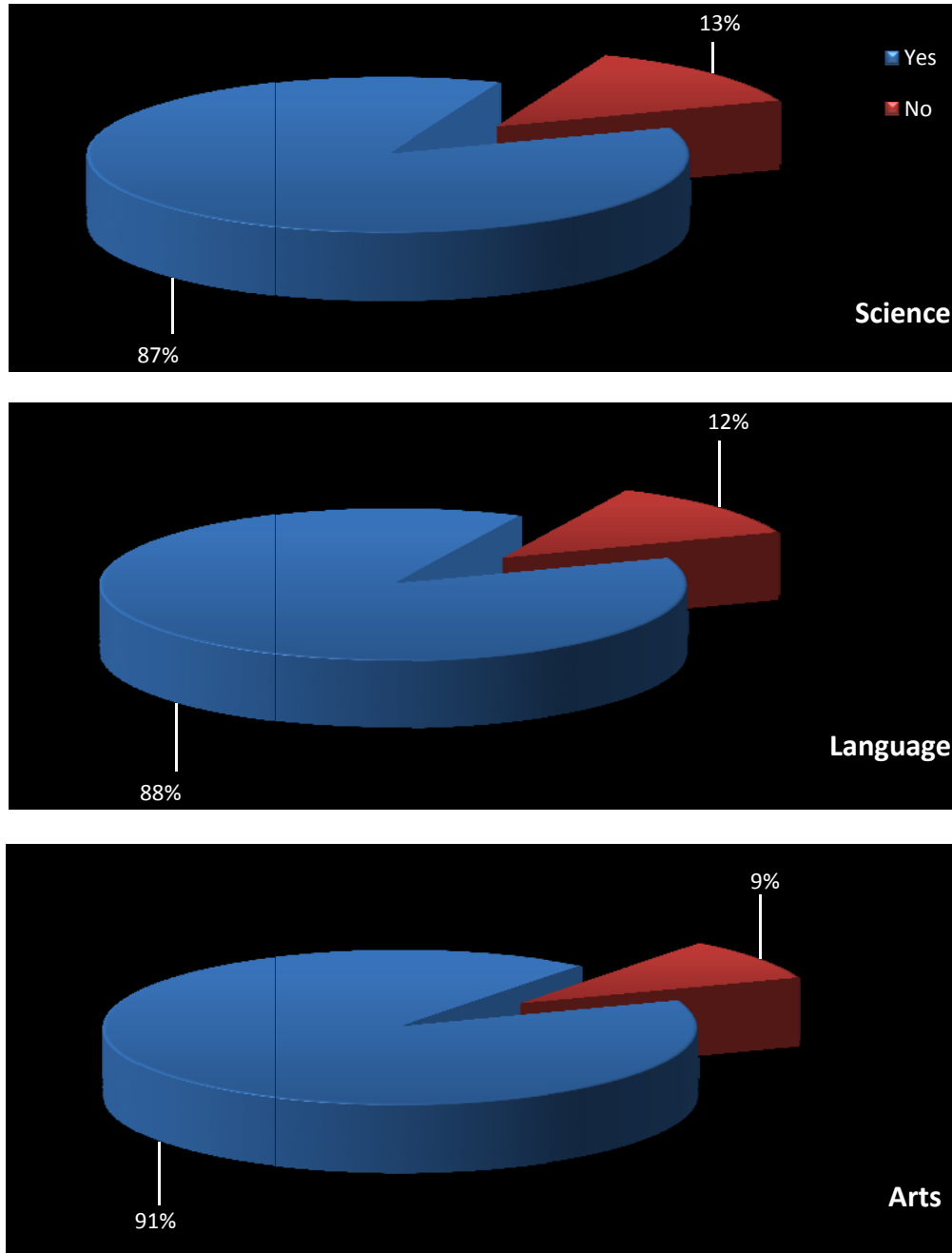


Table 4.81

Stream wise responses of the total sample for the question: Are you of opinion that the environmental problems are to be dealt with in the sequence of local, regional, national and international level?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	407	47	454
	Percent	89.6%	10.4%	100.0%
Language	Frequency	238	29	267
	Percent	89.1%	10.9%	100.0%
Arts	Frequency	179	20	199
	Percent	89.9%	10.1%	100.0%
Total	Frequency	824	96	920
	Percent	89.6%	10.4%	100.0%

The above table of responses regarding agreement or disagreement about question that whether environmental problems are to be dealt with in the sequence of local, regional, national and international level reveals that 89.6% of science stream students, 89.1% and 89.9% of language and arts stream students respectively responded in agreement with the question.

However, it was found that 10.4% of science students, 10.9% of language students and 10.1% of arts students responded as not in agreement with the question.

The graphical representation of the responses stream wise is shown in figure 4.81

Figure 4.81: Percentage of subjects' agreement or disagreement about whether environmental problems are to be dealt with in the sequence of local, regional, national and international level

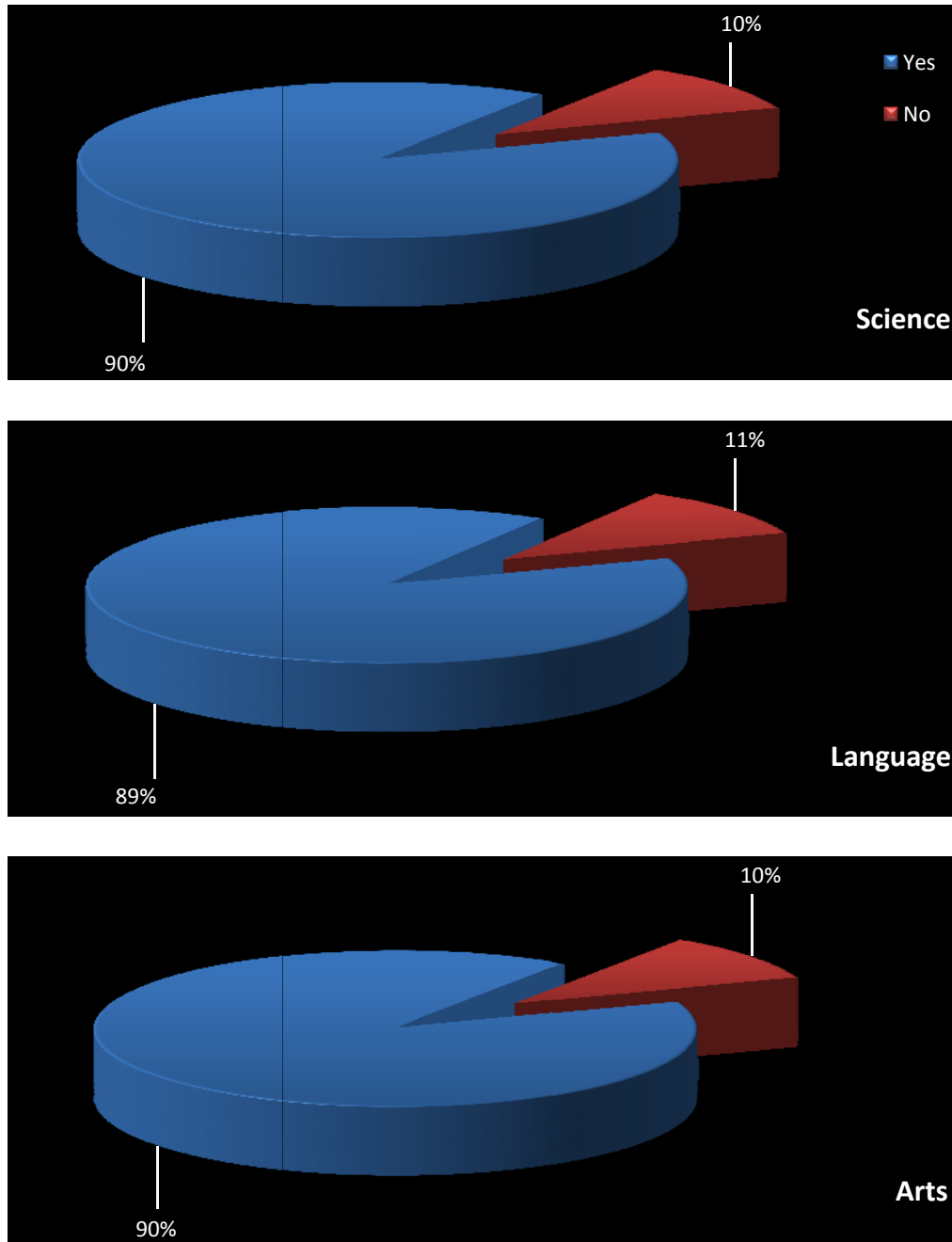


Table 4.82

Stream wise responses of the total sample for the statement: Ignorance regarding the consequences is a major reason for environmental degradation

STREAM		Responses		Total
		Yes	No	
Science	Frequency	402	52	454
	Percent	88.5%	11.5%	100.0%
Language	Frequency	229	38	267
	Percent	85.8%	14.2%	100.0%
Arts	Frequency	162	37	199
	Percent	81.4%	18.6%	100.0%
Total	Frequency	793	127	920
	Percent	86.2%	13.8%	100.0%

The above table of responses regarding agreement or disagreement about the statement, ignorance regarding the consequences is a major reason for environmental degradation, reveals that 88.5% of science stream students, 85.8% and 81.4% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 11.5% of science students, 14.2% of language students and 18.6% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 82

Figure 4.82: Stream wise percentage of subject's agreement or disagreement about the statement ignorance regarding the consequences is a major reason for environmental degradation

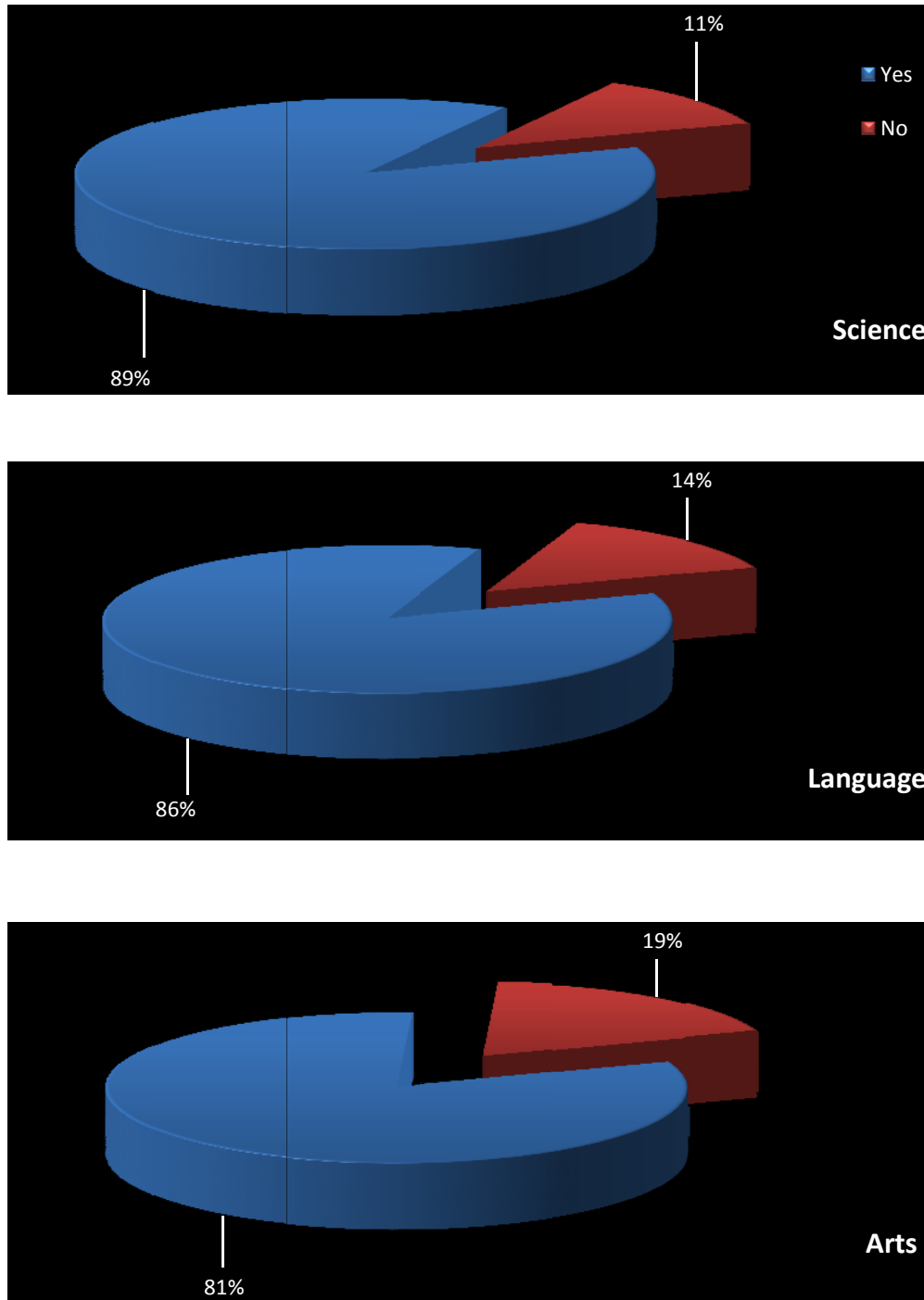


Table 4.83

Stream wise responses of the total sample for the question: Are you in favour of including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	426	28	454
	Percent	93.8%	6.2%	100.0%
Language	Frequency	242	25	267
	Percent	90.6%	9.4%	100.0%
Arts	Frequency	192	7	199
	Percent	96.5%	3.5%	100.0%
Total	Frequency	860	60	920
	Percent	93.5%	6.5%	100.0%

The above table of responses regarding agreement or disagreement about including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum reveals that 93.8% of science stream students, 90.6% and 96.5% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 6.2% of science students, 9.4% of language students and 3.5% of arts students responded as not in agreement with including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum.

The graphical representation of the responses stream wise is shown in figure 4.83

Figure 4.83: Stream wise percentage of subject's agreement or disagreement about including appropriate activities and projects with regard to sustainable development in the school and teacher education curriculum

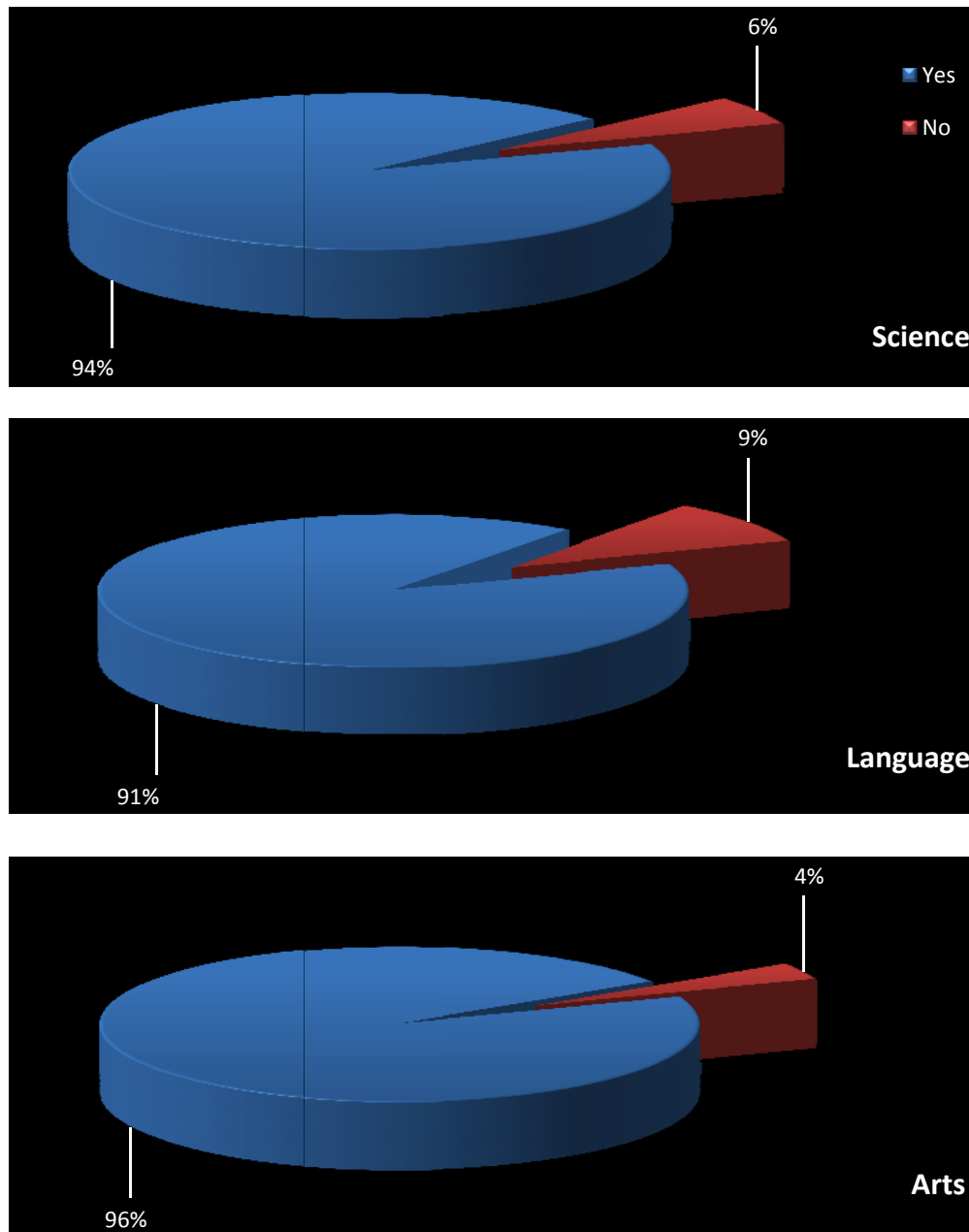


Table 4.84

**Stream wise responses of the total sample for the statement:
Manufactures should discourage the use of disposables**

STREAM		Responses		Total
		Yes	No	
Science	Frequency	317	137	454
	Percent	69.8%	30.2%	100.0%
Language	Frequency	172	95	267
	Percent	64.4%	35.6%	100.0%
Arts	Frequency	115	84	199
	Percent	57.8%	42.2%	100.0%
Total	Frequency	604	316	920
	Percent	65.7%	34.3%	100.0%

The above table of responses regarding agreement or disagreement about the statement that manufactures should discourage the use of disposables reveals that 69.8% of science stream students, 64.4% and 57.8% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 30.2% of science students, 35.6% of language students and 42.2% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.84

Figure 4.84: Stream wise percentage of subject's agreement or disagreement about the statement manufactures should discourage the use of disposables

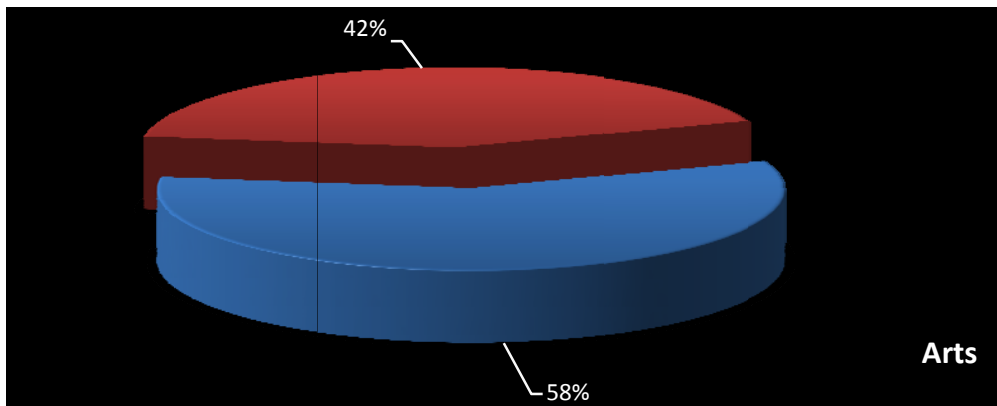
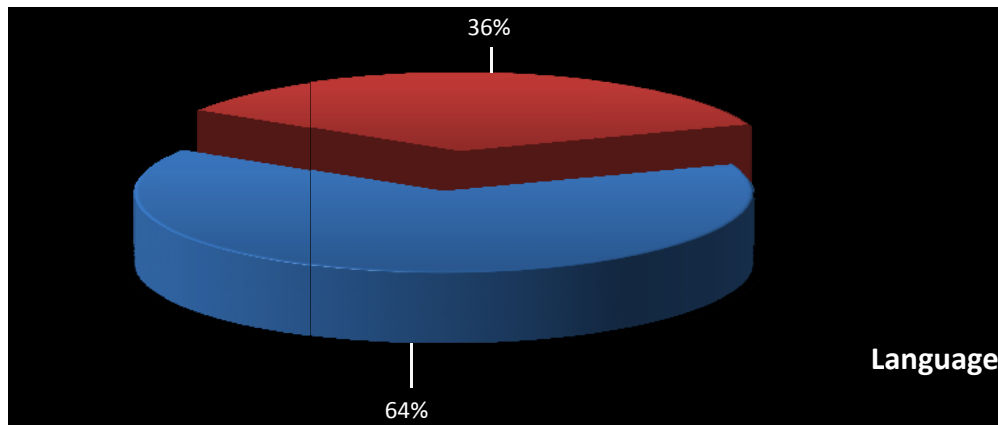
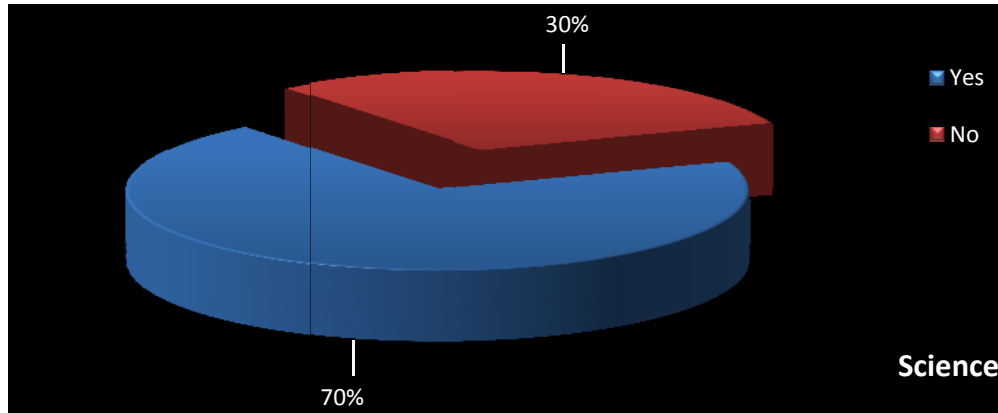


Table 4.85

Stream wise responses of the total sample for the statement: We need stricter laws and regulations to protect the environment

STREAM		Responses		Total
		Yes	No	
Science	Frequency	429	25	454
	Percent	94.5%	5.5%	100.0%
Language	Frequency	245	22	267
	Percent	91.8%	8.2%	100.0%
Arts	Frequency	187	12	199
	Percent	94.0%	6.0%	100.0%
Total	Frequency	861	59	920
	Percent	93.6%	6.4%	100.0%

The above table of responses regarding agreement or disagreement about the statement that we need stricter laws and regulations to protect the environment reveals that 94.5% of science stream students, 91.8% and 94.0% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 5.5% of science students, 8.2% of language students and 6.0% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.85.

Figure 4.85: Stream wise percentage of subject's agreement or disagreement about the statement, we need stricter laws and regulations to protect the environment

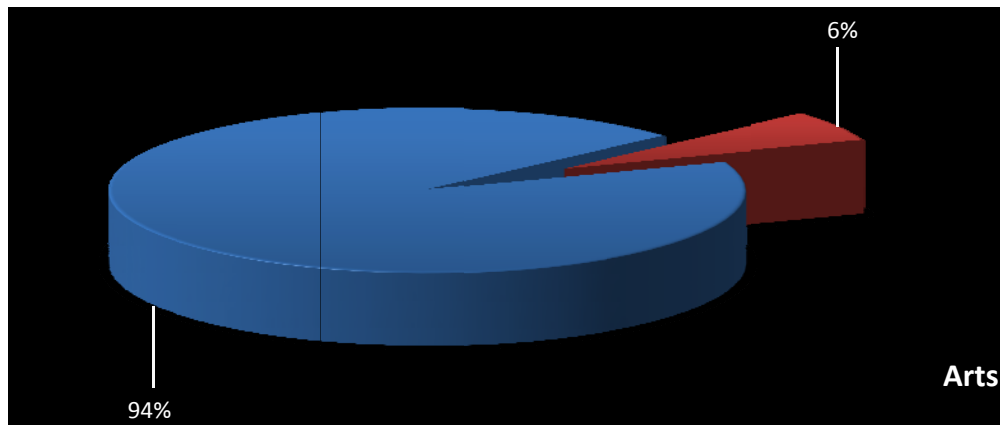
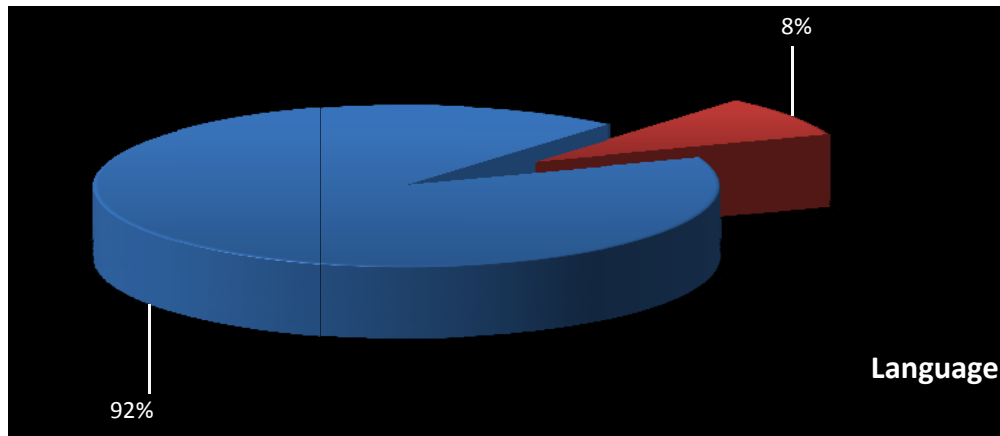
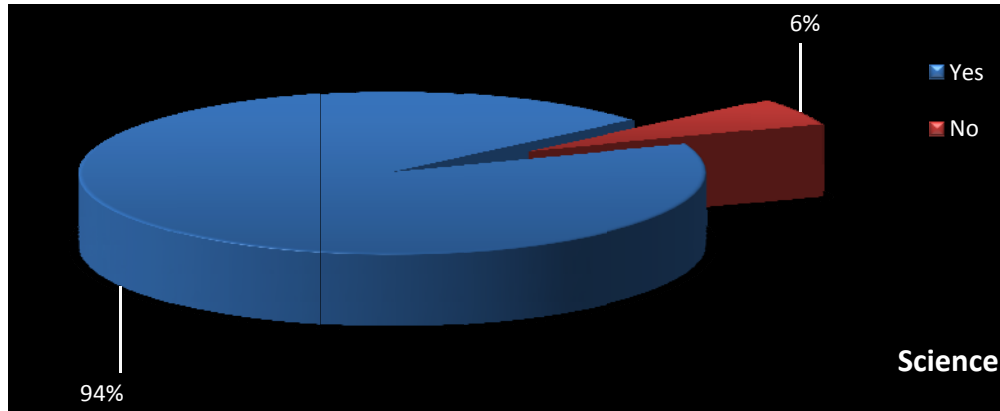


Table 4.86

Stream wise responses of the total sample for the statement: Sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries

STREAM		Responses		Total
		Yes	No	
Science	Frequency	293	161	454
	Percent	64.5%	35.5%	100.0%
Language	Frequency	164	103	267
	Percent	61.4%	38.6%	100.0%
Arts	Frequency	129	70	199
	Percent	64.8%	35.2%	100.0%
Total	Frequency	586	334	920
	Percent	63.7%	36.3%	100.0%

The above table of responses regarding agreement or disagreement about the statement that sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries reveals that 64.5% of science stream students, 61.4% and 64.8% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 35.5% of science students, 38.6% of language students and 35.2% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.86

Figure 4.86: Stream wise percentage of subject's agreement or disagreement about the statement sustainable development will not be possible until the wealthier nations stop exploiting the labour and natural resources of poorer countries

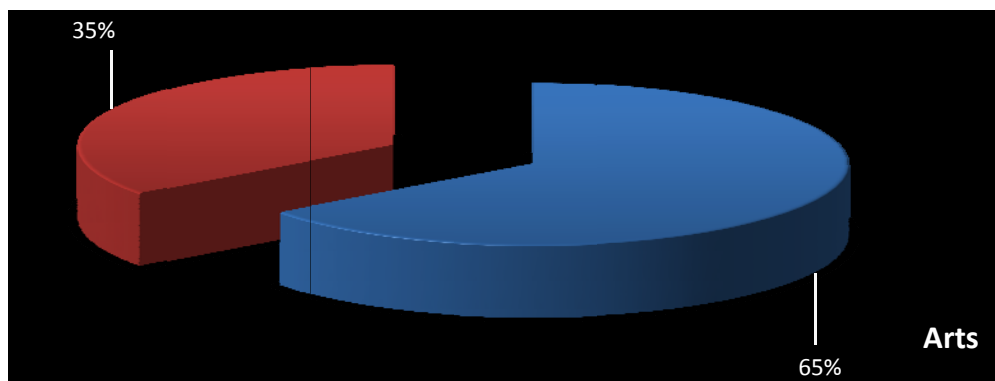
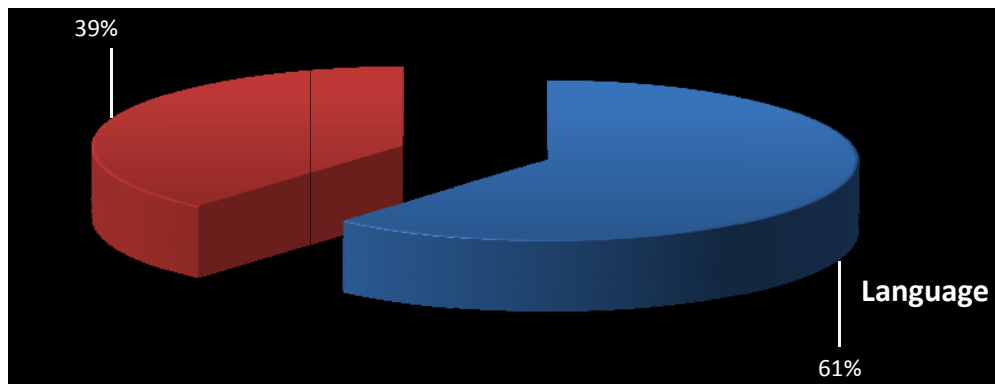
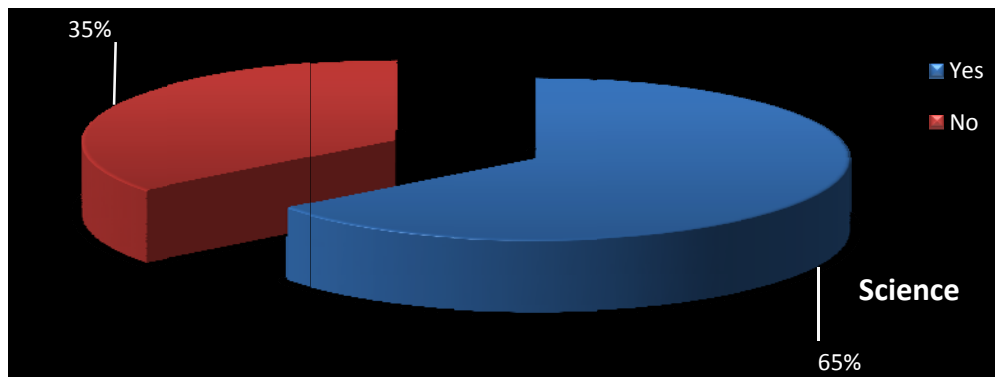


Table 4.87

Stream wise responses of the total sample for the statement: Companies that are environmentally sustainable are more likely to be profitable over the long run

STREAM		Responses		Total
		Yes	No	
Science	Frequency	120	334	454
	Percent	26.4%	73.6%	100.0%
Language	Frequency	68	199	267
	Percent	25.5%	74.5%	100.0%
Arts	Frequency	72	127	199
	Percent	36.2%	63.8%	100.0%
Total	Frequency	260	660	920
	Percent	28.3%	71.7%	100.0%

The above table of responses regarding agreement or disagreement about the statement, companies that are environmentally sustainable are more likely to be profitable over the long run reveals that 73.6% of science stream students, 74.5% and 63.8% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 26.4% of science students, 25.5% of language students and 36.2% of arts students responded in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.87.

Figure 4.87: Stream wise percentages of subject's agreement or disagreement about the statement companies that are environmentally sustainable are more likely to be profitable over the long run

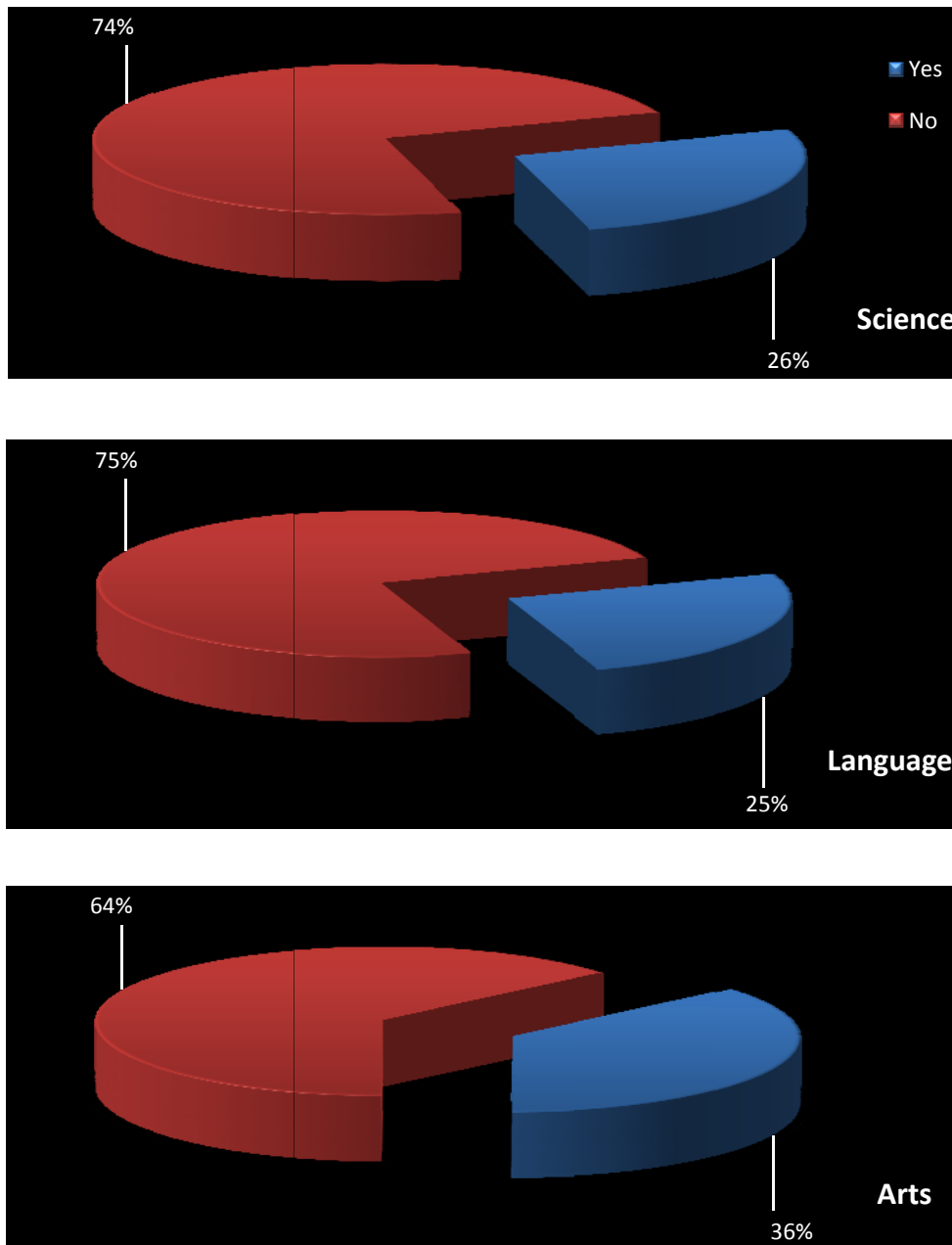


Table 4.88

Stream wise responses of the total sample for the question: Is the Education for Sustainable Development project is declared by UNESCO

STREAM		Responses		Total
		Yes	No	
Science	Frequency	335	119	454
	Percent	73.8%	26.2%	100.0%
Language	Frequency	167	100	267
	Percent	62.5%	37.5%	100.0%
Arts	Frequency	160	39	199
	Percent	80.4%	19.6%	100.0%
Total	Frequency	662	258	920
	Percent	72.0%	28.0%	100.0%

The above table of responses regarding agreement or disagreement about whether Education for Sustainable Development project is declared by UNESCO, reveals that 73.8% of science stream students, 62.5% and 80.4% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 26.2% of science students, 37.5% of language students and 19.6% of arts students responded as not in agreement that Education for Sustainable Development project is declared by UNESCO.

The graphical representation of the responses stream wise is shown in figure 4.88

Figure 4.88: Stream wise percentage of subject's agreement or disagreement about the question, is the Education for Sustainable Development project is declared by UNESCO

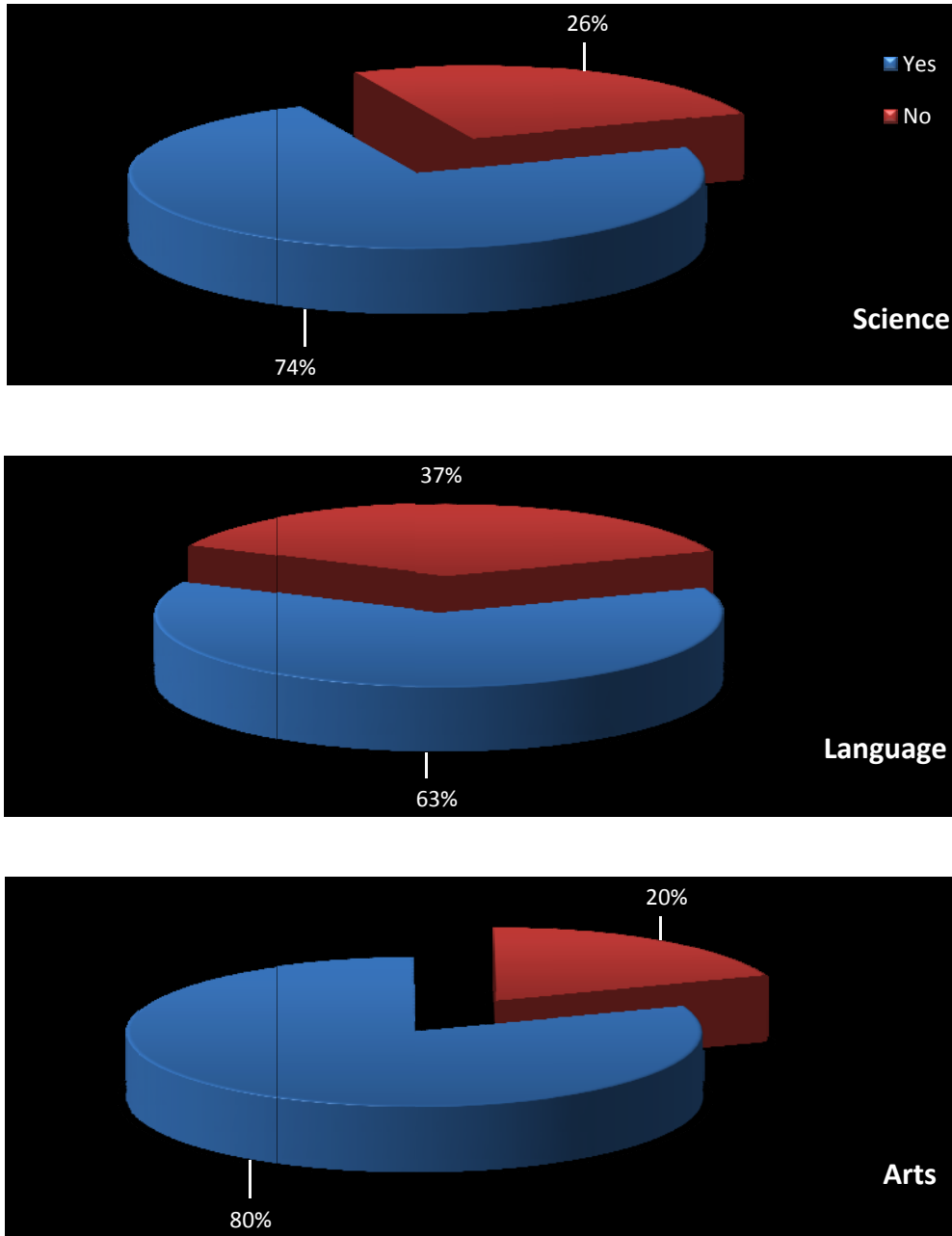


Table 4.89

Stream wise responses of the total sample for the question: Do you know about Agenda 21 of Rio Earth Summit?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	150	304	454
	Percent	33.0%	67.0%	100.0%
Language	Frequency	62	205	267
	Percent	23.2%	76.8%	100.0%
Arts	Frequency	56	143	199
	Percent	28.1%	71.9%	100.0%
Total	Frequency	268	652	920
	Percent	29.1%	70.9%	100.0%

The above table of responses regarding agreement or disagreement about the statement that whether they know about Agenda 21 of Rio Summit reveals that 33.0% of science stream students, 23.2% and 28.1% of language and arts stream students respectively responded that they know about agenda 21.

Whereas, it was found that 67.0% of science students, 76.8% of language students and 71.9% of arts students responded that they did not know about Agenda 21 of Rio Earth Summit.

The graphical representation of the responses stream wise is shown in figure 4.89

Figure 4.89: Stream wise percentage of knowledge about Agenda 21 of Rio Summit

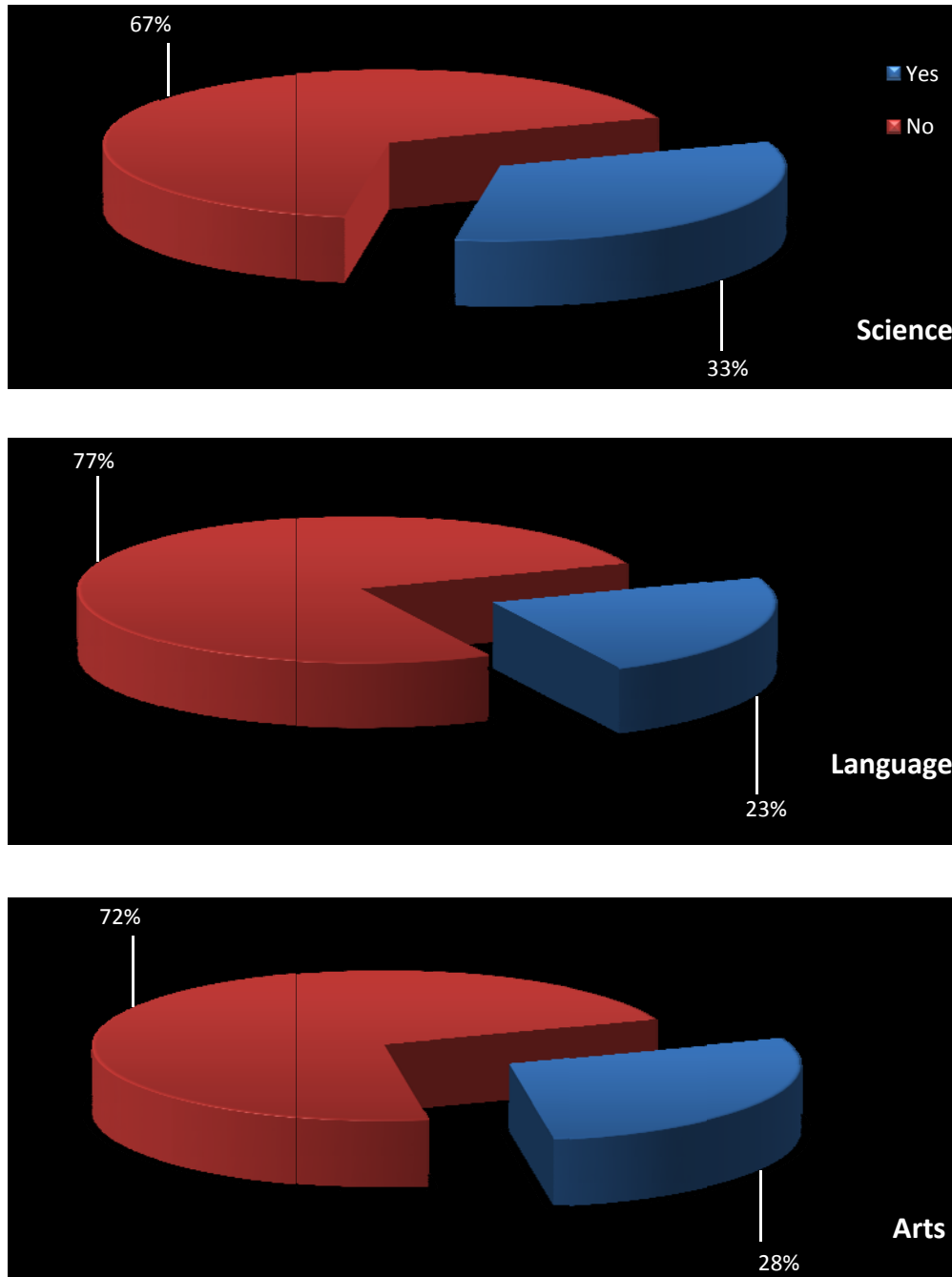


Table 4.90

Stream wise responses of the total sample for the question: Do you know about the document ‘our common future’?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	117	337	454
	Percent	25.8%	74.2%	100.0%
Language	Frequency	55	212	267
	Percent	20.6%	79.4%	100.0%
Arts	Frequency	73	126	199
	Percent	36.7%	63.3%	100.0%
Total	Frequency	245	675	920
	Percent	26.6%	73.4%	100.0%

The above table of responses regarding their knowledge about the document ‘our common future’ reveals that 25.8% of science stream students, 20.6% and 36.7% of language and arts stream students respectively have knowledge about the document ‘Our Common Future’.

Whereas, it was found that 74.2% of science students, 79.4% of language students and 63.3% of arts students responded as not having knowledge about the document.

The graphical representation of the responses stream wise is shown in figure 4.90.

Figure 4.90: Stream wise percentage of subject's knowledge about the document 'our common future'

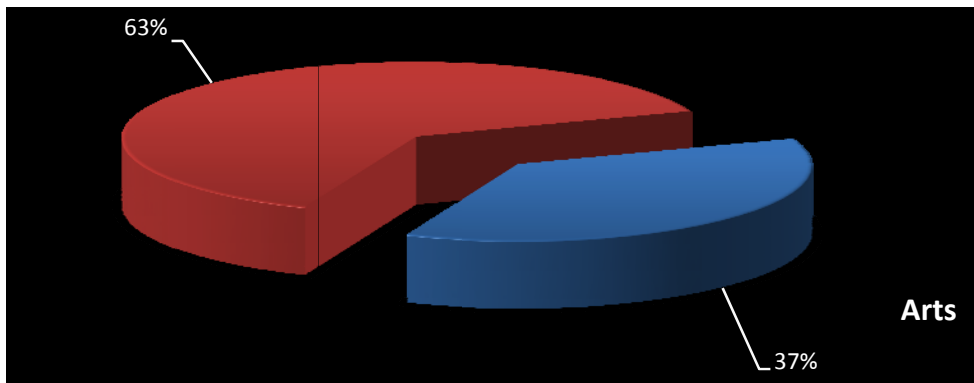
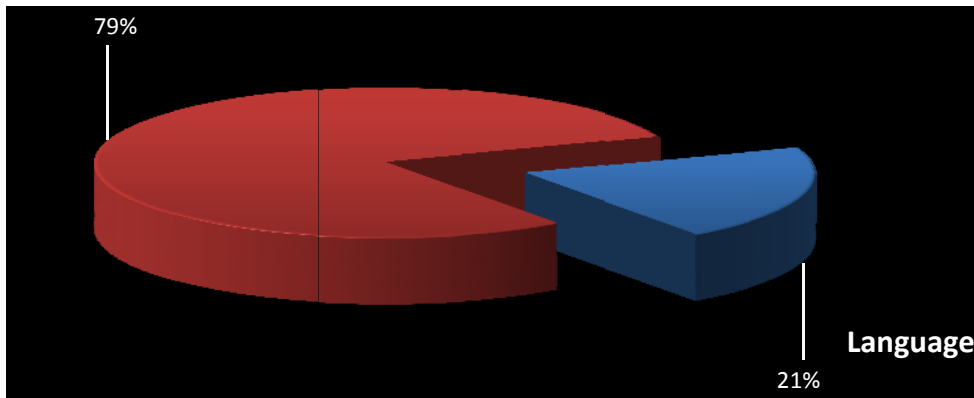
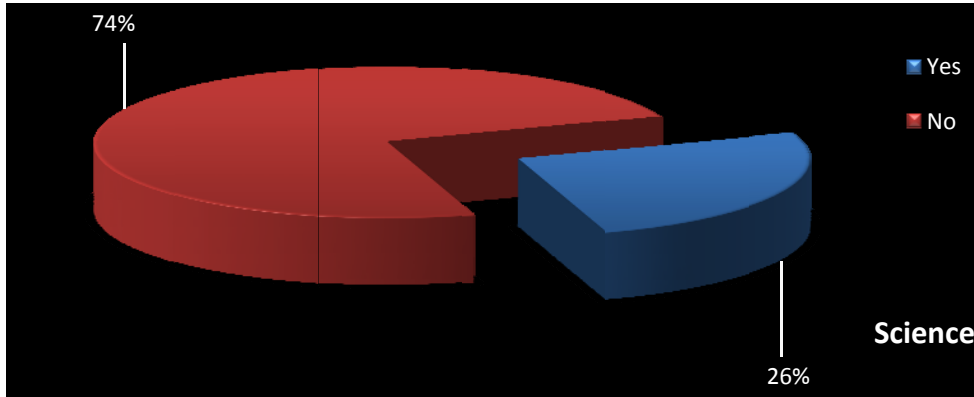


Table 4.91

Stream wise responses of the total sample for the question: Do you think that the campus has a practical role in sustaining the ecosystem?

STREAM		Responses		Total
		Yes	No	
Science	Frequency	409	45	454
	Percent	90.1%	9.9%	100.0%
Language	Frequency	244	23	267
	Percent	91.4%	8.6%	100.0%
Arts	Frequency	185	14	199
	Percent	93.0%	7.0%	100.0%
Total	Frequency	838	82	920
	Percent	91.1%	8.9%	100.0%

The above table of responses regarding agreement or disagreement about the question whether campus has a practical role in sustaining the ecosystem reveals that 90.1% of science stream students, 91.4% and 93.0% of language and arts stream students respectively responded in agreement with the question.

However, it was found that 9.9% of science students, 8.6% of language students and 7.0% of arts students have no agreement that the campus has a practical role in sustaining the ecosystem.

The graphical representation of the responses stream wise is shown in figure 4.91

Figure 4.91: Stream wise percentage of subject's agreement or disagreement about whether campus has a practical role in sustaining the ecosystem

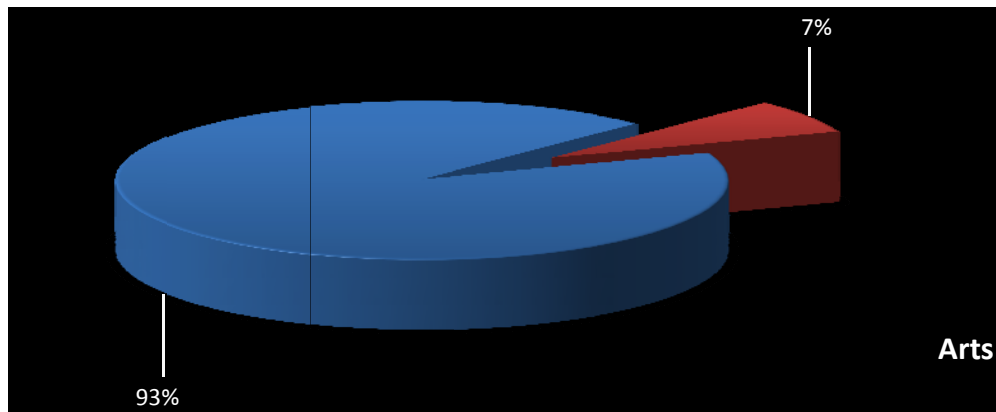
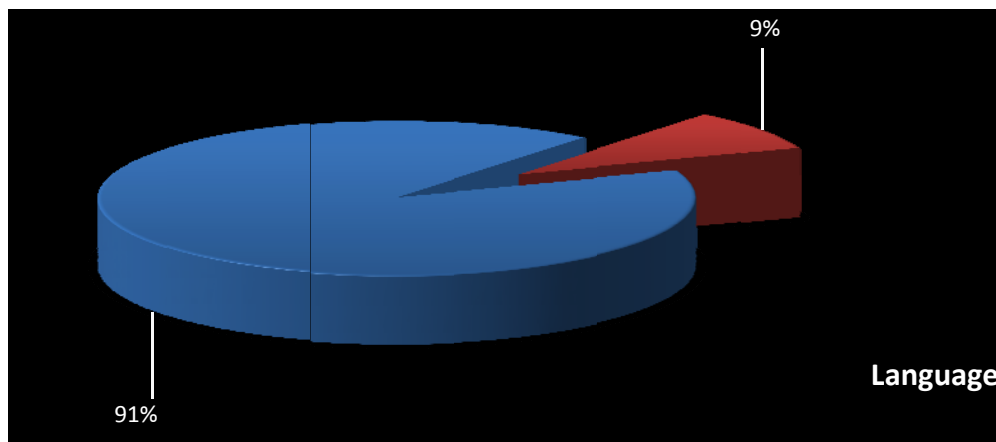
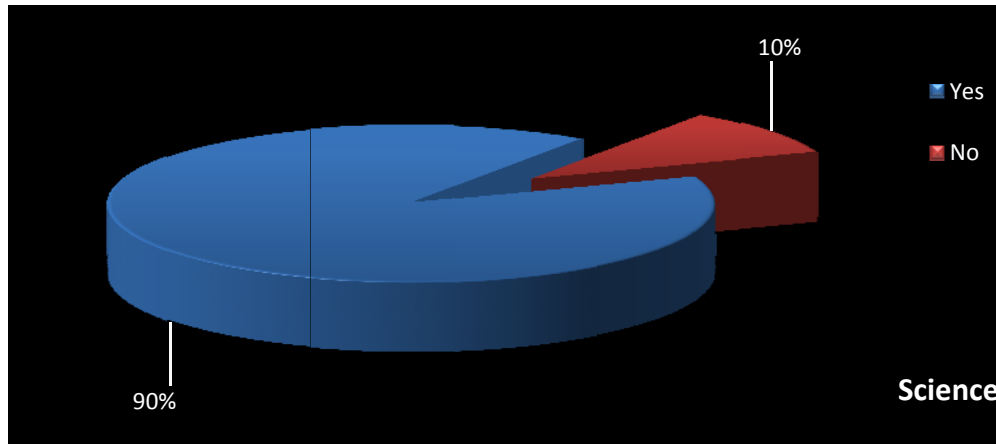


Table 4.92a

Stream wise responses of the total sample for the question: Do you have awareness about renewable energy

STREAM		Responses		Total
		Yes	No	
Science	Frequency	396	58	454
	Percent	87.2%	12.8%	100.0%
Language	Frequency	203	64	267
	Percent	76.0%	24.0%	100.0%
Arts	Frequency	170	29	199
	Percent	85.4%	14.6%	100.0%
Total	Frequency	769	151	920
	Percent	83.6%	16.4%	100.0%

The above table of responses regarding agreement or disagreement towards awareness about renewable energy reveals that 87.2% of science stream students, 76.0% and 85.4% of language and arts stream students respectively have knowledge about renewable energy.

However, it was found that 12.8% of science students, 24.0% of language students and 14.6% of arts students responded as not having knowledge about renewable energy.

The graphical representation of the responses stream wise is shown in figure 4.92a

Figure 4.92a: Stream wise percentage of awareness about renewable energy

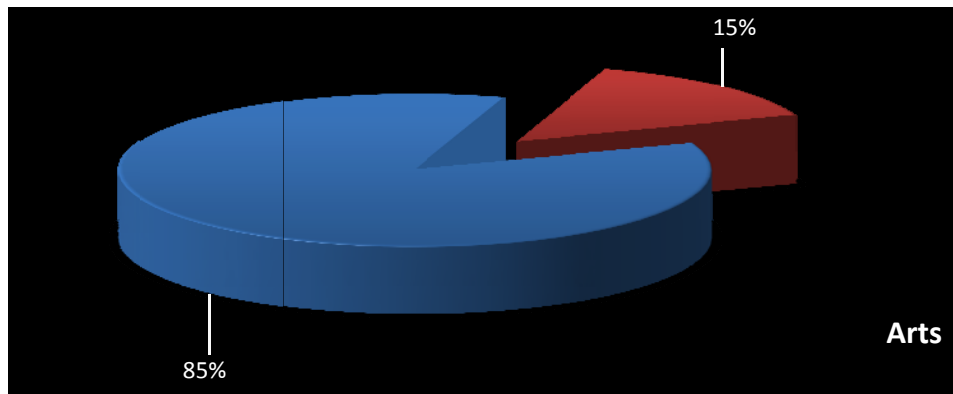
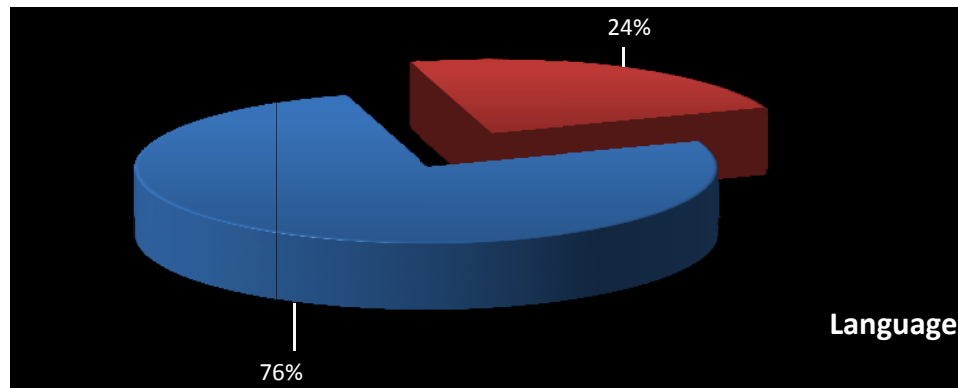
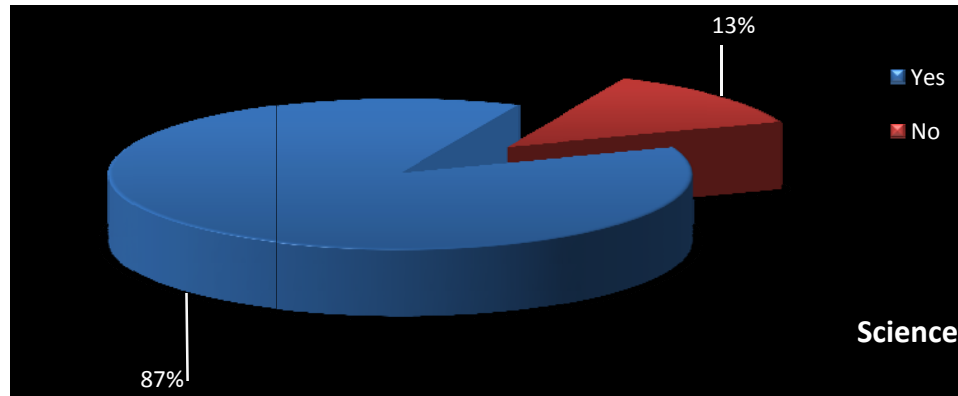


Table 4.92b

Stream wise responses of the total sample for the question: Do you have awareness about sustainable building design/green design

STREAM		Responses		Total
		Yes	No	
Science	Frequency	208	246	454
	Percent	45.8%	54.2%	100.0%
Language	Frequency	127	140	267
	Percent	47.6%	52.4%	100.0%
Arts	Frequency	88	111	199
	Percent	44.2%	55.8%	100.0%
Total	Frequency	423	497	920
	Percent	54.0%	46.0%	100.0%

The above table of responses regarding awareness about sustainable building design/green design reveals that 54.2% of science stream students, 52.4% and 55.8% of language and arts stream students respectively not having awareness about green design.

However, it was found that only 45.8% of science students, 47.6% of language students and 44.2% of arts students responded as having awareness about sustainable building design/green design.

The graphical representation of the responses stream wise is shown in figure 4.92b

Figure 4.92b: Stream wise percentage of subject's awareness about sustainable building design

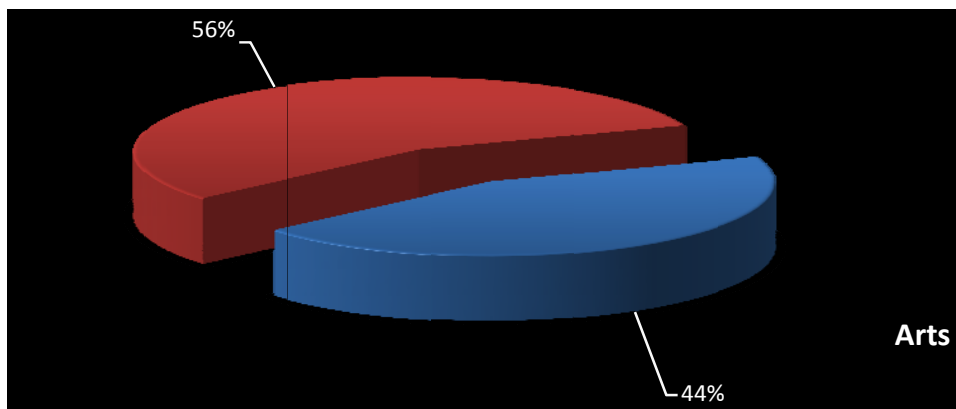
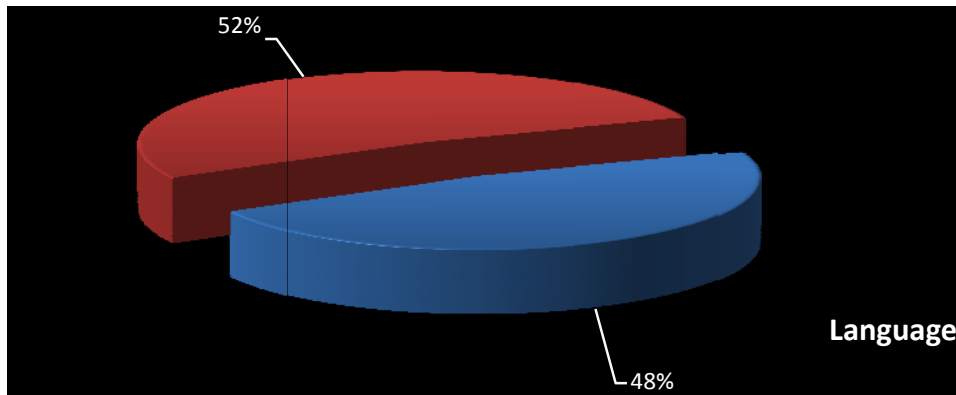
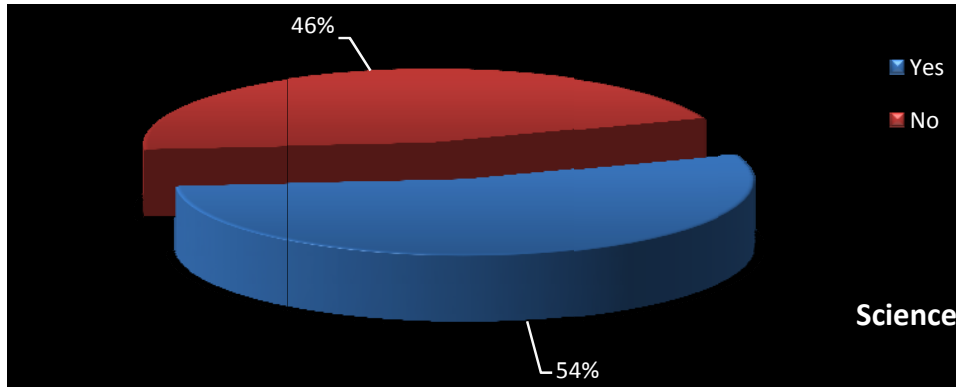


Table 4.92c

Stream wise responses of the total sample for the question: Do you have awareness about ecological economics

STREAM		Responses		Total
		Yes	No	
Science	Frequency	194	260	454
	Percent	42.7%	57.3%	100.0%
Language	Frequency	138	129	267
	Percent	51.7%	48.3%	100.0%
Arts	Frequency	77	122	199
	Percent	38.7%	61.3%	100.0%
Total	Frequency	409	511	920
	Percent	44.5%	55.5%	100.0%

The above table of responses regarding awareness about ecological economics reveals that 57.3% of science stream students, 48.3% and 61.3% of language and arts stream students respectively responded as not having awareness about ecological economics.

However, it was found that only 42.7% of science students, 51.7% of language students and 38.7% of arts students responded as having a awareness about ecological economics.

The graphical representation of the responses stream wise is shown in figure 4.92c

Figure 4.92c: Stream wise percentage of awareness about ecological economics

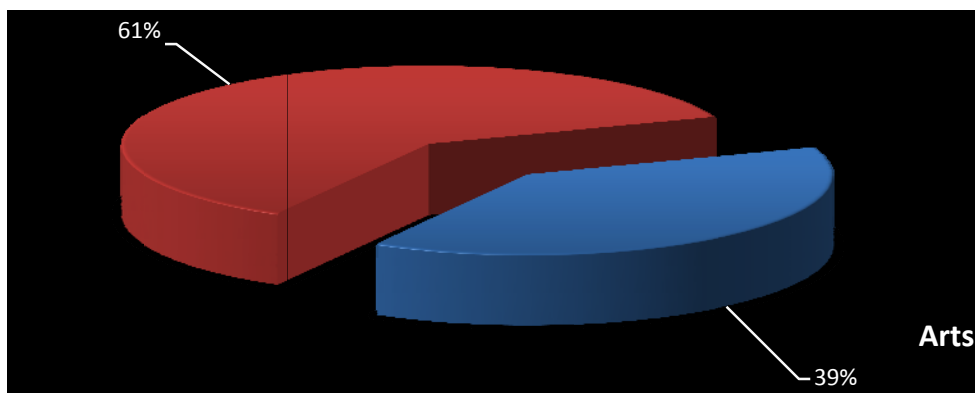
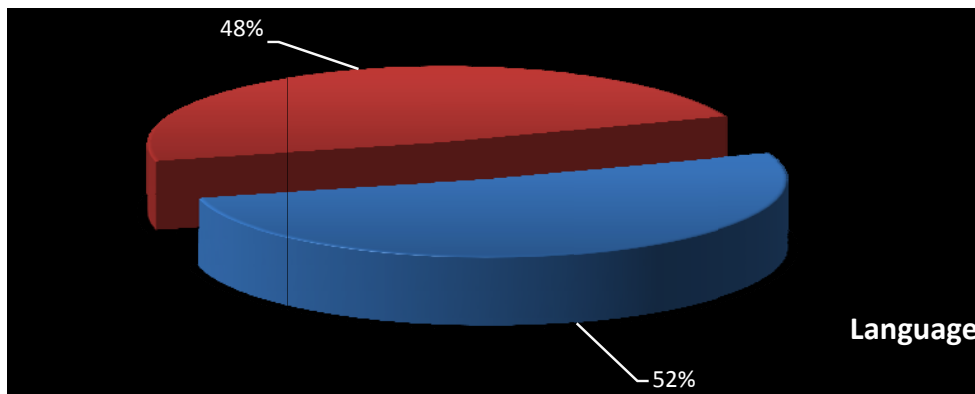
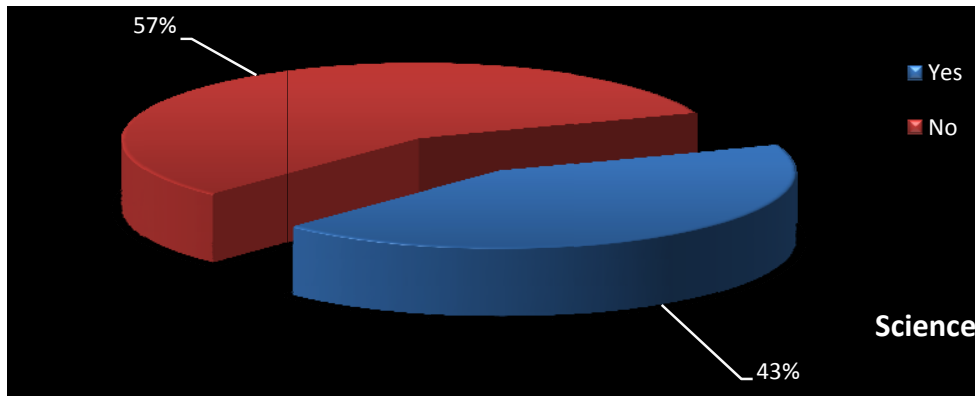


Table 4.92d

Stream wise responses of the total sample for the question: Do you have awareness about sustainable agriculture

STREAM		Responses		Total
		Yes	No	
Science	Frequency	378	76	454
	Percent	83.3%	16.7%	100.0%
Language	Frequency	197	70	267
	Percent	73.8%	26.2%	100.0%
Arts	Frequency	161	38	199
	Percent	80.9%	19.1%	100.0%
Total	Frequency	736	184	920
	Percent	80.0%	20.0%	100.0%

The above table of responses regarding awareness about sustainable agriculture reveals that 83.3% of science stream students, 73.8% and 80.9% of language and arts stream students respectively responded as having awareness about sustainable agriculture.

However, it was found that 16.7% of science students, 26.2% of language students and 19.1% of arts students responded as not having awareness about sustainable agriculture.

The graphical representation of the responses stream wise is shown in figure 4.92d

Figure 4.92d: Stream wise percentage of subject's awareness about sustainable agriculture

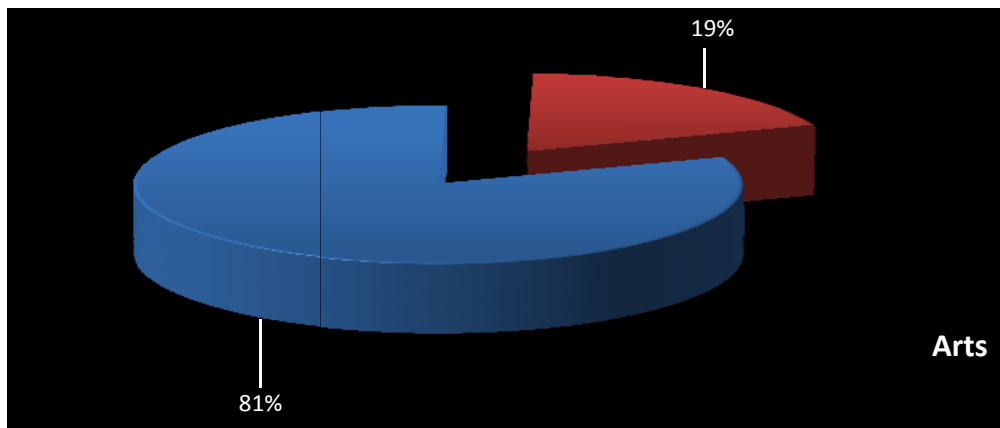
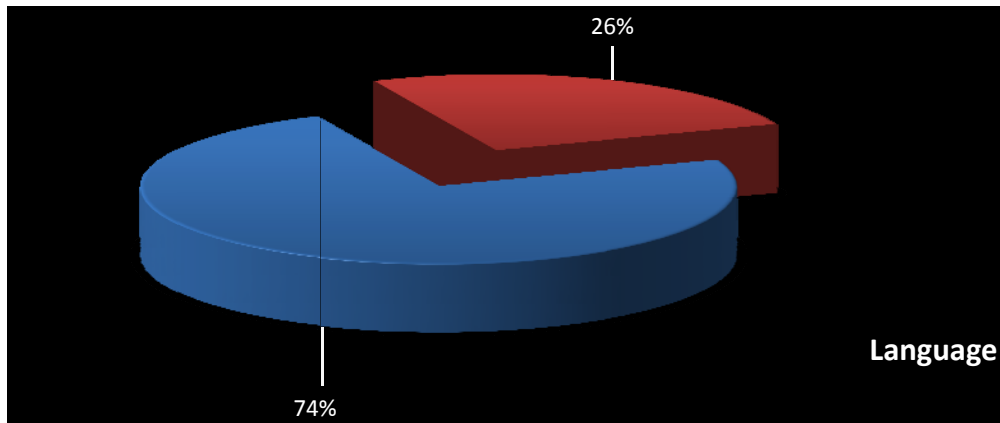
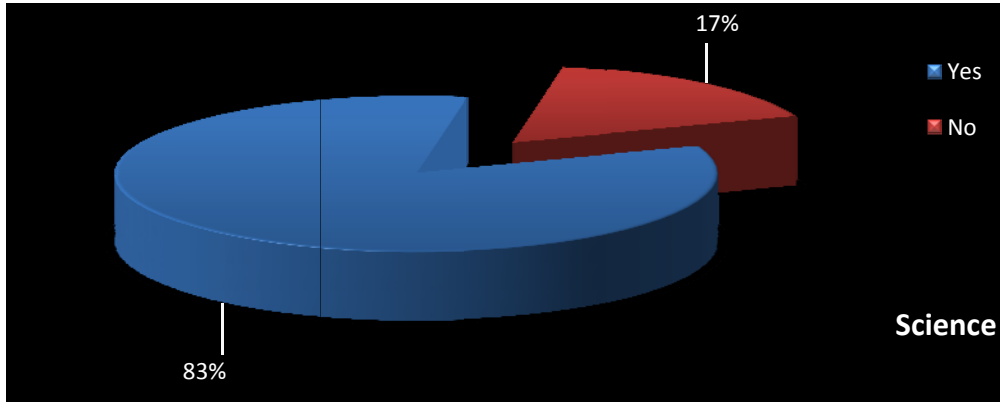


Table 4.92e

Stream wise responses of the total sample for the question: Do you have awareness about sustainable forestry

STREAM		Responses		Total
		Yes	No	
Science	Frequency	100	354	454
	Percent	22.0%	78.0%	100.0%
Language	Frequency	59	208	267
	Percent	22.1%	77.9%	100.0%
Arts	Frequency	49	150	199
	Percent	24.6%	75.4%	100.0%
Total	Frequency	208	712	920
	Percent	22.6%	77.4%	100.0%

The above table of responses regarding awareness about sustainable forestry reveals that 78.0% of science stream students, 77.9% and 75.4% of language and arts stream students respectively having awareness about sustainable forestry.

However, it was found that 22.0% of science students, 22.1% of language students and 24.6% of arts students responded as having awareness about sustainable forestry.

The graphical representation of the responses stream wise is shown in figure 4.92e

Figure 4.92e: Stream wise percentage of subject's awareness about sustainable forestry

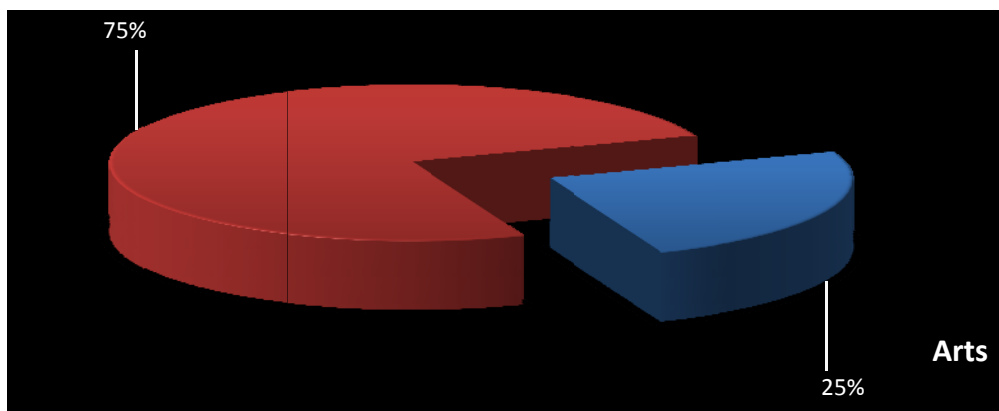
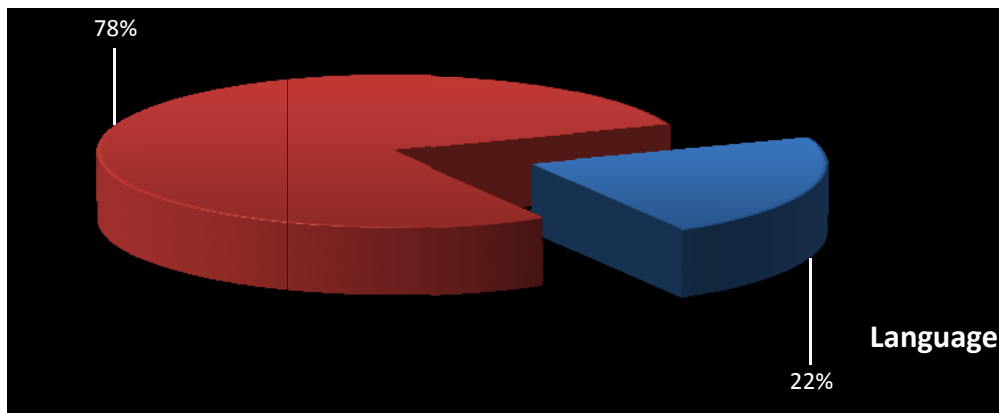
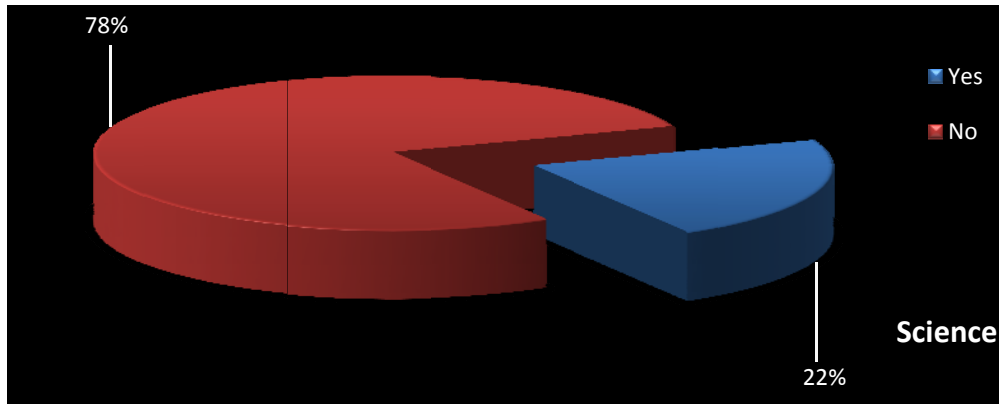


Table 4.92f

Stream wise responses of the total sample for the question: Do you have awareness about indigenous wisdom and technologies

STREAM		Responses		Total
		Yes	No	
Science	Frequency	173	281	454
	Percent	38.1%	61.9%	100.0%
Language	Frequency	115	152	267
	Percent	43.1%	56.9%	100.0%
Arts	Frequency	97	102	199
	Percent	48.7%	51.3%	100.0%
Total	Frequency	385	535	920
	Percent	41.8%	58.2%	100.0%

The above table of responses regarding agreement or disagreement about awareness about indigenous wisdom and technologies reveals that 38.1% of science stream students, 43.1% and 48.7% of language and arts stream students respectively responded as having awareness about indigenous wisdom and technologies.

However, it was found that 61.9% of science students, 56.9% of language students and 51.3% of arts students responded as not having awareness about indigenous wisdom and technologies.

The graphical representation of the responses stream wise is shown in figure 4.92f

Figure 4.92.f: Stream wise percentage of subject's awareness about indigenous wisdom and technologies

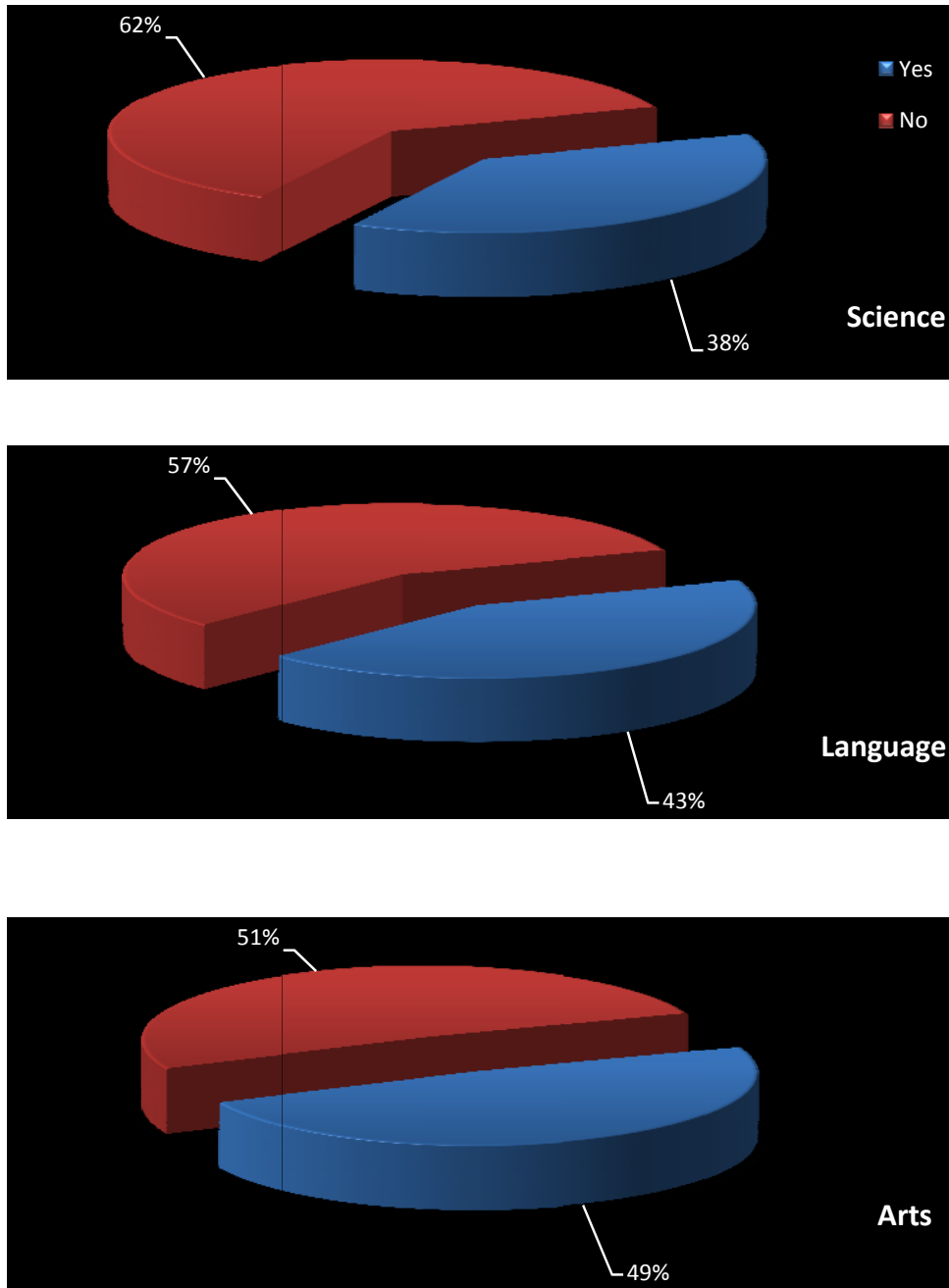


Table 4.92g

Stream wise responses of the total sample for the question: Do you have awareness about sustainable transportation

STREAM		Responses		Total
		Yes	No	
Science	Frequency	204	250	454
	Percent	44.9%	55.1%	100.0%
Language	Frequency	106	161	267
	Percent	39.7%	60.3%	100.0%
Arts	Frequency	60	139	199
	Percent	30.2%	69.8%	100.0%
Total	Frequency	370	550	920
	Percent	40.2%	59.8%	100.0%

The above table of responses regarding awareness about sustainable transportation reveals that 55.1% of science stream students, 60.3% and 69.8% of language and arts stream students respectively as not having awareness about sustainable transportation.

However, it was found that 44.9% of science students, 39.7% of language students and 30.2% of arts students responded as having awareness about sustainable transportation.

The graphical representation of the responses stream wise is shown in figure 4.92g

Figure 4.92g: Stream wise percentage of subject's awareness about sustainable transportation

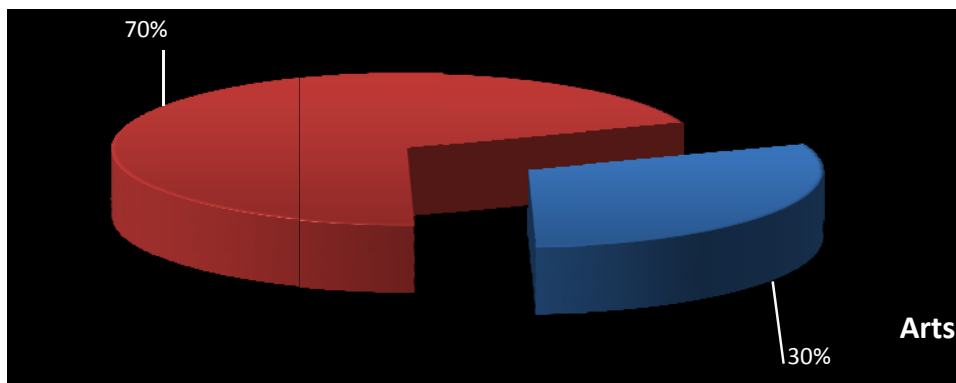
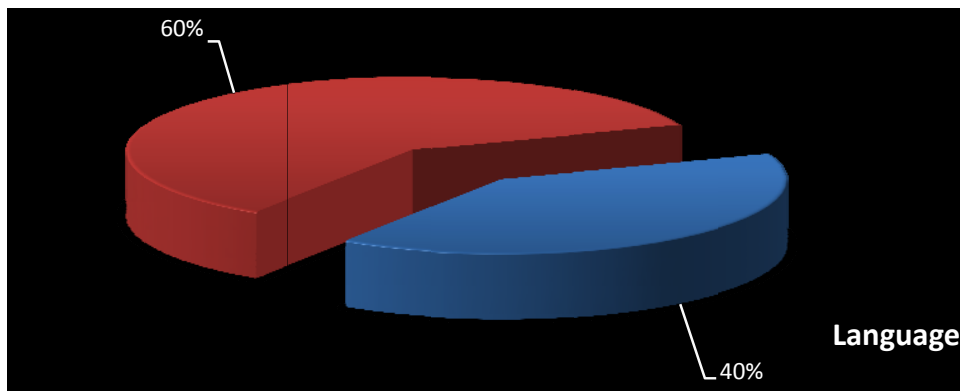
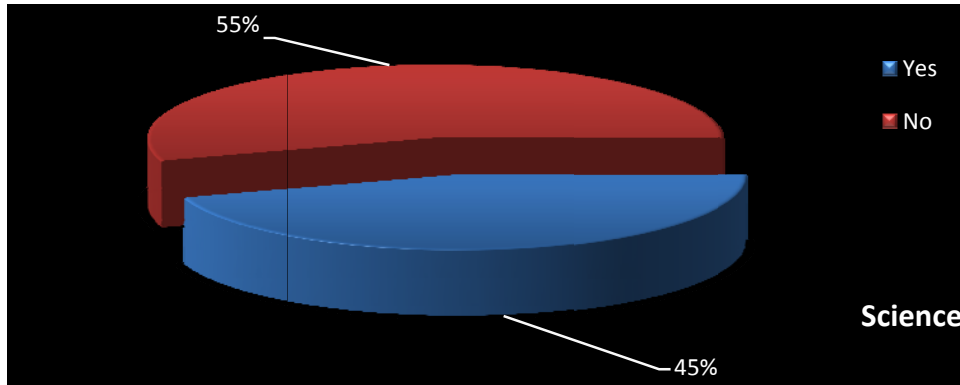


Table 4.92h

Stream wise responses of the total sample for the question: Do you have awareness about green purchasing

STREAM		Responses		Total
		Yes	No	
Science	Frequency	206	248	454
	Percent	45.4%	54.6%	100.0%
Language	Frequency	139	128	267
	Percent	52.1%	47.9%	100.0%
Arts	Frequency	89	110	199
	Percent	44.7%	55.3%	100.0%
Total	Frequency	434	486	920
	Percent	47.2%	52.8%	100.0%

The above table of responses regarding awareness about green purchasing reveals that 45.4% of science stream students, 52.1% and 44.7% of language and arts stream students respectively responded as having awareness about green purchasing.

However, it was found that 54.6% of science students, 47.9% of language students and 55.3% of arts students responded not having awareness about green purchasing.

The graphical representation of the responses stream wise is shown in figure 4.92h

Figure 4.92h: Stream wise percentage of subject's awareness about green purchasing

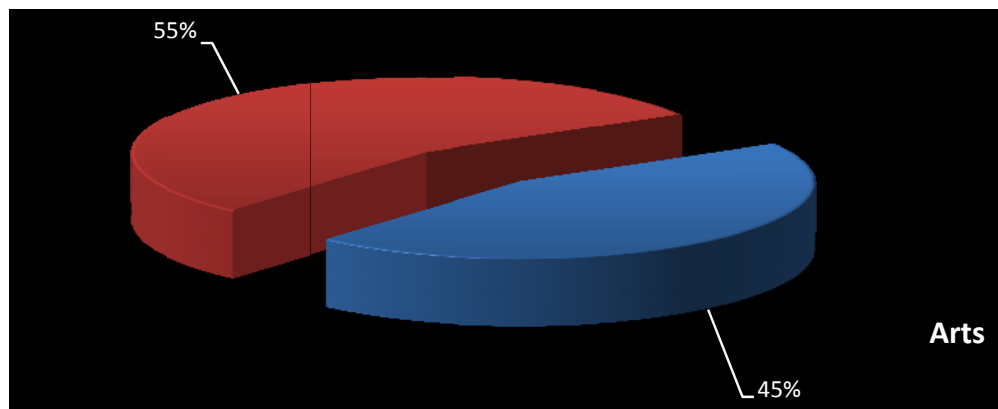
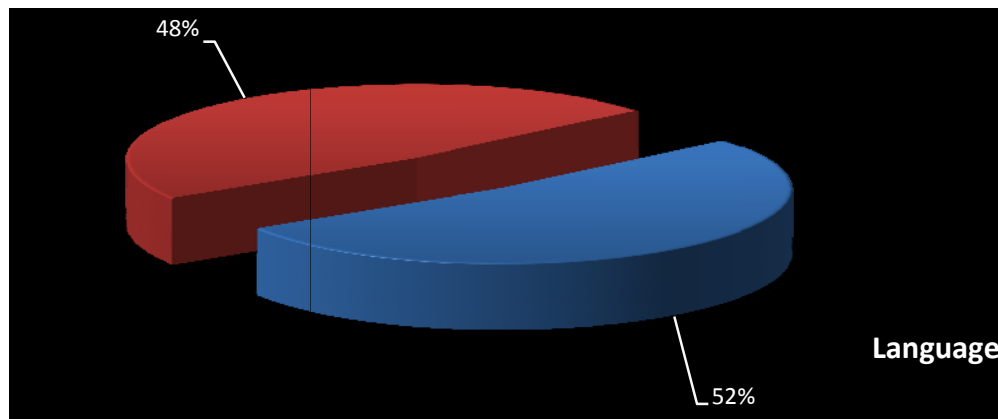
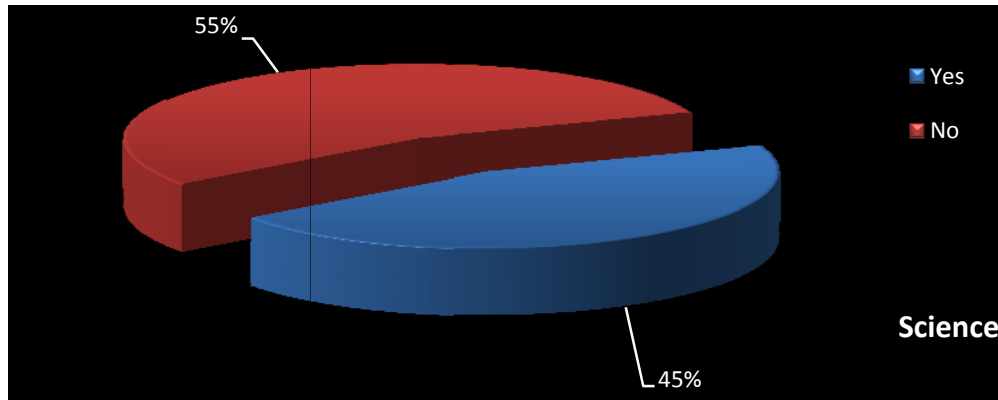


Table 4.92i

Stream wise responses of the total sample for the question: Do you have awareness about environmental audit

STREAM		Responses		Total
		Yes	No	
Science	Frequency	147	307	454
	Percent	32.4%	67.6%	100.0%
Language	Frequency	104	163	267
	Percent	39.0%	61.0%	100.0%
Arts	Frequency	80	119	199
	Percent	40.2%	59.8%	100.0%
Total	Frequency	331	589	920
	Percent	36.0%	64.0%	100.0%

The above table of responses regarding awareness about environmental audit reveals that 32.4% of science stream students, 39.0% and 40.2% of language and arts stream students respectively responded as having awareness about environmental audit.

However, it was found that 67.6% of science students, 61.0% of language students and 59.8% of arts students responded as not having awareness about environmental audit.

The graphical representation of the responses stream wise is shown in figure 4.92i

Figure 4.92i: Stream wise percentage of subject's awareness about environmental audit

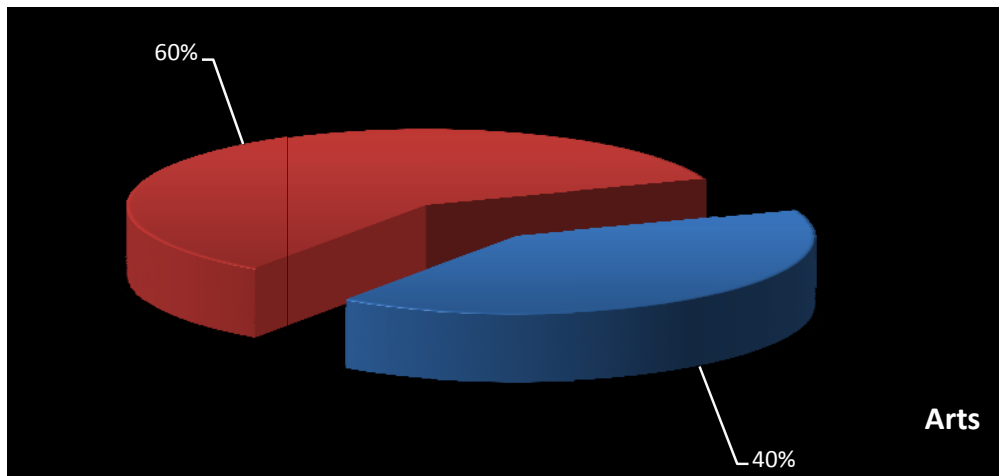
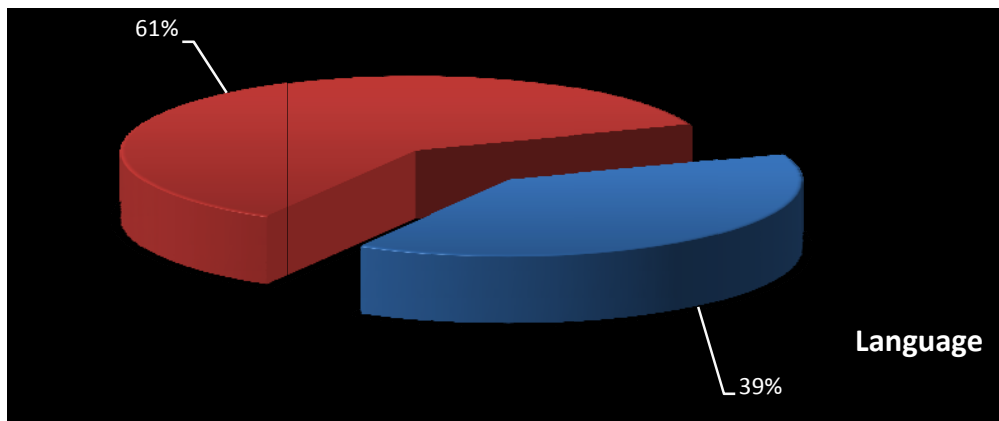
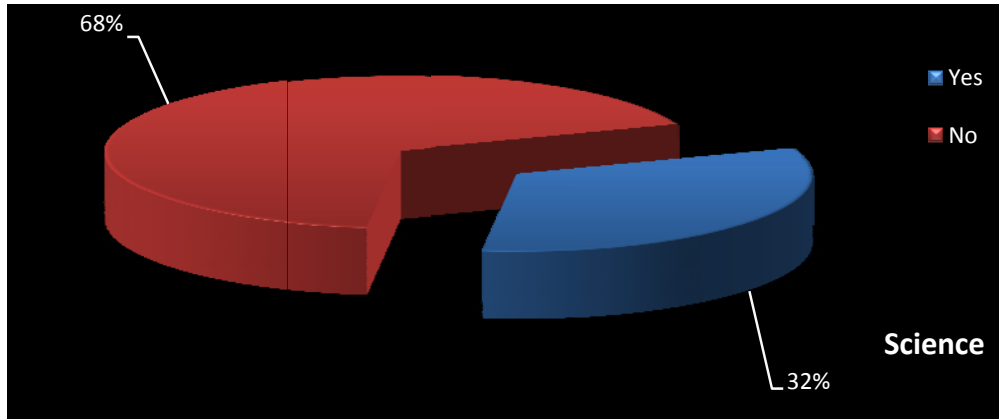


Table 4.93

Stream wise responses of the total sample for the statement: There is no point in getting involved in environmental issues, since government have all the power and can do what they like

STREAM		Responses		Total
		Yes	No	
Science	Frequency	157	297	454
	Percent	34.6%	65.4%	100.0%
Language	Frequency	88	179	267
	Percent	33.0%	67.0%	100.0%
Arts	Frequency	90	109	199
	Percent	45.2%	54.8%	100.0%
Total	Frequency	335	585	920
	Percent	36.4%	63.6%	100.0%

The above table of responses regarding agreement or disagreement about the statement that there is no point in getting involved in environmental issues, since government have all the power and can do what they like reveals that 34.6% of science stream students, 33.0% and 45.2% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 65.4% of science students, 67.0% of language students and 54.8% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.93

Figure 4.93: Stream wise percentage of subject's agreement or disagreement about the statement, there is no point in getting involved in environmental issues, since government have all the power and can do what they like

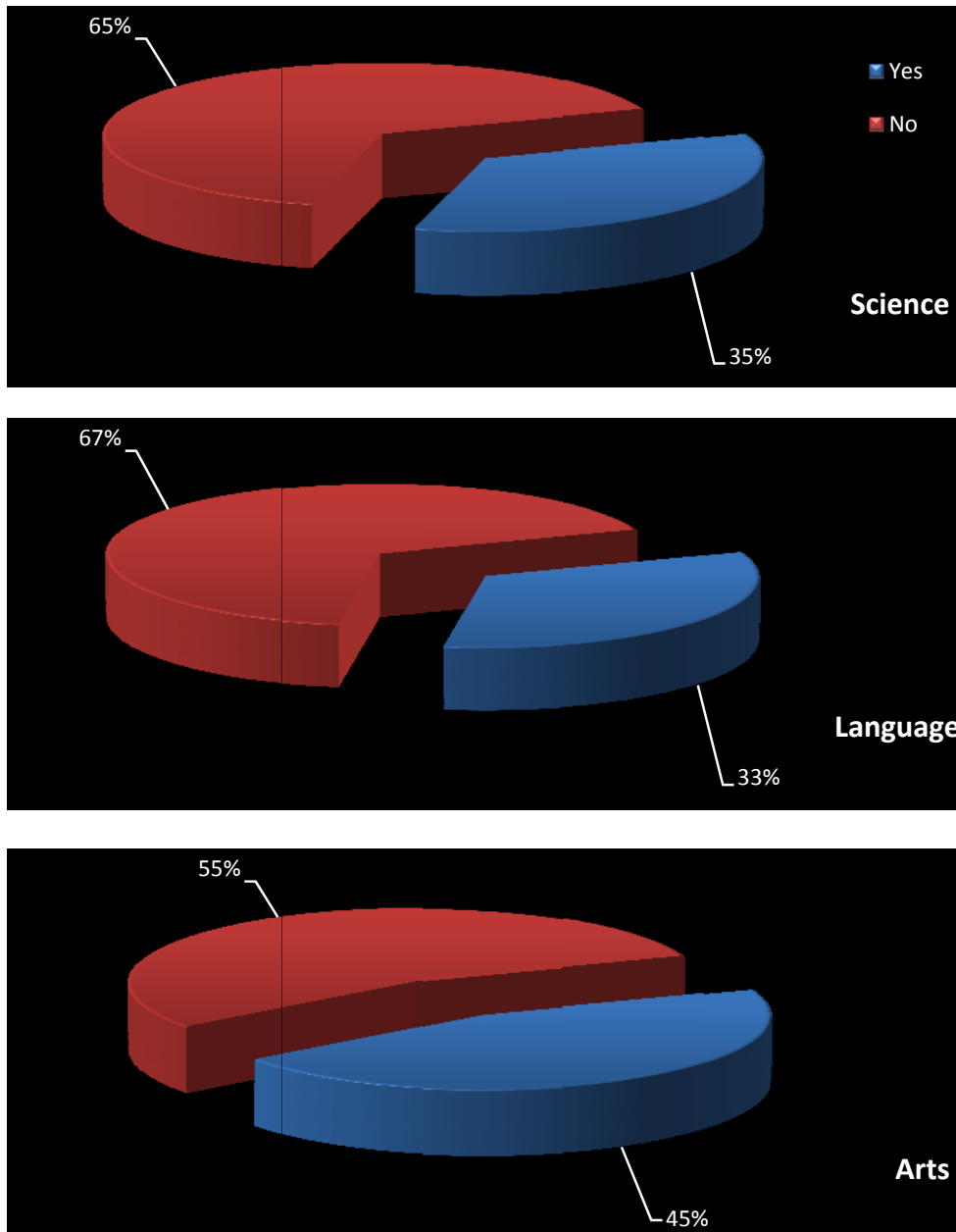


Table 4.94

Stream wise responses of the total sample for the statement: Gender equality has nothing to do with sustainable development

STREAM		Responses		Total
		Yes	No	
Science	Frequency	238	216	454
	Percent	52.4%	47.6%	100.0%
Language	Frequency	160	107	267
	Percent	59.9%	40.1%	100.0%
Arts	Frequency	117	82	199
	Percent	58.8%	41.2%	100.0%
Total	Frequency	515	405	920
	Percent	56.0%	44.0%	100.0%

The above table of responses regarding agreement or disagreement about the statement that, gender equality has nothing to do with sustainable development reveals that 47.6% of science stream students, 40.1% and 41.2% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 52.4% of science students, 59.9% of language students and 58.8% of arts students responded in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.94.

Figure 4.94: Stream wise percentage of subject's agreement or disagreement about the statement, gender equality has nothing to do with sustainable development

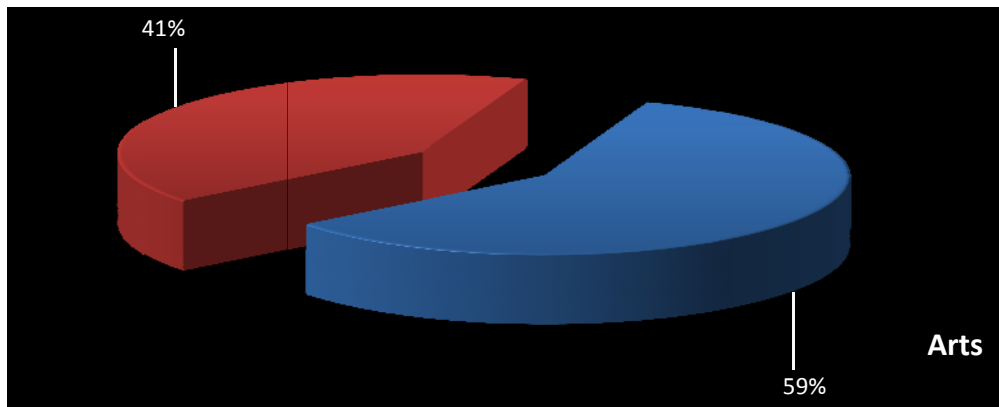
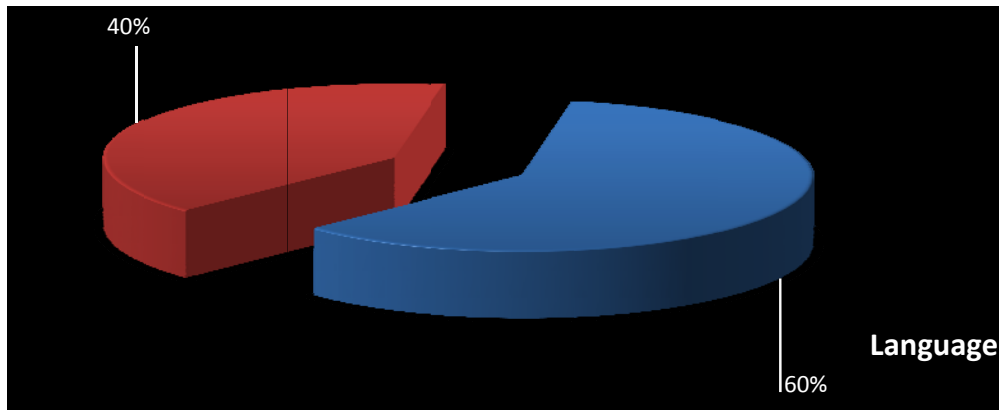
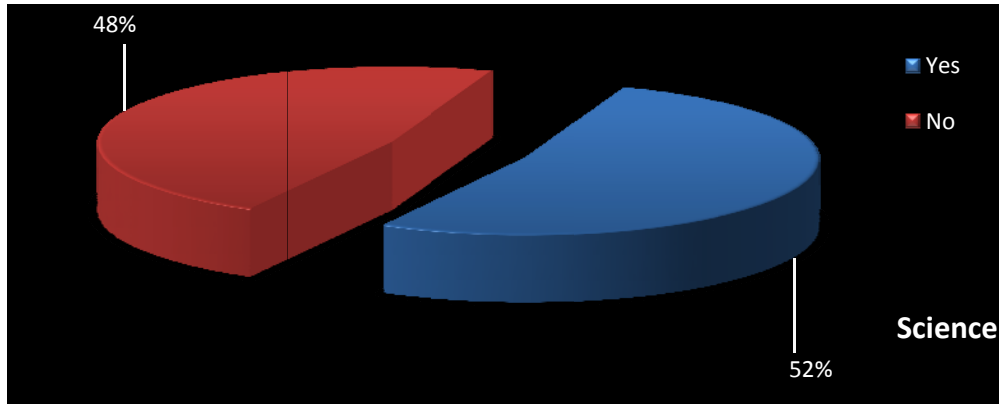


Table 4.95

Stream wise responses of the total sample for the statement: At home I try to recycle as much as I can

STREAM		Responses		Total
		Yes	No	
Science	Frequency	383	71	454
	Percent	84.4%	15.6%	100.0%
Language	Frequency	213	54	267
	Percent	79.8%	20.2%	100.0%
Arts	Frequency	175	24	199
	Percent	87.9%	12.1%	100.0%
Total	Frequency	771	149	920
	Percent	83.8%	16.2%	100.0%

The above table of responses regarding agreement or disagreement about the statement that at home I try to recycle as much as I can reveals that 84.4% of science stream students, 79.8% and 87.9% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 15.6% of science students, 20.2% of language students and 12.1% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.95

Figure 4.95: Stream wise percentage of subject's agreement or disagreement about the statement at home I try to recycle as much as I can

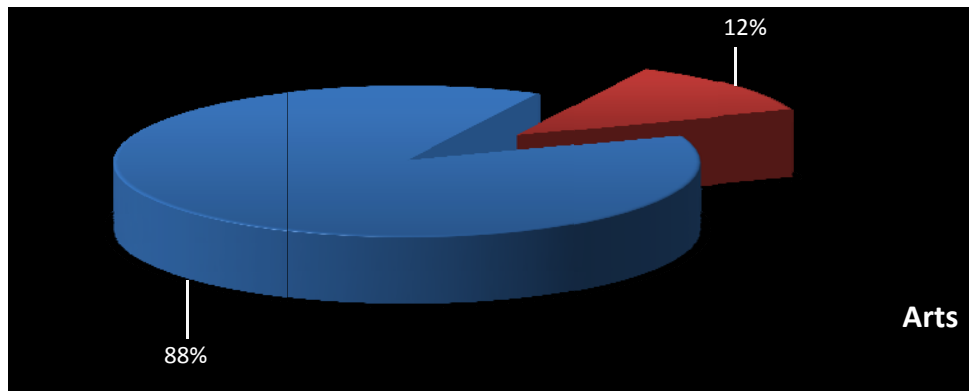
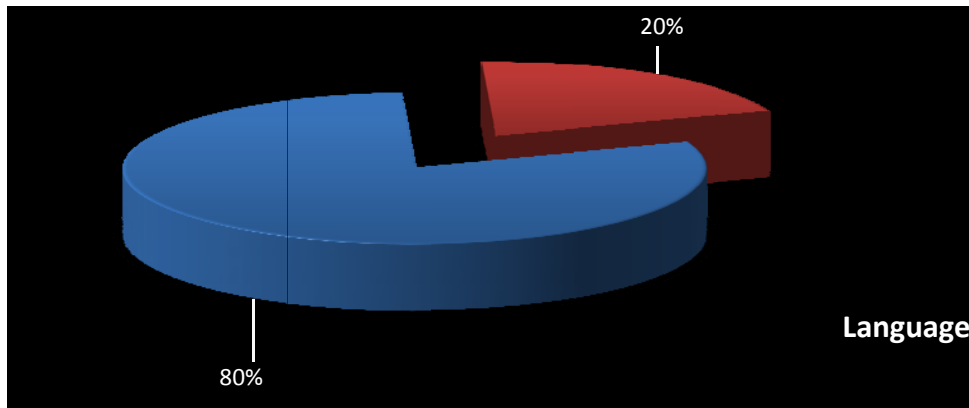
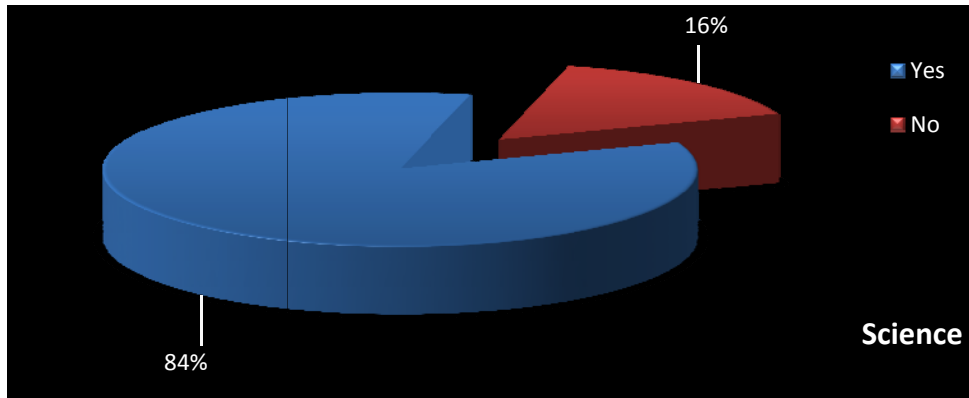


Table 4.96

Stream wise responses of the total sample for the statement: I have taken a seminar/ course, in which sustainable development was discussed

STREAM		Responses		Total
		Yes	No	
Science	Frequency	205	249	454
	Percent	45.2%	54.8%	100.0%
Language	Frequency	160	107	267
	Percent	59.9%	40.1%	100.0%
Arts	Frequency	69	130	199
	Percent	34.7%	65.3%	100.0%
Total	Frequency	434	486	920
	Percent	47.2%	52.8%	100.0%

The above table of responses of samples regarding agreement or disagreement about the statement that they have taken a seminar / course, in which sustainable development was discussed reveals that 54.8% of science stream students, 40.1% and 65.3% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 45.2% of science students, 59.9% of language students and 34.7% of arts students responded in agreement with the statement that.

The graphical representation of the responses stream wise is shown in figure 4.96

Figure 4.96: Stream wise percentage of subject's agreement or disagreement about the statement I have taken a seminar / course, in which sustainable development was discussed.

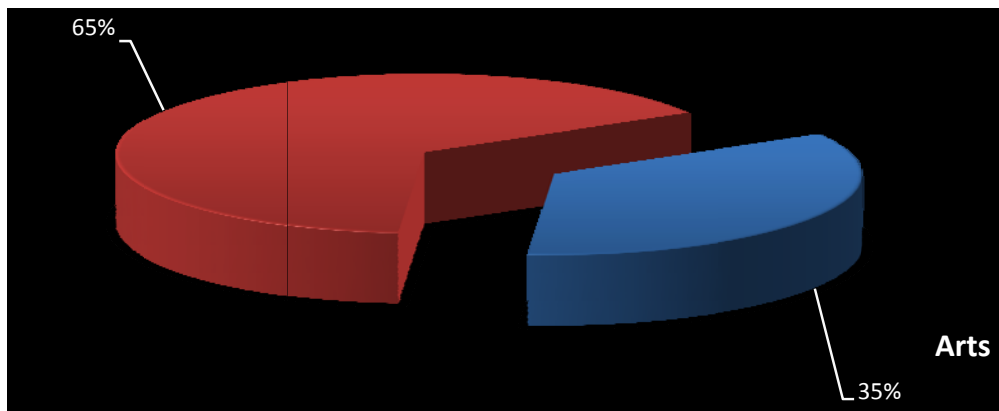
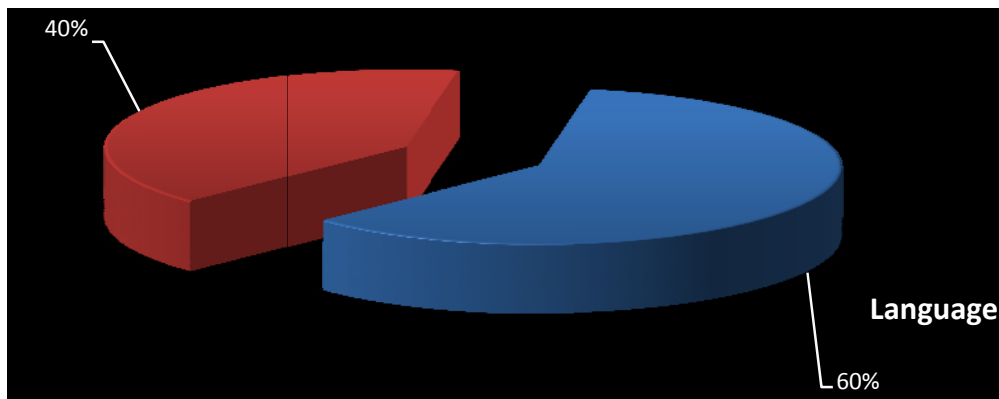
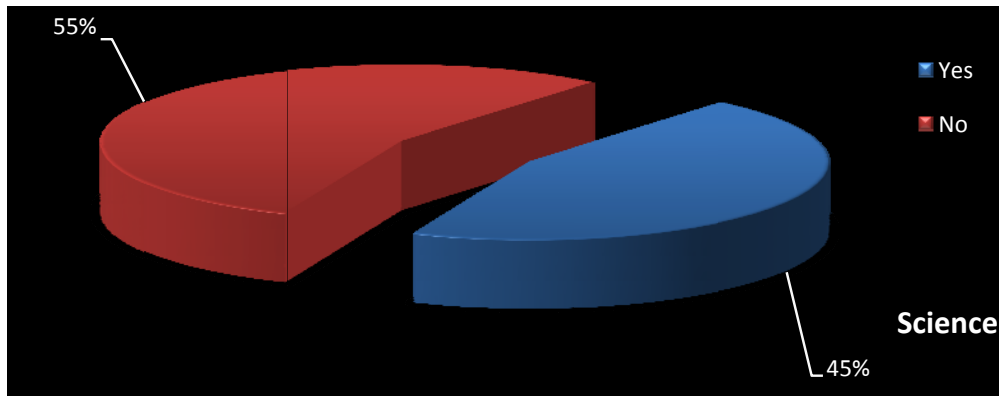


Table 4.97

Stream wise responses of the total sample for the statement: I talk to others about how to help people living in poverty

STREAM		Responses		Total
		Yes	No	
Science	Frequency	383	71	454
	Percent	84.4%	15.6%	100.0%
Language	Frequency	218	49	267
	Percent	81.6%	18.4%	100.0%
Arts	Frequency	160	39	199
	Percent	80.4%	19.6%	100.0%
Total	Frequency	761	159	920
	Percent	82.7%	17.3%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that they talk to others about how to help people living in poverty reveals that 84.4% of science stream students, 81.6% and 80.4% of language and arts stream students respectively responded in agreement to the statement.

However, it was found that 15.6% of science students, 18.4% of language students and 19.6% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.97

Figure 4.97: Stream wise percentage of subject's agreement or disagreement about the statement they talk to others about how to help people living in poverty

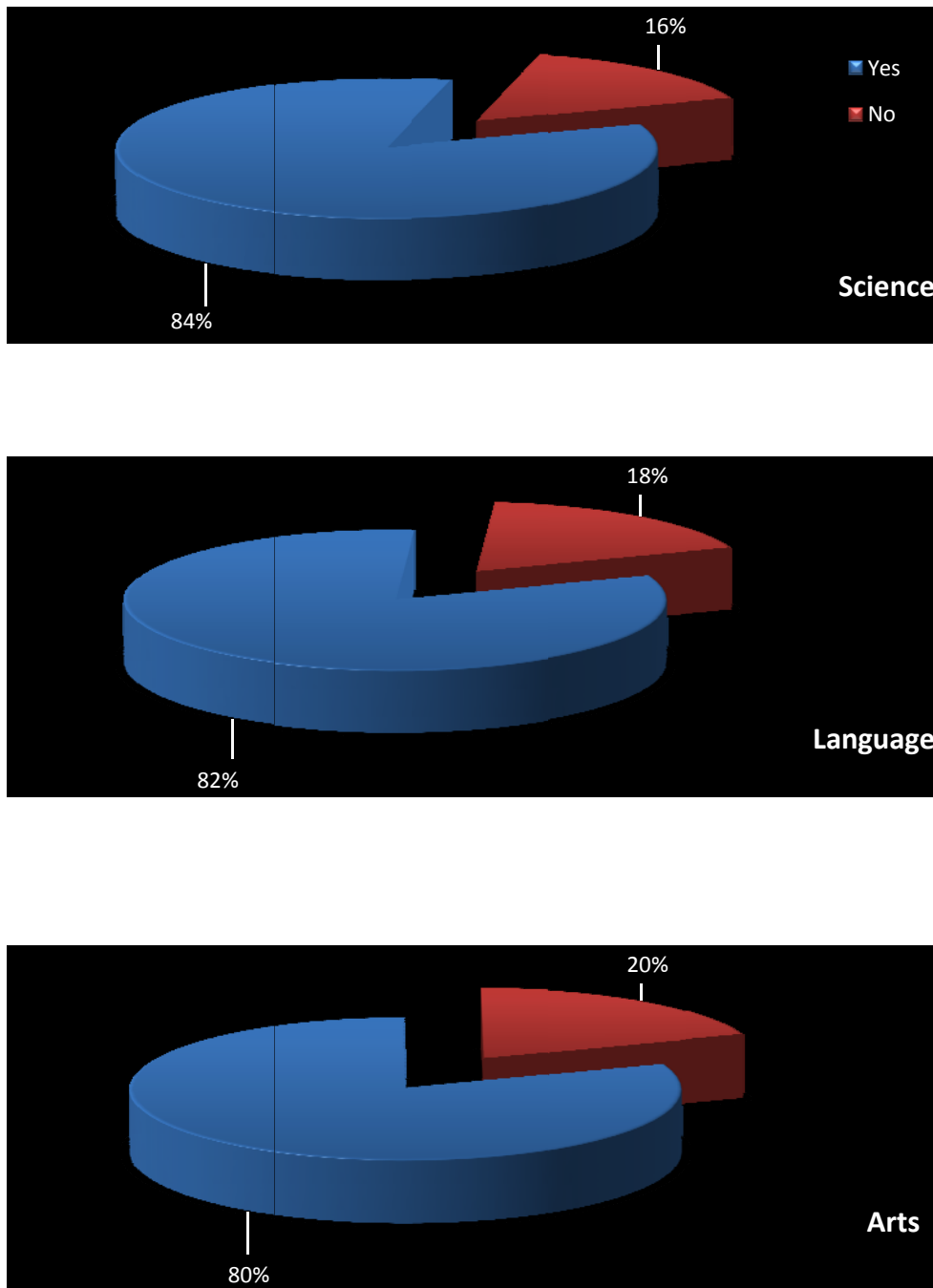


Table 4.98

Stream wise responses of the total sample for the statement: I vote in public elections

STREAM		Responses		Total
		Yes	No	
Science	Frequency	432	22	454
	Percent	95.2%	4.8%	100.0%
Language	Frequency	251	16	267
	Percent	94.0%	6.0%	100.0%
Arts	Frequency	167	32	199
	Percent	83.9%	16.1%	100.0%
Total	Frequency	850	70	920
	Percent	92.4%	7.6%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that whether they vote in public elections reveals that 95.2% of science stream students, 94.0% and 83.9% of language and arts stream students respectively responded as they cast their vote in public elections.

However, it was found that 4.8% of science students, 6.0% of language students and 16.1% of arts students responded as they do not vote in public elections.

The graphical representation of the responses stream wise is shown in figure 4.98

Figure 4.98: Stream wise percentage of subject's response whether they vote in public elections

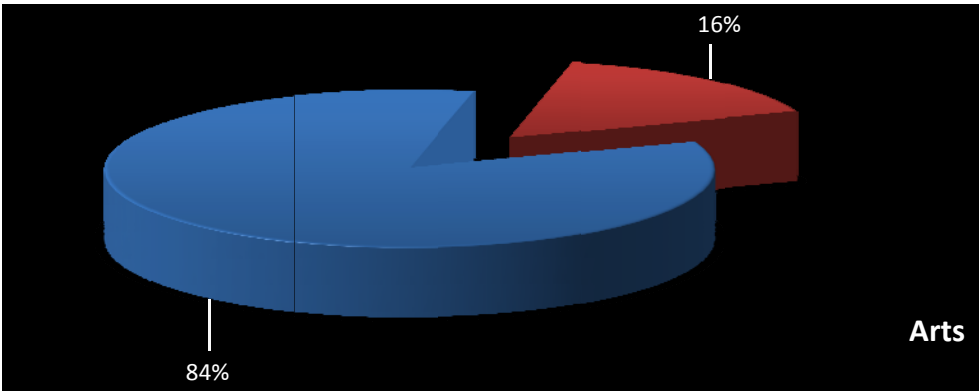
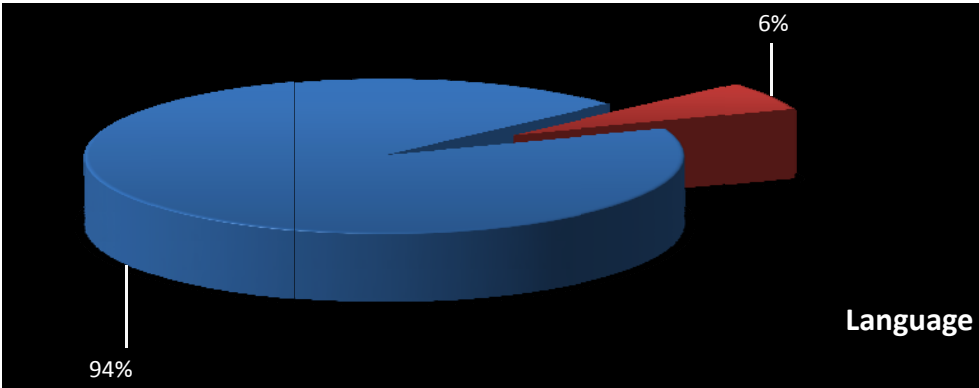
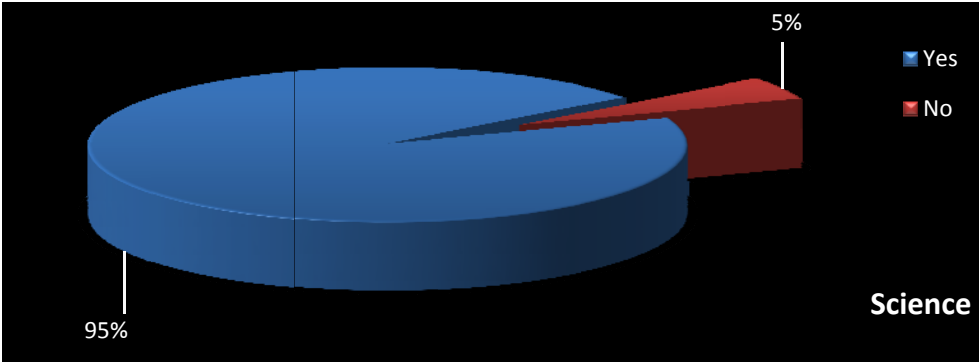


Table 4.99

Stream wise responses of the total sample for the statement: I often look for signs of ecosystem deterioration

STREAM		Responses		Total
		Yes	No	
Science	Frequency	147	307	454
	Percent	32.4%	67.6%	100.0%
Language	Frequency	102	165	267
	Percent	38.2%	61.8%	100.0%
Arts	Frequency	54	145	199
	Percent	27.1%	72.9%	100.0%
Total	Frequency	303	617	920
	Percent	32.9%	67.1%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that whether they often look for signs of ecosystem deterioration reveals that 67.6% of science stream students, 61.8% and 72.9% of language and arts stream students respectively responded as not in agreement with the statement.

However, it was found that 32.4% of science students, 38.2% of language students and 27.1% of arts students responded as in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.99

Figure 4.99: Stream wise percentage of subject's agreement or disagreement about the statement whether they often look for signs of ecosystem deterioration

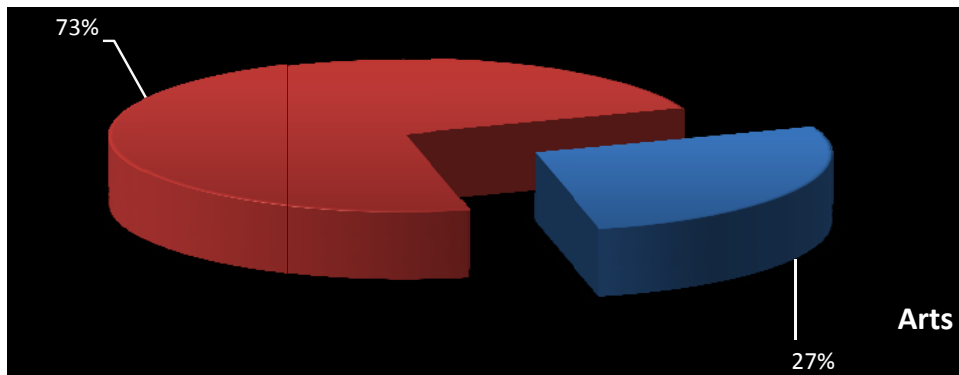
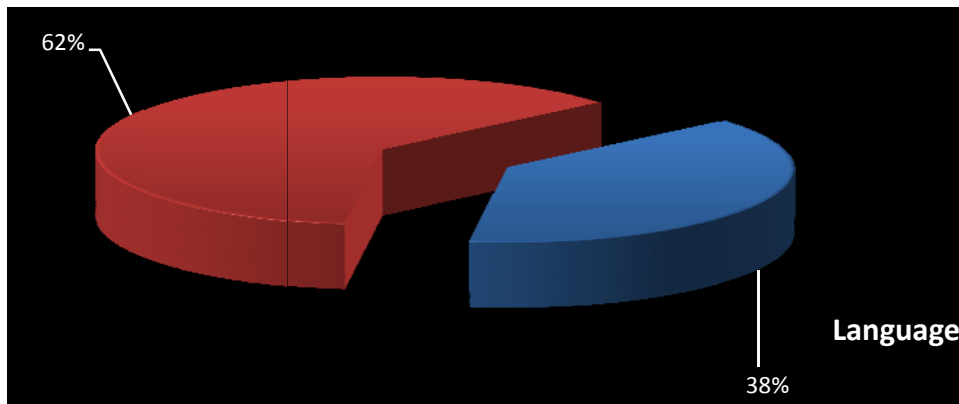
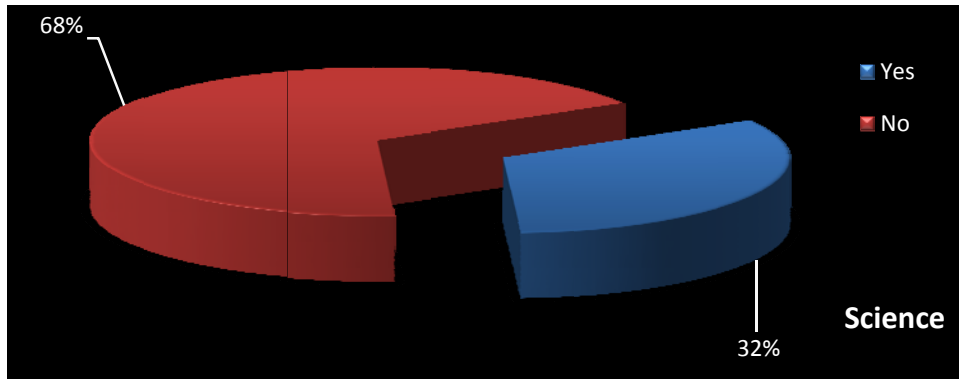


Table 4.100

Stream wise responses of the total sample for the statement: The household tasks in my home are equally shared among family members regardless of gender

STREAM		Responses		Total
		Yes	No	
Science	Frequency	390	64	454
	Percent	85.9%	14.1%	100.0%
Language	Frequency	197	70	267
	Percent	73.8%	26.2%	100.0%
Arts	Frequency	159	40	199
	Percent	79.9%	20.1%	100.0%
Total	Frequency	746	174	920
	Percent	81.1%	18.9%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that whether they share household tasks equally among family members regardless of gender reveals that 85.9% of science stream students, 73.8% and 79.9% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 14.1% of science students, 26.2% of language students and 20.1% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.100

Figure 4.100: Stream wise percentage of subject's agreement or disagreement about the statement that whether they share household tasks equally among family members

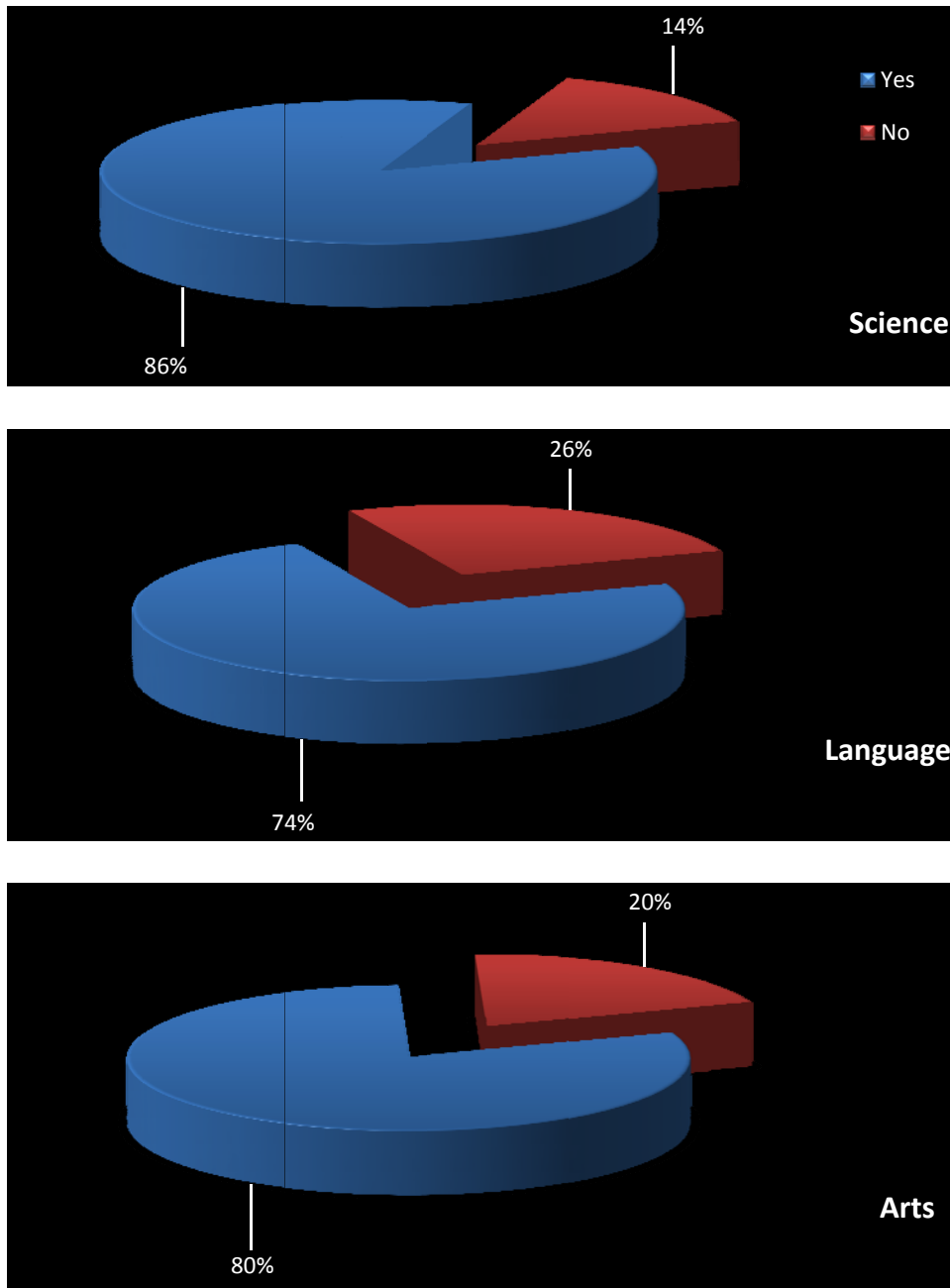


Table 4.101

Stream wise responses of the total sample for the statement: I try to avoid purchasing goods from companies with poor track record on corporate social responsibility

STREAM		Responses		Total
		Yes	No	
Science	Frequency	358	96	454
	Percent	78.9%	21.1%	100.0%
Language	Frequency	194	73	267
	Percent	72.7%	27.3%	100.0%
Arts	Frequency	144	55	199
	Percent	72.4%	27.6%	100.0%
Total	Frequency	696	224	920
	Percent	75.7%	24.3%	100.0%

The above table of responses of the samples regarding agreement or disagreement about whether they try to avoid purchasing goods from companies with poor track record on corporate social responsibility reveals that 78.9% of science stream students, 72.7% and 72.4% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 21.1% of science students, 27.3% of language students and 27.6% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.101.

Figure 4.101: Stream wise percentage of subject's agreement or disagreement about the statement whether they try to avoid purchasing goods from companies with poor track record on corporate social responsibility

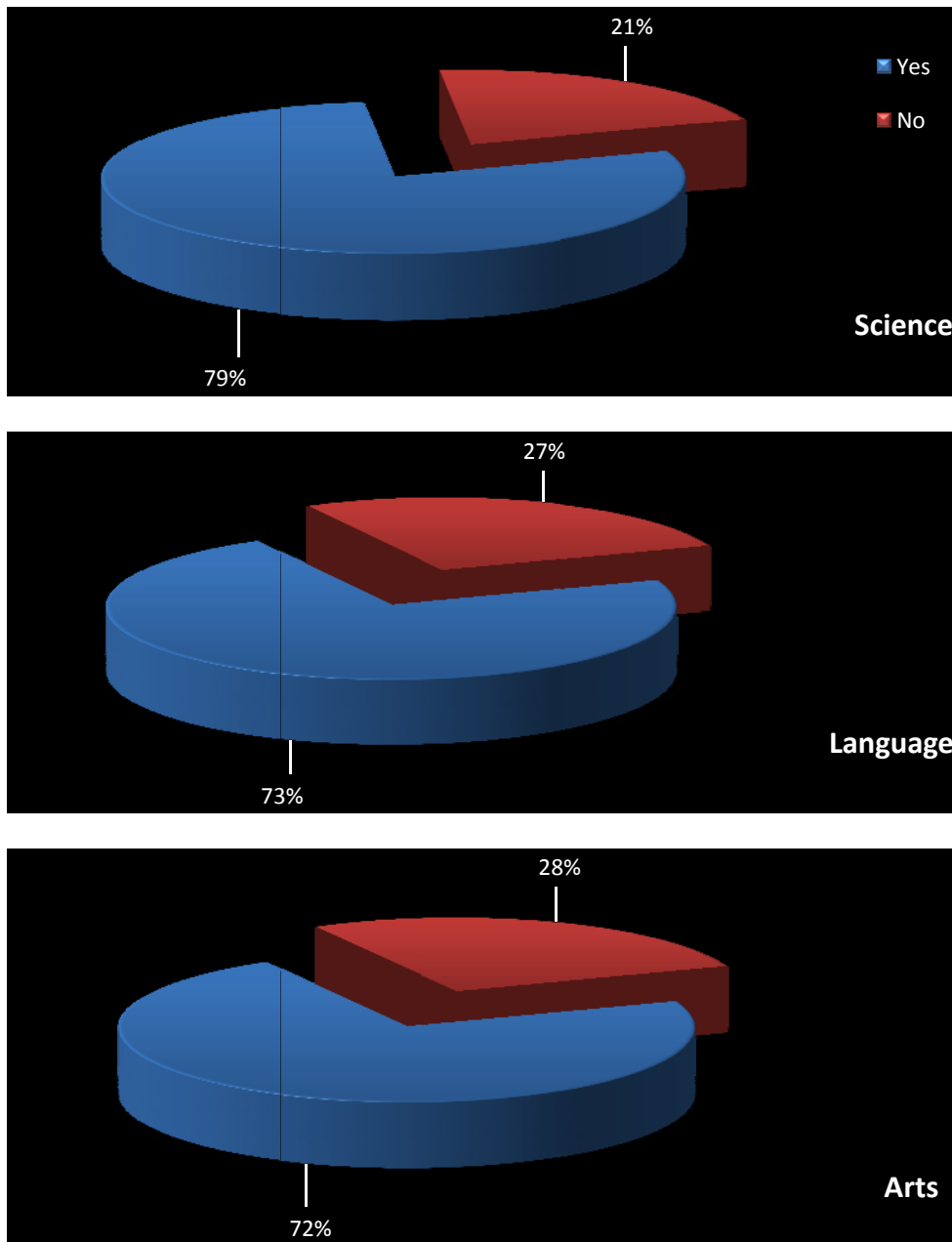


Table 4.102

Stream wise responses of the total sample for the statement: I changed my personal life style to reduce waste

STREAM		Responses		Total
		Yes	No	
Science	Frequency	396	58	454
	Percent	87.2%	12.8%	100.0%
Language	Frequency	218	49	267
	Percent	81.6%	18.4%	100.0%
Arts	Frequency	167	32	199
	Percent	83.9%	16.1%	100.0%
Total	Frequency	781	139	920
	Percent	84.9%	15.1%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that whether they changed their personal life style to reduce waste reveals that 87.2% of science stream students, 81.6% and 83.9% of language and arts stream students respectively responded in agreement with the statement.

However, it was found that 12.8% of science students, 18.4% of language students and 16.1% of arts students responded as not in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.102

Figure 4.102: Stream wise percentage of subject's agreement or disagreement about the statement whether they changed their personal life style to reduce waste

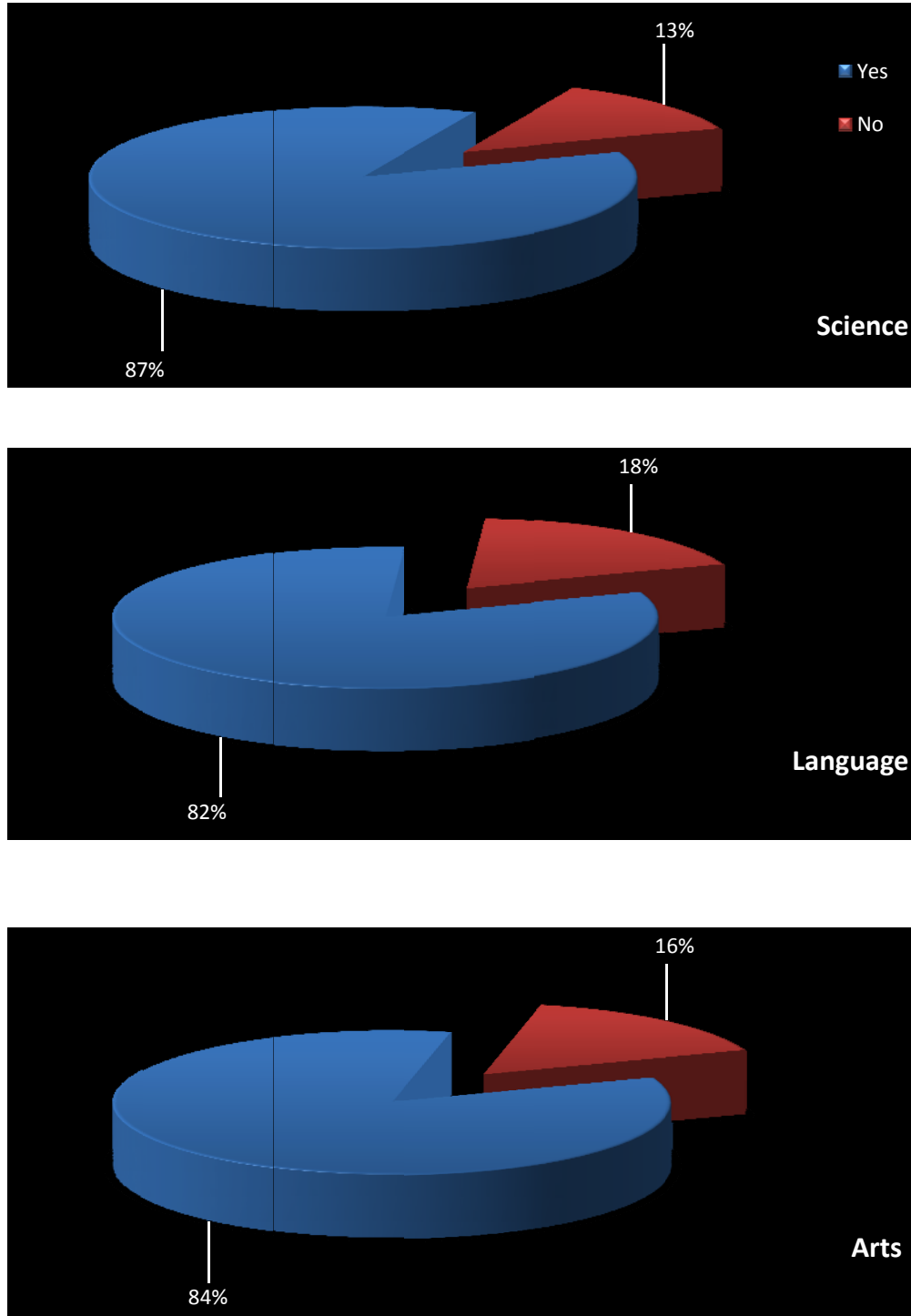


Table 4.103

Stream wise responses of the total sample for the statement: I volunteer to work with local charities

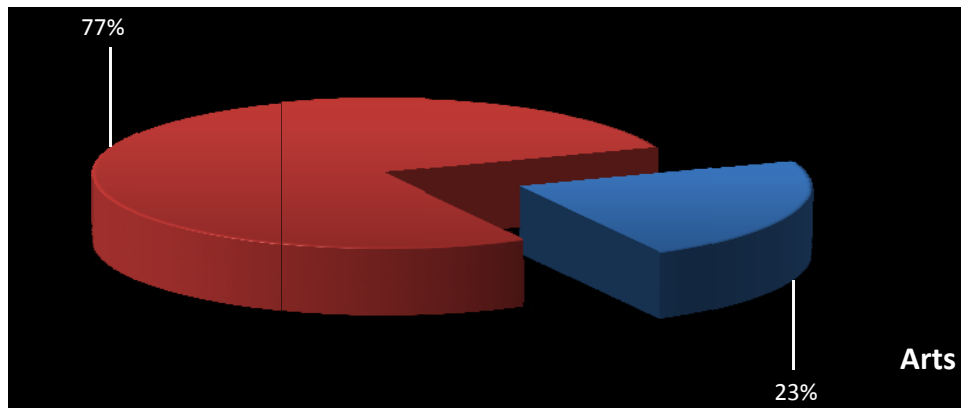
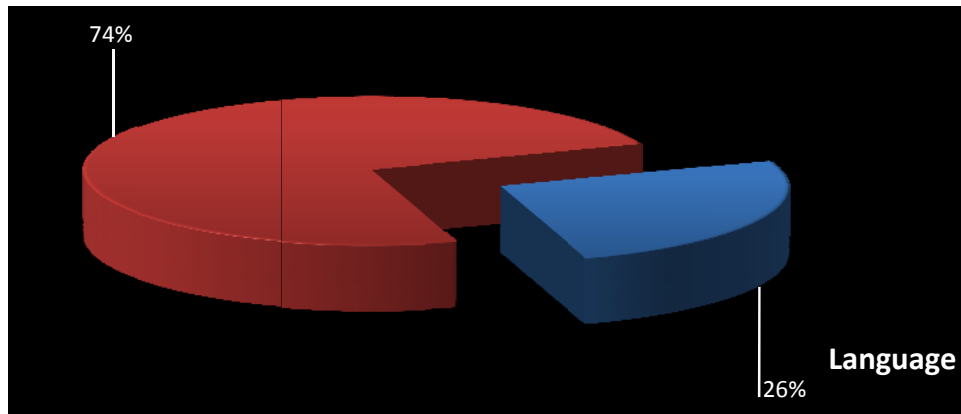
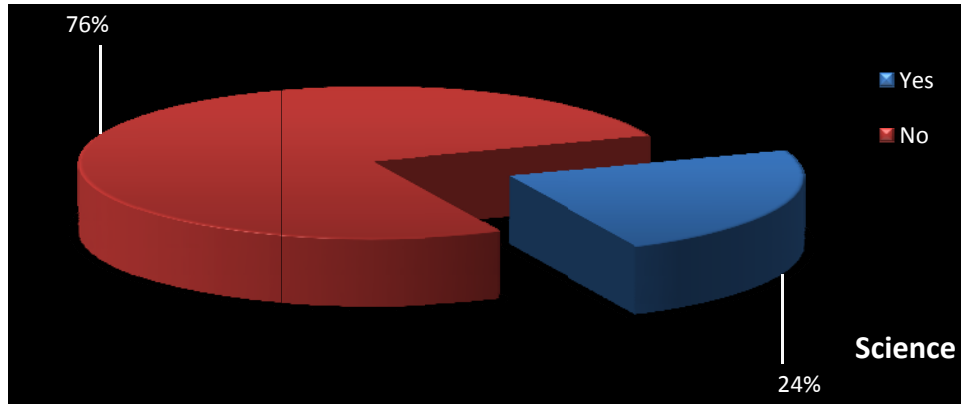
STREAM		Responses		Total
		Yes	No	
Science	Frequency	107	347	454
	Percent	23.6%	76.4%	100.0%
Language	Frequency	69	198	267
	Percent	25.8%	74.2%	100.0%
Arts	Frequency	45	154	199
	Percent	22.6%	77.4%	100.0%
Total	Frequency	221	699	920
	Percent	24.0%	76.0%	100.0%

The above table of responses of the samples regarding agreement or disagreement about the statement that whether they volunteer to work with local charities reveals that 76.4% of science stream students, 74.2% and 77.4% of language and arts stream students respectively responded in disagreement with the statement.

However, it was found that 23.6% of science students, 25.8% of language students and 22.6% of arts students responded in agreement with the statement.

The graphical representation of the responses stream wise is shown in figure 4.103

Figure 4.103: Stream wise percentage of subject's agreement or disagreement about the statement whether they volunteer to work with local charities



Section – C

Analysis of Response of Teacher Educators regarding Education for Sustainable Development

The responses of the teacher educators pertaining to the questions regarding knowledge, attitude, values and practices in sustainable development are presented below:

Table 4.104

Responses of the total sample for the question: To what extent are you in favour of promoting Education for Sustainable Development in teacher education?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	80	78.4	78.4
Some Extent	21	20.6	99.0
Very little extent	1	1.0	100.0
Total	102	100.0	

The above table of responses of the teacher educators for the question to what extent you are in favour of promoting Education for Sustainable Development in teacher education reveal that, 78.4% of the sample responded that to *greater extent* they were in favour; 20.6% responded that to *some extent* they were in favour. However, 1.0% of the sample responded that they were in favour to a very little extent. The graphical representation of the responses of the total sample for the above question is shown in figure 4.104.

Figure 4.104: Percentage of subjects in favour of promoting Education for Sustainable Development in teacher education

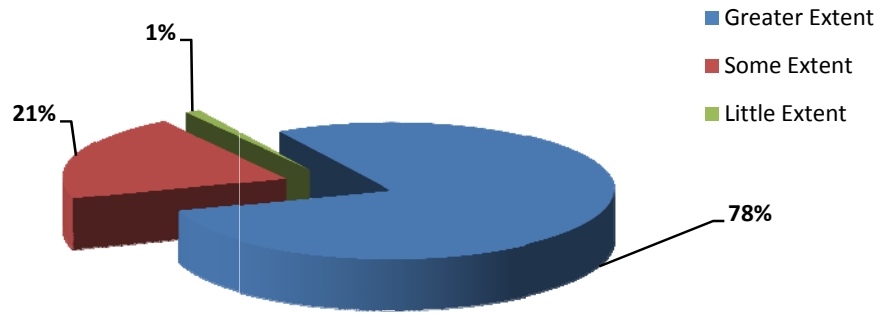


Table 4.105

Responses of the total sample for the question: How far the present policy of national development given due consideration for environmental protection leading to Sustainable Development?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	11	10.8	10.8
Some Extent	69	67.6	78.4
Very little extent	22	21.6	100.0
Total	102	100.0	

The above table of responses of the total sample for the question how far the present policy of national development given due consideration for environmental protection leading to Sustainable Development revealed that, 10.8% responded to *greater extent*; and 67.6% to *some extent*. However, 21.6% of the teacher educators responded only to a very little extent. The

graphical representation of the responses of the total sample for the above question is shown in figure 4.105.

Figure 4.105: Percentage of subject’s response to how far the present policy of national development given due consideration for environmental protection leading to Sustainable Development

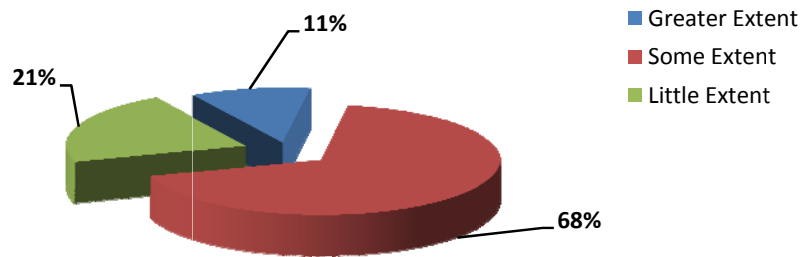


Table 4.106

Responses of the total sample for the statement: Poverty is a problem related to environmental degradation

Responses	Frequency	Percent	Cumulative Percent
Greater extent	14	13.7	13.7
Some Extent	39	38.2	52.0
Very little extent	39	38.2	90.2
Not at all	10	9.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement regarding poverty is a problem related to environmental degradation

revealed that, 13.7% of the sample agreed to the statement a *greater extent*; 38.2% to *some extent*. However, 38.2% of the sample agreed only to a *very little extent* and 9.8% of the sample did not agree at all to the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.106.

Figure 4.106: Percentage of subjects response to the statement about the relation between poverty and environmental degradation

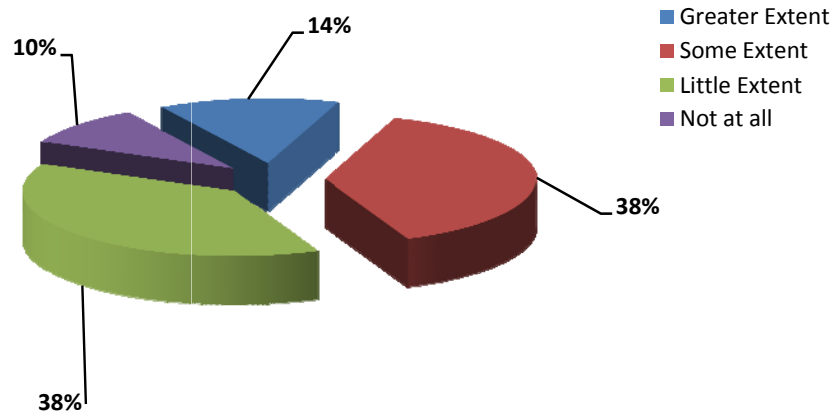


Table 4.107

Responses of the total sample for the statement: Democracy and Human rights have a role in Environmental protection and human development

Responses	Frequency	Percent	Cumulative Percent
Greater extent	58	56.9	56.9
Some Extent	32	31.4	88.2
Very little extent	9	8.8	97.1
Not at all	3	2.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, Democracy and Human rights have a role in Environmental protection and human development shows, 56.9% of the sample agreed to the statement to *greater extent*; 31.4% to *some extent*. However, 8.8% of the sample agreed only to a *very little extent* and 2.9% of the sample did not agree at all to the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.107.

Figure 4.107: Percentage of subjects responses to the statement that democracy and Human rights has a role in Environmental protection and human development

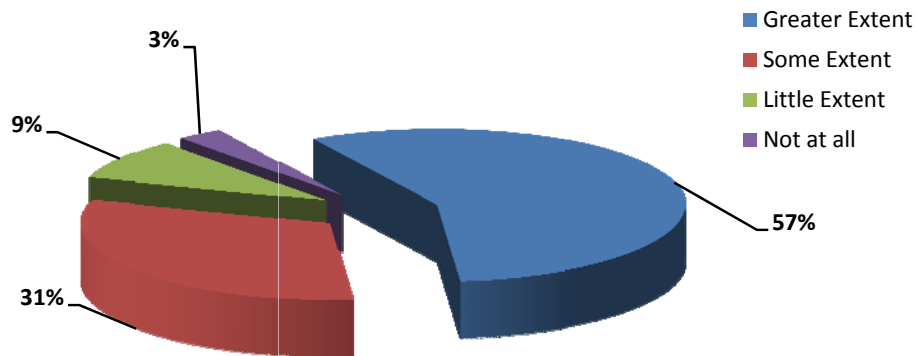


Table 4.108

Responses of the total sample for the statement: Ecosystem influences economic development and Standard of living

Responses	Frequency	Percent	Cumulative Percent
Greater extent	64	62.7	62.7
Some Extent	31	30.4	93.1
Very little extent	5	4.9	98.0
Not at all	2	2.0	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, ecosystem influences economic development and Standard of living indicates, 62.7% of the sample agreed to *greater extent*; and 30.4% agreed to *some extent*. However, 4.9% of the sample responded that they agreed only to a *very little extent* and 2.0% of the sample did not agree at all to the statement. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.108.

Figure 4.108: Percentage of subject's responses about the statement ecosystem influences economic development and Standard of living

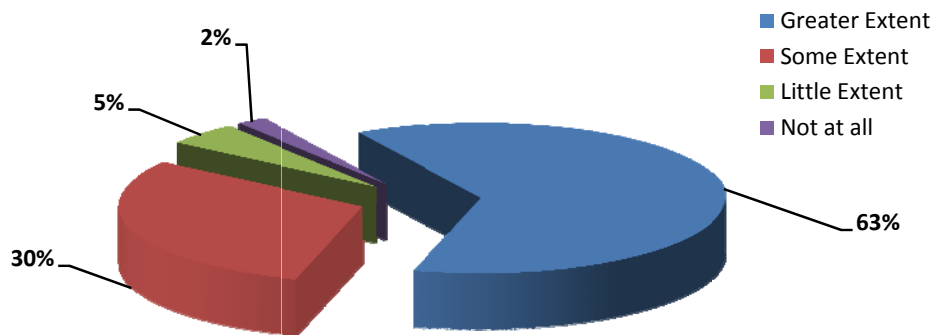


Table 4.109

Responses of the total sample for the statement: Political and economic policies influence the Quality of environment

Responses	Frequency	Percent	Cumulative Percent
Greater extent	57	55.9	55.9
Some Extent	29	28.4	84.3
Very little extent	16	15.7	100.0
Total	102	100.0	

The table of responses of the total sample for the statement, political and economic policies influence the Quality of environment shows that, 55.9% of the sample agreed to *greater extent*; and 28.4% agreed to *some extent*. However, 15.7% of the sample agreed only to a very little extent.

The graphical representation of the responses of the total sample for the above statement is shown in figure 109.

Figure 4.109: Percentage of subject’s responses about the statement political and economic policies influence the Quality of environment

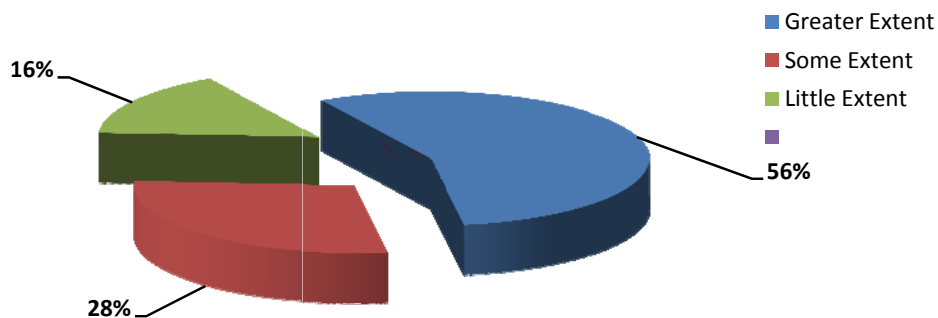


Table 4.110

Responses of the total sample for the statement: Education for Sustainable Development is interdisciplinary in nature. Hence all student teacher are supposed to develop sufficient understanding/ awareness about this concept

Responses	Frequency	Percent	Cumulative Percent
Greater extent	80	78.5	78.5
Some Extent	18	17.6	96.1
Very little extent	4	3.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, Education for Sustainable Development is interdisciplinary in nature. Hence all student teacher are supposed to develop sufficient understanding/ awareness about this concept revealed that, 78.5% of the teacher educators agreed to the statement to *greater extent*; and 17.6% agreed to *some extent*. However, 3.9% of the sample agreed only to a very little extent.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.110.

Figure 4.110: Percentage of subject’s responses about the statement that Education for Sustainable Development is interdisciplinary in nature. Hence all student teacher are supposed to develop sufficient understanding/ awareness about this concept

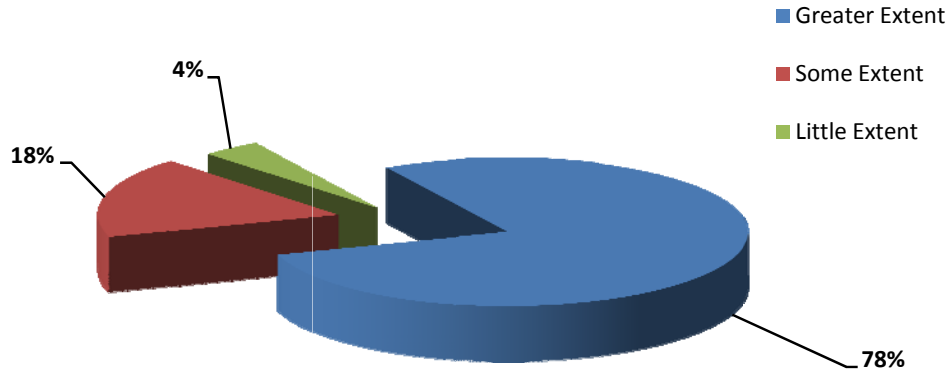


Table 4.111

Responses of the total sample for the statement: Education for Sustainable Development is an evolving concept. Hence wide and deliberate awareness and training has to be given to the entire public

Responses	Frequency	Percent	Cumulative Percent
Greater extent	80	78.4	78.4
Some Extent	22	21.6	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, Education for Sustainable Development is an evolving concept. Hence wide and deliberate awareness and training has to be given to the entire public shows that, 78.4% of the teacher educators agreed to *greater extent*; and 21.6% agreed to *some extent*.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.111.

Figure 4.111: Percentage of subject’s responses about the statement that Education for Sustainable Development is an evolving concept. Hence wide and deliberate awareness and training has to be given to the entire public

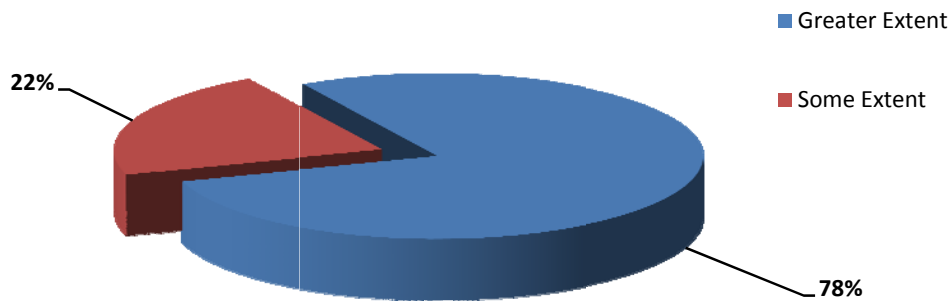


Table 4.112

Responses of the total sample for the statement: Every teacher educator should integrate the concept of Education for Sustainable Development at the time of handling different subject

Responses	Frequency	Percent	Cumulative Percent
Greater extent	71	69.6	69.6
Some Extent	28	27.5	97.1
Very little extent	3	2.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, every teacher educator should integrate the concept of Education for Sustainable Development at the time of handling different subject revealed

that, 69.6% of teacher educators agreed to *greater extent*; and 27.5% to *some extent*. However, 2.9% of the sample reported that they agreed only to a very little extent. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.112

Figure 4.112: Percentage of subject’s responses about the statement that every teacher educator should integrate the concept of Education for Sustainable Development at the time of handling different subject

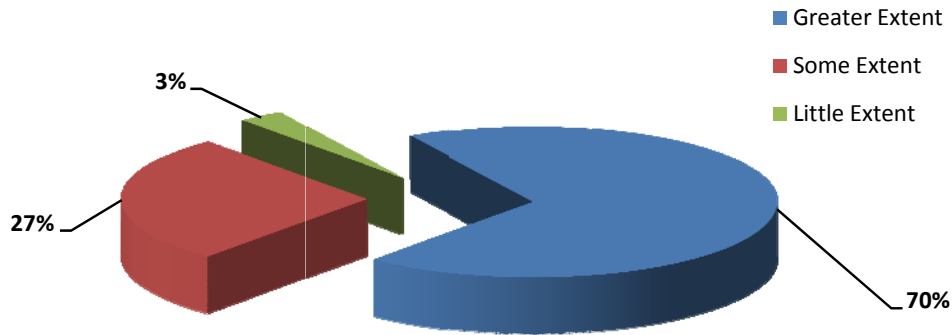


Table 4.113

Responses of the total sample for the statement: Constitutional provisions regarding Environmental Education are to be made aware for the entire public

Responses	Frequency	Percent	Cumulative Percent
Greater extent	75	73.5	73.5
Some Extent	20	19.6	93.1
Very little extent	7	6.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, constitutional provisions regarding Environmental Education is to be made aware for the entire public shows that, 73.5% of the sample agreed to *greater extent*; and 19.6% to *some extent*. However, 6.9% of the sample reported that they agreed only to a very little extent.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.113.

Figure 4.113: Percentage of subject's responses about the statement that constitutional provisions regarding Environmental Education is to be made aware for the entire public

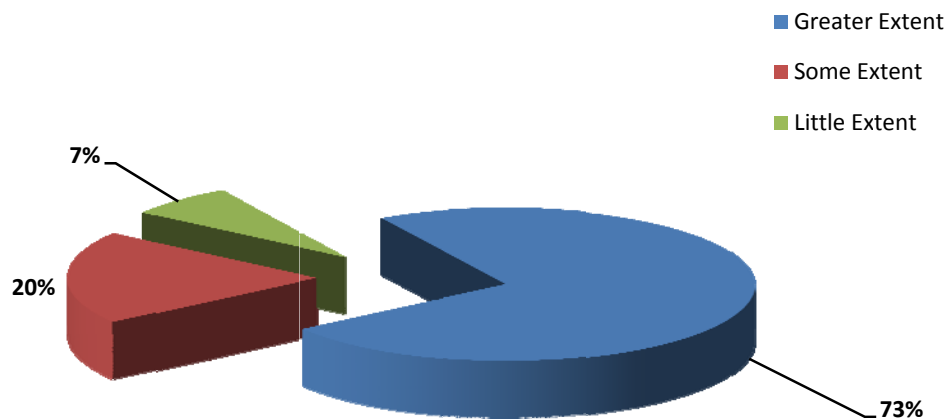


Table 4.114

Responses of the total sample for the statement: All teacher educators need training in integrating concepts of Education for Sustainable Development in their respective subjects

Responses	Frequency	Percent	Cumulative Percent
Greater extent	77	75.5	75.5
Some Extent	15	14.7	90.2
Very little extent	10	9.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, all teacher educators need training in integrating concept of Education for Sustainable Development in their respective subjects, 75.5% of the teacher educators agreed to *greater extent*; and 14.7% agreed to *some extent*. However, 9.8% of the sample reported that they agreed only to a very little extent. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.114.

Figure 4.114: Percentage of subject’s responses about the statement that all teacher educators need training in integrating concept of Education for Sustainable Development in their respective subjects

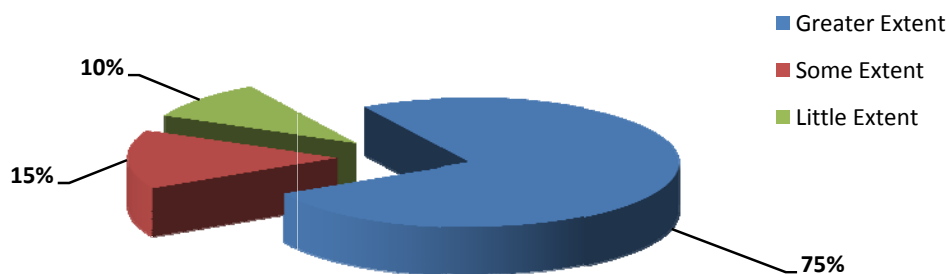


Table 4.115

Responses of the total sample for the statement: Values and skills regarding E.S.D if integrated in B. Ed. Curriculum will guide and motivate the students to lead a life in a sustainable manner

Responses	Frequency	Percent	Cumulative Percent
Greater extent	61	59.8	59.8
Some Extent	40	39.2	99.0
Very little extent	1	1.0	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement, values and skills regarding E.S.D if integrated in B. Ed. Curriculum will guide and motivate the students to lead a life in a sustainable manner reveals that, 59.8% of the sample agreed to *greater extent*; 39.2% agreed to *some extent*. However, 1.0% of the sample agreed only to a very little extent.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.115.

Figure 4.115: Percentage of subject's responses about the statement that values and skills regarding E.S.D if integrated in B. Ed. Curriculum will guide and motivate the students to lead a life in a sustainable manner

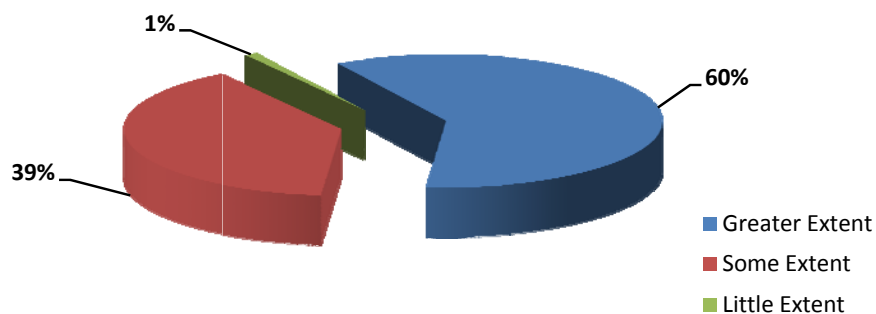


Table 4.116

Responses of the total sample for the statement: Education for Sustainable Development is viewed as an effective instrument for creating civic consciousness and inculcating positive attitude among teacher trainees towards the environment

Responses	Frequency	Percent	Cumulative Percent
Greater extent	62	60.8	60.8
Some Extent	34	33.3	94.1
Very little extent	6	5.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the statement that, Education for Sustainable Development is viewed as an effective instrument for creating civic consciousness and inculcating positive attitude among teacher trainees towards the environment shows, 60.8% of the sample agreed to *greater extent*; and 33.3% to *some extent*. However, 5.9% of the sample reported that they agreed only to a very little extent.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.116.

Figure 4.116: Percentage of subject’s responses about the statement that Education for Sustainable Development is viewed as an effective instrument for creating civic consciousness and inculcating positive attitude among teacher trainees towards the environment

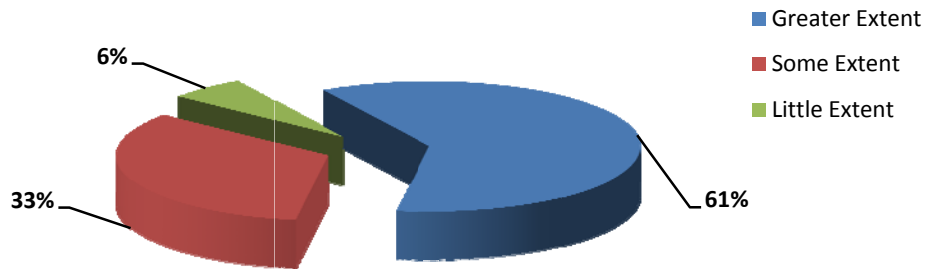


Table 4.117a

Responses of the total sample for the question: To what extent management of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	18	17.6	17.6
Some Extent	44	43.1	60.8
Very little extent	24	23.5	84.3
Not at all	16	15.7	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent management of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum shows, only 17.6% of the sample responded to *greater extent*; 43.1%

responded to *some extent* that management take initiative. However, 23.5% and 15.7% of the sample reported that management takes little or no initiative at all. The graphical representation of the responses of the total sample for the above question is shown in figure 4.117a.

Figure 4.117a: Percentage of subject’s responses about the question that to what extent management of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

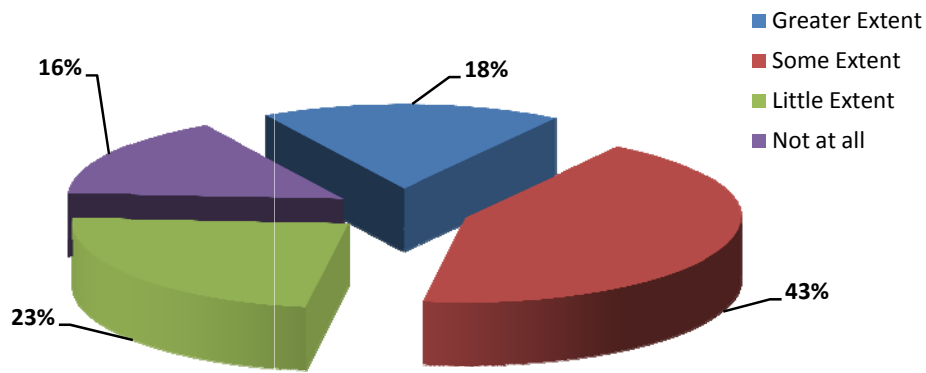


Table 4.117b

Responses of the total sample for the question: To what extent Principal of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	35	34.3	34.3
Some Extent	45	44.1	78.4
Very little extent	21	20.6	99.0
Not at all	1	1.0	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent Principal of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum shows only 34.3% of the sample responded to *greater extent*; 44.1% responded *some extent* that Principal takes initiative. However, 20.6% and 1.0% of the sample reported that Principal takes little or no initiative at all. The graphical representation of the responses of the total sample for the above question is shown in figure 4.117b.

Figure 4.117b: Percentage of subject's responses about the question that to what extent Principal of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

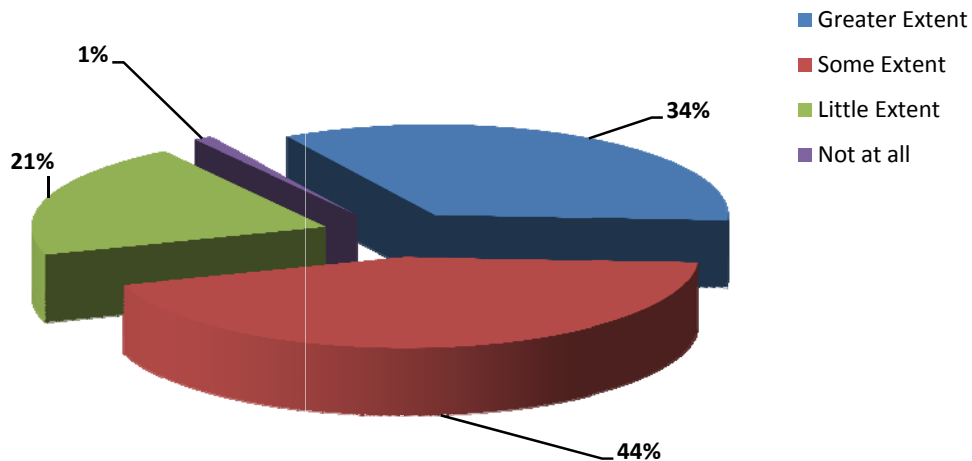


Table 4.117c

Responses of the total sample for the question: To what extent teachers of your institution take initiative in integrating concepts of Education for Sustainable Development in the curriculum?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	39	38.2	38.2
Some Extent	55	53.9	92.2
Very little extent	8	7.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent teachers of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum shows that, only 38.2% of the sample responded to *greater extent*; 53.9% responded that to *some extent* teachers take initiative. However, 7.8% of the sample reported that teachers take very little initiative only.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.117c.

Figure 4.117c: Percentage of subject’s responses about the question that to what extent teachers of the institution take initiative in integrating concepts of Education for Sustainable Development in the curriculum

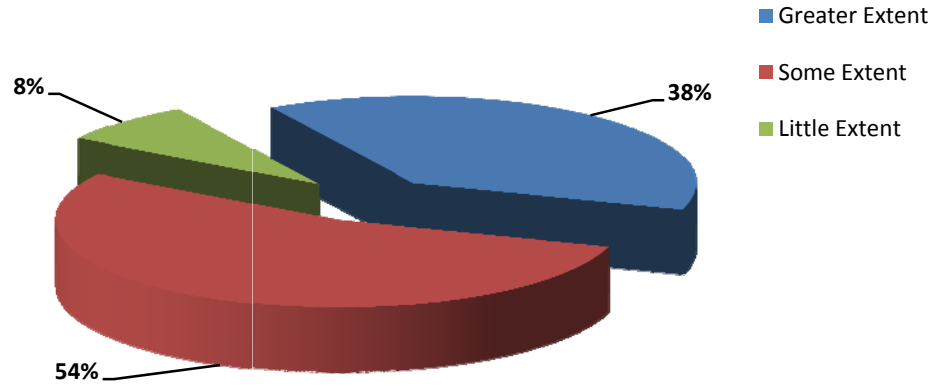


Table 4.117d

Responses of the total sample for the question: To what extent teacher organisations of your institution take initiative in integrating concepts of Education for Sustainable Development in the curriculum

Responses	Frequency	Percent	Cumulative Percent
Greater extent	20	19.6	19.6
Some Extent	39	38.2	57.8
Very little extent	35	34.3	92.2
Not at all	8	7.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent teacher organisations of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum, only 19.6% of the sample responded to *greater extent*; 38.2%

responded that to *some extent* teacher organisations take initiative. However, 34.3% and 7.8% of the sample reported that teacher organisations take little or no initiative at all. The graphical representation of the responses of the total sample for the above question is shown in figure 4.117d.

Figure 4.117d: Percentage of subject’s responses about the question, to what extent teacher organisations of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

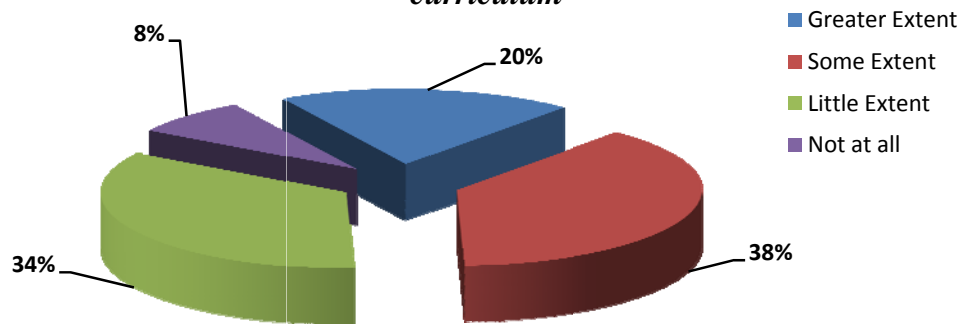


Table 4.117e

Responses of the total sample for the question: To what extent student organisations/clubs of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

Responses	Frequency	Percent	Cumulative Percent
Greater extent	35	34.3	34.3
Some Extent	48	47.1	81.4
Very little extent	16	15.7	97.1
Not at all	3	2.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent student organisations/clubs of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum, only 34.3% of the sample responded to *greater extent*; 47.1% responded that to *some extent* student organizations /clubs take initiative. However, 15.7% and 2.9% of the sample reported that organizations /clubs take little or no initiative at all.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.117e.

Figure 4.127e: Percentage of subject’s responses about the question to what extent organizations /clubs of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

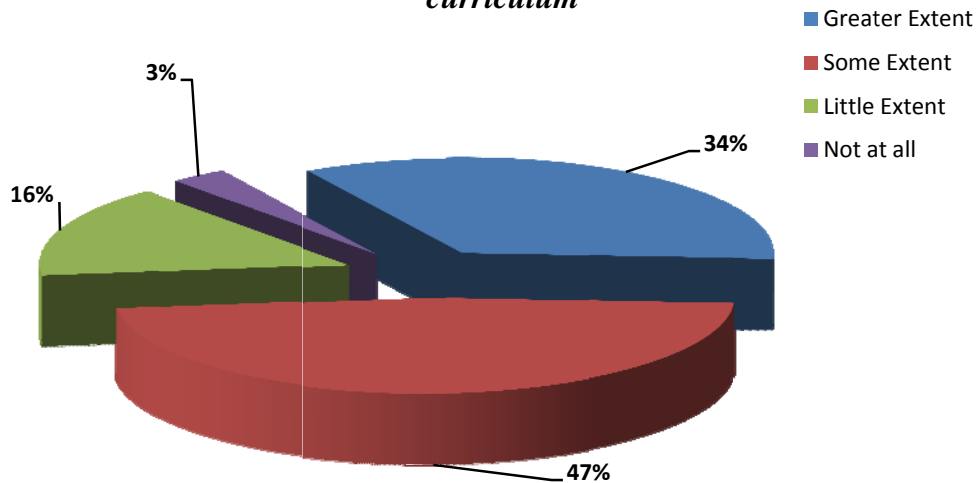


Table 4.117f

Responses of the total sample for the question: To what extent PTA of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

Responses	Frequency	Percent	Cumulative Percent
Greater extent	9	8.8	8.8
Some Extent	36	35.3	44.1
Very little extent	47	46.1	90.2
Not at all	10	9.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent PTA of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum, only 8.8% of the sample indicated to *greater extent*; 35.3% indicated that to *some extent* PTA take initiative. However, 46.1% and 9.8% of the sample reported that PTA takes little or no initiative at all.

The graphical representation of the responses of the total sample for the above statement is shown in figure 117f.

Figure 4.117f: Percentage of subject’s responses about the question that to what extent PTA of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

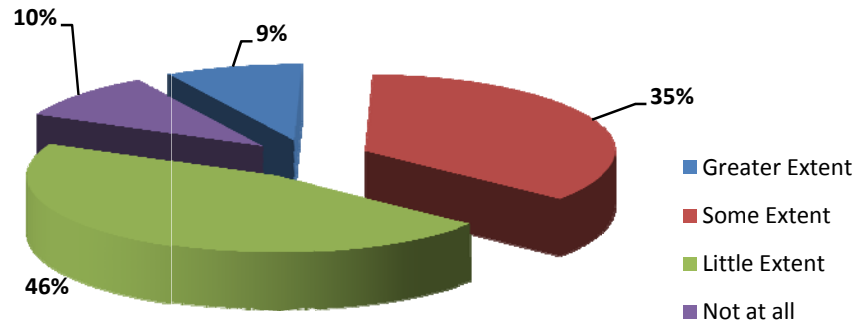


Table 4.117g

Responses of the total sample for the question: To what extent alumni of your institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

Responses	Frequency	Percent	Cumulative Percent
Greater extent	4	3.9	3.9
Some Extent	31	30.4	34.3
Very little extent	42	41.2	75.5
Not at all	25	24.5	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent alumni of the institution take initiative in integrating concepts of Education for Sustainable Development in the curriculum, only 3.9% of the sample indicated to *greater extent*; 30.4% indicated that to *some extent*

alumni take initiative. However, 41.2% and 24.5% of the sample reported that alumni take little or no initiative at all. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.117g.

Figure 4.117g: Percentage of subject’s responses about the question that to what extent alumni of the institution takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

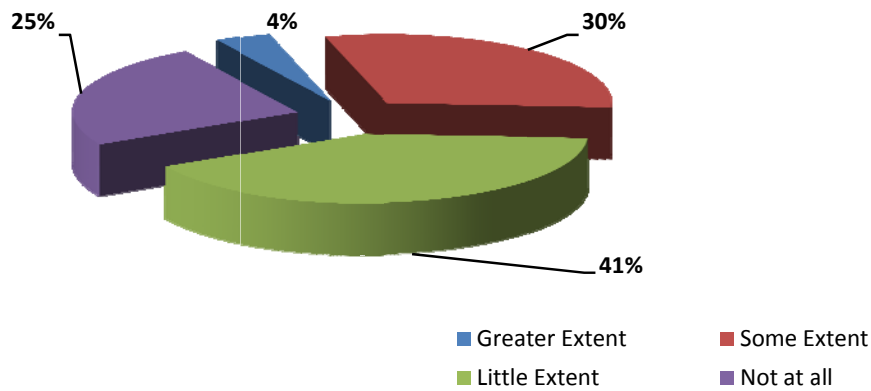


Table 4.117h

Responses of the total sample for the question: To what extent social groups takes initiative in integrating concepts of Education for Sustainable Development in the curriculum?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	34	33.3	33.3
Some Extent	47	46.1	79.4
Very little extent	21	20.6	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent social groups take initiative in integrating concepts of Education for Sustainable Development in the curriculum, 33.3% of the sample indicated to *greater extent*; 46.1% indicated that to *some extent* social groups take initiative. However, 20.6% of the sample reported that social groups take only very little initiative.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.117h.

Figure 4.117h: Percentage of subject’s responses about the question that to what extent social groups takes initiative in integrating concepts of Education for Sustainable Development in the curriculum

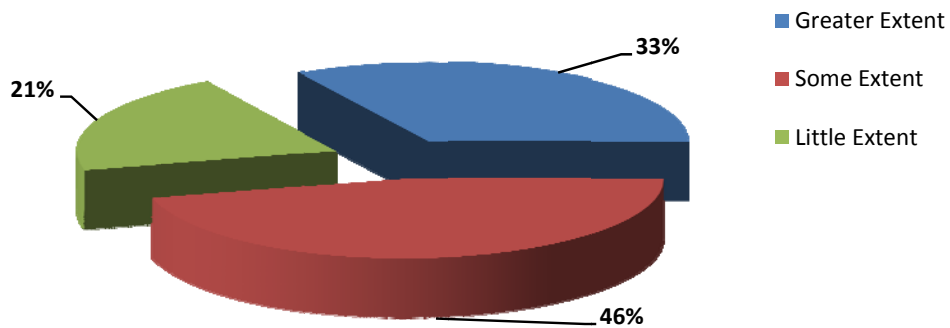


Table 4.118a

Responses of the total sample for the question: To what extent your institution involve/use the resources of environmental organizations in your educational/training activities?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	27	26.5	26.5
Some Extent	49	48.0	74.5
Very little extent	21	20.6	95.1
Not at all	5	4.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent your institution involve/use the resources of environmental organizations in your educational/training activities, only 26.5% of the sample indicated to *greater extent*; 48.0% indicated that to *some extent* they use the resources. However, 20.6% and 4.9% of the responses revealed that they use the resources of related organizations to a *very little extent* or *not at all*.

The graphical representation of the responses of the total sample for the above statement is shown in figure 118a.

Figure 4.118a: Percentage of subjects responded to the question, to what extent your institution involve/use the resources of environmental organizations in your educational/training activities

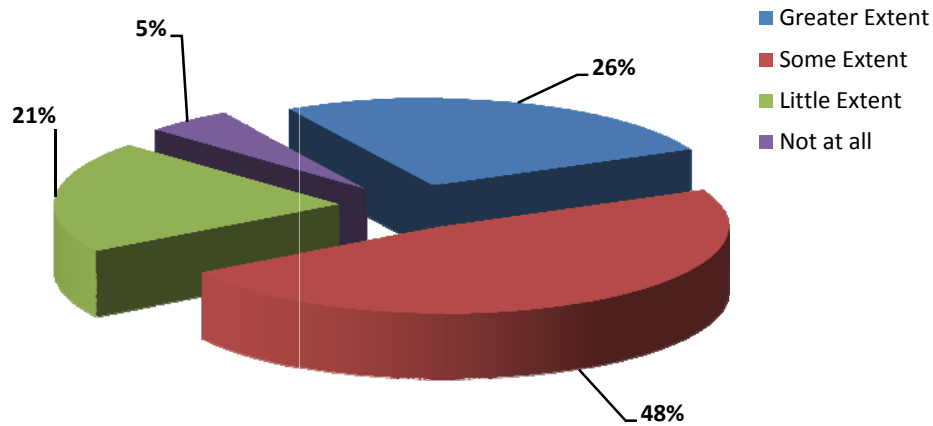


Table 4.118b

Responses of the total sample for the question: To what extent your institution involve/use the resources of consumer organizations in your educational/training activities?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	2	2.0	2.0
Some Extent	55	53.9	55.9
Very little extent	32	31.4	87.3
Not at all	13	12.7	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent your institution involve/use the resources of consumer organizations in your educational/training activities, only 2.0% of the

sample indicated to *greater extent*; 53.9% indicated that to *some extent* they use the resources. However, 31.4% and 12.7% of the responses revealed that they use the resources of related organizations to a *very little extent* or *not at all*.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.118b.

Figure 4.118b: Percentage of subject's responses about the question, to what extent your institution involve/use the resources of consumer organizations in your educational/training activities

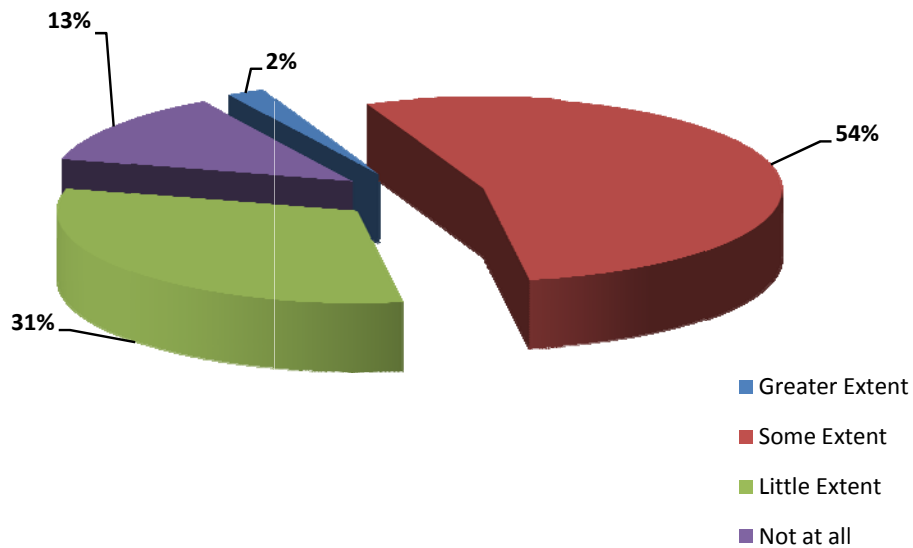


Table 4.118c

Responses of the total sample for the question: To what extent your institution involve/use the resources of human rights organizations in your educational/training activities?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	15	14.7	14.7
Some Extent	52	51.0	65.7
Very little extent	27	26.5	92.2
Not at all	8	7.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent your institution involve/use the resources of human rights organizations in your educational/training activities, only 14.7% of the sample indicated to *greater extent*; 51.0% indicated that to *some extent* they use the resources. However, 26.5% and 7.8% of the responses revealed that they use the resources of related organizations to a *very little extent* or nor at all.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.118c.

Figure 4.118c: Percentage of subject’s responses about the question, to what extent your institution involve/use the resources of human rights organizations in your educational/training activities

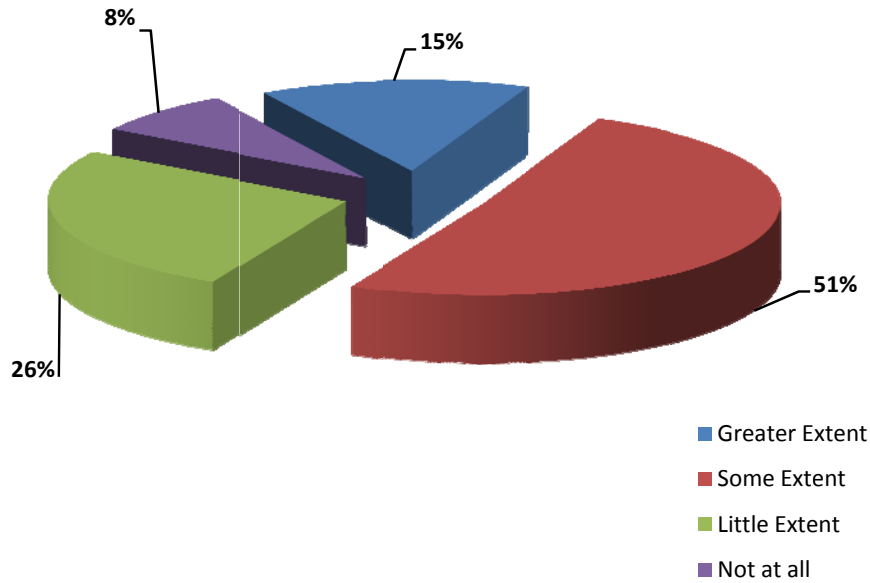


Table 4.118d

Responses of the total sample for the question: To what extent your institution involve/use the resources of women’s organizations in your educational/training activities?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	8	7.8	7.8
Some Extent	34	33.3	41.2
Very little extent	48	47.1	88.2
Not at all	12	11.8	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent your institution involve/use the resources of women’s

organizations in your educational/training activities, only 7.8% of the sample indicated that *greater extent*; 33.3% indicated that to *some extent* they use the resources. However, 47.1% and 11.8% of the responses revealed that they use the resources of related organizations to a *very little extent* or *not at all*.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.118d.

Figure 4.118d: Percentage of subjects responded to the question, to what extent your institution involve/use the resources of women’s organizations in your educational/training activities

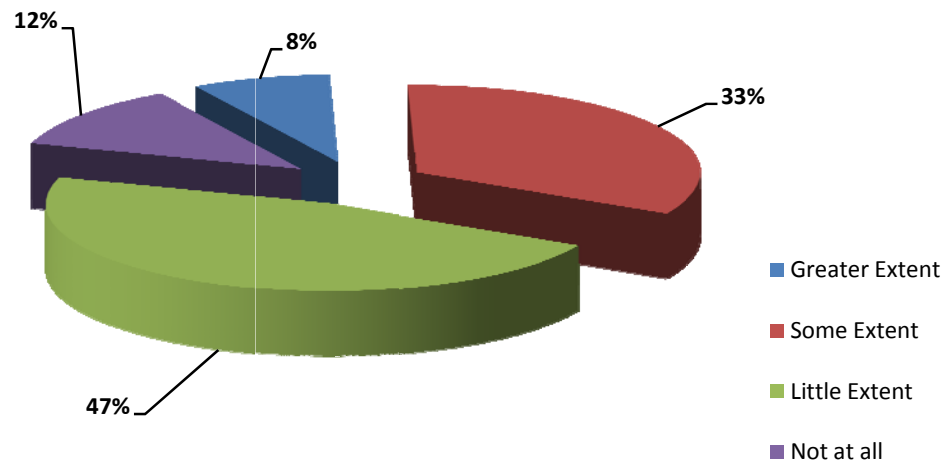


Table 4.118e

Responses of the total sample for the question: To what extent your institution involve/use the resources of peace and value organizations in your educational/training activities?

Responses	Frequency	Percent	Cumulative Percent
Greater extent	15	14.7	14.7
Some Extent	57	55.9	70.6
Very little extent	24	23.5	94.1
Not at all	6	5.9	100.0
Total	102	100.0	

The above table of responses of the total sample for the question, to what extent your institution involve/use the resources of peace and value organizations in your educational/training activities, only 14.7% of the sample indicated to *greater extent*; 55.9% indicated that to *some extent* they use the resources. However, 23.5% and 5.9% of the responses revealed that they use the resources of related organizations to a *very little extent* or nor at all.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.118e.

Figure 4.118e: Percentage of subjects responded to the question, to what extent your institution involve/use the resources of peace and value organizations in your educational/training activities

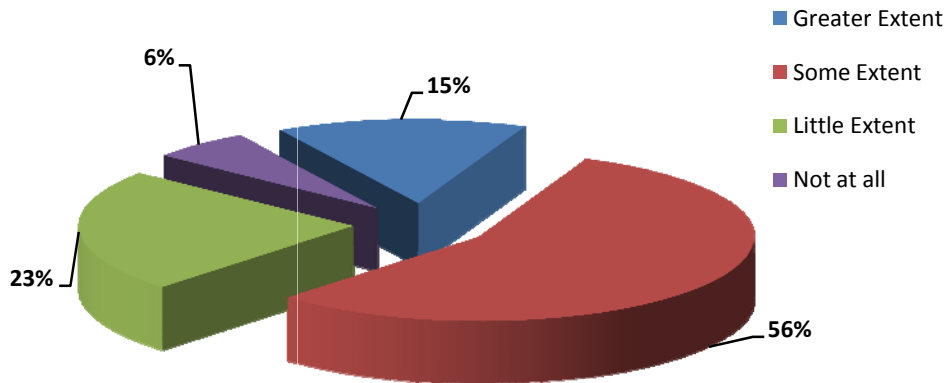


Table 4.119

Responses of the total sample for the statement: The concept ‘The knowledge about development of nation should be in conformity with sustainability of environment’ should have a place in the present B.Ed. curriculum

Responses	Frequency	Percent	Cumulative Percent
Yes	95	93.1	93.1
No	7	6.9	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement the knowledge about development of nation should be in conformity with sustainability of environment’ should have a place in the present B.Ed. curriculum shows that, 93.1% of the samples have agreed and 6.9% of the subjects did not agree with the statement. The graphical representation of

the responses of the total sample for the above statement is shown in figure 4.119.

Figure 4.119: Percentage of subjects who think that the knowledge about development of nation should be in conformity with sustainability of environment' should have a place in the present B.Ed. curriculum

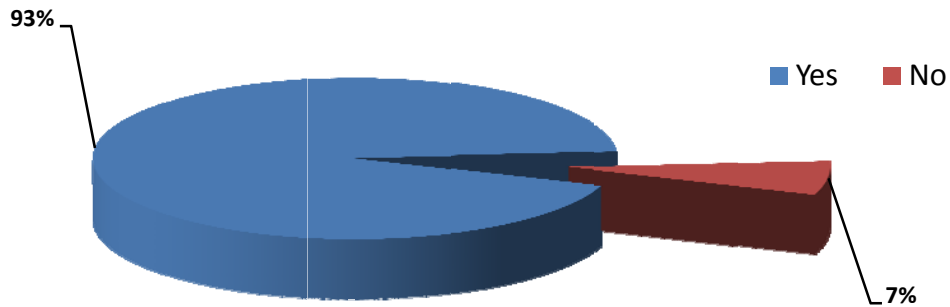


Table 4.120

Responses of the total sample for the statement: The slogan ‘Quality of life depends on the Quality of environment’ has to be highlighted in the teacher education curriculum

Responses	Frequency	Percent	Cumulative Percent
Yes	100	98.0	98.0
No	2	2.0	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement ‘Quality of life depends on the Quality of environment’ has to be highlighted

in the teacher education curriculum shows that, 98.0% of the samples have agreed and 2.0% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.120.

Figure 4.120: Percentage of subjects who think that the slogan ‘Quality of life depends on the Quality of environment’ has to be highlighted in the teacher education curriculum

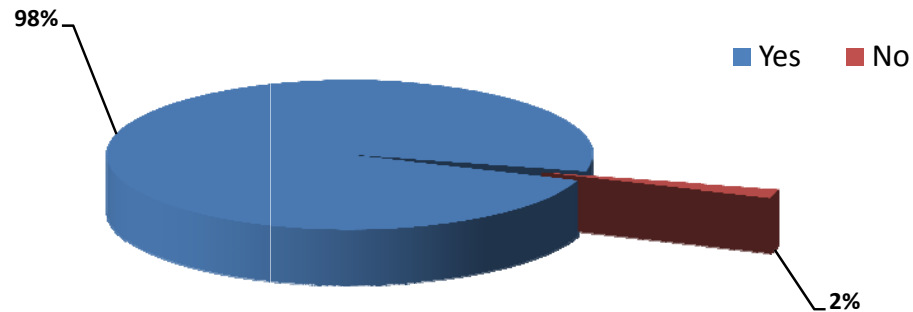


Table 4.121

Responses of the total sample for the statement: Values like co-operation instead of competition, survival of the weakest along with fittest, eco- friendly living style etc. should be highlighted in the teacher education curriculum

Responses	Frequency	Percent	Cumulative Percent
Yes	102	100.0	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement values like co-operation instead of competition, survival of the weakest

along with fittest, eco- friendly living style etc. should be highlighted in the teacher education curriculum shows that, 100% of the samples have agreed with the statement. The graphical representation of the responses of the total sample for the above question is shown in figure 4.121.

Figure 4.121: Percentage of subjects responded to the statement, the values like co-operation instead of competition, survival of the weakest along with fittest, eco- friendly living style etc. should be highlighted in the teacher education curriculum

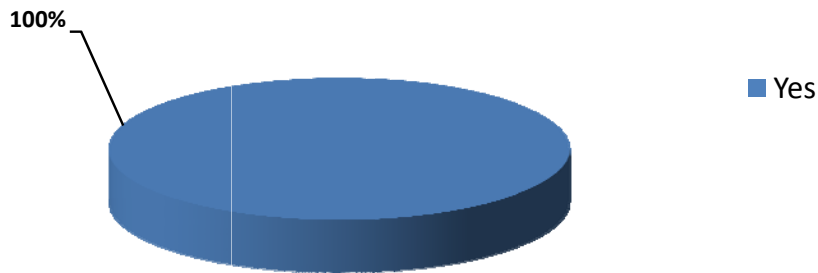


Table 4.122

Responses of the total sample for the statement: Education for sustainable development emphasizes education for a culture and peace

Responses	Frequency	Percent	Cumulative Percent
Yes	84	82.4	82.4
No	18	17.6	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement education for sustainable development emphasizes education for a culture and peace shows that, 82.4% of the samples have agreed and 17.6% of the

subjects did not agree with the statement. The graphical representation of the responses of the total sample for the above statement is shown in figure 4.122.

Figure 4.122: Percentage of subjects responses to the statement, education for sustainable development emphasizes education for a culture and peace

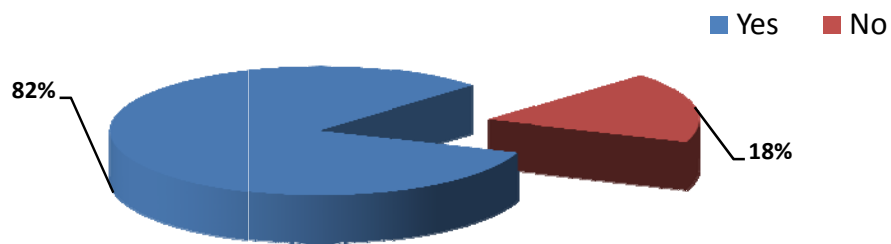


Table 4.123

Responses of the total sample for the statement: Sustainable development is as much about the children in the future as it is about what we need today

Responses	Frequency	Percent	Cumulative Percent
Yes	91	89.2	89.2
No	11	10.8	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement sustainable development is as much about the children in the future as it is about what we need today shows that, 89.2% of the samples have agreed and 10.8% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.123

Figure 4.123: Percentage of subject’s responses to the statement sustainable development is as much about the children in the future as it is about what we need today

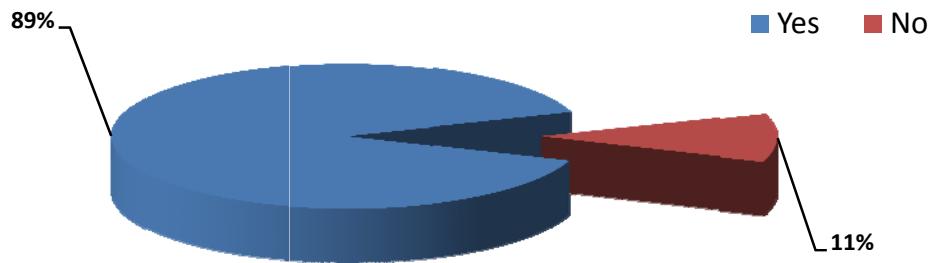


Table 4.124

Responses of the total sample for the statement: Sustainable development has nothing to do with Social justice

Responses	Frequency	Percent	Cumulative Percent
Yes	25	24.5	24.5
No	77	75.5	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement Sustainable development has nothing to do with Social justice indicates that, 24.5% of the samples have agreed and 75.5% of the subjects did not agree with the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.124.

Figure 4.124: Percentage of subjects who think that sustainable development has nothing to do with Social justice

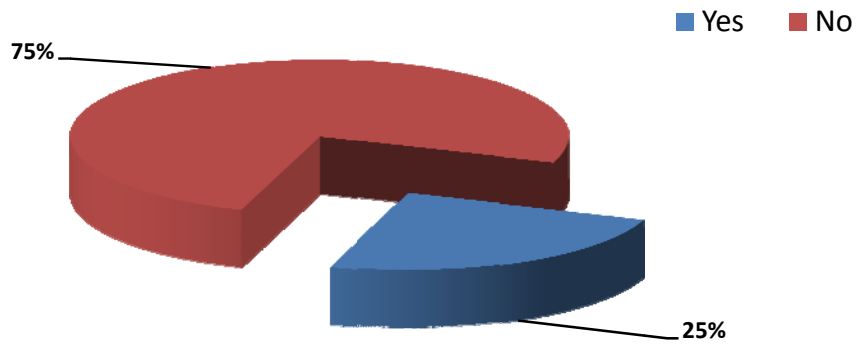


Table 4.125

Responses of the total sample for the statement: We cannot slow the rate of climate change

Responses	Frequency	Percent	Cumulative Percent
Yes	48	47.1	47.1
No	54	52.9	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement we cannot slow the rate of climate change shows that, 47.1% of the samples have agreed and 52.9% of the subjects did not agree with the statement.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.125.

Figure 4.125: Percentage of subjects responses to the statement, we cannot slow the rate of climate change

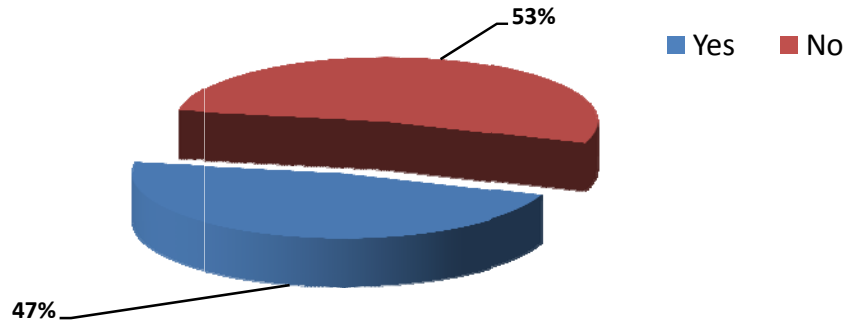


Table 4.126

Responses of the total sample for the statement: Corporate social responsibility is irrelevant to sustainable development

Responses	Frequency	Percent	Cumulative Percent
Yes	31	30.4	30.4
No	71	69.6	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement corporate social responsibility is irrelevant to sustainable development indicates that, 30.4% of the samples have agreed and 69.6% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.126.

Figure 4.126: Percentage of subject's responses to the statement corporate social responsibility is irrelevant to sustainable development

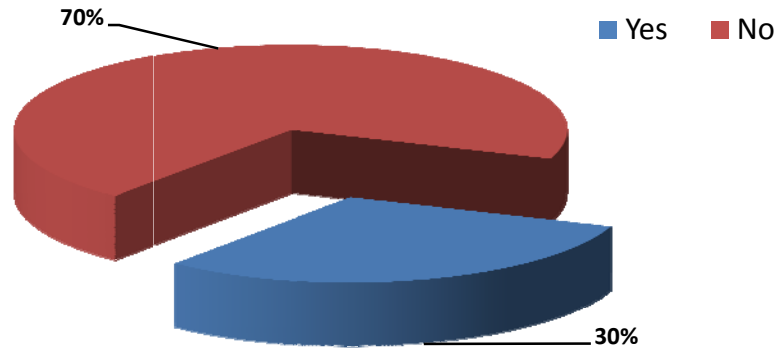


Table 4.127

Responses of the total sample for the statement: Education for sustainable development supports Cultural diversity

Responses	Frequency	Percent	Cumulative Percent
Yes	80	78.4	78.4
No	22	21.6	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement Education for sustainable development supports Cultural diversity shows that, 78.4% of the samples have agreed and 21.6% of the subjects did not agree.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.127.

Figure 4.127: Percentage of subject’s responses to the statement, education for sustainable development supports Cultural diversity

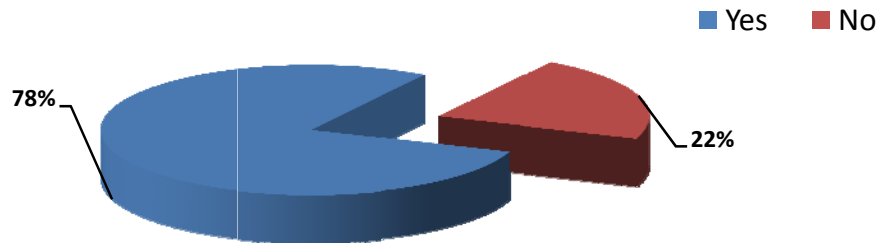


Table 4.128

Responses of the total sample for the statement: Environment education and Education for Sustainable Development is one and the same thing

Responses	Frequency	Percent	Cumulative Percent
Yes	27	26.5	26.5
No	75	73.5	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement environment education and Education for Sustainable Development are one and the same thing indicates that, 26.5% of the samples have agreed and 73.5% of the subjects did not agree. The graphical representation of the responses of the total sample for the above question is shown in figure 4.128.

Figure 4.128: Percentage of subjects who think that Environment education and Education for Sustainable Development is one and the same thing

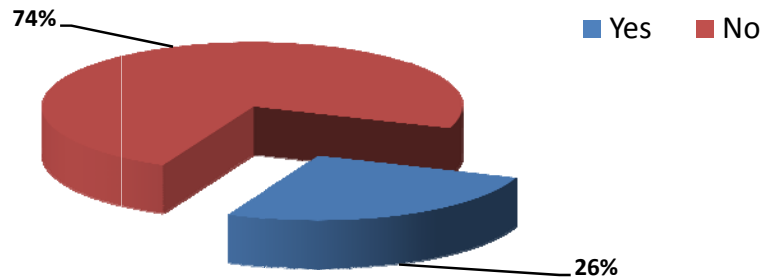


Table 4.129

Responses of the total sample for the question: Do you think that the five year planning of India should be designed, with a perception of future extending to 20-50 years ahead?

Responses	Frequency	Percent	Cumulative Percent
Yes	62	60.8	60.8
No	40	39.2	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question, ‘do you think that the five year planning of India should be designed, with a perception of future extending 20-50 years ahead’, shows, 60.8% of the samples have agreed and 39.2% of the subjects did not agree. The graphical

representation of the responses of the total sample for the above question is shown in figure 4.129.

Figure 4.129: Percentage of subject’s responses to the question whether five year planning of India should be designed, with a perception of future extending to 20-50 years ahead

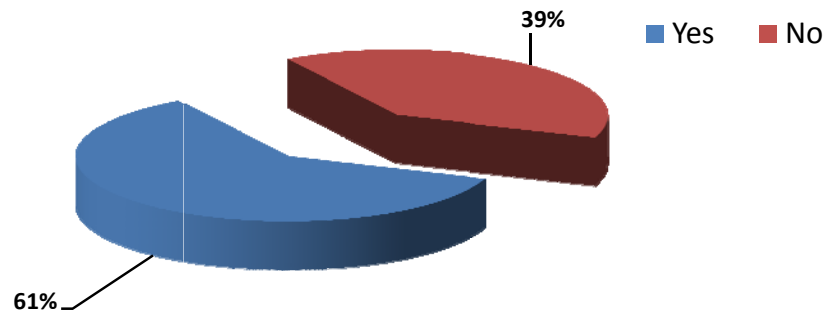


Table 4.130

Responses of the total sample for the statement: The concept of Sustainable Development is rooted on the value enunciated ‘Loka Samasta Sukhino Bhavantu’

Responses	Frequency	Percent	Cumulative Percent
Yes	101	99.0	99.0
No	1	1.0	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement concept of Sustainable Development is rooted on the value enunciated “Loka Samasta Sukhino Bhavantu” shows, 99.0% of the samples have agreed and 1.0% of the subjects did not agree with the statement.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.130.

Figure 4.130: Percentage of subject’s responses to the statement Sustainable Development is rooted on the value enunciated ‘Loka Samasta Sukhino Bhavantu’

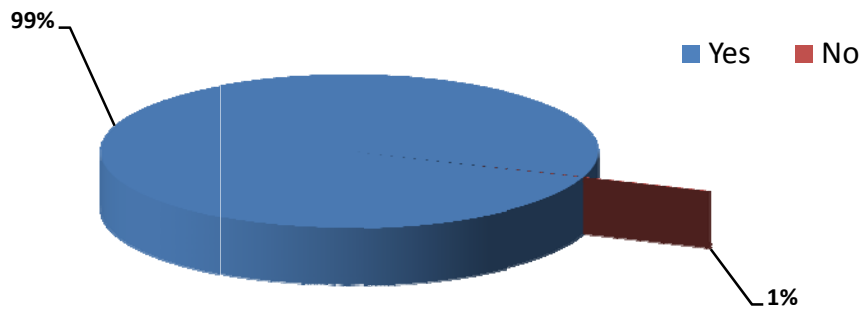


Table 4.131

Responses of the total sample for the question: Are you in favour of including appropriate activities and projects with regard to Sustainable Development in the school and teacher education curriculum?

Responses	Frequency	Percent	Cumulative Percent
Yes	102	100.0	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are in favour of including appropriate activities and projects with regard to Sustainable Development in the school and teacher education curriculum shows that, 100% of the samples have agreed to it.

The graphical representation of the responses of the total sample for the above question is shown in figure 131.

Figure 4.131: Percentage of subjects who responded that they are in favour of including appropriate activities and projects with regard to Sustainable Development in the school and teacher education curriculum

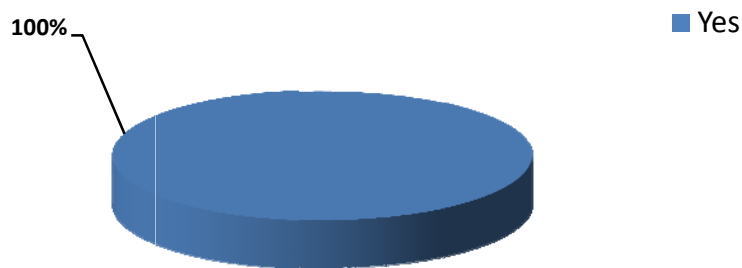


Table 4.132

Responses of the total sample for the statement: Manufacturers should discourage the use of disposables

Responses	Frequency	Percent	Cumulative Percent
Yes	73	71.6	71.6
No	29	28.4	100.0
Total	102	100.0	

The above table of responses of the total sample, for the statement manufacturers should discourage the use of disposables, 71.6% of the samples have agreed and 28.4% of the subjects did not agree. The graphical representation of the responses of the total sample for the above question is shown in figure 4.132.

Figure 4.132: Percentage of subjects who think that manufacturers should discourage the use of disposables

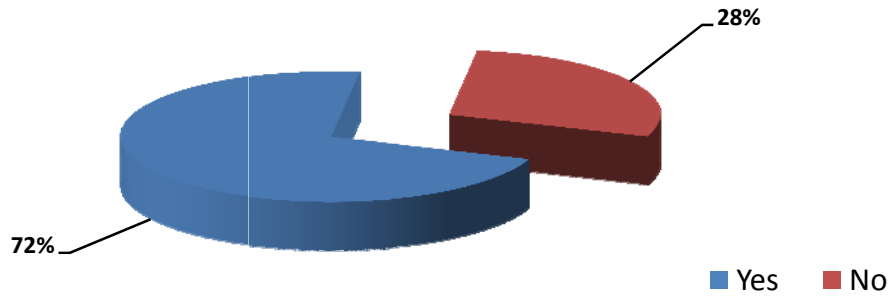


Table 4.133

Responses of the total sample for the question: Is the Education for Sustainable Development project is declared by UNESCO?

Responses	Frequency	Percent	Cumulative Percent
Yes	62	60.8	60.8
No	40	39.2	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether the Education for Sustainable Development project declared by UNESCO, 60.8% of the samples have responded ‘Yes’ and 39.2% of the subjects responded ‘No’.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.133.

Figure 4.133: Percentage of subject’s responses to the question whether Education for Sustainable Development project is declared by UNESCO

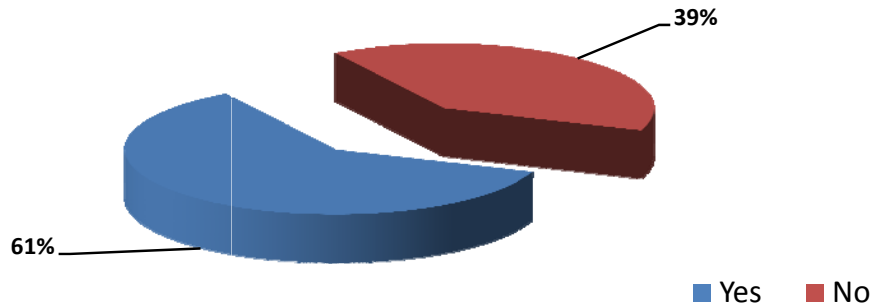


Table 4.134

Responses of the total sample for the question: Do you know about Agenda 21 of Rio earth summit?

Responses	Frequency	Percent	Cumulative Percent
Yes	39	38.2	38.2
No	63	61.8	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they know about Agenda 21 of Rio earth summit, 38.2% of the samples replied they know about it. But 61.8% of the teacher educators said they have no idea about agenda 21 of Rio Earth Summit.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.134.

Figure 4.134: Percentage of subjects awareness of Agenda 21 of Rio earth summit

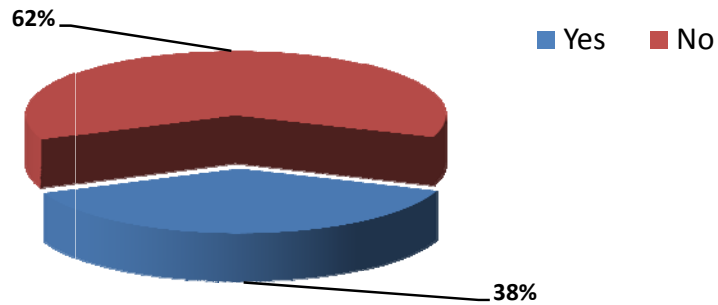


Table 4.135

Responses of the total sample for the question: Do you know about the document “our common future”?

Responses	Frequency	Percent	Cumulative Percent
Yes	39	38.2	38.2
No	63	61.8	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they know about the document “our common future”, 38.2% of the samples replied they know about it. But 61.8% of the teachers said they have no idea about the document “our common future”.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.135.

Figure 4.135: Percentage of subjects awareness about the document “our common future”

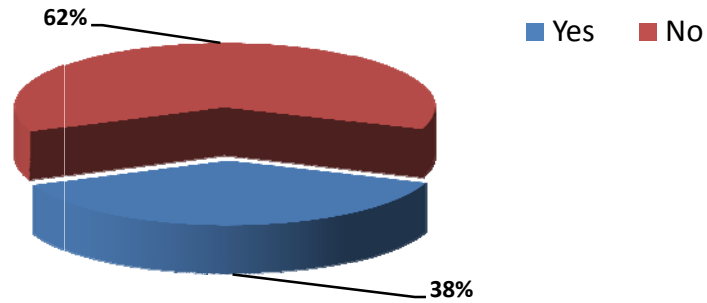


Table 4.136a

Responses of the total sample for the question: Do you have awareness about renewable energy

Responses	Frequency	Percent	Cumulative Percent
Yes	89	87.3	87.3
No	13	12.7	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about renewable energy, 87.3% of the samples said ‘Yes’. However 12.7% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136a.

Figure 4.146a: Percentage of subject’s knowledge about renewable energy

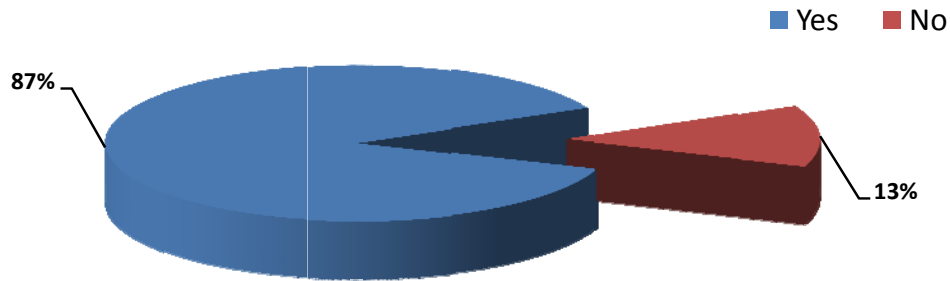


Table 4.136b

Responses of the total sample for the question: Do you have awareness about sustainable building design/green design

Responses	Frequency	Percent	Cumulative Percent
Yes	73	71.6	71.6
No	29	28.4	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about sustainable building design/green design, 71.6% of the samples said ‘Yes’. However 28.4% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136b.

Figure 4.136b: Percentage of subjects knowledge about sustainable building design/green design

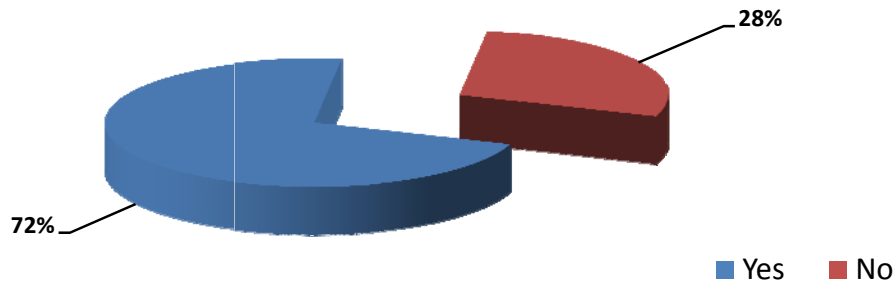


Table 4.136c

Responses of the total sample for the question: Do you have awareness about ecological economics

Responses	Frequency	Percent	Cumulative Percent
Yes	60	58.8	58.8
No	42	41.2	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about ecological economics, 58.8% of the samples said ‘Yes’. However 41.2% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136c.

Figure 4.136c: Percentage of subject’s awareness about ecological economics

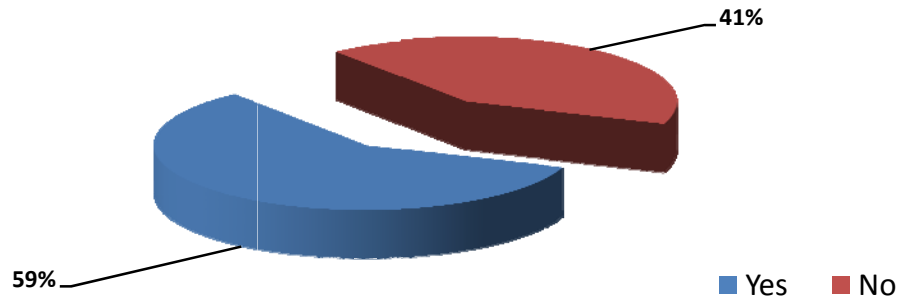


Table 4.136d

Responses of the total sample for the question: Do you have awareness about sustainable agriculture

Responses	Frequency	Percent	Cumulative Percent
Yes	85	83.3	83.3
No	17	16.7	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about sustainable agriculture, 83.3% of the samples said ‘Yes’. However 16.7% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136d.

Figure 4.136d: Percentage of subject’s knowledge about sustainable agriculture

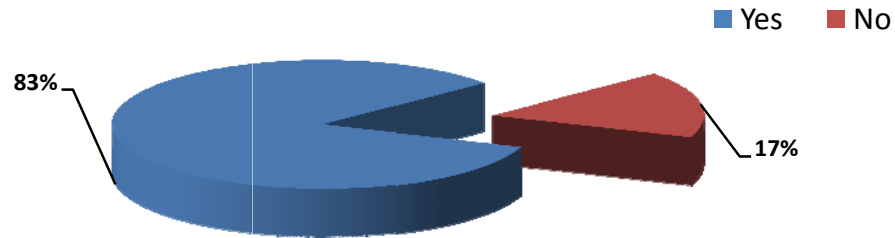


Table 4.136e

Responses of the total sample for the question: Do you have awareness about sustainable forestry

Responses	Frequency	Percent	Cumulative Percent
Yes	91	89.2	89.2
No	11	10.8	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about sustainable forestry, 89.2% of the samples said ‘Yes’. However 10.8% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136e.

Figure 4.136e: Percentage of subjects knowledge about sustainable forestry

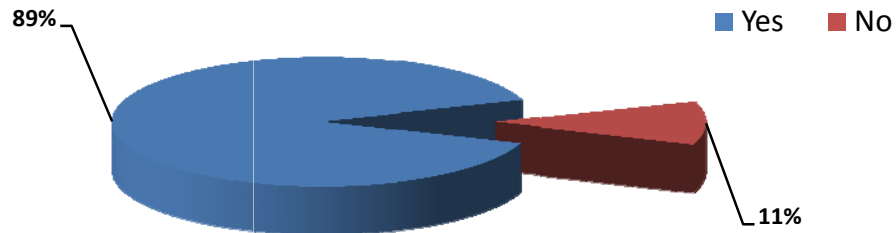


Table 4.136f

Responses of the total sample for the question: Do you have awareness about indigenous wisdom and technologies

Responses	Frequency	Percent	Cumulative Percent
Yes	64	62.7	62.7
No	38	37.3	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about indigenous wisdom and technologies, 62.7% of the samples said ‘Yes’. However 37.3% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136f.

Figure 4.136f: Percentage of subject’s knowledge about indigenous wisdom and technologies

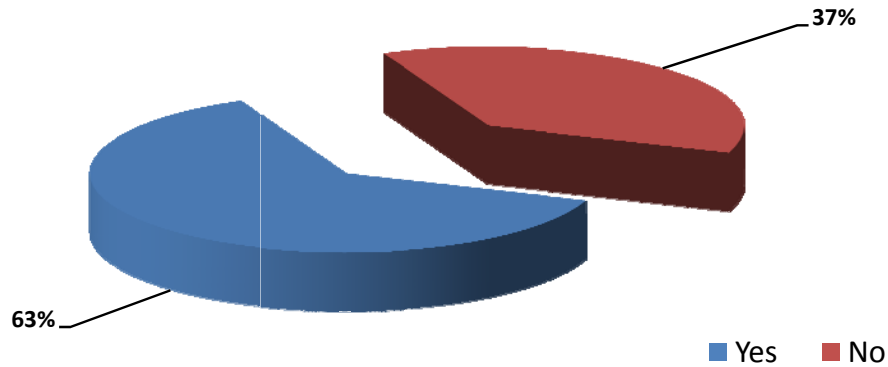


Table 4.136g

Responses of the total sample for the question: Do you have awareness about sustainable transportation

Responses	Frequency	Percent	Cumulative Percent
Yes	69	67.6	67.6
No	33	32.4	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about sustainable transportation, 67.6% of the samples said ‘Yes’. However 32.4% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136g

Figure 4.136g: Percentage of subject’s knowledge about sustainable transportation

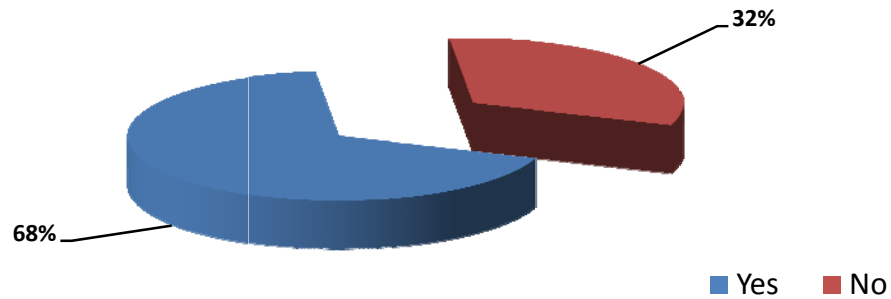


Table 4.136h

Responses of the total sample for the question: Do you have awareness about green purchasing

Responses	Frequency	Percent	Cumulative Percent
Yes	46	45.1	45.1
No	56	54.9	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about green purchasing, 45.1% of the samples said ‘Yes’. However 54.9% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136h.

Figure 4.146h: Percentage of subjects knowledge about green purchasing

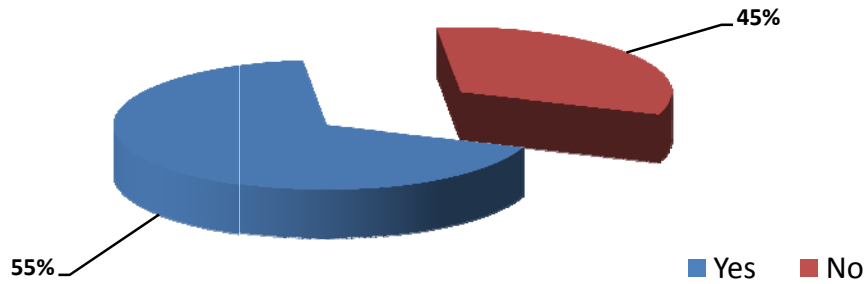


Table 4.136i

Responses of the total sample for the question: Do you have awareness about environmental audit

Responses	Frequency	Percent	Cumulative Percent
Yes	44	43.1	43.1
No	58	56.9	100.0
Total	102	100.0	

The above table of responses of the total sample, for the question whether they are aware about environmental audit, 43.1% of the samples said 'Yes'. However 56.9% of the subjects said they have no idea about it.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.136i.

Figure 4.136i: Percentage of subject’s knowledge they know about environmental audit

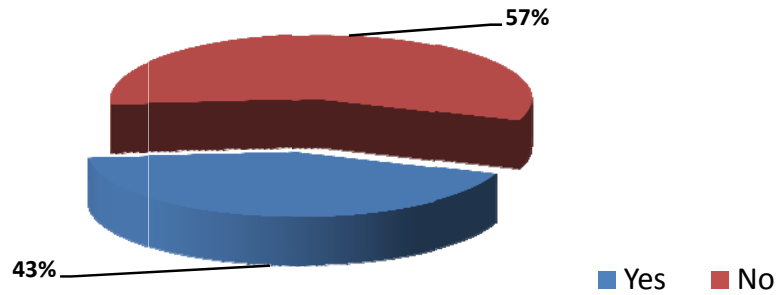


Table 4.137

Responses of the total sample for the statement: Gender equality has nothing to do with Sustainable development

Responses	Frequency	Percent	Cumulative Percent
Yes	40	39.2	39.2
No	62	60.8	100.0
Total	102	100.0	

The above table of responses of the total sample shows, 39.2% of the samples said gender equality has nothing to do with Sustainable development. However 60.8% of the subjects said Gender equality is closely related with sustainable development.

The graphical representation of the responses of the total sample for the above statement is shown in figure 4.137.

Figure 4.137: Percentage of subjects response to the statement that gender equality has nothing to do with Sustainable development

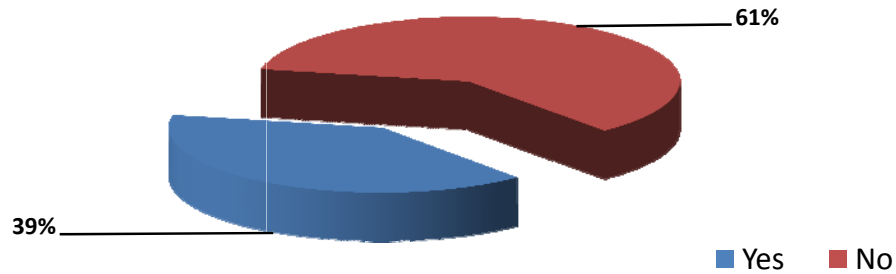


Table 4.138

Responses of the total sample for the question: Is your training curriculum subject centered or are there opportunities for cross disciplinary

Responses	Frequency	Percent	Cumulative Percent
Subject Centered	52	51.0	51.0
Cross Disciplinary	50	49.0	100.0
Total	102	100.0	

The above table of responses for the question whether the training curriculum was subject centered or cross disciplinary, 51.0% of the samples reported that it was subject centered, whereas 49.0% reported that it was cross disciplinary.

The graphical representation of the responses of the total sample for the above question is shown in figure 4.138.

Figure 4.137: Percentage of subjects response to the question whether the training curriculum was subject centered or cross disciplinary

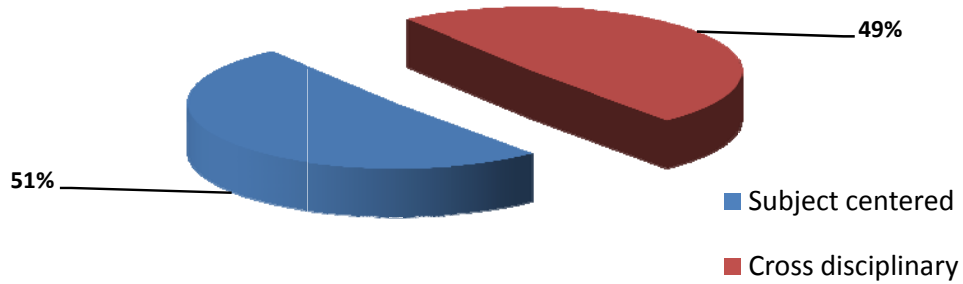


Table 4.139

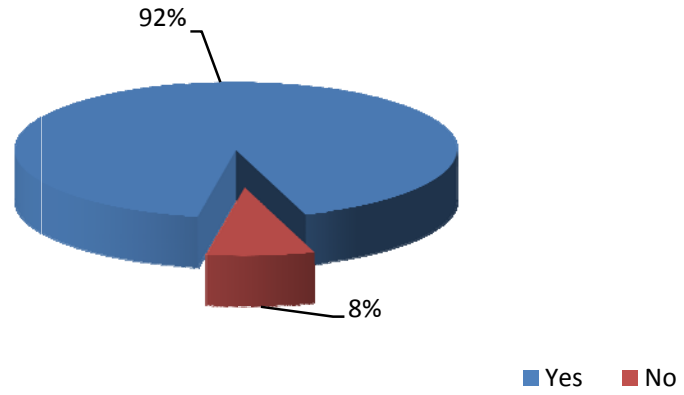
Responses of the total sample for the question: Have you taken a seminar/ course, in which sustainable development was discussed

Responses	Frequency	Percent	Cumulative Percent
Yes	94	92.0	92.0
No	8	8.0	100.0
Total	102	100.0	

The above table of responses for the question whether they have taken a seminar/course, where sustainable development was discussed 92.0% of the samples responded yes and 8.0% of the subjects responded no.

The graphical representation of the responses of statement is shown in figure 4.139.

Figure 4.139: Percentage of subjects who have taken a seminar/ course, in which sustainable development was discussed



Section D

Analysis of interview Response of Experts with regard to the preparation of suggested module and strategies for improving the curriculum towards Education for Sustainable Development

As part of realizing the objectives 4 and 5 the investigator visited a number of experts and teacher educators related to the field of sustainable development and education for the preparation and finalization of the sample module.

At first, the investigator prepared a content outline of module suggested for teacher education at the secondary level. The content was selected as a result of wide reference on available materials and also in consultation with experts in the field. The sample module is prepared for thirty hours with due weightage for the three key aspects of sustainable development, i.e. society, environment and economy and its associated perspectives.

The copy of sample module was given to the experts at the time of interview. For this an interview schedule was prepared with eight questions under three heads, namely (i) current status and relevance of Education for Sustainable Development. (ii) application / implementation of Education for Sustainable Development in Education and (iii) Social context of Education for Sustainable Development.

The interview took thirty to sixty minutes with each expert, Their feedback and suggestions are summarized below.

1. Current status and relevance

- (i) What is the specific relevance of Education for Sustainable Development in the present context?

All the respondents were of unanimous opinion that, it is highly relevant and a present need of the hour, as we need to protect and conserve whatever we have (natural resources) on this Planet for this generation as well for the generations to come. It is very essential to make people understand and participate effectively in solving or mitigating environmental problems. An appropriate example is Climate change discussions are happening. The world community is witnessing how difficult it is to sort out environmental issues. Two of the experts were of the opinion that the present mode of development, which is based on a mechanistic view, is unsustainable and results in the present issues related to environment, society and development. Hence we have to ensure integration of Sustainable Development concepts in education whenever and wherever possible.

One of the experts also pointed out the need for including two more components i.e.

1. 'History and evolution of Sustainable Development'
 2. 'Why Education for Sustainable Development - present scenario'
- as an introductory part of the prepared module'.

(ii) Do you think that Education for Sustainable Development is a panacea to address the multitude of issues of the present world?

Response was almost same, while Education for Sustainable Development is not a panacea to address the multitude of environmental and developmental issues, certainly it is one of the un-disputed tools to solve or prevent new ones. The potentials of education need to be combined with many other measures – policy, legislation, etc- to make sustainability a reality. Education for Sustainable Development is interdisciplinary in nature which includes various disciplines. Hence it is applicable for all students irrespective of their subject. The different perspectives of Education for Sustainable Development spread out to all domains of the individuals’ personality and life on earth.

2. Application / Implementation of Education for Sustainable Development

(i) What approaches can you suggest for implementing Education for Sustainable Development?.

It needs to be seen at both the levels – as a standalone subject of specialization in higher education and as an infused theme of concern at other levels to focus the applicability of the disciplines under study. The concept of Education for Sustainable Development can be developed by suitable learning experience and projects through inside and outside classroom activities. It should have an integrated approach correlated with subjects,

society and environment. Provisions of special programmes on Education for Sustainable Development are also necessary to realize certain specific objectives of Sustainable Development.

- (ii) What are the components to be included in the curriculum at different levels (content, methodology and evaluation)?

Content related to various perspectives of Education for Sustainable Development, should be practical oriented, and based on student activities. More contents may be added according to the needs of the situation both at global and regional level. Incorporation of ESD values like respect, equity (intergenerational and intra-generational and gender) in the curriculum is necessary. Attitudinal change and skill development should be emphasized. Continuous and comprehensive evaluation methods such as observation, anecdotal methods, ratings of project evaluation, survey etc. are recommended.

One of the experts was of the opinion that ESD needs to be interdisciplinary and trans-disciplinary and hence the contents and methodology of such a course needs to be defined that way without limiting it to the realms of economics or environment alone.

In ESD, generation of knowledge is always emphasized, hence constructing knowledge or development of new patterns of working needs to be developed. As Albert Einstein has once said “Problems cannot be solved within the mindset that created them”. Hence, learning will be the focus in ESD rather than teaching or

just imparting information. It has to progress from transmission of Knowledge —▶transaction —▶transformation of behaviour.

Since knowledge generation will be the focus, even evaluation has to be planned to measure outcomes of learning rather than teaching. It has to be process oriented

(iii) What are the outcomes expected of such integration of Education for Sustainable Development in teacher education curriculum?

To make the prospective teachers as ambassadors to instill the values of Sustainable Development among students and people. Attitudinal change, values and skill development, awareness and understanding, participatory behavior, sustainable living habits like maximum use and reuse and eco-friendly living style are expected as learning outcomes. A shift from '3Rs' to '5Rs' is recommended i.e. apart from 3Rs, 'Refuse' and 'React' also to be highlighted. A teacher trainee who is equipped with knowledge, values / attitudes and Practices of sustainability and who understands the critical role of education in moving towards sustainability will be able to link what he teaches with the issues outside which concerns environment and ultimately life of the individual

3. Social context

(i) What are the values and principles of sustainability that should be integrated in education and learning?

- Values with respect to fellow human beings, right of every individual for living with dignity,
- Values attached to conserving environment;
- Values regarding the purpose of life and existence.
- Values of sharing natural resources – present and coming generations, etc.
- Right of every individual for natural resources.
- Democracy and social equity.
- Sense of belonging, identity and self-esteem
- Commitment to learning
- Respect and care for self and the rights of others (Equity)
- Respect for diversity

are to be integrated in the teaching learning process

(ii) How can we integrate values of sustainability into education?

Responses to the question are summarized as follows:

- Through using more of value orientation and clarification teaching-learning strategies. Providing hands-on and real life (extent possible) experiences for student trainees to internalize the sustainability values. While dealing with the same, pollution of the social environment also should be taken in to consideration.

- Giving provision for sufficient flexibility in the curriculum in order to get maximum opportunity for infusion and correlation at all levels of education.
- Environmental problems should be raised first to the level of a social issue to develop a felt need and provide maximum experience from their environment.

(iii) Can you suggest some practical measures for getting acceptability for sustainability among people (people friendly approach towards sustainability)?

Communication strategies and field work relating to livelihoods of people. Only this work, without linking communication with their livelihoods or living styles, strategies of communication will remain theoretical and dry. Localization of education system is also recommended. While dealing with challenges highlight local issue and its impact on immediate surroundings, instead of global ones.

Some of the practical measures for propagating Education for Sustainable Development among people of the locality are given below:

1. Active participation of the voluntary organization
2. Properly utilising the community resources.
3. Promoting practices related to Sustainable Development such as self sufficiency, traditional farming etc

4. Creating awareness regarding slogans like PPP (Population, Pollution, Poverty). 'No Passive Acceptance but Active Refusal'. 'Let us make every day the World Environmental Day' etc

Suggested Strategies

- Regarding the strategies to be implemented as part of ESD curriculum, emphasize should be given for constructivist approach. Experiential learning strategies such as project, role play, case study, brain storming, group discussion, survey, script writing, making of short films and documentaries, screen play field trip, experimental and action research project are to be given priority in the curriculum.
- Since most of the outcomes expected are Long Range Objectives, coming under affective and psychomotor level, continuous and comprehensive evaluation strategies are recommended. Observation, anecdotal record, performance test, case study, checklist, questionnaire etc. are examples.
- The related topics with regard to sustainable development which are spread over in different places of the existing curriculum are to be combined and included under a single broad heading, Education for Sustainable Development. This will make the curriculum, more goal oriented, save time and effort and provide

for effective and meaningful transaction of the concept. Such an initiative is possible as part of a total restructuring of the entire curriculum in teacher education.

- Almost all the experts suggested to add more instructional hours to the proposed module. They have also suggested to develop a series of module having more details with regard to pedagogy and evaluation.

Preparation of such modules with a variety of learning experience and strategies with regard to pedagogy and evaluation is beyond the scope of the study. Therefore the investigator limited the same with the preparation of a content outline of the module.

In the light of expert's comments and suggestions, the investigator revised the sample module by adding more components and instructional hours, the final sample of the suggested module on ESD was prepared.

Findings of the Study

Curriculum analysis

The findings of the study are summarized under three major headings with regard to the objectives of the study.

I: Analysis of the Teacher Education Curriculum in the Universities of Kerala with regard to the concepts of Sustainable Development

Objectives:

1. To compare the existing curriculum in teacher education at the secondary school level in different universities of Kerala with respect to various dimensions of Education for Sustainable Development
2. To evaluate how far the existing teacher education curriculum reflects the concepts of sustainable development.

With regard to the first two objectives the investigator collected the teacher education curricula of four universities in Kerala for detailed analysis. These are the universities with Departments of Teacher Education.

The analysis revealed that the concept of Sustainable Development is included only as a subtopic of Environmental Education which is the component of a general paper in the B. Ed. Syllabus. In Kerala, Calicut and Kannur Universities, Environmental Education is a part of Paper III which is a core subject for all student teachers. In MG University, Environmental Education is a full paper but it is only an elective paper. Findings of university wise analysis, regarding the reflection of Sustainable Development are given below.

1. In Kannur University, Sustainable Development is included as a subtopic among sixteen subtopics of Environmental Education in

the second semester and only thirty instructional hours are allocated to Environmental Education.

2. In Kerala University also, it is the same as that of Kannur University. Here the total instructional hours allotted for Environmental Education curriculum is forty in the second semester.
3. The relative importance given to Environmental Education and Sustainable Development in Calicut University is the same as that of Kannur and Kerala Universities. Total number of instructional hours allotted is only fifteen and this is the least among the universities in Kerala.
4. In MG University, though Environmental Education is included in the syllabus as a full paper with one hundred and fifty instructional hours it is only an elective paper and concept of Sustainable Development is included only as a subtopic, same as in the other universities in Kerala.
5. As per the updated model curriculum of UGC (March 2001) on education, Environmental Education is included as an elective paper with five units and fifteen subtopics. Out of this, the Vth unit is the one dealing with Sustainable Development. i.e. 'Role of schools in Environmental Conservation and Sustainable Development'.

6. The course content suggested by the NCTE for inclusion in the teacher education programme at secondary level (Environmental Education Frame Work for Teacher Educators 2005) has sixteen sub topics out of which only one contains the contents of SD namely, 'Sustainable Development, Energy and Waste Management'. The remaining dealing with various aspect of Environmental Education.
7. At present RIE (NCERT) Mysore is not conducting B.Ed. course. But the 2 year B.Ed. course conducted till last year did not give due weightage to Sustainable Development. In the fourth semester, Environmental Education was included as a unit called 'Education for the Protection of Environment' in a general paper named 'Education and National Concerns', which consists of five units. Among these five units, issues which are related or can be related to Sustainable Development were included.

In short, though Sustainable Development as such was not included, the various issues related to Sustainable Development were dealt in another way. But at the same time, it seems that the treatment is not in tune with the objectives of Education for Sustainable Development.

8. Though there are a few topics in other papers which are related to the concepts of Sustainable Development, are present in the teacher

education curricula of Kerala, the organization of content is not in tune with the objectives of Sustainable Development.

Hence, in general the comparison of teacher education curriculum of different universities of Kerala reveals that the existing teacher education curriculum is not giving due weightage to Environmental Education and Sustainable Development.

II: Awareness, knowledge, attitude and practices of student teachers and teacher educators

Objective:

3. To assess the awareness of teacher educators and student teachers towards the concepts of education for sustainable development.

With regard to the above objective, the investigator collected data regarding awareness, knowledge, attitude and practices of student teachers and teacher educators on Sustainable Development through well prepared questionnaires. The student data were analysed under two heads, i.e. (i) analysis of the total sample (ii) stream wise analysis of the total sample as science, arts and language groups. The analysis of total sample of teacher educators were also done and findings presented in separate head (iii).

The findings pertaining to analysis of (i) is summarized below.

i. Analysis of the total sample of student teachers

1. The first Question (Table 4.4) regarding to what extent the student teachers are aware of concepts of Sustainable Development revealed that majority of the sample (66%) has only very little knowledge regarding Sustainable Development. Out of the remaining 34% sample, 23% are aware to *some extent* and only 11% of the samples are aware about concepts of Sustainable Development to *a greater extent*. This finding indicates that a great majority of the students are not having sufficient awareness regarding Sustainable Development as it is not included in the curriculum.
2. For questions presented in Tables 4.5, 4.6, 4.14, 4.15, 4.33 regarding whether the concepts, values, attitudes and skills of Education for Sustainable Development are to be included in teacher education curriculum, majority of the sample supported for it. It highlights the need for inclusion of Sustainable Development concepts in the curriculum.
3. Majority of student teachers (64%) says (Table 4.7) that present policy of national development is giving consideration for environmental protection to a considerable amount. In reality, the present policy is not giving due weightage for environmental

protection. Here the finding indicates that majority of the students do not have proper awareness about Sustainable Development as it is already reflected in their response to the first question (Table 4.4).

4. For questions presented in Table 4.8, 4.9, which assess the student teachers' awareness regarding various dimensions of Sustainable Development, majority (55-70%) responded towards lower levels. Here the issues raised were not so familiar to the students and these issues were not discussed in the present curriculum.

To the questions presented in Tables 4.10, which is directly related with environmental aspects, majority registered their responses as *some extent* and *a greater extent*, because these issues were discussed in the present curriculum

5. For the question 8 (table 4.11) which assess whether the present curriculum deals with dimensions of sustainable development, majority responded towards *very little extent*, *some extent*, *not at all*, indicates the inadequacy of the present curriculum.
6. To the question presented in table 4.12, which deals with the social aspect of sustainable development, majority responded to the lower levels, i.e. *very little extent* and *some extent* shows their lack of adequate knowledge in this area

7. Table 4.13 and 4.16 for the questions 10 and 13, regarding the practical aspect of Sustainable Development, majority did not have a clear idea. Even though issues raised were related with Sustainable Development the sample was not in a position to give specific responses such as *a greater extent* or *not at all*. Here majority registered their response as *some extent* or *very little extent*.
8. For questions 14 and 15 (Table 4.17, 4.18) regarding the social and cultural aspect of Sustainable Development majority (81%) responded in a positive way as, these factors seem related with Sustainable Development or it may be due to their general awareness. For Table 4.19, 4.21 and 4.23 seeking in-depth knowledge regarding Sustainable Development, majority (80%) responded wrongly as these questions are not related to the environmental aspects of Sustainable Development.
9. To questions 17, 19 and 21 presented in Table 4.20, 4.22 and 4.24, related to the environmental aspect of Sustainable Development majority responded in a positive way as these are directly or indirectly dealt within the present Environmental Education curriculum.
10. For question 22 presented in the Table 4.25, whether Environmental Education and Education for Sustainable Development are one and

the same, around 59% said that Education for Sustainable Development and Environmental Education are not one and the same. It clearly indicates that though the students have no exact idea about Sustainable Development, they know that it is something other than the conventional Environmental Education and at the same time a considerable number (41%) of students cannot distinguish between Environmental Education and Sustainable Development.

11. To question 23 presented in Table 4.26, 52%, though, not a great majority supports the idea that five year planning should be redesigned to longer term planning. It indicates their thinking about development, that the present planning is insufficient and it needs some changes, but at the same time, a good number of students (47%) are not concerned with the present strategy of planning at all. It highlights the urgent need of incorporating concepts of Sustainable Development in the curriculum, so that students get a balanced view regarding development by considering its integral aspects of society and economy along with environment.
12. For question 24 presented in Table 4.27, 'Do you think that teachers are the most effective agents for the dissemination of Environmental Education?' a great majority (83%) responded positively.

13. Since Questions 25 to 32 (Table 4.28 - 4.35) deal with the content and pedagogical aspects which are related with the environmental aspect of Sustainable Development, majority of students (80%) responded positively as these concepts seem familiar to them.
14. For Table 4.36 related with the exploitation of wealthier nations on poor countries, majority responded positively as it shows their general social awareness than the in-depth knowledge in Sustainable Development.
15. Questions 34 (Tables 4.37) deal with the application of sustainability principles and majority registered wrong responses as these aspects of Sustainable Development are not familiar to students.
16. Though questions 35 - 37 (Tables 4.38 - 4.40) were direct regarding the origin and evolution of Education for Sustainable Development concepts, majority has given negative responses. It shows the lack of their background knowledge regarding the history of Sustainable Development and Education for Sustainable Development.
17. To question 38 (Table 4.41) 'do you think that campus have a practical role in sustaining the ecosystem?' great majority registered positive response which shows their readiness for environmental protection.

18. For question 39a to 39i and 41 (Table 4.42a - 4.42i and 4.44) that assessed student's knowledge in the emerging areas related with Sustainable Development such as sustainable building design, ecological economics, renewable energy, majority had negative responses. These responses including response regarding gender equality (4.44), were due to lack of proper knowledge in the various emerging areas of Sustainable Development which are essential for the welfare of present and future generation.
19. Question 40 (Table 4.43) deals with students' civic and social responsibility related with environment. Majority responded rightly, which is a positive indicator of their civic and social consciousness.
20. For the other eight questions 42 to 50 (Tables 4.45 - 4.53) except one(4.46), those assess the attitude and practices of student teachers with regard to the sustainability principles related with environment, majority registered positive responses for six questions and negative responses for two questions. It shows their attitude and practices. It depends on their opportunity for getting exposure to various aspects of environment and social issues and the quality of education provided to them.
21. For question 43 (Table 4.46) 'I have taken course/seminar on 'Sustainable Development'', 47% have undergone or attended

seminars, but 53% have not. This factor is reflected in their responses for all questions and the variation in different responses may be due to the quality of seminar / programme provided or their extent of participation / involvement in the seminar.

The findings pertaining to analysis of (ii) is summarized below.

ii. Findings of the stream wise analysis are given below.

1. Stream wise analysis for the question number 1 presented in Tables 4.54 that dealt with the extent of awareness of student teachers' on Sustainable Development revealed that 16.6% of arts students show awareness to *a greater extent* compared with that of language and science students with 9.7% and 9.5% respectively. In the other levels of awareness, all the three groups expressed almost the same level of performance, i.e. *Some Extent, Very Little Extent* and *Not at All*. This shows that arts students show better awareness towards Sustainable Development compared with Language and Science students. However it was found that 9% of language and 6% of arts and 5.9% of science students show no awareness at all regarding Sustainable Development.
2. To the 2nd, 3rd and 30th questions (Tables 4.55, 4.56 and 4.83) regarding inclusion of Education for Sustainable Development concepts, activities and skills in the curriculum, majority of students

among each stream registered their responses as *a greater extent* and also in other levels of responses the three streams were responded in the same way. This indicates the need of inclusion of Sustainable Development and related aspects in the teacher education curriculum.

3. Analysis of question number 4 presented in Table 4.57 that deals with the present policy of National Development in relation to environmental concern revealed that more students in each stream made the response as *some extent* and *little extent* (45% and 31%). Only around 15% responded it as *a greater extent*, whereas 2-5% made the response that *not at all*. It indicates their lack of clear cut awareness about Sustainable Development and its perspectives.
4. For questions 5, 6 and 9 (Tables 4.58, 4.59 and 4.62) that discuss issues related to the social aspect of Sustainable Development, only few students in each stream made their response as '*a greater extent*'.
5. Majority of the response presented in table 4.60 that deals with the quality of ecosystem and development, concentrated in the lower levels, i.e. '*some extent to not at all*'. Only 30 - 37% supports it to *a greater extent*. Here science stream students show higher order of thinking than the other sections.

6. To Questions 8 (Tables 4.61) that deal with the different aspects of SD in the present Environmental Education curriculum, majority registered responses in the *very little extent* and *not at all*, revealed that present Environmental Education curriculum lacks important issues related to Sustainable Development. Among the responses *a greater extent*, language stream students are more in number.
7. To Questions 10 (Tables 4.63) that deals with the practical application of principles of Sustainable Development, majority in each stream responded to *some extent* and *very little extent*. The responses towards *a greater extent* in science is 10%, language 10.9% and arts is 12%. This indicates that comparatively arts students are more aware of social responsibility towards women. However around 3% in each stream says women have no special role and responsibility in the practical application of sustainability principles.
8. Question 11 and 12 (Tables 4.64 and 4.65) regarding the development of skill based programmes related to Sustainable Development, almost the same responses were registered in each level by the three groups. Majority have responded to *some extent* and *little extent* and to the *greater extent* it was 49% by science 45% by language and 48% by arts students respectively. It indicates lack of proper knowledge in Sustainable Development.

9. To Questions 13 (Tables 4.66) regarding the present pattern of living style and Sustainable Development, majority in each discipline responded to *some extent* and *very little extent* and to the *a greater extent* 21% by science students, 26% by language and 19% by arts students.
10. Questions 14 and 15 (Tables 4.67, and 4.68) regarding the wider meaning of Sustainable Development, majority registered positive responses which indicate their general awareness towards Sustainable Development.
11. For question 16 (Tables 4.69) regarding Sustainable Development and social justice, majority, i.e. 82% of science, 85% of language and 75% of arts stream student teachers registered negative responses, indicates lack of sufficient knowledge in the related areas of Sustainable Development. However with the low percentage among the three groups, arts students show higher social consciousness than others.
12. For Questions 17 (Tables 4.70) regarding the possibility of reducing the rate of climate change, majority of students in arts (55%) and science (60%) group registered 'No' which was the correct response. But in language group only 49% responded 'No'. It indicates the weaker status of language group.

13. To Questions 18, 20 and 34 (Tables 4.71, 4.73 and 4.87) that deals with social aspect of Sustainable Development, majority responded negative which indicate their low level of awareness especially in the emerging issues with regard to Sustainable Development.
14. To Question 19 presented in Table no 4.72 that deals with conservation of water and role of campus in preservation of ecosystem, great majority in each group responded 'No' which is the correct answer. It indicates their environmental consciousness as these issues are present in the existing Environmental Education curriculum.
15. To Questions 21 (Tables 4.74) which is related with economic aspect of environment, majority registered correct response 'Yes' with a higher percentage from the science group. Question 22 whether Environmental Education and Education for Sustainable Development are one and the same, science students (63%) and arts students (60%) have major percentage of correct response where as the language students have only 53% of correct responses.
16. To Question 23 (Tables 4.76) which demand a redesign of five year planning; only 50 - 52% have given correct response, which shows lack of balanced view regarding planning and development. Here language group shows relatively high percentage in correct responses with 58%.

17. For Questions 24 - 33 (Tables 4.77 - 4.86), majority responded 'Yes' which was the correct answer. These questions deal with various issues which were included in the present Environmental Education curriculum. Even though for Question 31 regarding manufacture of disposables, arts group had the less percentage of correct responses compared to other streams.
18. Questions 35 - 37 and 41 (Table numbers 4.88 -4.90 and 4.94) which deal with the origin and evolution of Education for Sustainable Development and related issues, majority registered wrong response, which indicate the lack of background knowledge regarding Education for Sustainable Development.
19. Question 38 (Tables4.91) which deals with the role of campus in sustaining the ecosystem, a great majority (90-93%) responded 'yes' which was the correct response. This may be due to the fact that this question is directly related with Environmental Education.
20. To questions 39a to 39i (Tables4.92a – 4.92i) that deal with awareness regarding emerging areas related with Sustainable Development, majority do not have adequate knowledge except in two areas. But language students had more percentage of correct responses compared to that of arts and science students.

21. Questions 40 (Tables 4.93) regarding social commitment in each group, majority registered the correct response 'No'. This shows their social consciousness.
22. For Questions 43 (Tables 4.96) regarding participation in seminar / programme on ESD. The responses revealed that majority (60%) of the language students participated in seminar on Sustainable Development, whereas science students followed with 45% and arts students coming last with 35%.
23. From Questions 42, 44 - 50 (Tables 4.95, 4.97 - 4.103) regarding the attitude and good practices towards Sustainable Development, majority in each optional group opted the correct response, which shows their good practices and attitude regarding Sustainable Development whereas for questions 46 and 50, (Tables 4.99 and 4.103) majority of the wrong answers shows their lack of proper exposure to the social life.

The findings pertaining to analysis of (iii) is summarized below.

iii. Findings Related to Teacher Educators

The data analysis and findings pertaining to teacher educators are given below. When compared to student teachers, a general remark with regard to the data analysis of teacher educators is that majority of them possess awareness, attitudes, values and practices regarding Sustainable

Development to a considerable extent. However, the exact knowledge, especially about various dimensions of Sustainable Development and their complex inter-relationship with the various aspects of the society, environment, economy and development is lacking. Since curriculum is the basis of education, it may be due to the lack of opportunity in the curriculum to interact and understand the concepts of Sustainable Development.

The existing awareness may be the result of their exposure and participation in the seminars or associated programmes related with Sustainable Development.

Item wise findings are listed below.

1. Question 1, (Table 4.104) which deals with the need of promoting Education for Sustainable Development in teacher education curriculum, a great majority (78.4%) are in favour of promoting Education for Sustainable Development in the teacher education to *a greater extent*, 21% to *some extent* and only 1% of teacher educators opted at *a very little extent*. This shows the urgent need of incorporation of Education for Sustainable Development concepts in the teacher education curriculum.
2. Question 2 (Table 4.105), regarding environmental concern on policy of national development, majority of the sample opted to *some extent* and *very little* options with 67.6% and 21.6%

respectively, whereas only 11% responded as *a greater extent*. This shows their understanding about the lack of environmental consideration in the present National Policy on Development.

3. Question 3 (Table 4.106) deals with poverty, a perspective of Sustainable Development, majority of the sample (76%) responded as *some extent* and *very little extent* and *not at all* (10%), whereas, only 14% responded towards *a greater extent*. It indicates the lack of proper knowledge in identifying the dimensions of Sustainable Development which are closely related with environmental degradation.
4. Questions 4 - 6, (Tables 4.107 - 4.109) which deal with some common issues, related to social life such as democracy, politics and standard of living, majority of teacher educators, responded as *a greater extent* and *some extent*. Only a few opted for *very little extent* and *not at all*. This clearly shows their social awareness and its relation with environmental quality and standard of living.
5. For questions 7, 9 and 11 (Tables 4.110, 4.112 and 4.114) which deal with the need of incorporating Sustainable Development in the Teacher Education curriculum and providing training to both teacher educators and student teachers; majority of the sample (above 70%) responded as *a greater extent* and that too without any response towards *not at all*.

This clearly shows the acceptance and attitude of teacher educators towards incorporating components of Education for Sustainable Development in the teacher education curriculum.

6. For questions 8 and 10 (Tables 4.111 and 4.113) which highlights the need of Education for Sustainable Development consciousness for the entire public, majority of the samples (nearly 80%) responded as *a greater extent* without any opinion towards *not at all*. This shows the awareness and attitude of teachers towards the urgent need for developing the awareness regarding Education for Sustainable Development among the entire public.
7. For questions 12 and 13, (Tables 4.115 and 4.116) that deal with the need and relevance of integrating Education for Sustainable Development components in the B. Ed. curriculum to develop values, attitudes and skills regarding sustainability among student teachers. Majority (around 60%) responded as *a greater extent* and 35 - 40% as *some extent*. This reveals the readiness and attitude of teacher educators regarding Education for Sustainable Development. However due to lack of knowledge regarding the variety and range of value dimensions of Sustainable Development only 60% responded towards *a greater extent* and remaining towards *some extent* and a very few towards *very little extent*.

8. Questions 14a to 14h (Tables 4.117a - 4.117h) discuss the informal means of initiative taken by the various components of an institution such as management, principal, teachers, student organizations, PTA and alumni in integrating the concepts of Education for Sustainable Development in the present curriculum.

Here responses of the sample indicate that presently no particular group is taking initiative to integrate Education for Sustainable Development in the curriculum to *a greater extent*. Majority has function / taking initiative at different levels ranging from *some extent to not at all*.

For questions 14a to 14d, (Tables 4.117a to 4.117d) the percentage of management and teacher organizations taking initiative at *a greater extent* is nearly 20% whereas PTA and alumni (Question numbers 14f and 14g (Tables 4.117f and 4.117g) functioning at *a greater extent* is only 9% and 4% respectively.

Questions 14b, c, e and h, (Tables 4.117b, c, e and h) percentage of principals' teachers, students' organization and social groups for taking initiative at *a greater extent* is little bit high when compared to other components of institution i.e. 34%, 38% 34% and 33% respectively. This indicates the present status of initiative taken by institution in integrating components of Education for Sustainable Development in the existing curriculum and highlights

the necessity and priority of implementation of Education for Sustainable Development

9. Question 15a to 15e (Table 4.118a to 4.118e) deal with how far institutions make use of the related organization (such as environmental, consumer, human rights, women, peace and value organizations) in their education and training activities.

To question 15a, (Tables 4.118a) the percentage of institutions making use of the resources of environmental organizations to *a greater extent* is only 26.5% and majority of the institution make use of the same ranging from *some extent* to *not at all*.

To questions 15b and 15d, (Tables 4.118b and 4.118d) the percentage of institutions making use of consumer and women organization to *a greater extent* is below 10% i.e. 2% and 8% respectively, whereas majority remains in the lower levels.

Question no 15c and 15e (Tables 4.118c and 4.118e) revealed that the percentages of institutions making use of the resources of organizations related to human rights, peace and value is around 15%.

This indicates the present position of the gap between educational institutions and community resources and the necessity and the significance of integration of knowledge and training with the community and society.

10. Questions 17 and 18 (Tables 4.119 and 4.120) demanding the need for the inclusion of the principle 'quality of life and national development depends on quality of environment in the teacher education curriculum. Here a great majority (around 95%) responded positively. This shows the teacher educator's willingness towards inclusion of Education for Sustainable Development principles in the curriculum.
11. For questions 18 and 27, (Tables 4.121 and 4.130) deals with the need of highlighting values which are essential for the peaceful coexistence of man and other living beings in the nature also rooted in the ancient Indian thoughts in the teacher education curriculum almost 100% responded positively.
12. Questions 19, 25, 29 and 34 (Tables 4.122 to 4.128, 4.132 and 4.137) are related with the various dimensions of Sustainable Development, evaluates the knowledge and attitude of teacher educators, majority has registered correct response.
13. For questions 28 (Tables 4.131) which discusses the pedagogical approach towards Sustainable Development 100% teacher educators responded positively. This indicates that the teacher educators have basic awareness on Education for Sustainable Development and also show their unanimous opinion regarding its pedagogical strategies.

14. Questions 30 to 32 (Tables 4.133 to 4.135) assess the origin and evolution of the concepts of Education for Sustainable Development. For this majority has registered negative response, indicate the lack of in-depth knowledge about Education for Sustainable Development concepts.
15. Questions 33a and 33i (Tables 4.136a to 4.136i) deals with the emerging areas related with Sustainable Development and except for 33h and 33i, majority responded positively, indicating their knowledge in areas which are already in practice (e.g. Renewable energy, sustainable agriculture etc.). However there is lack of awareness in recent and evolving trends like green purchasing and environmental audit.
16. Questions 35 (Tables 4.138) assesses the nature of curriculum with regard to the scope of opportunities for cross disciplinary approach. The responses to this question reveal that almost equal number of samples registered their responses as yes or no i.e. 51 and 49% respectively. This indicates the attitude of teacher educators towards integrated approach in the teaching learning process even though there is no direct provision for the same in the present curriculum
17. For question 36 (Table 4.139) regarding the participation in ESD related seminars/programs a great majority responded positively, shows their interest in such academic programmes.

III: Findings related to the interview response with regard to the preparation of module and strategies for improving the existing curriculum towards Education for Sustainable Development

Objectives

4. To develop a relevant modules on Education for Sustainable Development to be incorporated into the curriculum of teacher education.
5. To suggest and recommend strategies for improvement of the existing curriculum towards Education for Sustainable Development.

Findings

1. All the experts, are of the unanimous opinion that the present teacher education curriculum should be re-oriented with the concepts of Education for Sustainable Development at the earliest.
2. Constructivist, experience centered pedagogy and continuous and comprehensive evaluation strategies are to be highlighted in the teaching learning process
3. Special emphasis should be given to create awareness and sensitivity among people with regard to the principles of sustainability
4. The relevant concepts and related content areas with regard to sustainable development, which are spread over in different places of

the existing curriculum are to be combined and included under a single broad heading, Education for Sustainable Development. Such an initiative is possible as part of a total re-structuring of the entire curriculum in teacher education.

5. In the light of data analysis (teacher educators and student teachers) and comments and suggestions made by the experts, the investigator revised the sample module by adding more components and instructional hours, the final sample of the suggested module on ESD was prepared

**Sample module on Education for Sustainable Development to be
integrated in Teacher Education Curriculum**

35 Hours

The sample module on Education for Sustainable Development is divided in to four sections. The first section is an introduction to the concepts and understanding of Education for Sustainable Development with duration of five hours. The second session on socio-cultural perspectives of Education for Sustainable Development takes nine hours. The third session on Environmental perspectives of Education for Sustainable Development takes thirteen hours. Fourth section on economic perspective takes eight hours

I: Introduction to Concepts and Understandings of Education for Sustainable Development

5 Hours

Contents

- i. Meaning and understanding of sustainable development

- ii. Agencies and conventions on environment and development
- iii. History and evolution of Sustainable Development
- iv. Environment education and education for sustainable development
- v. Why Education for Sustainable Development – present scenario
- vi. Education for Sustainable Development (ESD) and Education for Sustainable Living (ESL) and Education for Sustainable Future (ESF). United Nations Decade of Education for Sustainable Development (UNDESD)
- vii. Major perspectives of Education for Sustainable Development
 - a. Socio cultural perspectives
 - b. Environmental perspectives
 - c. Economic perspectives

Objectives

- a) To understand the concept of Education for Sustainable Development
- b) To become aware of the role of agencies for sustainable development
- c) To understand the major perspectives of Education for Sustainable Development

II: Social-cultural perspectives

9 Hours

- i. Human rights – Building a culture of human rights for all**
Contents
 - i. Nature and meaning of Human Rights
 - ii. Type of Human Rights
 - iii. Social justice and Human Rights
 - iv. Universal Declaration of Human Rights
 - v. Commission and agencies for protection of Human Rights

Objectives

- a) To understand the nature and the meaning of Human Rights
- b) To recognize the different types of Human Rights
- c) To understand the role of Human Rights in social justice
- d) To get acquainted with various agencies and bodies for protection of Human Rights
- e) To be aware of provisions and legislative dimensions of Universal Declaration of Human Rights

Peace and co-existence – towards harmonious interdependence within the biosphere

Contents

- i. Dismantling the culture of war
- ii. Prejudice and stereotyping
- iii. Non-violence – understanding human nature
- iv. Biosphere – the larger system
- v. Beyond anthropocentrism

Objectives

- a) To realize the outcomes and impact of militarization and war
- b) To understand prejudice and stereotyping
- c) To identify non-violence as a value for peaceful existence
- d) To understand biosphere as a life supporting larger system
- e) To motivate human thinking beyond anthropocentrism

ii. Equity, equality and sustainability

Contents

- i. Inter and intra generational equity
- ii. Gender equality
- iii. Cultural diversity

iv. Towards sustainable living

Objectives

- a) To understand equity within the perspective of sustainable development
- b) To realize the significance of gender equality in sustainability
- c) To develop a positive attitude towards sustainable living

III: Environmental perspective

13 Hours

i. Natural resources

Contents

- i. Carrying capacity
- ii. Depletion of natural resources
- iii. Environmental problems and its impact on sustainability
- iv. Conservation of natural resources
- v. Use of renewable sources of energy
- vi. Innovations towards alternative sources of energy

Objectives

- a) To realize the consequences of depletion of natural resources
- b) To develop awareness regarding various environmental problems and its impact on eco system
- c) To develop attitude towards conservation of natural resources
- d) To recognize various sources of renewable energy
- e) To get acquainted with alternative sources of energy

ii. Climate change

Contents

- i. Climate change as a global issue
- ii. Science of climate change
- iii. Positive responses to the challenges of climate change

Objectives

- a) To understand the global issues pertaining to climate change
- b) To understand the factors contributing to climate change
- c) To develop positive responses to the challenges of climate change

iii. Biodiversity

Contents

- i. Interdependence within the ecosystem
- ii. Unity in diversity
- iii. Loss of biodiversity
- iv. Conservation of biodiversity

Objectives

- a) To understand the significance of interdependence of the various factors for Sustainable Development
- b) To appreciate unity in diversity
- c) To realize the loss of biodiversity in the context of development
- d) To develop a positive attitudes towards conservation of biodiversity

IV: Economic perspective

8 Hours

i. Poverty and population

Contents

- i. Globalization and its impact on the society
- ii. Indicators of sustainable economic development
- iii. Unequal distribution and utilization of resources
- iv. Over consumption as a challenge to sustainable development
- v. Population explosion, unemployment and economic inequality

Objectives

- a) To realize the impact of globalization on development
- b) To identify the indicators of sustainable economic development
- c) To understand the influence of poverty on sustainable development
- d) To realize various factors contributing to poverty

ii. Corporate responsibility and accountability

Contents

- i. Role of companies in society and social accountability
- ii. Sustainable production and consumption
- iii. Ecological economics
- iv. Corporate social responsibility

Objectives

- a) To realize the social responsibility and accountability of corporate sectors on Sustainable Development
- b) To be aware of sustainable production and consumption
- c) To understand the concept of ecological economics

The Concept of Education for Sustainable Development and its perspectives can be represented in the form of a wheel which travels towards the future:



ESD is fundamentally concerned with values. Hence, while designing the above model, the investigator gave special emphasis for corresponding values in each aspect i.e. Environment, Society and Economy

Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

In 1987, the concept of sustainable development was first brought into the international arena by the World Commission on Environment and Development in their report 'Our Common Future' (also known as 'The Brundtland Commission Report'). The report contained the most commonly used definition of sustainable development:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Thus, while development may be necessary to meet human needs and improve the quality of life, it must happen without depleting the ability of the natural environment to meet present and future needs. This protects both the interests of future generations and the earth's capacity to regenerate.

Following the Earth Summit in Rio de Janeiro in 1992, one hundred and seventy eight UN countries committed, under the title of Agenda 21, to take action globally and locally to promote sustainable development, focusing on such issues as addressing poverty, protecting the environment, maintaining biological diversity, promoting human

health and equality, as well as strengthening the role of farmers, workers, businessmen and the scientific community in achieving these objectives. The Earth Summit also gave high priority in Chapter 36 of Agenda 21 to the role of education in promoting sustainable development and improving capacity of the people to address environment and development issues. Peace, health, democracy and human rights are also important prerequisites for sustainable development.

This broad approach to sustainable development was reaffirmed in a further World Summit in Johannesburg in 2002. At that stage, it was considered that education systems throughout the world should play an important role in promoting the knowledge, skills and values among youth and adults who would help to shape a sustainable future for all.

Accordingly, the UNECE (the United Nations Economic Commission for Europe), one of the five regional commissions in the United Nations for promoting co-operation on economic, environmental and energy issues was asked to draw up an overall strategy for Education for Sustainable Development (ESD) in 2005. Accordingly the suggested strategy of Education for Sustainable Development was adopted by the United Nations by declaring 'Decade for Education for Sustainable Development' from 2005 to 2014. (UNDESD 2005 – 2014)

Education for sustainable development is a far-reaching and complex undertaking. Its conceptual basis, socio-economic implications, environmental and cultural connections make it an enterprise, which potentially touches on every aspect of life. The basic vision of education for sustainable development is a world where everyone has the opportunity to benefit from the education and learn the values, behaviour and life styles required for a sustainable future and for positive social transformation. (Draft implementation scheme – 2004)

A sound programme of professional education of teachers is essential for the qualitative improvement of education. The importance of the teacher playing a vital role to relate education to national development and positive social change is to be highlighted. He is responsible to guide and inspire his students to maintain discipline and to inculcate values which are in consonance with our social heritage and our social objectives. This involves the transmission of knowledge from one generation to another and extension of boundaries of knowledge through research, investigation and enquiry. Various educational innovations like the restructuring of courses, introduction of examination reforms, making programmes relevant to social environment and community needs, developing new areas of studies can be brought about successfully only if the teacher accepts a progressive outlook on education.

The urgency of reorienting the teacher education for sustainable development is to be attempted by highlighting that, the life on earth is under threat and the responsibility of teacher educators to face this challenge with sincere commitment will contribute to a great extent to the very existence of life. The common impression about teacher education is that it has remained unchanged for a very long time and is not found relevant to the social needs at the national and the global contexts. The principal concern of the human race now is that earth has come under threat because of the lifestyles of its six billion inhabitants.

In this context it is the basic necessity of the society that teacher education should adopt a curriculum and programmes for implementation of a sustainable lifestyle. In operational terms the children at the school might have to be made aware of the threat to their life and that of other species because of the environmental degradation, and social inequality and poverty caused by the attitude and conduct of their elders.

There are over 60 million teachers in the world. Each one is a key agent for bringing about the changes in values and life in consonance with the demands for sustainable development. For this reason, innovative teacher education is an important part of educating for a sustainable future.

So, teacher education has to give top priority for E.S.D. The contents related to Education for Sustainable Development in the existing curriculum in all the universities of Kerala, are limited to few concepts of environmental education and do not include other dimensions of Education for Sustainable Development. The investigator being a teacher educator decided to conduct a study regarding this aspect, by comparing the Environmental Education Curriculum of different universities of Kerala and suggest a relevant module on Education for Sustainable Development for incorporating in the teacher education curriculum.

Statement of the Problem

‘A Study of the Concepts on Sustainable Development in the Curriculum of Teacher Education at the Secondary School Level in Kerala’.

Objectives of the Study

1. To compare the existing curriculum in teacher education at the secondary school level in the different universities of Kerala with respect to various dimensions of Education for Sustainable Development.
2. To evaluate how far the existing teacher education curriculum reflects the concepts of Sustainable Development.
3. To assess the awareness of teacher educators and student teachers towards the concepts of education for sustainable development.

4. To develop a relevant module on Education for Sustainable Development to be incorporated into the curriculum of teacher education.
5. To suggest and recommend strategies for improvement of the existing curriculum towards Education for Sustainable Development.

Methodology

Methodology / Procedure Adopted

In the present study both qualitative and quantitative aspects are employed in order to complement each other.

1. The study used the descriptive survey design. With regard to the objectives 1 and 2 the very first effort the researcher has taken was to analyze the existing teacher education curriculum and evaluate, to what extent it reflects the concepts and various dimensions with regard to Sustainable Development. For this the investigator collected the existing teacher education curriculum of four different universities in Kerala where there is faculty of education (Kannur, Kerala, Calicut and MG) and also the curriculum framework of national bodies like UGC, NCTE and RIE (NCERT) Mysore.
2. The present study also intended to assess the awareness, knowledge, attitude and practices of both student teachers and

teacher educators regarding Sustainable Development. For the development of an appropriate module on Education for Sustainable Development a semi-structured interview was also conducted for the experts in the field of teacher education and Sustainable Development.

Sample for the Study

The study targeted 1000 student teachers in the regular secondary teacher education programmes in the colleges of education and 120 teacher educators in the respective colleges. Education for Sustainable Development being inter disciplinary, the sample population consisted of students and teachers selected from various optional subjects from different types of institutions including government, aided, unaided and university centers using stratified random sampling.

The student sample was selected from twenty one colleges from four Universities of Kerala, five colleges each from Kerala, MG, Calicut and six colleges from Kannur University. Forty to sixty students were selected from each college proportionate to the total strength of students.

Tools Used

In order to collect data regarding awareness, knowledge, attitude and practices about Education for Sustainable Development from the student sample, a well structured questionnaire was used. In order to get the

responses from teacher educators, a separate questionnaire was used. To obtain comments and suggestions from experts in the field of teacher education and Sustainable Development, a semi-structured interview schedule was adopted.

The researcher distributed questionnaire to 1000 students and 120 teacher educators. Response was obtained from 920 students teachers and 102 teacher educators. Structured interview was conducted with 12 experts in the field of teacher education and Sustainable Development.

Analysis

Qualitative and appropriate statistical procedures were used to analyze the data. The data were categorized into homogeneous groups, coded and information summarised into frequencies and percentages using Statistical Package for Social Sciences (SPSS Version 16).

The information obtained was then analysed in term of frequencies and percentages. On the basis of data analysis and expert opinion, the sample module and strategies for Education for Sustainable Development in teacher education was finalized. The information from the analysed data was examined critically and inferences and findings were summarised .

5.2. Conclusion and Discussion

1. The comparative analysis of the teacher education curriculum of the four universities in Kerala shows that due weightage is not given to

the concepts of Sustainable Development in the present teacher education curriculum. In all universities, Sustainable Development is a sub-topic of Environmental Education which is only a part of one of the core paper. Even though Environmental Education is given more weightage in MG University, it is only an elective paper. students In the National Curricula for Teacher Education, proposed by UGC and NCTE also do not give due consideration regarding the importance to Sustainable Development .

2. Analysis of data revealed that, majority of student teachers does not have adequate awareness and knowledge regarding Sustainable Development whereas the majority of teacher educators have some basic awareness of sustainable development. However, lack of adequate basic knowledge is evident from their response. Since subject competency is one of the primary requirements for teachers, such handicaps should not be discarded. A considerable number of student teachers could not distinguish between Education for Sustainable Development and Environment Education.
3. From the analysis of the response of both teacher educators and student teachers, it is clear that they are not getting sufficient information and concepts regarding various aspects of Sustainable Development. Majority of them are not in a position to understand and appreciate the complex inter relationship between Environment,

Society and Economy, which is due to lack of opportunity in the present curriculum.

4. Stream wise analysis of student teachers reveals that the responses of the three groups (Science, Arts and Language) were almost in the same pattern and in general, there is no significant difference between the groups. This may be due to the fact that Education for Sustainable Development is multidisciplinary in nature and students of various disciplines have equal opportunity to get information other than from the curriculum. However, these information are not in the form of a curricular experience, hence the objectives of Education for Sustainable Development may not be realized.
5. Stream wise analysis also shows that students of arts group and to a certain extent language group have more social awareness regarding sustainable development, whereas the students of science group have more knowledge about the environmental aspect of Sustainable Development. Sufficient knowledge is needed in this area for the arts students and more social awareness should be created among science students.
6. All the experts, teacher educators, and great majority of student teachers strongly recommended that present teacher education curriculum should be re-oriented with the concepts of Education for Sustainable Development at the earliest

7. Constructivist, experience centered pedagogy and continuous and comprehensive evaluation strategies are to be highlighted in the teaching learning process and special emphasis should be given to create awareness and sensitivity among people with regard to the principles of sustainability
8. In the light of data analysis (teacher educators and student teachers) and comments and suggestions made by the experts, the investigator revised the sample module by adding more components and instructional hours, the final sample of the suggested module on ESD was prepared.

The present study is concerned with the analysis of existing teacher education curriculum and provide useful suggestions for improvement. Inclusion of relevant and recent concepts in the curriculum will contribute to a greater extent for better outcomes which are significant to the present needs of the society. The present mode of unsustainable pattern of development has contributed many issues in the global and local level which have a multi dimensional impact on every facet of life including environment, society and economy.

The existing environmental education curriculum deals only with environmental aspects and it fails to address the associated aspects of society and economy. In short, majority of the content of the present environment

education curriculum deals with the physical and biological aspects of the environment and practically it remains as an ecological study. Hence except Natural Science Optional, majority of the students from other optional subjects may neglect this area, a general tendency noted among student teachers. Whereas Education for Sustainable Development is interdisciplinary, which covers all related aspects of the society and economy makes it a holistic one, so that it is equally applicable and beneficial for all, resulting in better understanding and outcomes. Environmental Education curriculum is theory oriented, whereas Education for Sustainable Development is life centered. Environmental Education highlights the concepts and problems of environment, whereas Education for Sustainable Development highlights both problems and problem solving with an integrated approach.

Since education is the most powerful tool to achieve any desirable social goal, and teachers are the most effective agents in the transformation of the society, renewal of teacher education curriculum is inevitable. Inclusion of new concepts in the curriculum should be based on the criteria of its significance and quality with regard to the present and future generation. In this context, considering the far-reaching social impact, inclusion of concepts of sustainable development should be given top priority in education.

The concepts regarding Sustainable Development is a new a vision which involves a value based approach towards development incorporating a holistic approach. Sustainable Development includes mainly three factors: environment, society and economy. This means that natural environment, economy and society are interrelated and mutually contributing to each other. Degradation of any one factor will negatively affect other factors. Discussions in various international forums such as Stockholm conference, Rio Earth Summit and the decisions in the Johannesburg summit also realized this interdependence and thus Agenda 21 and Decade of Education for Sustainable Development were evolved.

Education for Sustainable Development is fundamentally concerned with the value of respecting all living organism including the present and future generations. The natural and cultural diversity should be respected. Education should enable us to understand ourselves and others and our links with the wider natural and social environment and this understanding serves as a durable basis for building respect. Along with a sense of justice, feel of responsibility, tendency for exploration and willingness for a dialogue, ESD aims to move us to adopting behaviours and practices which enable all to live a full life without being deprived of basics.

Beyond social justice and equality, human beings are in search of eternal happiness. The purpose of life itself is a pursuit of happiness. Mere material prosperity need not bring happiness always. Hence Sustainable

Development aims at building a healthy and happy society. That's why now development experts have replaced Gross National Product with Gross National Happiness.

In terms of National Happiness, calculated by a British based agency, India has beaten many of the rich countries of the world. India ranks fourth in the table of happiest population in the world with 34% of its inhabitants being 'very happy' in spite of widespread poverty existing in the country. On a global scale, 20% of people claimed to be happy with their life over all. This means that beyond wealth and material richness there is something that makes people happy.

The case of Bhutan also underlines the fact that happiness cannot be purchased from market. Bhutan has a GDP of just five hundred million dollars, but it is one of the happiest society in the world. Japan, which is the second industrial power in the world, has also industrialized world's highest suicide rates. Hence Japan believes that it has to study much from the development experience of Bhutan.

In Bhutan Gross National Happiness has been attained by concentrating on four areas - sustainable and equitable socio-economic development, environmental conservation, preservation and promotion of culture and the good governance. In its quest for its development model, Bhutan relied on a model that resonated with Bhutan's values and desires.

Thus beyond the material means, Sustainable Development requires an emphasis on spiritual means and values.

Realizing the nature and value of ESD it is understood that the values and concepts of Education for Sustainable Development is not new for India. The spiritual dimension of Indian thought was based on the foundations of the values represented by Education for Sustainable Development. The values of society according to *Vedas* depend upon humanism, sacrifice, love, respect, kindness, and purity or cleanliness. This is represented by the term 'Dharma' in India. Here purity involves purity of the person and environment. The individual should adjust with the environment in a natural way. All these are rooted in our Indian tradition and values. This is what is embodied in the statements "Loka Samstah Sukhino Bhvanthu" and "Vasudhaiva Kudumbakam". This means that whatever we do should be for the welfare of the whole world including the entire ecosystem and the whole world is a family.

5.3. Recommendations

1. A monitoring committee consisting of educational experts, teacher educators, school teachers' environmentalist, philosophers, sociologist economists, political leaders and the administrators should be constituted at the state and national levels for developing a unified

curriculum on Sustainable Development at all levels of teacher education.

2. The existing teachers should be given orientation in Education for Sustainable Development.
3. The relevant concepts and related content areas with regard to sustainable development, which are spread over in different places of the existing curriculum are to be combined and included under a single broad heading, Education for Sustainable Development. Such an initiative is possible as part of a total re-structuring of the entire curriculum in teacher education
4. A central institute or agency should be established at the state and the national level for the coordination of the activities regarding Sustainable Development, in the areas of research, extension, evaluation and guidance.
5. Since Education for Sustainable Development has a global dimension, it will be desirable to start an international university at the auspices of UNO for research, extension work, curriculum development and teaching of Sustainable Development at International level.
6. The idea regarding Sustainable Development is to be spread and implemented among people through various programmes with the

cooperation of local bodies and NGOs with due emphasis on sustainability principles.

7. Practical works like survey, projects and case studies related to Sustainable Development should be made compulsory for all student teachers during their practice teaching.
8. Journals, booklets and books regarding Sustainable Development should be published and made available to students and teachers at the state and national levels.
9. Seminars, workshops and in-service courses may be organized for teachers, public administrators, officials concerned and representatives of people.
10. Themes related to Education for Sustainable Development should be included as an item in the interschool and college level competitions, work experience, exhibitions etc.
11. The cultural and social traditions of India should be analyzed and studied in the lights of Sustainable Development and the good practices should be highlighted and the negative practices should be discouraged.
12. Values related to Sustainable Development should be identified and included as an important component of the present curriculum in all levels of education.

13. Workshops and seminars should be organized to develop innovative and appropriate pedagogical and evaluation strategies for transacting the curriculum on Education for Sustainable Development
14. Since ESD has no place in the present teacher education curriculum, the existing curriculum on environmental education may be replaced with the suggested module on Education for Sustainable Development

5.4. Suggestions for Further Research

1. Similar studies may be undertaken at different levels of teacher education like pre-primary, primary and university levels
2. Studies related to Education for Sustainable Development can be done at the general education level among school students and teachers
3. A study may also be conducted at the unaided sector of school education especially with the CBSE and ICSE streams
4. Similar investigation is highly relevant among people of various localities with respect to their environment and standard of living (Health, Education and Income status)
5. Research on developing a curriculum on Education for Sustainable Development at all levels of teacher education at the state and national level is highly necessary

6. A comparative study of the relationship between society, economy and environment may be conducted with regard to developed, developing and underdeveloped countries
7. A specific study may be conducted with regard to the relationship between the various factors like consumerism, standard of living, democratic attitude and environmental education in different countries and localities.

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List of Colleges of Education

1. Govt. College of Teacher Education, Thiruvananthapuram
2. Mar Theophilus Training College, Thiruvananthapuram
3. St. Thomas College of Teacher Education, Palai
4. St. Joseph's Training College, Mannanam
5. H. M. Training College, Moovattupuzha
6. St. Joseph's College of Teacher Education, Nedumkunnam
7. Govt. College of Teacher Education, Calicut
8. Devakiamma memorial Training College, Chelambra, Calicut
9. C. K. Raghavanm Memorial College o Teacher Eduation, Pulppally
10. Maha Jubilee Training College, Mullookkara
11. New B.Ed. College Nellimood, Thiruvananthapuram
12. PKM College of Education, Madampam
13. Govt. College of Teacher Education, Thalassery
14. Keyi Sahib Training College, Taliparamba
15. Crescent B. Ed. College, Payangadi
16. Malabar Training College, Peravoor, Kannur
17. SUM College of Teacher Education, Mamba
18. University College of Teacher Education, Moovattupuzha
19. Sri Vivekananda College of Teacher Education, , Nilamboor
20. College of Teacher Education Arkannur, Kollam
21. University College of Teacher Education Nedumangad,
Thiruvananthapuram

Appendix - C

QUESTIONNAIRE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT IN THE CURRICULUM OF TEACHER EDUCATION (TEACHER EDUCATORS)

Dear Colleague,

I am undertaking a research work on a topic related to Education for Sustainable Development (ESD). Your sincere and honest responses are very important for the successful completion of the study

Kindly go through the following items and cross mark (X/tick mark) in the appropriate response corresponding to each question/statement.

I assure you that your responses will be kept confidential and used for the research purpose only.

Name : _____

Department and Designation: _____

College : _____

GE (Greater Extent) SE (Some Extent) LE (Very Little Extent) NA (Not at all)					
1.	To what extent are you in favour of promoting ESD in teacher education?	GE	SE	LE	NA
2.	How far the present policy of national development given due consideration for environmental protection leading to Sustainable Development?	GE	SE	LE	NA
3.	Poverty is a problem related to environmental degradation.	GE	SE	LE	NA
4.	Democracy and Human rights have a role in Environmental protection and human development.	GE	SE	LE	NA
5.	Ecosystem influences economic development and Standard of living.	GE	SE	LE	NA
6.	Political and economic policies influence the Quality of environment.	GE	SE	LE	NA
7.	E.S.D. is interdisciplinary in nature. Hence all student teachers are supposed to develop sufficient understanding/ awareness about this concept.	GE	SE	LE	NA
8.	ESD is an evolving concept. Hence wide and deliberate awareness and training has to be given to the entire public.	GE	SE	LE	NA
9.	Every teacher educator should integrate the concept of ESD at the time of handling different subject.	GE	SE	LE	NA

Appendix - C

10.	Constitutional provisions regarding Environmental Education are to be made aware for the entire public.	GE	SE	LE	NA
11.	All teacher educators need training in integrating concept of ESD in their respective subjects.	GE	SE	LE	NA
12.	Values and skills regarding E.S.D if integrated in B. Ed. Curriculum will guide and motivate the students to lead a life in a sustainable manner.	GE	SE	LE	NA
13.	ESD is viewed as an effective instrument for creating civic consciousness and inculcating positive attitude among teacher trainees towards the environment.	GE	SE	LE	NA
14.	To what extent the following group takes initiative in integrating concepts of ESD in the curriculum? Very Little Extent				
	Group	Greater Extent	Some Extent	Very Little Extent	Not at all
	Management				
	Principal				
	Teachers				
	Teacher Organisations				
	Student Org/Clubs				
	PTA				
	Alumni				
	Social Groups				
15.	To what extent your institution involve/use the resources of related organizations in your educational/training activities				
	Organizations	Greater Extent	Some Extent	Very Little Extent	Not at all
	Environmental				
	Consumer				
	Human rights				
	Women's organizations				
	Peace and Value				

Make your responses with tick mark

16.	The concept 'The knowledge about development of nation should be in conformity with sustainability of environment' should have a place in the present B.Ed. curriculum.	Yes	No
17.	The slogan 'Quality of life depends on the Quality of environment' has to be highlighted in the teacher education curriculum.	Yes	No
18.	Values like co-operation instead of competition, survival of the weakest along with fittest, eco- friendly living style etc. should be highlighted in the teacher education curriculum.	Yes	No

Appendix - C

19.	Education for sustainable development emphasizes education for a culture and peace	Yes	No
20.	Sustainable development is as much about the children in the future as it is about what we need today		
21.	Sustainable development has nothing to do with Social justice	Yes	No
22.	We cannot slow the rate of climate change	Yes	No
23.	Corporate social responsibility is irrelevant to sustainable development	Yes	No
24.	Education for sustainable development supports Cultural diversity	Yes	No
25.	Environment education and ESD are one and the same thing	Yes	No
26.	Do you think that the five year planning of India should be designed, with a perception of future extending to 25-50 years ahead?	Yes	No
27.	The concept of Sustainable Development is rooted on the value enunciated 'Loka Samasta Sukhino Bhavantu'	Yes	No
28.	Are you in favour of including appropriate activities and projects with regard to Sustainable Development in the school and teacher education curriculum?	Yes	No
29.	Manufacturers should discourage the use of disposables	Yes	No
30.	Is the DESD project declared by UNESCO?	Yes	No
31.	Do you know about Agenda 21 of Rio Earth Summit?	Yes	No
32.	Do you know about the document 'our common future'?	Yes	No
33.	Do you have awareness of -	Yes	No
	a) <i>renewable energy?</i>	Yes	No
	b) <i>sustainable building design/green design?</i>	Yes	No
	c) <i>ecological economics?</i>	Yes	No
	d) <i>sustainable agriculture?</i>	Yes	No
	e) <i>sustainable forestry?</i>	Yes	No
	f) <i>indigenous wisdom and technologies ?</i>	Yes	No
	g) <i>sustainable transportation?</i>	Yes	No
	h) <i>green purchasing?</i>	Yes	No
	i) <i>environmental audit</i>	Yes	No
34.	Gender equality has nothing to do with Sustainable development	Yes	No
35.	Is your training curriculum subject centered, or are there opportunities for cross disciplinary?		
	a) Subject centered		
	b) Cross-disciplinary		
36.	Have you attended a seminar/course in which sustainable development was discussed	Yes	No

Stephen T A (Research Scholar)

Lecturer (Sr. Scale)

P K M College of Education Madampam, Kannur.

Appendix - D**INTERVIEW SCHEDULE FOR EXPERTS IN THE FIELD OF EDUCATION
FOR SUSTAINABLE DEVELOPMENT****Introduction**

- (i) Request permission to conduct interview
- (ii) Introduction to the research work
- (iii) Consent for interview and explanation of the process of interview

Personal Background and Background of the study

- (i) Work History
 - (ii) Personal background in the field of EE and ESD
 - (iii) Background of ESD in research/course
-

Questions**Current status and relevance**

- (i) What is the specific relevance of ESD in the present context
- (ii) Do you think that ESD is a panacea to address the multitude of issues of the present world

Application /Implementation of ESD

- (i) What approaches can you suggest implementing ESD i.e.
 - (a) Through the integration of ESD themes across all relevant subjects / programmes / courses and / or
 - (b) Through the provision of specific ESD programmes/courses
- (ii) What are the components to be included in the curriculum at different levels (content, methodology and evaluation)
- (iii) What are the outcomes expected of such integration of ESD in teacher education curriculum

Social context

- (i) What are the values and principles of sustainability that should be integrated in education and learning
- (ii) How can we integrate values of sustainability into education
- (iii) Can you suggest some practical measures to propagate and in getting acceptability for sustainability among people (people friendly approach towards sustainability)

Syllabus of Kannur University**Unit VIII : Environmental Education (30 Hrs)**

1. Principle of Environment – biotic and abiotic ecosystem
Environmental components – natural environment, manmade environment, their components, physical factors, biological factors of environmental components
2. Need and importance of Environmental Education
Incorporating environmental education at various levels – primary, secondary and tertiary level
3. Objectives and principles of Environmental Education
4. Conservation of natural resources (renewable and non renewable)
 - a. Inter dependence between natural resources and man's degradation of natural resources, changing life style and its impact on environment. Environment and economic development
 - b. United Nation's Environment Programme (UNEP)
5. Environmental problem: causes and effects
 - i. Global Level: Global warming, green house effect, ozone depletion and CFS's, population exploitation etc.
 - ii. State Level: Bio diversity, loss of arable soil, habitat, deforestation and extinction of species
 - iii. Urbanization, over fishing, shrinking of back waters, destruction of mangroves, quarrying, food adulteration – hygiene and sanitation programmes
 - iv. Local level: Pollution-air, water, solid waste and its disposal and bio magnification
 - v. How students locate environmental problems and identify their causes; how they should be helped to suggest solution to problems

Sustainable Development

1. Concept and need of Sustainable Development
2. Role of Government and Non Government Agencies

Core Paper I: Education in the Emerging Indian Society**Semester I: Unit III: Sociological basis of education**

1. Relationship between education and society – factors affecting the relationship
2. Education in the social context and social change
3. Nature of Indian Society – Unity in Diversity
4. Factors influencing social change
5. Role of education in promoting social change
6. Education and modernization
7. Education and economic development
8. Education and democracy

Unit IV: Education, Culture and Human Values

1. Universal and traditional Indian values and values laid down in our constitution
2. Meaning and classification of values, Nature of moral and ethical values
3. Value oriented education
4. Value crisis and role of education in resolving value crisis

Second Semester**Unit V: Human Rights Education**

1. Human Rights, meaning, Universal Declaration of Human Rights – International Covenants (General Idea) – Convention on Human

Appendix - E

Rights of the Children (1989) – Indian Constitution and Human Rights

2. Human Right Education: Rationale – principles of Human Rights Education – Importance of Human Rights Education at Different Stages (Elementary, Secondary and Higher Secondary)

Syllabus of Kerala University

Environmental Education

(40 Hrs)

Unit I: **Environmental Education**

1. Environmental components – natural environment, manmade environment, their components, physical factors, biological factors of environmental components, ecosystem
2. Need and importance of Environmental Education - Incorporating environmental education at various levels – primary, secondary and higher secondary levels
3. Objectives and principles of Environmental Education
4. Methodology of teaching – Specific approaches

Unit II: **Conservation of Natural Resources (Renewable and Non renewable)**

1. Inter dependence between natural resources and man's degradation of natural resources, changing life style and its impact on environment.
2. Environment and economic development
3. United Nation's Environment Programme (UNEP)

Unit III: **Environmental Problem: Causes and Effects**

1. Global Level: Global warming, green house effect, ozone depletion and CFS's, population exploitation etc.

Appendix - F

2. State Level: Bio diversity, loss of arable soil, habitat, deforestation and extinction of species
3. Urbanization, over fishing, shrinking of back waters, destruction of mangroves, quarrying, food adulteration – hygiene and sanitation programmes
4. Local level: Pollution-air, water, solid waste and its disposal and bio magnification
5. How students locate environmental problems and identify their causes; how they should be helped to suggest solution to problems

Unit IV: Sustainable Development

1. Concept and need of Sustainable Development
2. Role of Government and Non Government Agencies

Unit V: Transaction Mode

- | | | |
|------------------|---|--|
| 1. Approaches | : | Infusion / Problem Solving |
| 2. Methods | : | Activity oriented / apprenticeship |
| 3. Techniques | : | Lecture – Discussion, nature trail, group work, surveys, quiz, role play, brainstorming, case study, Panel discussion, debate etc. |
| 4. Curricular | : | Intervention models |
| 5. Co-curricular | : | field trip, collection, eco-club, film show |

Appendix - F

6. Action Research : Practical / record – student’s report of environmental problems in their locality; they critically review the programmes adopted for the solution and suggest new solutions; they join with NGOs for solution of the problems

Semester I**Core Paper I****Theoretical base of education; philosophical and sociological**

Unit V: Education and social change

1. Factors affecting social change
2. How social change takes place
3. Role of education in promoting desired social change

Unit VII: Education and welfare of the society

1. Education for peace and co-existence
2. Education for economic stability
3. Education an instrument for intellectual property and inventions and discoveries for the welfare of the society

Semester II

Unit VI: Values and Education

1. Universal values
2. Traditional values
3. Values laid down in construction of India
4. Role of education in promoting values

Syllabus of Calicut University

Unit VIII: Environmental Education (15 Hrs)

1. Meaning, scope and significance of Environmental Education
2. Historical background of environmental education
3. Role of national and international organization and movements in the promotion of environmental education
4. Aims and objectives of environmental education
5. Concept of sustainable development
6. Environmental problems – environmental degradation, environmental pollution, waste disposal, deforestation
7. Strategies for environmental education
 - a. Legislative measures for environmental protection at the state level, national level and international level
 - b. Instructional strategies for curriculum transaction
 - i. Identification of relevant topics from the syllabus
 - ii. Content analysis and formation of objectives
 - iii. Approaches – direct, indirect through co-curricular activities, through hidden curriculum
 - iv. Learning experiences – discussion, participant observation, surveys, field trips, projects, cultural activities
 - v. Evaluation and monitoring through different techniques

Appendix - G

Core paper I, Education in the Emerging Indian Society, first semester

Unit IV, in the first semester deals with National Goals and Education

Unit VI - Structure and Issues of Education in India

Unit III of second semester, Society, Culture and Education

Unit IV Education from Economic Perspective (second semester)

Core paper III, Trends and Developments in Modern Educational Practices,

Unit III Child Rights Education (second semester)

Unit IV Education and Human Values,

MG University
GROUP III – ELECTIVE PAPER
PAPER VI – (1) ENVIRONMENTAL EDUCATION

Course outline

Contact hours : 150
 Duration of Exam: 3 hrs

Max. Marks: 125
 Theory : 100
 Practicum : 25

Course objectives

On completion of the course, student-teachers are expected to

- i. understand the concept of environmental education and its significance
- ii. understand the interdependence of life and environment and the need for maintaining healthy environment
- iii. understand environmental problems and their causes and remedies
- iv. understand the role of education in developing desirable attitudes in pupils to live in harmony with nature.
- v. develop a sense of responsibility and favourable attitude towards conservation of environment, biodiversity and sustainable development
- vi. understand the different strategies for environmental education and apply them effectively

Mode of transaction

Lecture cum demonstration, discussion, survey, field trips, debate, project work, panel discussion, dramatization, role play, exhibition, film show, video show etc.

Course content

Unit 1 Environmental education

- 1.1 Meaning, nature, significance and scope of environmental education
- 1.2 Historical background of environmental education
- 1.3 Role of national and international organizations like UNESCO in the promotion of environmental education
- 1.4 Role of voluntary organizations
- 1.5 Environmental ethics and environmental accountability

Unit 2 Our environment

- 2.1 Components of environment – interdependence between man and natural resources

- 2.2 Ecosystem – meaning, structure and functions of an ecosystem, energy flow, ecological succession, food chain, food web, ecological pyramids, biodiversity.
- 2.3 Classification of natural resources – terrestrial and aquatic (plant and animal resources of land and water) – wild life – ecological balance

Unit 3 Conservation of natural resources

- 3.1 Need for conservation, importance, depletion of resources and management.
- 3.2 Natural resources and associated problems – forest resources, water resources, mineral resources, food resources, energy resources, land resources and wild life
- 3.3 Conservation of biodiversity
- 3.4 Water conservation, rain water harvesting, watershed management
- 3.5 The concept of sustainable development

Unit 4 Challenges of environment

- 4.1 Population explosion - problems and prospects
- 4.2 Urbanization and environmental degradation
- 4.3 Environmental pollution – causes effects and remedial measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, radio active pollution and E-waste pollution
- 4.4 Waste disposal – effect on health and environment
- 4.5 Deforestation, soil erosion, climate changes, green house effect, global warming, ozone depletion, acid rain, biomagnification, eutrophication – remedial measures
- 4.6 Disaster management – epidemics, forest fire, floods, earthquake, cyclones, landslides, tsunami - precautions & measures to be adopted to check natural disasters

Unit 5 Environment and behaviour

- 5.1 Environmental stress (emotional reaction when the environment does not suit to the needs and coping ability of the individual.) Stressors: natural disasters, noise, heat, air pollution, water pollution and overcrowding
- 5.2 Effect of stressors on health and behaviour – morbidity, respiratory problems, skin problems, nervous system diseases, hypertension, aggression, performance impairment etc.

Unit 6 Strategies for environmental education

- 6.1 Environmental awareness through education - developing pro-environmental behaviour in children

- 6.2 Activities – field trips, workshops, exhibitions, video shows, nature clubs, nature walk and celebration of environment day.
- 6.3 Use of prompts (cues that convey a message, for eg. ‘keep your city clean’), brochures, pamphlets and booklets
- 6.4 Legislative measures for environmental protection at the state, national and international level
- 6.5 Practical measures – saving energy, hygiene and sanitation programmes, eco-friendly behaviour, organic farming, ‘clean and green campus’ programme.

Practicum

1. Prepare a report of the environmental problems in the locality
2. Prepare any one teaching aid for environmental education
3. Prepare an action plan for environmental protection in the locality

Break up of marks for practicum

3 x 5	15
Assignments	5
Termly Exams	5
Total	25

References

1. Carson, Sean Mc B (1978) *Environmental Education – Principles and Practices*, London, Edward, Arnold Publishers.
2. NCERT (1981) *Environmental Education at the School level*, New Delhi.
3. Sharma, C. (1981) *Environmental Education*, New Delhi
4. UNESCO, *Environmental Education–Principles of Teaching and Learning*, Paris.
5. Saxena, AB (1986) *Environmental Education*, Agra: NPC.
6. Chatterjee, B (2003) *Environmental laws: Implementation, problems and prospects*, Deep and Deep Publications
7. Dhaliwal, G.S. (2000) *Fundamentals of environmental science*, N.D. Kalyan Publishers.
8. Kumar, Vijandra (2000) *Modern methods of teaching environmental education*, Sarup and Sons

Core Paper**UNIT 3: Sociology and Education (15 hours)**

- 3.1 Sociology – meaning and scope – Relationship between sociology and education
- 3.2 Education and culture – preservation, transmission, and transformation of culture
- 3.3 Education and socialization
- 3.4 ✓ Education for modernization and social change.
- 3.5 ✓ Values – meaning – classification of values: social, moral and spiritual.
Traditional values of India – concept of purusharthas, truth, non-violence, tolerance, simplicity, spirituality and self-
- 3.6 ✓ Value education – meaning and significance – Value education for combating social evils.
- 6.4 ✓ Equality of educational opportunities – education of the socially and economically disadvantaged, women’s education, human rights education, population education and Family life education
- 6.5 ✓ Educational Planning and Human Resource development – Empowerment of India through Science and Technology.
- 6.6 ✓ Education for national integration and international understanding – role of UNESCO
- 6.7 ✓ Globalization – impact on Indian society and education.

Syllabus UGC

**COURSE OBJECTIVES**

1. To enable the student teacher understand about the concept of environmental education.
2. To develop in the student teacher a sense of awareness about the environmental pollution, and possible hazards and its causes and remedies.
3. To develop a sense of responsibility towards conservation of environment, bio-diversity and sustainable development.
4. To develop reasonable understanding about the role of school and education in fostering the idea of learning to live in harmony with nature.
5. To enable the students to understand about the various measures available to conserve the environment for sustaining the development.

COURSE CONTENTS**UNIT I**

- Environment : meaning, scope and nature of environmental education.
- Types of environmental pollution.

UNIT II

- Causes and effects of environmental hazard, global and local : environmental pollution and its remedies.
- Green house effect – an impending catastrophe.
- Ozone layer depletion – environmental threat, acid rain, pillar melting, rise of sea level and their implications.

UNIT III

- Salient features of environmental awareness through education : programmes of environmental education for secondary school children.
- Programmes of environmental education for attitude changes among the children.

UNIT IV

- Biodiversity : Conservation of genetic diversity. An important environment priority : learning to live in harmony with nature.

Appendix - I**UNIT V**

- Role of school in environmental conservation and sustainable development.

PRACTICUM

- To submit a report after surveying a typically degraded area and to suggest necessary remedial measures with latest statistical data. The area of this project is to include any one of the following topics :
 - a) Noise pollution
 - b) Water pollution
 - c) Air pollution
 - d) Deforestation
 - e) Role of the pollution control boards
 - f) Role of voluntary organisations.
- The report on the practicum should be submitted to the college within the date specified by the college authority. The length of the report may be around 700 words.

Appendix - J

Syllabus NCERT (RIE Mysore)

(Approved by K I E M), regulations & scheme of studies
 IV SEMESTER Effective from 2002 - 0

BS 4.4 EDUCATION AND NATIONAL CONCERNS

Contact Hrs per Week : 4
 Exam Duration : 2½ hrs

Max Marks : 75
 Sessional : 15
 Terminal : 60

Course Content

Unit 1: Education for Protection of Environment

- a) Environmental resources and man - Renewable and non-renewable natural resources including bio-diversity and wild life
- b) Environmental problems - Population, socio-economic-cultural and biophysical factors of environmental degradation. Remedial measures of management and conservation of environment - recycling of resources, environmental health, hygiene and sanitation programmes of Environmental protection - National and International efforts in conservation of environment, legal aspects of environmental conservation
- c) Education for Environmental protection - Meaning, scope, need and objectives and its place in secondary school curriculum; Methodology of teaching Environmental Education; Environmental Ethics and Values

Unit 2: Population, Quality of Life and Development Education

- a) Population and Development Education - Concept, characteristics, objectives and significance, historical perspective, reconceptualization, national population education programme, issues in population education, population and quality of life, population, resources, (environment and sustainable development) determinants of population change and basic demographic concepts, population distribution, urbanization and migration. The place of population education in the secondary school curriculum, value-clarification and the role of teacher in a transacting population education
- b) Adolescence Education - Concept, objective, need and problem of adolescence education; the process of growing up; physical and psychological development; family: changing roles and responsibilities; responsible parenthood; gender equality and equity; health and education: key determinants of population change; HIV/AIDS; drug abuse and reproductive health

Appendix - J**Unit 3: Education for Value Development**

- a) Nature, meaning and types of values, sources of values (BSE) (cultural, social, constitutional, economical, school subjects as a source, scriptural values)
Core values-84 (secularism, democracy, equality etc. according to NCERT)
- b) Conceptual framework of value education – importance and objectives of value education, place of value education in secondary school curriculum; strategies for inculcation of values; role of teacher (role model) in inculcation of values; evaluation strategies in value education

Unit 4: Education for National Integration and International Understanding

- a) National Integration – Progress and formation of India as a Nation; Role of anti colonial resistance and struggle for freedom and its distinctive characteristics, unique features of Indian Culture, Unity in Diversity, National goals, Socialism, Secularism, Democracy, Challenges to National Unity and meeting these challenges
- b) International Understanding – Peace and Co-operation; Historical perspectives of international conflicts; attempts at disarmaments, International Co-operation, International Organizations, Non-Aligned Movement, Regional Cooperation, Human Rights, Racism and apartheid; Economic relations among the World Nations in the Context LPG

Unit 5: Education for Participation in National Reconstruction

Economic Growth and Measures taken to achieve Economic Growth, Economic planning and 5 year plan, Scientific and Industrial Policy, Educational Policies, Population Growth and its problem including small family norm, Environmental imperatives, Cohesive socio-cultural societies, Women empowerment, Dynamics of the quest for Equity, Equality and Excellence, Movements for Equality, Constitutional provisions and State Policy

Syllabus NCTE**7.1.3 Environmental Education for Teachers of Secondary Schools****Courses****Theory**

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- Concept, meaning, scope, objectives and importance of environmental education in the contemporary Indian context.
- Environmental conditions in India.
- Causes of environmental degradation.
- Development of environmental awareness among teachers, students and community, strategies and action plan.
- Biodiversity and its conservation.
- Relationship between man and nature.
- Environment protection as a constitutional duty.
- Movements for protection of environment in the country.
- Directions from courts, executive actions and the laws.
- Roles of teachers and other institutions.
- Roles of voluntary agencies.
- Pollution : causes, effect and control measures.
- Development of environmental education projects and their execution.
- Regional environmental problems and their solutions.
- Sustainable development, energy and waste management.
- Any other need-based programme.

List of Experts

1. **Dr. Cyriac Thomas**; Former Vice Chancellor, Mahatma Gandhi University, Kottayam.
2. **Dr. M.K. Prasad**; Chairman, Information Kerala Mission
3. **Dr. V.S Vijayan**; Chairman, Kerala Bio Diversity Board
4. **Dr. M. J Ravindranath**; Sr. Specialist, Centre for Environment Education, Bangalore
5. **Dr. Sreekumar Chathopadhyaya**; Sr. Scientist (E2), Centre for Earth Studies, Thiruvananthapuram
6. **Dr. C. P Aravindakshan**; Environmentalist, Former Principal, Govt. College for Women, Thiruvananthapuram
7. **Dr. T. V. Muraleevallabhan**; Reader, SVR NSS College Vazhoor
8. **Dr. Theresa Susan**; HoD of Education, University of Kerala
9. **Dr. B. Suresh**; Reader, Govt. Training College Thiruvananthapuram
10. **Dr. Santhosh Kumar**; Sl. Gr. Lecturer, Govt. Training College Thiruvananthapuram
11. **Dr. T. V. Kunhiraman**; Sr. Scale Lecturer, Govt. Training College Thiruvananthapuram
12. **Dr. Muhammedunni Alias Mustaffa**; Lecturer, Dept. of Education Calicut University.

**QUESTIONNAIRE ON EDUCATION FOR SUSTAINABLE
DEVELOPMENT (STUDENT TEACHERS)**

Dear Student Teacher,

I am undertaking a research work on a topic related to Education for Sustainable development (ESD). Your sincere and honest responses are very important for the successful completion of the study.

Kindly go through the following items and circle or tick on the appropriate responses corresponding to each question/statement

I further assure you that your responses will be kept confidential and used for the research purpose only.

(G.E = Greater Extent; S.E = Some Extent, LE = Very Little Extent; N.A = Not at all)

1	How much are you aware about the concepts of Sustainable Development?	GE	SE	LE	NA
2	To what extent you agree that an awareness of E.S.D. is relevant in the present age?	GE	SE	LE	NA
3	To what extent are you in favour of promoting ESD in teacher education?	GE	SE	LE	NA
4	How far the present policy of national development given due consideration for environmental protection leading to Sustainable Development?	GE	SE	LE	NA
5	Poverty is a problem related to environmental Degradation.	GE	SE	LE	NA
6	Democracy and Human rights have a role in Environmental protection and human development.	GE	SE	LE	NA
7	Ecosystem influences economic development and Standard of living.	GE	SE	LE	NA
8	Environmental education curriculum at Present deal with areas like peace, equity, gender issues, fraternity, social justice etc.	GE	SE	LE	NA
9	Political and economic policies influence the Quality of environment.	GE	SE	LE	NA
10	Women have a special role and responsibility in the practical application of many principles regarding Sustainable Development.	GE	SE	LE	NA
11	E.S.D. imparts certain skills for a better living.	GE	SE	LE	NA
12	Promotion of Sustainable Development needs some action level programmes.	GE	SE	LE	NA
13	The present pattern of the development and living style are against the principles of ESD.	GE	SE	LE	NA

Appendix - B

Make your responses with tick mark

14	Education for sustainable development emphasizes education for a culture and peace.	Yes	No
15	Sustainable development is as much about the children in the future as it is about what we need today.	Yes	No
16	Sustainable development has nothing to do with Social justice.	Yes	No
17	We cannot slow the rate of climate change.	Yes	No
18	Corporate social responsibility is irrelevant to sustainable development.	Yes	No
19	Conservation of fresh water is not a priority in Kerala because we have plenty.	Yes	No
20	Education for sustainable development supports Cultural diversity.	Yes	No
21	It is useful to estimate the monetary value of the Services that the ecosystem provides to us, such as neutralizing air pollutants or purifying water.	Yes	No
22	Environment education and ESD are one and the same thing.	Yes	No
23	Do you think that the five year planning of India should be designed, with a perception of future extending to 25-50 years ahead?	Yes	No
24	Do you think that teachers are the most effective agents for the dissemination of Environmental Education?	Yes	No
25	ESD is interdisciplinary in nature.	Yes	No
26	The concept of Sustainable Development is rooted on the value enunciated as 'Loka Samasta Sukhino Bhavantu'.	Yes	No
27	The concept of Sustainable Development is something to be practiced in life rather than acquiring mere knowledge.	Yes	No
28	Are you of opinion that the environmental problems are to be dealt with in the sequence of local, regional, national and international levels?	Yes	No
29	Ignorance regarding the consequences is a major reason for environmental degradation.	Yes	No
30	Are you in favour of including appropriate activities and projects with regard to Sustainable Development in the school and teacher education curriculum?	Yes	No
31	Manufacturers should discourage the use of disposables	Yes	No
32	We need stricter laws and regulations to protect the environment.	Yes	No
33	Sustainable development will not be possible until wealthier nations stop exploiting the labour and natural resources of poorer countries.	Yes	No
34	Companies that are environmentally sustainable are more likely to be profitable in the long run.	Yes	No
35	Is the DESD project is declared by UNESCO?	Yes	No
36	Do you know about Agenda 21 of Rio Earth Summit?	Yes	No
37	Do you know about the document 'our common future'?	Yes	No
38	Do you think that campus has a practical role in sustaining	Yes	No

Appendix - B

	the ecosystem?		
39	Do you have awareness of -	Yes	No
	a <i>renewable energy?</i>	Yes	No
	b <i>sustainable building design/green design?</i>	Yes	No
	c <i>ecological economics?</i>	Yes	No
	d <i>sustainable agriculture?</i>	Yes	No
	e <i>sustainable forestry?</i>	Yes	No
	f <i>indigenous wisdom and technologies?</i>	Yes	No
	g <i>sustainable transportation?</i>	Yes	No
	h <i>green purchasing?</i>	Yes	No
	i <i>environmental audit?</i>	Yes	No
40	There is no point in getting involved in environmental issues, since governments and industries have all the power and can do what they like.	Yes	No
41	Gender equality has nothing to do with Sustainable development.	Yes	No
42	At home I try to recycle as much as I can .	Yes	No
43	I have taken a seminar/course in which sustainable development was discussed .	Yes	No
44	I talk to others about how to help people living in poverty	Yes	No
45	I vote in public elections.	Yes	No
46	I often look for signs of ecosystem deterioration.	Yes	No
47	The household tasks in my home are equally shared among family members regardless of gender.	Yes	No
48	I try to avoid purchasing goods from companies with poor track records on corporate social responsibility.	Yes	No
49	I have changed my personal life style to reduce waste	Yes	No
50	I volunteer to work with local charities.	Yes	No

Stephen T A (Research Scholar)

Lecturer (Sr. Scale)

P K M College of Education Madampam, Kannur.