EDUCATION FOR SUSTAINABLE DEVELOPMENT: AN ANALYSIS OF PRIMARY SCHOOL CURRICULUM

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A dissertation submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Education with specialization in Curriculum and Instruction to the Department of Education at Faculty of Education, International Islamic University Islamabad.

Department of Education
Faculty of Education
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اقرأ باسم ربك

DEDICATION

I dedicate this study to my family with love and gratitude;

And

My wife and two sons for all the sacrifices they have made during my time of study

FORWARDING SHEET

The thesis entitled **"EDUCATION FOR SUSTAINABLE DEVELOPMENT: AN ANALYSIS OF PRIMARY SCHOOL CURRICULUM"** submitted by Mr. Ijaz Ahmad Registration No. **136-FSS/Ph.D.Edu/F17** in partial fulfillment of Ph.D. degree in Education has been completed under my guidance and supervision. I am satisfied with the quality of scholars' research work and allow him to submit this thesis to the Department of Education for further process as per IIU rules and regulations.

Signature----------
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Dated 13/12/2022

STATEMENT OF UNDERSTANDING

I, Ijaz Ahmad, Registration No. 136-FSS/Ph.D.Edu/F17, student of Ph.D. Education, International Islamic University Islamabad, do hereby solemnly declare that the thesis titled "Education for Sustainable Development: An Analysis of Primary School Curriculum" submitted by me in partial fulfillment for the requirement of Ph.D. degree in Education with specialization in curriculum and instruction is my original work. The material I have consulted is acknowledged in the text. This thesis has not been submitted or published earlier and nor will be submitted in future for any degree from any university or institution.

Dated: 13-12-2022

Signature _____

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APPROVAL SHEET

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ABBREVIATIONS

SD	Sustainable Development
ESD	Education for Sustainable Development
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wide Fund
WCED	World Commission on Environment and Development
DESD	Decade of Education for Sustainable Development
SDG	Sustainable Development Goals
MDG	Millennium Development Goals
UNEP	United Nations Environment Program
WSSD	World Summit on Sustainable Development
KP	Khyber Pakhtunkhwa

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Ijaz Ahmad

December 2022

Abstract

Education for sustainable development (ESD) provides crucial opportunities for young people to be involved in complex sustainability issues. This study investigates the status of ESD in primary education curriculum of Pakistan, primary schools teachers' current understanding of ESD, their attitude towards ESD and how they implement the ideas of ESD in their classroom setting. A convergence parallel mixed methods research design is used to investigate the research problem. The primary education curriculum and 10,905 primary school teachers of KP constitute the population of the study. Sample of the study comprises of four subjects (General science, Social Study, Urdu and Islamic study) of primary education curricula and 400 teachers from four districts of KP using proportionate convenience sampling technique. A coding scheme is developed for qualitative content analysis. While a test of understanding and attitude scale developed by Michalos, Creech, McDonald, & Kahlke, (2009) are adopted to collect quantitative data. The quantitative data are analysed with the help of SPSS 21 using percentage, frequency, mean, standard deviation and independent t-test. Findings of the study show that some signs and indicators of SD are present in primary education curriculum, however the term sustainable development (SD) or sustainability is never mentioned in the curriculum. Similarly primary school teachers have a very low level of understanding of ESD but still have a very positive attitude towards SD. Similarly, findings f the study reveals that lecturing, group discussion and story telling the three most frequently used teaching strategies regarding SD .Findings of the study can be used for reorienting ESD in primary education curriculum. It is recommended that in the development or revision of primary education curricula the principles of ESD must be considered. Moreover, when choosing a criteria for textbook development, the Ministry of Education, as an authority, must ensure that textbook authors and reviewers observe the principles of ESD, if the nature of the subject allows these. It is also recommended that primary school teachers should be trained about ESD both at in-service and pre-service levels.

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Chapter 1

1. INTRODUCTION

Perhaps the most important problem for survival in our times is how to sustain the natural environment and our planet resources at the same time to improve prosperity and wellbeing for ever increasing population. This massive task is given in the concept of sustainable development (SD), first suggested in the final report of World Commission on Environment and Development (WCED), and described SD as a "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (UNESCO, 2014, p. 15). Over the past three decades, the global community has (under UN supervision) agreed to jointly address sustainability. As a result, 'Education for Sustainable Development' (ESD) was set up as one of the key answer to deal with SD (Pauw, Gericke, Olsson, & Berglund, 2015). In 2005, UN declared the decade of 2005-14, as a Decade of ESD. Similarly, the United Nations in 2015, approved Agenda 2030, "Transforming Our World". Agenda 2030 for sustainability is considered as an ambitious plan that for the first time, linked the eradication of poverty and inequity with the preservation of a safe and sustainable world.

At the heart of this plan are the seventeen (17) Sustainable Development Goals, or SDGs, that set the path for mankind to preserve human rights and to eliminate gender and racial discrimination across the world by 2030 (Nolet, 2017). The SDGs are universal call of action to eradicate poverty, preserve the earth, and assure that every individual has equal opportunity to live a peaceful and prosperous life (United Nations, 2015; Lena , et al., 2022). The 4.7 goal of SDGs 4 aims that by 2030, all students will be empowered with

knowledge, skills, values and attitude through ESD for Sustainability, which will help them to address "*human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to SD*" (United Nation, 2015, p. 19).

As a consequence ESD has been adopted globally and curricula have been reshaped worldwide for the purpose to empower individuals with SD skills through a holistic interdisciplinary perspective of content and with different student-centered active teaching approaches (Pauw et al., 2015). Despite of international commitment to ESD as a teaching methodology, there is very little empirical evidence of the implementation of ESD at primary level. The literature also identified this gap of ESD in primary education setting. Davis (2009) and Headfalk et al. (2015) in their literature review on ESD found that there is a lack of research on ESD at the international level and more research is needed especially at primary level. Similarly, Sterling, Warwick and Vyness (2016) urge the need for more research on the long-term effects of ESD and large-scale comparative international studies. Michelsen (2016) also identified the need for evidence-based recommendations aimed at "developing basic ESD competencies. The purpose of this study is to analyze primary education curriculum in order to identify the status of ESD in the curriculum, teacher understand and attitude towards SD, their strategies for implementing ESD ideas and factors affecting the implementation of these ideas.

1.1 Rationale of the Study

We the humans are living on a very unique and sensitive planet, with limited natural resources. This fragile planet is badly affected by humans' activities and their consumption patterns of natural resources. According to WWF (2006), humans are using earth's natural

resources 20% to 30% higher than its normal rate and will be three times more by 2050. United Nations Environment Program [UNEP] (2011), warns that earth is running out of some of the essential resources such as oil, gold, copper, fresh water etc., which can cause conflicts among humanity. Similarly, it warns about global warming caused by the industrial development and the deadly effects of global warming on humans' life. With ever increasing population and need for more prosperity to provide basic facilities such as food, water and sanitation, shelter and quality education etc., it is unlike to reduce this unsustainable consumption pattern, particularly in developing countries (Kaklauskas & Kaklauskiene, 2022).

Therefore, there is an urgent need of rethinking the links between prosperity and natural resources to minimize the use of natural resources to preserve the earth for our future generations and provide a peaceful society, where everyone has equal opportunity to live a quality life. To achieve this inter-generational justice, we have to change the behavior, consumption patterns and make awareness in our young generation about a sustainable future. The aim of ESD is to prepare individuals that actively participate in the development of a sustainable future. Therefore, we need to reorient our education and integrate ESD in our curriculum particularly at primary level. Kalsoom (2017) mentioned the lack of knowledge of ESD and strategies used for ESD implementation at all levels. Considering these gaps, this study investigated the status of ESD in primary education. Similarly, this study investigated to find out primary school teachers understanding of ESD and SD, their attitude and strategies used for implementing ESD in their classroom setting.

The main reason for choosing primary education for ESD research was that primary education period plays the most important role in the development of an individual life and considered as the base on which the rest of an individual life is built (Musterd, 2000) . Therefore, this period of study can be used as a tool to transform the knowledge, skills and values of our young generation and prepare them for their role in the development of a sustainable society.

Another reason is the researcher's own experience as a primary school teacher for twenty years that most of the primary school teachers possess content and pedagogical knowledge but have very limited knowledge of international issues and their possible solutions such as environmental and social justice and human rights etc. They, also. have prejudiced attitudes against gender and other cultures. The excessive use of resources such as stationary were also observed, which motivate the researcher to evaluate primary school teachers' understanding and their attitude towards SD and ESD.

1.2 Statement of the Problem

To maintain a sustainable planet for future generations, a change in human behavior, production and consumption patterns are required (Redclift, 1992). According to Kerkhoff and Lebel (2006), humans' behavior about environment can be changed through public awareness and education. Similarly, Agenda 21 gives a prime importance to education to develop humans' competencies about a sustainable future (United Nations, 1992). In the 2002 world summit, it was recognized that "Education is the primary agent of transformation towards SD" (UNESCO, 2002). As primary school period plays the most

significant role in the development of an individual's life and is usually viewed as the base on which the rest of an individual life is built (Musterd, 2000).

Therefore, primary school education can be used as a tool to change students' behavior about the earth. It is clear from the literature that primary school settings are very interested in ESD (Hedefalk, Almqvist, & Östman, 2015). Despite of greater interest, some countries have not yet integrated ESD in their primary school curriculum (Johannesson, Norodahl, Oskarsdottir, Palsdottir, & Petursdottir, 2011). In their reviews of research literature on the ESD, Davis (2009) and Hedefalk et al. (2015) urges for more research on ESD at the primary level. Although some studies have been conducted about different aspects of ESD but most of them were in developed countries.

In developing countries there are scarcity of this type of studies, despite of that they have developed polices to include ESD at all levels and reshaped their curricula. Primary school students, as a future generation of Pakistan, need to be experts of ESD. Therefore, primary school curriculum is a key variable in introducing, engaging and influencing students' knowledge, skills, values and attitude for a sustainable future.

Recognizing the importance of primary education in ESD and the need for ESD research in Pakistan. This study analyzed the status of ESD in primary education curriculum, primary school teachers' understanding of SD and ESD, their attitude towards SD, the strategies they used to implement ESD ideas in their classroom and the factors affecting the implementation of these ideas.

1.3 Objectives of the Study

The objectives of the study are:

1. To analyze the primary education curriculum for different aspects of 'Education for Sustainable Development'.
2. To investigate primary schools teachers' understanding of 'Education for Sustainable Development'.
3. To find out primary school teachers' attitude towards 'Education for Sustainable Development'.
4. To examine the techniques adopted by primary school teachers to implement the ideas of 'Education for Sustainable Development' in their classrooms.
5. To investigate the constraints in implementing ideas of 'Education for Sustainable Development' in primary schools.

1.4 Research Questions

To attain the purpose of the study, the following research questions were investigated.

1) How the aspects of 'education for sustainable development are included in primary school curriculum?
2) How do primary school teachers understand 'Education for Sustainable Development'?
3) What are the primary school teachers' attitude towards 'Education for Sustainable Development'?
4) What strategies have been adopted by primary school teachers in the context of 'Education for Sustainable Development'?

5) What factors affect the implementation of 'Education for Sustainable Development' ideas in classroom?

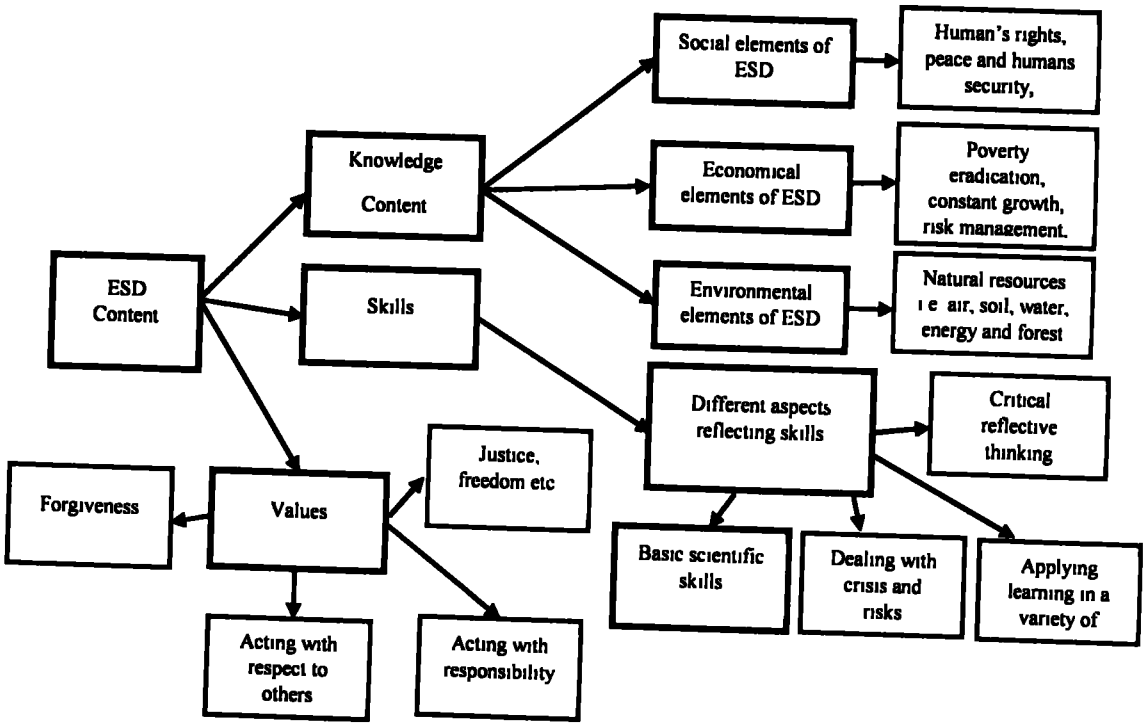
1.5 Conceptual Framework

According to Rogers, Boyd and Jalal (2008), SD is a fusion of environmental, economic and social issues, which are known as three pillars of SD. According to Rogers et al. (2008), Munasinghe (1992) presented these three pillars as, the economic pillar support a revenue increase, with a stable or growing stock of capital, while the environmental pillar advocates the preservation of biological and physical systems. Similarly the social pillar believes in humans' dignity and maintains a stable and peaceful society, with equal opportunity for all. SD needs a balanced and integrated analysis from these key points. Each viewpoint represents an area and a process that has its own distinct driving forces and goals (Paul, 2015). ESD deals with these domains and systems by improving basic education and developing community understanding and awareness about SD.

The purpose of ESD is to empower individual with knowledge, skills, values and attitude to play an active and responsible role in the development of a sustainable future (UNESCO, 2012). According to Pauw et al. (2015), ESD includes a process that nurtures an individual's knowledge, skills, values and behavior that influence the individual, the school, the community to create a sustainable society, in which everyone has equal opportunities to enjoy economic and environmental security and democracy. Figure.1.1 represents the Conceptual organization of the study.

Figure.1.1

Conceptual Framework of ESD



(Adopted from Domazet et al, 2012)

Knowledge: The knowledge feature of ESD deals with the concepts, facts and action related to time and space regarding social, economic and environmental elements of SD. The knowledge about these elements will help the individual to shape their action and find a solutions for SD challenges. The knowledge feature helps in understanding different SD issues e.g. relationship between carbon and global warming, poverty and its causes, conflicts its causes and solutions etc.

Skills: ESD tries to improve different skills in individuals such as critical thinking skill, applying learning in different contexts to preparing students to solve the SD problems and act responsibly and respectfully.

Values: Our values, attitudes, beliefs and assumptions determine our perception, our philosophy, our choices and even our actions. It also affects our feelings. Equity is the main guiding principle of ESD i.e. societal, inter-generational, gender, racial etc. The concept of equity within humans and nature is clearly integrated in SD. Similarly it deals with humans' rights, respect and democracy etc.

1.6 Delimitations of the Study

The study was delimited to;

i Four districts of KP (Pakistan) namely District Haripur, District Malakand, District Kohat and District Charsadda.

ii Teachers of Public primary schools of KP.

iii Curriculum of Urdu, Social Study, General Science and Islamic Studies at the primary level.

iv Grade 4 and 5 of primary level.

1.7 Significance of the study

This study is the first attempt to analyzed primary education curriculum regarding ESD. The outcomes of the research may be used for different purposes, for example' providing relevant data to different national and international organizations about the presence of sustainability in primary school curriculum in Pakistan. The result of the study may raise ESD understanding in those primary school settings, where it is not being addressed currently. The study may help in the promotion of actions or plans of action adopted by provincial institutions and curriculum designers to achieve the SDG's of the Agenda 2030, by incorporating ESD principles, ideas and practices in every aspect of teaching and learning process by 2030. The finding of the study may be used as a model in future to

conduct full assessment about sustainable development in primary school settings. Finally, the outcomes of the research might motivate researchers to create new theories and hypotheses based on the data that is emerged.

1.8 Summary of the Methodology

A mixed methods approach was adopted to investigate the research questions. The design of the study was a convergent parallel. According to Creswell (2012) in convergent parallel mixed methods design both the qualitative and quantitative data are collected concurrently and both data are weightage equally. The qualitative data were based on the content analysis of primary education curriculum, while the quantitative data was based on teachers' perception and attitude about ESD.

Population of the study comprised of primary school core curriculum and all the primary school teachers (both male and female) in the four districts of KP. The defined population was a total of 10905 primary school teachers' as listed by Elementary & Secondary Education Department Khyber Pakhtunkhwa [E&SE] (2018). Textbooks of General science, social studies, Islamic studies and Urdu were selected as samples for qualitative content analysis, while for quantitative data a proportionate convenience sampling technique was used to select 400 teachers from selected districts using 95% confidence level and 5% confidence interval.

Qualitative data were collected through content analysis from textbooks of primary education, for quantitative data a test of understanding and attitude scale developed by Michalos et al. (2009) was adopted. The qualitative data were analyzed using qualitative

content analysis, whilst the quantitative data were analyzed using percentage, mean, standard deviation, independent sample t-test and ANOVA using SPSS 21.

1.9 Operational Definitions

Sustainable Development: The process of meeting the continuing and evolving needs of people while protecting and enhancing the resources for future generation.

Education for Sustainable Development: Concepts, facts and action related to time and space regarding social, economic and environmental elements of sustainability

Curriculum: Used, in this study, in a broad sense, to refer to the sum components found within primary school curriculum; namely- the knowledge, skills, values, the Teacher's Role, the Learning Environment, "What" is learned, and "How" it is taught

Perception: Teacher's view about education for sustainable development and sustainability.

Chapter 2

2 Literature Review

This chapter reviews and synthesizes literature relevant to the study enhancing students' knowledge, skills and values to actively play their role in the development of a sustainable world through primary education. Therefore, the chapter's theoretical framework includes Sustainable Development (SD), Education for Sustainable Development (ESD), basic education and reorientation of curriculum.

The chapter starts with the concept of SD, its dimensions and challenges that support the study. Then the concept of ESD and relation of education with SD is explored. It includes meaning and concept of ESD, basic roles of education, education and SD and the method used by teachers to achieve sustainability followed by opportunities provided by primary education and its curriculum for sustainability. The last section of the chapter is used to analyze UN efforts and contribution for SD and ESD.

2.1 Background of "SD"

Planet earth is facing crises since World War 2 as development became the guiding principle of the era and the whole world was devoted to scientific and technological development (Khataybeha, Subbarinia, & Shurmana, 2010; McGrath, 2018) and the concept of "development" has been considered as modernization, and economic security was the main focus (McGrath, 2018; Elliott, 2006), without realizing its effect on future (Sustainable Development Commission [SDC], 2011). But,when almost all people were intoxicated by material comfort, many problems were instantly created, such as pollution, biodiversity loss, human rights violation, ineffective usage of energy, climate change and

broadening the gap between richer and poorer (McConnell & Stephen, 2005) along with alarming statistics on deforestation, illiteracy, social inequity as well as health and social issues (Khataybeha et al., 2010), which shows that humans are degrading the planet earth. According to McConnell and Stephen (2005), many people realized that the earth is facing a great danger of unsustainable development.

The general model of development was greatly controversial and was greatly criticized, for example, many environmentalists rejected material and instrumental perspectives in favor of focusing on "*the production level that the ecosystem can bear*" (Summèrs, Cornèr, & Childs, 2003, p. 327).

According to Kaprao, Razali and Azraai (2008) development is not just material prosperity or economic growth". Therefore, the longer unsustainable development is pursued, its consequences are likely to become more frequent and severe. Therefore, humans need to change the consumption pattern and the way they live to tackle the challenges of this unsustainable development (Basheer, et al., 2022). At the end of the 20th century, a new notion of SD emerged with the goal of discovering new knowledge, skills and sustainable ways of doing business, for present and future generation (SDC, 2011).

2.2 Sustainable Development

Carmichael (2003) describes sustainability or SD as a fundamental social phenomenon and has been part of international discussion since the late 1980s. The world community became aware and show their concern about the life of future generations. Different reports support the world community's concern about humanity that they lived beyond the carrying capacity of planet Earth (Pavlova, 2009). In 2006, WWF reported that the world population and consumption of natural resources are beyond the earth carrying capacity to support

humanity and other species since 1987. And the last three decades were the worst, where the earth's biological diversity has dropped by about 30%, indicating that humans are degrading natural environment with an unprecedented rate in human history (WWF, 2006), which has made humans as a "future eaters" (Flannery, 2002).

According to Hales & Corvalan (2006) the accumulated "environmental deficit" is 20 to 30% higher than the normal rate because of the industrial development in developed countries. These accumulated shortfall due to catastrophic developments are so severe and widespread that scientist used the term "the Anthropocene age" to indicate impact of humans' activity on ecosystem and suggest a strong international response to change in humans' behavior, to live a life that is personally, culturally, socially, environmentally and economically more sustainable (Taylor, Quinn, & Eames, 2015; Lena , et al., 2022).

The continuous degradation of earth's ecosystem stimulated discussions that questioned industrialization and economic development. Initially the concept of SD concerns with the use of forest resources only but, now, it is a broadly used word in the field of sciences in general and is considered a particular term in environmental education (Leal Filhó, 2000).

The notion of sustainability that supports the simultaneous resolution of the gigantic and complicated issues of ecological declension and similarly huge and complex issues of humans' development and the eradication of poverty in its all forms, was explored in the Brundtland Commission, and gave a widely accepted definition of SD, which focuses on the intergeneration justice and sustainability in every aspect of development (UN-WCED, 1987). This commission described SD as the "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*"

(p. 15). After the approval of "Agenda 21", 194 member countries of UN endorsed the aim of sustainable development with putting mankind at the center of concern for SD (UNCED, 1992) and became a guiding idea in global strategy (Rauch, 2010).

The sustainable development depends on the equilibrium between different aspects which defines the quality of life, in general (Kaklauskas & Kaklauskiene, 2022). Thus, the concept of SD are thought to have three pillars: economic, social and environmental (UNESCO, 2005). These three pillars or dimensions are interrelated to each other with humans at the center (Eli, et al., 2020). These pillars and their interdependencies are explained in the following sections.

2.2.1 First Pillar of SD 'Enviornmental Sustainability'

Despite criticism regarding the use of "environment" instead of "nature", there is a consensus that in the discourse of the SD, the environment means the natural environment (Le Grange, 2008; Lena, et al., 2022). According to Jehan and Umana (2003) environmental SD is not only associated with renewable and consumable natural resources, but also stresses on their appropriate uses along with the restoration of the environment so that the future generations have equal opportunities to live a sustainable life.

Therefore, environmental SD is not only about the integrity and protection of environment, conservation of their productivity and performance, or restoring natural resources that support people's lifestyles (Landorf, Doscher, & Rocco, 2008; Wei Peng, et al., 2021) but also analyzes and explains the relationship between life and environment (Bosselmann, 2001). According Herremans and Reid (2002) and Lena ,et al., (2022), environmental aspect of SD also recognizes the inherent values of othe living organisms other than humans. Similarly Langhelle (1999), stated that the environment also has some

restrictions that should not to be exceeded. Therefore, eniornmental protection and preservation becomes an essential element of SD.

In environmental sustainability, it is assumed that humans are not only valued living beings and all other forms of life are equally important for a sustainable future (Ansari & Holz, 2020). Therefore, the main purpose of enviormental sustaianability is not only to develop respect for all forms of life and the acknowledgement of their inherited values in human beings but also to ensure the long-term survival of the earth and to preserve its dynamic evolution process (Scott & Gough, 2003).

According to Harris (2000) environmental element of SD tries to maintain earth carrying capacity that support humanity and other species, prevents over use of renewable resource system or environmental sink services, and minimizes the use of non-renewable natural resources. Therefore, ideas regarding ecological justice and discrimination are also included in the concept of environmental SD. Environmental justice not only means to protect earth caring capacity and its sink function that support life but also to distributes its "good and bad", equally, among people (Foley, 2004).

According to Bass (1998), Environmental justice is about ensuring fair and meaningful participation of every individual, in designing, developing and implementing environmental laws. Moreover, similarly Le Grange (2008) stated that environmental justice concerns with the unjust distribution of environmental benefits across societies, globally and locally. Furthermore, it advocates the participation of women, children and the poor in deciding how "goods and bads" are distributed. It makes sure that ethnic minorities or poor families are not over-exposed to adverse ecological effects or hazards (Jain, Urban, Balbach, & Webb, 2012). The environmental element of SD attaches great importance with

environmental justice (Ansari & Holz, 2020; Kaklauskas & Kaklauskiene, 2022). According to Agyeman and Evan (2004), environmental issues cannot be separated from social issues such as health, employment and education. Similarly Beder (2006) described environmental discrimination as another problem of environmental justice, which means that ethnic, racial, class and colors are defining elements in deciding who is facing the environmental burdens and decision making.

Therefore, not only environmental discrimination is the direct result of institutionalized discrimination and creates differences between different communities, but also affects environmental law, land use, workplace, living and sports (Lena , et al., 2022).

According to Teise (2013), the definition of SD in terms of environmental SD or sustainability led to the concept of strong sustainability. Where environmental SD challenges the legitimacy of classical business models and theories that support them, Strong SD advocates that renewable resources should not be spent faster than its refilling (Springett, 2005). Similarly strong SD states that humans or capital resources can not replace natural resources (Beder, 2006). Therefore, the concepts of economic prosperity, growth and development need to be reviewed for environmental sustainability (Higgit, Haigh, & Chalkley, 2005).

According to the environmental principles and values, the environmental element of SD focuses on harmful humans' activities on environment and its natural sink function (Magis & Shinn, 2009).

2.2.2 Second Pillar of SD 'Economic Sustainability'

According to anthropocentric views, the economic element of SD refers to the product, distribution and consumption of wealth that is usually described as the means of achieving

humans' material needs through money, property, or any financial assets measurable in terms of price (Pigozzi, 2007). According to Thin (2000) economic sustainability is a steady growth of GDP, monetary profit, efficacy and motivation of private enterprises. Similarly, Munasinghe and Swart (2005) stated that economic sustainability not only increases the revenue but also defines the relationship between global economies that requires integrated approaches to stimulate a responsible long term growth.

Therefore, the main purpose of SD is to provide equal opportunities to every individual to live a prosperous life and eradicate poverty in all its forms (United Nations, 2015). Improving life style of all people and eradication of poverty in its all forms is the main developing goal of many countries across the globe especially, in poor and developning countries (Adams, 2009). The UN conference on environment and development placed an incredible responsibilty on world community to eradicate poverty in its all forms through economic growth to improve the standard of life around the globe, reduce discrimination and meet the needs of most people in the world (United Nations, 2015).

Therefore, poverty eradication and economic development are essential for SD. Though Banerjee (2003), Sauvé, Berryman and Brunelle (2007) and Adams (2009) stated that the main purpose of SD is the economic development to solve our environmental and social problems. But they neither identifies the systematic causes of poverty nor explored the idea that such development and economic growth can be key factors for solving social and economic problems at stake (Teise, 2013; Kaklauskas & Kaklauskiene, 2022).

Magis and Shinn (2009) stated that although economic growth and development depend on each other still both are different processes having different purposes and aims, and that the economic growth does not necessarily lead to poverty eradication,

environmental SD, employment or equity, despite an essential element for SD (Castro, 2004). Although the notion of continuous growth is an important characteristic of a prosperous society still it is not enough because it is no longer defensible (Rao, 2000). The emphasis on economic sustainability and the resulting new model of growth has led to what is generally known as weak SD.

According to Ross (2009) in the framework of weak and economic SD, the environment is considered only a form of capital, where economic growth is consider important for environment. According to Springett (2005) guided by the modern paradigm and industrial means of production, which mostly produced instability, weak sustainability encourages globalization and capitalism for achieving a sustainable future. As the concept of SD presented by Brundtland report is highly anthropocentric and growth oriented, so it can be said that it mainly embraces weak or economic sustainability (Achterberg, 1999).

Similarly Clifton (2009) stated that mainstream economists favor weak sustainability, and consider it as a prevailing favorite approach for SD. In the growth paradigm, SD is generally understood as financial growth and related with revenue expansion. It means that to achieve sustainability an increase in economic growth is required (Davoudi & Layard, 2001). Bigg (2005) describes poverty eradication as an essential requirement for SD and SD is considered as the only way to eradicate poverty. However, many scholars caution against this simple perspective of the association between economic development and poverty eradication and argue that economic development ignores human rights (Banèrjee, 2003). Similarly, Rees and Westra (2003) stated that in developing countries perpetual poverty increased despite of economic growth while the economic gap between developed and developing countries is increasing day by day.

This perspective is opposite to Fischer, Maginnis, Jackson, and Barrow (2008) perspective that blames SD for lack of progress and emphasise on economic growth first while hoping that environmental and societal sustainbility will follow inevitably. Therefore, the current special attention to (economic) growth as a prerequisite for sustainability seems to make no positive contribution to the efforts of SD and the eradication of poverty. It seems that not only the benfits of economic growth are not distributed fairly, but also the growth, apparently, is promoted at the cost of the environment.

2.2.3 Third Pillar of SD 'Social Sustainability'

Social aspect of SD is usually accepted as a domain of sustainability which is mostly neglected and mostly invisible. According to the principles and values of social justice, social SD concerns the humans' dimension of SD (Teise, 2013). Whereas environmental sustainability is connected with environmental justice, social sustainability deals with social issues such as social justice, gender discrimination, poverty and peace (Landorf et al., 2008). Similarly Harris (2000) stated that social sustainability deals with social justice, supplying equal social facilities such as health and education, gender equality, political liability and accountability.

According to Dresner (2008) this principle of social justice is described in terms of inter and intra generational equity. Similarly Heng (2006) stated that no society can be sustainable nor their people can live with dignity and peace without social justice, equity, tolerance, gender or racial equality. Therefore, it is believed that societies with basic human rights violations are not sustainable. Therefore, aim of social sustainability is to foster a

sense of responsibility in the present generation about environmental and societal needs of future generation, to provide equal opportunities to everyone to live a quality life.

From the above discussion it is concluded that the notion of SD demands more than just economic development or environmental protection. In principle, SD is also a "human concept" that includes issues related to social justice. The three pillars of SD are interrelated to each other with humans at the center, which demand to integrate these three pillars into a single and unified conceptualization of SD. As giving importance to one pillar will surely damage the others pillar and will, therefore, result in unsustainable development.

2.2.4 Interdependency of SD Pillars

Despite their multidimensional nature, the various domains of SD do not operate separately, neither are they indivisible (Teise, 2013) and are characterized by their interrelated nature (Landorf et al., 2008). Dillard, Dujon and King (2009) also highlighted this interrelatedness by stating that SD is based on systems theory which describes that society, the environment and the economy are interrelated elements of a larger system.

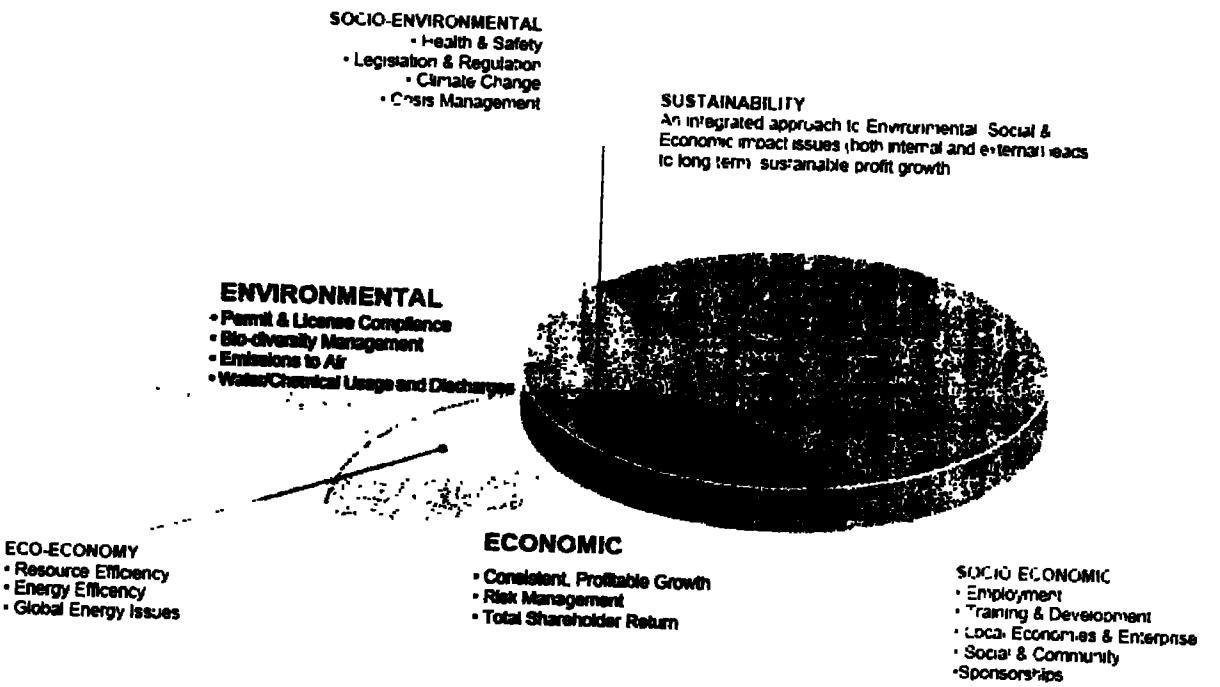
Therefore, it is assumed that a larger system can remain sustainable only if each of its element work properly. As environmental understanding cannot be separated from social and economic interaction, the interrelationship of these pillars is an important feature of SD.

Bell and Morse (2003) and UNESCO (2005) argue that the traditional concept of SD explained by three overlapping circles representing the social, environmental and economic

elements of SD. This perspective shows that these three pillars are equally important and associated because one cannot sustain without any other.

For example, a healthy environment is essential for a healthy and prosperous society, so that people have clean drinking water, food resources and clean air to breathe (UNESCO, 2006). This interdependencies are shown in Figure. 2.1

Figure 2.1



Sources (UNESCO, 2005; Bell & Morse, 2003)

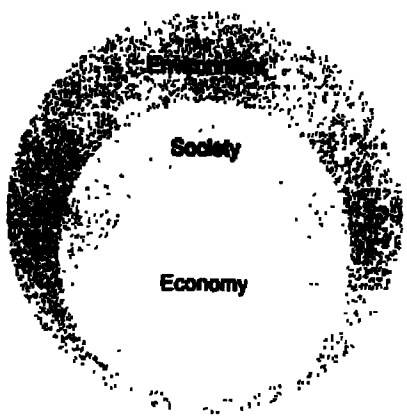
However many people criticized this illustration, stating that this represents a very fragmented and false point of view, where economic development continue to grow without any control, and development can occur in one dimension without influencing others (Webster, 2004; Pitt & Lubben, 2009). Contrary to the prior view, a parallel model

of SD was given, claiming that the ecosphere (planet earth) contains all human activities (see fig 2.3).

It is known as "strong model of SD" not very popular, where environment has a significant importance and the economic and social system are secondary to the natural system. According to Shallcross and Robinson (2007) this model claims that "*systems of human construction (cultural systems) cannot exist without natural support systems*" (p. 140). Therefore, society and the economy must work within the boundries of ecosystem. In this model economy is presented in the middle circle, to fulfil societal needs. It believes that economic system is the subset of social and environmental system. This model adovcates that econmoic and social goals cannot be achieved without achievieng natural goals (Teise, 2013). Therefore, the environment is central to human society and economy.

Fig 2.2

SD as Concentric Circles



Source: Shallcross & Robinson (2007)

However, it is noticed that despite of this interdependency, all the these pillars of SD were not emphasize, encourage and developed equally. In recognition of this

interdependency, it is assumed that SD can be obtained only if these three pillars are given equal importance. UNESCO (2005) suggested that these three pillars not only be treated equally but also be implemented simultaneously locally and globally.

2.2.5 SD, Globalization and Localization

SD cannot be constrained to a specific place or location as it expanded across the national boundaries (UNCED, 1992). According to Gillis & Vincent (2000) SD is closely related to a globalized agenda. Globalization is basically an economic process, including social and political changes that comprise of earth which leads to equality, hybridization and interdependence "*a global enmeshment of money, people, images, values and ideas that has entailed smoother and swifter flows across national boundaries*" (Voisey & O"Riordán, 2001, p. 26).

According to N"zimande (1997) globalization transformed the world into a single market controlled by multinational companies. Similarly, globalization represents the intensity of social relations around the world, in which distant areas are connected with each other in such a way that local events are affected by distant events (Morrow & Torres, 2002). Tlali (2010) described globalization as an opening for (monetary) growth and peace, which are essential requirements for SD.

Understanding SD as a global requirement, leads to the idea that it is not just about environment nor does development end in a single location or it is for individuals or for a single group or country. Within the framework of globalization and due to emphasis on economic growth, each place is somehow connected with events happening in other parts of the world (Adams, 2009). Globalization provides opportunities and challenges for SD

(UN, 2002). Although SD provides equal opportunity to every individual to live a prosperous life, still Jackson (2010) is not sure about the positive effect of globalization on SD. As such, accepting globalization as an important agenda for a sustainable and just society for everyone without questioning it, has been challenged.

According to Monsanghi (2009) due to the influence of Neoliberalism, globalization is considered a threat for native cultures, people sovereignty and democracy, at the same time connected with the promotion and influence of Western civilization, capitalism, and wealth and power in the hands of few. Similarly Kellner (2002) stated that globalization could bring a very harmful change in local traditions e.g. "*permanent subjugation of poor countries and territories by richer ones, ecological destruction, and homogenization of culture and everyday life*" (p. 302).

Despite their globalized characteristic, SD needs to be addressed locally, as every country has their own problem and priorities and each country is in a better position to identify these problems and opportunities. To implement SD successfully, local relevance is very important (Teise, 2013). In Agenda 21, it was clearly mentioned that international communities must develop their own plans and policies to address SD, stating that these strategies should strengthen functional strategies of the country regarding social, economic and environmental development (UNCED, 1992). Similarly world summit on sustainable development [WSSD] (2002) described that

> *Each country has the primary responsibility for their own SD, and the role of national policies and development strategies cannot be overemphasized. Every country should promote SD at the national level by, inter alia, enacting and enforcing clear and effective laws that support SD* (p. 61).

Contrary to this background, Munton (1997) stated that SD initially received attention at international level but local responses define its achievements. Local Agenda 21 was approved in 1992, aiming that local plans and strategies will be adopted by each country. As a member of UN, Pakistani Government approved the Agenda 21, on March 1, 1992, under National conservation strategy to guide SD others initiative (Dhindsa, 2016) . The federal government coordinated it informally and associated it with other organizations such as environment and urban affairs division, whereas the SD Policy Institute linked these with Pakistan Environmental Protection Council for regulatory. Pakistan is part of the UN environmental education program (Governmet of Pakistan National Frame work, 2018). It led Pakistan to reorient the current education system towards SD with a compulsory element in the curriculum at all levels (Dhindsa, 2016).

Pakistan had a variety of policies, frameworks and plans for sustainable development with ambitious goals and optimistic deadlines (Faisal, 2017). However, the country suffers from serious delays in the implementation of these plans due to poor monitoring and weaknesses in project appraisal (Kakakhel, 2011). Since early 1990s, Pakistan has launched different short-term developmental programs and policy reform packages, some of which were initiated by government, but most of them were prescribed by international donors like IMF and World Bank. These plans include National Conservation Strategy (1991), The Poverty Reduction Strategy 1 & 2 (2003 & 2007), Medium Term Development Frame work (2005), Pakistan in the 21st Century: Vision 2030 (2007), Framework for Economic Development in Pakistan (2011) and National SD Strategy (2012).

Similarly with the retirement of MDGs and the elaborative SDGs ready to take field, a national frame work (for SDGs) was proposed in March, 2018 by National Economic

Council (NEC). The basic purpose of this frame work was to get maximum result in minimum time in term of economic security, population control, eradication of poverty and hunger, quality education and ecological perspective (Governmet of Pakistan National Frame work[NFW], 2018).

This framework localizes the SDGs and targets that are more important than others in Pakistani context, were identified and prioritized. This framework divided SDGs into three categories. In category-1 those SDGs were included, which need immediate policy intervention to achieve these goals in short time like food security, healthy life, equitable and quality education, clean drinking water, peace and affordable clean energy. Category-2 contains those goals, which require a longer period of time e.g. eradication of poverty, reduction of discrimination both in gender and urban rural areas. Category-3 consists of those goals, that required a "*long gestation periods and will require major institutional reforms*" (NFW, 2018, p. 4).

Main ojective of these prioritization exercise is to get maximum of all these targets by 2030. A key element of this policy is to promote effectiveness through economics-based development and education. But there are different challenges which can hinder the achievement of these targets. This frame work also point out the obstacles and constraints, and argue that ever growing population and its pressures on resources affecting economic growth, war on terror, political uncertainty and lake of administrative and financial powers at lower level will hinder in achieving these goals.

The greatest problem identified by this framework was, how to create awareness and knowledge about SD in public. To overcome all these obstacle and achieve these goals, this framework suggested, a strong political, policy and institutional support for the

achievement of SDGs. Similarly an effective collaboration with non-government organization and partnership with community organizations and private sector will also be required to achieve these goals (Dhindsa, 2016).

2.2.6 Challenges of SD

It is notable that SD is equally important for both developed and developing countries, despite the fact that they are dealing in opposite sides of the spectrum (Adhikari, 2018). The main goal of every nation is to get rid of societal issues of inequity, waste management and environmental degradation. But there are number of challenges and controversies since the emergence of the concept in 1980's, which are related to the concept and practices of SD and show contradiction in it (Elliott, 2006).

2.2.6.1 SD: an Ambiguous Concept

The concept of SD is inherently revolutionary but, unfortunately, extremely difficult for a pragmatic definition as its concept is multi-disciplinary, complex, and systematic (Amacker, 2011). In beginning SD was considered only the conservation of natural resources (Huntington, 1991) which was very basic level (Amacker, 2011). At that time the solo purpose was to stop the exploitation of nature which was "*negatively affecting the environment*" (Allen, 1999, p. 315). The biggest problem with SD is the availability of a large number of definitions as "*SD means so many things to so many people*" (Portney, 2003, p. 3). But unfortunately still no clear definition of SD has been developed. The most widely used definition is that presented by "Our Common Future" which stated that "SD is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN-WCED, 1987).

But this definition also has two issues, first it did not specify the needs as needs of people living in rich countries, are different from those living in poor countries. For example, richer countries focus to maintain a constant growth in real income per capita without jeopardizing the environment and natural resources (Elliott, 2006). Similarly the poor countries will focus on employment, quality life and on preparing future generations for a prosperous society (Elliott), which enables the developed countries to export their negative externality to developing countries, who are exploiting their natural resources like developed countries did, in industrial revolution (Wheeler, 2001). Second, this definition did not give any time span, as generation can only be interpreted ambiguously (Amacker, 2011).

McKeown (2002) stated that for different academic fields ideal sustainability is different i.e. for economic educators sustainability is based on 'interest', while for humans' rights activist sustainability is about peace, equity, respect and democracy. Similarly, Bonnett (1999) stated that "*how any surface agreement on sustainable development soon breaks down when one asks what it is that is to be sustained*" (p. 328). Compare to those people who are interesting in different interpretation and different ideas about SD, and skeptical about its real implementation process, some critics' viewpoint is opposite to this that "there is no need of SD" (UNESCO, 2005a). But many people strongly believe that lack of clear definition is a positive aspect of SD for attaining a sustainable world. It is irrational to consider these different point of views of SD as a problem of implementation (Teise, 2013). Contrary to this some people argue that the vague, broad and unclear nature of SD provides an opportunity to fully understand the world (Khataybeha et al., 2010) and act in varying ways to attain a sustainable future (Amacker, 2011). Similarly, the

nondescript nature of the SD will encourage people, nations and governments to adopt policies according to their own needs (UNESCO, 2005a). Daly (1991) stated that the ambiguity of SD provides opportunity for a greater consensus in favor of the notion that seeing the world as a business in liquidation is both morally and economically wrong.

2.2.6.2 The Feasibility of SD

Another problem with SD is to bring the theoretical and abstract concept in to reality for everyone (Krueger & Gibbs, 2007). Agenda 21 encourage local authorities around the globe including Pakistan to develop their own plan of action to attain SD. The 2002, report of International Council for Local Environmental Initiatives [ICLEI] shows that 6000 local government around the globe initiated local and regional SD plans. Similarly Swyngedouw (2007) stated that it was hard to find someone who does not support the idea of SD, because people clearly feel the threat and the need for appropriate action as "*they smell the problem in the air; they taste it in their water; they see it in more congested living spaces and blemished landscapes*" (UNESCO, 2002, p. 3).

Although SD seems to be the winner in the fight against big social problems (Campbell, 1996), still it is very obvious that change in people's behavior are happening too slowly, and little has changed (Khataybeha et al., 2010). According to Mckeown (2002) some people believe that SD cannot be achieved due to its slippery nature. Similarly Rauch (2002) pointed the danger of reducing the term of SD to a mere slogan of the past century and "*the basic concept can devolve into a hollow shell*" (p. 47). While many people believe that this concept, integrating ideas, policies and tools will help in achieving a sustainable future. Summers et al. (2003) stated that SD is a dominant and successful concept just "*because it is everything for everyone*" (p. 327). Similarly, the concept of SD is considered

a "universal spell" (Ráuch, 2002) especially everyone can easily become a part of it, from a modern industrialist to a common farmer (Bonnett, 2002).

For the last three decades, SD concept was widely used for different purposes and are happening in more concreate forms i.e. more bike paths, reduction of carbon and strategies for reducing environmental degradation (Krueger & Gibbs, 2007). Similarly Krueger and Gibbs (2007) argue that a critical analysis from the experts who understand the mechanism and issues of social change in various circumstances, is required to minimize the gap between theory and practice.

From the above discussion, it is clear that attaining sustainability and transforming people knowledge, skills, values and attitude to play their role in the development of sustainable world are the two biggest challenges in 21st century. UNESCO (2005a) stated that education, as a key human right, is a primary agent in transforming human vision into reality about SD. In the following section ESD, basic role of education, education and SD and the method used by teachers to achieve sustainability will be elaborated.

2.3 Education and Sustainable Development

Mckeown (2002) stated that the relation between education and SD was explored at the time of endorsing the notion of SD. As the basic purpose of contemporary education is to prepare responsible citizens in order to develop responsible societies, which leads to sustainability (Laurie, Nonoyama-Tarumi, McKeown, & Hopkins, 2016). Chapter 25 of Agenda 21 described the important role of children and young people in attaining SD (UNCED, 1992).

According to Ciferri and Lombardi (2009), education ensures to prepare responsible individuals for family, community and nation who ensure a sustainable world, not only that

but also influence implementation, decision making and quality of life in any SD plan (Mckeown, 2002). According to Department for Education and Skills [DfES] (2006), solutions to tomorrow's problems are in the hand of today's students. There is a strong relationship between education and SD and that education improves agricultural productivity, quality of life, preservation of ecosystem and the status of women in the society (Mckeown, 2002). Similarly, UNESCO (2014a) has presented an inspiring argument for how education is transforming people's lives;

> *Education reduces poverty, increases employment and promotes economic prosperity. Education promotes a healthy lifestyle, strengthens the roots of democracy and changes attitudes towards protecting the environment and empowering women* (p. 13)

Transforming the lives of our youth through education is the soul of SD (UNESCO, 2012a), and both elementry and secondary education are very vital periods in this regard (Benavot, 2014). But in many countries, low level of education is badly affecting the SD plans, While "*high quality of education produces 'greenery' and more sustainable industries and jobs*" (Mckeown, 2002, p. 12). Education has always been recognized as an important and necessary tool to improve and promote people's capability to solve SD problems. Acording to Orr (1994), most people are not giving any attention to the current unsustainable way of life nor feel danger or any guilt. Education as a primary agent to transform people's mind is considered the only way to resolve this intractable crisis (Sterling, 2013). Similarly education provides understanding about SD issues and enable individuals to discuss, advise and help the authorities to follow a radical policy, and put into practices these ideas and policies (Laurie et al., 2016). It is concluded that different thinking and ways of life, due to education, mostly decide whether the future will be

sustainable or not. The next section highlights the nature of education to explore the effect of education on SD.

2.3.1 Nature of Education

"Education is the most powerful weapon which you can use to change the world."

Nelson Mandela

Many people consider education as a process that transmits knowledge from one group to another, and nurture and develop the whole person, which is a good thing, and considered answers to many problems (Sterling, 2001). Although education is an old but debatable concept, and different perspectives and ideas have emerged in this debate (Winch, 2002). While recently this debate focuses on modern issues, different people have different views about the purpose of education, which is an essential element of educational philosophy and a key to highlight the values and nature of education (Sterling, 2001).

According to Campbell (2008), the purpose of education has long been discussed, but still very few can give a complete answer to this question. It is difficult to describe the relationship between SD and education without understanding the nature and purpose of education. Without a clear outcome of education and its effect, it is impossible to evaluate the education process, especially, in the context of SD (Cheng, 2015). According to Sterling (2001) adopting an effective educational paradigm for SD, it is important to understand educational values that are implicit, and truly prevail in contemporary academic discourse.

The contemporary theories of education have a great variety and diversity regarding the purpose and role of education. For example, in the US, the seven cardinal principals were put forward to formulate educational objectives (Cheng, 2015). Similarly, in the 20th

century, for some people the prime purpose of education was to prepare individuals to play their role in the development of a society, the economy and the nation (Burns, 2002). Similarly, Winch (2002) described three basic purposes of education i.e. "*personal needs, civic cooperation and vocation*" (p. 101).

It looks like that different educational systems reflect different goals and functions, and different concepts on this issue were and will be discussed in educational discourses and policies. To conclude, education has at least four basic roles – liberal role, socialization role, vocational and economic role, and transformative role, which are according to Sterling (2001) "*at different time jostle*" (p.25).

2.3.1.1 Liberal Role of Education

According to Sterling, one of the role of education is derived from Latin word "educare" means to bring up, to train or to mould. A similar concept of education can be found in the early Chinese education system (McGrath, 2018; Fraser, 2006). According to Fraser (2006) education is not just an acquisition of knowledge but to train and develop the whole person. Fraser also said that education empowers the individuals with knowledge, skills, values, attitudes and behaviors to develop themselves and understand the world.

According to McGrath (2018), one of the core of many liberal argument is that education plays a vital role in "*the psychological, cultural and social development of individuals and socities*" (p. 4). Moreover, for a civilized person, character and virtues are important, "*such as honesty, wisdom and non-violence, as well as intellectual qualities such as openness, critical thinking, generosity and perseverance.*" (Bianchi, 2007, p. 513). A similar view was expressed by McGrath (2018) that "*education is a way of building criticality and resistance to injustice*"(p. 4). Obviously, the abilities that education

develops allow people to live like humans, in other words, the way they think, act or experiences are beyond the abilities of animals (Fraser, 2006).

According to Sterling (2001) in addition to the above functions of education, another function of education is derived from another Latin word "Educere" which means to develop or draw out. Pring (2005) stated that this role can only be achieved if educators promote individual's diversity and personal development. In addition to general knowledge, skills and attitudes, educators also try for developing every individual's abilities and curiosity (Pring, 2005). An ancient Chinese philosopher Xunzi stated that due to different kinds of education, people will become significantly different on the basis of their activities, characters and achievements (Cheng, 2015). According to Winch (2002), only quality education can meet the challenges of the changing world, which cultivates and stretches people's minds, shapes independent personalities, enables them to make decisions about self- esteem and other important matters and thus enables them to improve their abilities and achieve maximum in their lives.

According to Whitehead (1959), in Cheng (2015) education is a liberal concern because it developed individuals' abilities of self-development and self-fulfillment. No one can successfully complete the process of education without understanding its purposes. According to Bass (1997), the above mentioned two functions of education enable individuals to achieve their present and future goals.

2.3.1.2 Socialization Role of Education

According to Durkheim (1951), education is the "*reflection of society*" (p.340). Both Burns (2002) and Sterling (2001) stated that to replicate and preserve the culture of a

society an effective system of education was required. Education, societies and humans are interrelated with each other. Green, Preston, and Janmaat (2006) described humans as a 'naturally social' beings, whereas, education also occurs "*in a social context*", and is characterized as "*a significant source*" of "*social capital*" (p. 129). Education is considered as a tool that enables each generation to acquire what their predecessor learned during their lifetime. According to Bass (1997), this tool must be effective, otherwise each generation will have to discover knowledge and skills on their own which will prevent them from replicating and perpetuating their society and culture.

Society can exist only if its members have a significant degree of similarities (Durkheim, 1992). Education maintains and strengthens uniformity of society by fixing essential similarities in the child from beginning. Moreover, education plays the most important role of promoting personal sociolaization and transforms the "natural" person into a "social" one, through different formal and informal processes (Rosenbury, 2007; Chantia, 2006).

As stated earlier, education is much more than just transmission of basic knowledge. It transfers the culture including values, world view, attitude, tradition, ritual, skills and some intangible, artistic and emotional aspects "*that form and regulate the functioning of a society*" (Burns, 2002, p.129). A similar view is presented by Campbell (2008), Baig (2008) and Singer and Pezone (2003) that education must develop good citizens and leaders for the survival and smooth functioning of a society, otherwise, it will collapse. It is concluded that education has a direct effect on the welfare of a society, and it determines its health (Baig, 2008).

2.3.1.3 Vocational and Economic Role of Education

From this perspective of education, professional division of labor is an important element of the social development, and that education provides opportunities of employment and careers (Campbell, 2008; Sterling, 2001), and prepares manpower for the world (McGrath, 2018). There are two kinds of education that will help prepare manpower for the world of work. One is called pre-vocational and are taught at secondary level. In this period basic informations such as principles of various jobs, its history, its place in the economic world and society and practical knowledge of these jobs, are introduced to students. It empowers students with knowledge, skills and awarness about their expected role in future employment (Winch, 2002; McGrath, 2018). However, it can be said about the Pakistani education system that students do not have the ability to make informed choices about their educational goals and their future careers, and this is mainly due to lack of professional goals in the curriculum at elementry and secondary level. (UNESCO, 2009; Khan & Pathan, 2011).

The secod type of education is the vocational which equips students with basic skills for the world of work. A strong vocational education system provides people with employable skills and higher productivity levels, and is a prerequisites for economic growth (Khan & Pathan, 2011). Countries with skilled workforce will have increased competitiveness, productivity and profitability, which is crucial in today's globalized economy (UNESCO, 2009).

According to McGrath (2018, p. 138), vocational education "*serves the economy through the twin paths of employability enhancement and productivity improvement*". In

many countries, education is considered as the basic means of technological development, leading to new ways of productivity and economic prosperity (Baig, 2008). According to Winch (2002), the "*economic goals of education are just as legitimate as any other*" (p. 101) and education is essential for a healthy economy. Society needs skilled workforce for industry and business as a whole to compete in the global world (UNESCO, 2009), and education is the only means of providing skilled and knowledgeable workforce.

According to Burns (2002), education always enhances gross national product, which is a measure of annual national production of goods and services. Theoretically education reduces poverty, improves economic growth and enhances competitiveness (Comyn & Barnaart, 2010). Similarly, Burns (2002) argues that education enables people to earn more money, join preferred field and contribute in the development of a prosperous society. In other words, education provides skilled workforce to achieve the country's economic goals.

As stated earlier education enhances the economy, promotes technological development, enhances employment and competitiveness (Burns, 2002; Winch, 2002; UNESCO, 2009; Comyn & Barnaart, 2010; McGrath, 2018). Where, for many people, employment is the primary purpose of life (Winch, 2002), to support their families, communities, grow as people and in the words of McGrath (2018) "flourish as human beings", not simply for increasing their income.

2.3.1.4 Transformative Role of Education

Whilst, education keeps a society functioning, the question is whether it can develop a healthy and just society? Which was disagreed by Emile Durkheim and conservatives of

the last century. According to Durkheim (1951), education "*replicates and follows the latter...it does not create it*" (p. 340).

According to Daniels (2008) as cited in Cheng, (2015) conservatives also believed that only the economic development can bring social changes and nothing else, including education. John Dewey, however, disagree with this view and believes that various factors, such as economic, national, international, religious, cultural, demographic and political influence social change (Chantia, 2006), and for the survival and development of any society, change in ethics, mindset and values are needed (Dewey, 2008). Only the economic change does not necessarily lead to other societal changes, whereas schools are committed to develop student's "*mentality, belief, attiude, desire, purpose" and culture, which can provide a great opportunity for social change*" (Dewey, 2008, p. 412).

According to Dewey's concept of education, social order is regularly changing and education plays an important role in "*the determination of future social order*" (Dewey, 2008, p. 409). A similar view is expressed by Sterling (2001) that education helps in the eradication of social ills, boosts democracy, supports political reforms and brings other changes in society.

Accoding to Dewey (2008), eduction has an important role in the transformation of a society but the question is how it should do it, whether blindly and irresponsibly or with the greatest possible courageous mind and responsibility. For this purpose, Dewey uses the terminology of "indoctrination" an "*organized usage of any possible means to impress upon the minds of pupils a particular set of political and economic views to the exclusion of every other*", happens regularly in schools (2008, p. 415).

According to Daniels (2008), some people believe that this is the right way to reflect and make changes in society, but others believe that active participation of learners is an essential aspect of education for transformation. Singer and Pezone (2003) state that educators must challenge the unjust and unfair distribution of power inside and outside the schools. Paulo Freire (1995) in Singer and Pezone (2003), believes that through education, students seeks new questions about themselves, and the world around them, and students are encouraged to become "agent of curiosity" in the "search for ..." why of "things", when actively involved in educational activities aimed at solving social problems.

It leads the student to evaluate the events from different perspective, respects other people's views and expand democracy (Singer & Pezone, 2003). Freire (1995), considers education as a process of continuous group discussion, while the role of the teacher in this discussion is to help the learners to identify the problems faced by the society, discover new ideas or symbols, describe personal experiences, encourage analysis of previous experiences and society as the basis of a new educational understanding and social process (Singer & Pezone, 2003). According to Dewey (2008), school alone cannot create or express the idea of democracy, but it develops individuals, who understand its concept, those who care for it in their hearts, and who are ready to fight for it in their actions.

The humanist view about education is that, it develops individual talent., even in this view, social intention is visible, "*individual is a product of education*", whose skills and creativity need to be nurtured, "*in one narrative to better serve the nation*" (Burns, 2002, p. 24). According to Burns (2002), an active and critical individual can guide the process

of social change and the passive individuals are considered good workers and citizens to participate in the outcomes of this social change.

The role of education "to bring" social change' has been long discussed. For example, Frieden (1955) advocates that education plays a vital role in the formation of the modern Europe and social changes after WW2. Similar view is expressed by Hans (1955), that the aim of education is to "*train an individual to an autonomous personality*" (p.149), who willingly assumes his/her responsibilities for the development of the society.

Haavelsrud (1981) describes three basic roles of education for a nation. First, it provides leadership and skills to keep the crucial order in a changing society, second, develop skills, values and attitudes to reform this order and lastly develops individuals to guide and contribute more in the development of a just society. According to Chantia (2006), education does not seem to reduce the class differences between educated and uneducated but it accelarates the social changes in other areas. Chantia also finds that people understand the role of education that it eradicates poverty and gender bias, enables individuals to make the right choices, enhances social mobility and finds solution to all problems that arise in a society. Similarly, Matsepe (2002) finds that education is the key element of change in Basotho. Education provides opportunity to the people of Basotho to become aware of their problems, and the social forces that they confront and start to solve these problems. Education change their attitudes, understanding of problems and behaviors in varying degrees.

From above discussion, it ca be concluded that education "either promotes status quo or a possible new direction for the development of society" which according to Thomas

Jefferson, are essential for social reforms (Singer & Pezone, 2003). Daniels (2008), believes that school has the potential to guide the society on certain paths. It means that attention must be paid to those directions that education can take (Dewey, 2008).

According to Daniels (2008), teachers and schools at the same time should know how to prepare individuals for adopting social changes and guiding society in the right direction. Some efforts were made to transform education into new directions. For example, peace education, for making the world a more humane place, transmits specific skills, values, attitudes and behavior have been integrated in different educational system around the globe. According to Bar-Tal (2002), the primary goal of peace education is the "creation of a just society where equity, tolerance, human rights, environmental protection, peace, and other positive aspects prevail. Bar-Tal also stated that a positive result motivates both teacher and students to participate in the process of change, and both react positively.

2.3.2 Relation Between the Nature of Education and SD

According to the UK Department for Education (2010), education helps people to get a full time job, shape the society around them, enhance their inner life and live a prosperous life. Sterling (2001) also supports these four functions of education. He notes that these four roles inform and expand each other, and ESD has been launched to harmonize them, with emphasis on liberal and transformative ones.

The liberal role of education emphasizes on its "intrinsic" values, while the remaining three roles are more likely to emphasize on its "instrumental"' values. ESD relies on the "*best existing thought and practices in the liberal humanist tradition*" (Sterling, 2013, p.

27). While the transformative role of education seems more relevant to the UN vision of SD (Cheng, 2015).

According to Jacquard (1995) in Sauvé (1996), due to rapid global technological and economic development the "triumphant economy" has been greatly criticized. For example, Baker (2006), criticizes the present development model. He stated that despite of the high consumption rate, it emphasizes economic growth, which is itself a big threat for the development of future generation. As a result "change" becomes an essential requirement for a sustainable future (UNESCO, 2005a). According to UNESCO (1997)

> *Attaining SD will depend ultimately on change in behavior and lifestyle, change which will need to be motivated by a shift in values and rooted in the cultural and moral principles upon which behavior is predicated. Without change of this kind, even the most enlightened legislation, the cleanest technology, the most sophisticated research will not succeed in steering society towards the long-term goal of sustainability* (p. 32).

Education is a big investment in our sustainable future. The role of education for the achievement of SD was signified by agenda 21. A full chapter, chapter 36 is devoted to education and states that:

> Education is essential to promote SD, address ecological and development issues and improve people's skills..... It is also essential for the acquisition of environmental and ethical awareness, values and attitudes, skills and practices in accordance with the SD and active participation in decision-making (UNCED, 1992).

According to Ban Ki-moon, solid, collective and long-term educational efforts are required to achieve sustainability (UNDP, 2010).

2.4 Concept of Education for Sustainable Development

'Education for Sustainable Development' (ESD) can be defined as a transformative learning process that empowers the learner with knowledge, skills, values and attitudes to actively participate in the development of a sustainable future (UNESCO, 2014). ESD is a

new concept and was first introduced in Agenda 21 approved in 1992, at Rio de Janerio in UN conference on environment and development [UNCED].

A whole section is devoted to education, which forms the basis of ESD, and views education as a primary agent of transformation towards SD by enhancing humans' abilities to change their visions for society into reality (UNCED, 1992). Indeed, education and SD are inextricably linked (McKeown, 2002), which cause reorientation of policies, curricula, teachers training programs, learning and practices in local schools, community and work places. It involves the process of nurturing the knowledge, skills, values and attitudes that influence the individuals, school and the community to shape a fair and just society, economic security, environmental capability and democracy (Pauw et al., 2015).

The education section (chapter36) of Agenda 21, highlighted the critical contribution that the students can make in the achievement of SD (UNCED, 1992). The focus of Agenda 21 education section was on the four domains (1) improving basic education (2) reorienting the current education to describe SD, (3) improve people perception and (4) training. UN decade of ESD (2005-14) proved to be an important milestone for the promotion of ESD. It was a rigorous international effort to reorient education and improve the quality of humans' lives around the globe through a shift in education policies, investment and practice (UNESCO, 2011).

The 2002, UN summit on SD suggested that the concept of ESD, given in agenda 21, needed to be corrected, which was then considered as environmental education only. The aim of the UN Decade (2004-2014) of ESD was to combine the SD principles, values and practices into education sectors (UNESCO, 2005a). The aim was to ensure a more sustainable society through reoriented education, where ecological, social and economic

aspects are managed sensibly. In September 2015, the UN, approved "*Transforming Our World*" agenda 2030 for SD, which is an ambitious plan that, for the first time, linked the eradication of poverty and inequity with the preservation of a safe and sustainable world.

At the heart of this plan are seventeen (17) SDGs, that set the path for mankind to preserve human rights and to eliminate gender and racial discrimination across the world by 2030 (Nolet, 2017). The SDGs are international call of action to eradicate poverty, preserve the earth, and make sure that everyone enjoys a quality and peaceful life, all while managing climate change and trying to protect the oceans and forests (United Nations General Assembly, 2015). The essential role of ESD is to implement policies relevant to local context, and all SD programs including ESD must consider ecological, economic and social conditions, which enable ESD to take many form around the globe (UNESCO, 2011).

2.4.1 Improving Basic Education

The first priority of ESD is to improve basic education around the globe. Each country has its own content, and different years of basic education. For example, in some countries primary education is considered as basic education, in others it's eight or twelve years of education. But most countries focus on reading, writing and computing in this period of education (UNESCO, 2006). Reading a newspaper, writing a simple letter, calculating everyday matters and developing skills necessary to fulfil their expected responsibilities in society are taught to students. For example, girls can learn about nutrition and care. Students also learn, how their government and the world outside their community function (Mckeown, 2002).

Increasing this type of basic education will not contribute in the development of a sustainable society. For sustainable future nations must focus on knowledge, skills, values and attitude that encourage the individuals to actively participate in the development of sustainable society (UNESCO, 2014). Therefore, for SD, the existing basic education must be reoriented to improve students' different skills, like critical thinking skills, skills of organizing and interpreting data and skills of analyzing societal issues etc. (UNESCO, 2006). The low level of basic education in different countries is badly affecting national plans of SD. In Pakistan, many children attend school for an average of five years only, where girls receive fever years of education to make this average (UNESCO, 2011). The war against terror and the terrorist attacks on schools worsen the situation. According to UNESCO (2011) report on ESD, the low quality of education is often found in poor and war affected countries, which limits their efforts to implement SD plans.

At the turn of millennium, the global communities turn their attention to quality basic education and try to close the gap between gender educations, which helps the nations to increase the enrollment rate at primary level. In fact, more girls were enrolled than boys under "Education for All" movement, still a large number of girls remain out of schools. Recognizing the need for quality basic education distinguishes ESD from the other educational efforts, such as environmental education or population education (UNESCO, 2006).

2.4.2 Reorienting Existing Education

Reorienting the existing education becomes a powerful tool for educators to understand the changes required for ESD at every level (UNESCO, 2006). According to UNESCO (2013), ESD is not an option but is a priority, and must be integrated in the current

education, and not be treated as a separate subject. Therefore, the current basic education must be reoriented, to add more principles, skills, perspective and values about ESD in the current education system, to provide appropriate and relevant education about SD (UNESCO, 2006).

Therefore, reorienting education for SD not only deals with the quantity but also with the appropriateness and relevancy (UNESCO, 2011). Similarly, the reorientation of education requires knowledge, skills, values, and attitude about teaching, to prepare and motivate individuals for active participation in the development of a sustainable world (UNESCO, 2014).

ESD not only provides relevant information about ecology, prosperity and society but also directs about learning skills, perceptions and values that direct and encourage humans to achieve a sustainable economy, contribute to a fair and just society, and live in a sustainable way.

As SD cannot be achieved individually but collectively it can be achieved. Therefore, ESD not only involves local issues but as well as global issues. Therefore, UNESCO (2005a), identifies five core aspects (knowledge, skills, values, attitude and issues) to be described in reoriented curriculum about SD. As in many countries, it will not be possible to add curriculum about SD as they already have a complete curriculum. Reorientation of curriculum helps the designers in deciding "what to leave out—what does not contribute to sustainability or is obsolete—is an integral part of the reorienting process" (UNESCO, 2006).

According to Stables and Scott (2002), it is better to integrate ESD ideas in different disciplines as teachers are also trained through different disciplines, and it is better to

appreciate the prime agenda of the discipline. But some researchers question the appropriateness of ESD integration in the current disciplinary-based curriculum structures, as knowledge is grouped by discipline and subject, and subject is divided into separate parts or units. This structure fragment knowledge and issues cannot be neatly fit into well-defined sections of disciplines (Mórin, 2001).

According to Edwards (2006), ESD must be imposed through an integrated and flexible curricula which "*not only blurs disciplinary boundaries but also reconciles the tension between abstract academic knowledge, and the grounded knowledge acquired from everyday experience*" (p.118). According to McKeown (2002), knowledge, skills, values, perspectives and issues must be considered in reorienting education about ESD.

2.4.2.1 Knowledge

SD involves environment, economy and the society (McKeown, 2006). Therefore, to understand sustainability principles, people from all disciplines need basic knowledge of SD to become aware of its implementation, realize its values and consequences of their implementation (UNESCO, 2006; Mckeown, 2002). UNESCO describe that "*knowledge based on traditional disciplines supports ESD*" (p. 19). The greatest challenge faced by world community in the development of ECD curriculum, is the selection of knowledge that supports their SD goals (McKeown, 2006). Another problem is to let go those topics which were taught successfully for many years but are not relevant any more (Webster, 2004).

To select appropriate knowledge, the communities must first identify goals of sustainability. According to Daly, Cobb, Jr and Cobb (1994), there are three condition for a sustaibale future:

1. The rate of consumption of renewable resources must not exceed the rate of its regeneration.
2. The rate of consumption of non-renewable resources must not exceed the rate of its renewable substitutes.
3. Pollutant emission standards must not be greater than the absorbing capacity of the ecosystem.

Some argue that peace, equality and tolerance are also essential elements of a sustainable world (UNESCO, 2006). Agyeman (2001) in UNESCO (2006), states that sustainability provides equal oppurtunity to every one to live a quality life in a just and equitable manner, while protecting ecosystem. Communities have to select culturally appropriate and locally relevant SD targets that describe their current and future needs. With the passage of time, the basic principles chosen for the curriculum will become part of local worldview.

2.4.2.2 Issues

The focus of ESD is primarily on key social, ecological and economic issues that threaten the future of the planet (Mckeown, 2002). Almost all of these issues were addressed in Agenda 21. While the main purpose of ESD is to address all those issues that are locally relevant (UNESCO, 2006). As Agenda 21 described all those curial issues, which the world community agreed to resolve. For example, section 1 of Agenda 21 described the social and economic issues such as combating poverty, change in consumption pattern, condition of human heath, sustainable human settlements and making decisions for sustainable development. Similarly, section 2 describes the environmental

issues and section 3 and 4 describe the role of major groups and the implementation strategies (UNESCO, 2014a; UNCED, 1992).

Integrating each issue in ESD curriculum associated with Agenda 21, principles and conventions will not be feasible for each country, as each country has its own distinct issues. But must chose relevant issues from three spheres of SD i.e. economic, social and environmental (UNESCO, 2006). For example, a landlocked country might focus on sustainable mountains, and either ignore or cover a bit of ocean protection and management. Some issues such as women in SD, omission of CO_2 to air and combating poverty are relevant to each country (Mckeown, 2002).

2.4.2.3 Skills

ESD not only have to teach these crucial issues but also have to equip individuals with practical skills to live a sustainable life after leaving the school. Depending on the context, the skills will differ in each country for their ESD curriculum, but must fall in one or more of the three spheres of SD (Mckeown, 2002). According to McClaren (1989) in UNESCO (2006), the following skills are essential for each individual to live a sustainable life:

1 Effective communication skills (both written and oral).

2 Skills to think about the system (both natural and social).

3 Skills of using knowledge in different context.

4 Critical thinking skills about value issues.

5 The ability to move from awareness to knowledge and action.

6 Skills to work cooperatively with other.

7 The ability to develop an aesthetic response to the environment.

In addition to these skills some other skills such as skills of recycling different materials, the skills of harvesting wild plants without endangering their future reproduction, skills to grow plants that need little water and skills to draw water from unpolluted sources (Mckeown, 2002; UNESCO, 2006; UNESCO, 2014a).

2.4.2.4 Perspectives

The ESD perspective is essential for understanding global and local issues in a global context (McKeown, 2006). "*Every issue has a history and a future*" (UNESCO, 2006, p. 22) and the purpose of ESD is to look at the root cause of any issue, and predict the possible future based on different scenarios, as it is understood that many global problems are interconnected. For example, excessive use of paper leads to deforestation, which is related to global warming. Considering an issue from the perspective of different stakeholder is essential for ESD (Mckeown, 2002).

These multiple perspectives lead to intra-national and international understanding of the issues (McKeown, 2006; UNESCO, 2012a). This understanding is crucial for the creation of a "mood of collaboration" that supports SD (UNESCO, 2006). A similarly view is presented by USTESD (2013), that multiple perspective about an issue leads to greater cooperation and collaboration.

MacKeown (2006) provides a list of ESD-related perspectives that students need to understand.

- Social and environmental issues change over time and have a history and future.
- Existing global environmental issues are interlinked.
- All humans have some common characteristics (love their childern)

- In order to understand local issues in a global context, it is also important to look beyond their local and national boundaries.
- Considering multiple perspectives before making any decision about an issue
- Science and technology cannot solve all our problems.
- People are citizens of the local community as well as of the global community.
- Individual user decisions and other activities affect resource extraction and production in remote locations.

When all of these are taught to a generation, it will be embedded in the local worldview (UNESCO, 2012a; McKeown, 2006; UNESCO, 2006).

2.4.2.5 Values

The goals and quest of any society are driven by the values that society chooses to prioritize. Values that distinguish human beings from animals, and immediately put pressure on material well-being and satisfaction that prefer one group to others, which promotes greater self-satisfaction as a whole than family, community, or society and focus on short term over long term have pushed the world in a very unsustainable direction (International Environment Forum [IEF], 2001). Fortunately, shared values embody all the great religious, spiritual and cultural traditions, and form the basis of human rights and others. The world community needs to organize their economic and social institutions to reflect such values (IEF).

These values are important elements of ESD (UNESCO, 2006). In some countries, these values are taught overtly to everyone in the school. However, in other countries, even if these are not overtly studied, they are planed, described, analyzed or discussed (McKeown, 2006). In both cases, values are important elements of understanding multiple

perspectives. Understanding, personal, social and communal values are crucial to learning for a sustainable future (UNESCO, 2006). According to McKeown (2002):

> *In ESD, values have different roles in the curriculum. In some ESD efforts, pupils adopt certain values as a direct result of instruction or modeling of accepted values. In other cultures, studying the relationship between society and the environment leads pupils to adopt values derived from their studies. In cultures where inquisitiveness is encouraged, pupils come to value curiosity and questioning. In democratic societies, pupils also develop shared values around concepts of democratic process, community participation in decision making, volunteerism, and social justice. Each of these approaches contributes to the overall goal of sustainability* (p. 22)

Social justice, which is considered the central part of ESD in most countries, includes meeting basic human needs and caring for the rights, dignity and well-being of all, is another aspect of ESD values (UNESCO, 2014). Social justice supports the respect of other society's traditions and religions (McKeown, 2006). Environmental sustainability and conservation of resources are parts of social justice. The values taught in the school should reflect the wider values of the community around the school. And new values must be considered by policy maker if needed.

2.4.3 Public Understanding and Awareness of ESD

SD needs a population aware of SD goals and possess knowledge and skills necessary for SD (UNESCO, 2006). Well informed citizen is an essential requirement for any democratic society. Because population, empowered with SD skills and knowledge will help the governments to implement SD policies. According to UNESCO (2006), people are surrounded by media and, therefore, must be media literate to analyze any advertisement. Research shows that individuals "*aware of and informed about resource-management decisions and programs can help achieve program*" (UNESCO, 2006, p. 17). While unaware population can undermine resource-management program. Similarly,

education is essential in many other programs, such as public health efforts to prevent the spread of certain diseases.

2.4.4 Training

The third priority of Agenda 21 was training. The world needs literate and ecologically aware citizens and work force to help countries implement their sustainable development plans. Therefore, all sectors of a country are encouraged to provide basic training about environmental management to their leaders and workers (UNESCO, 2006). As training is different from education in the sense that training is about a specific skill (Barnes, 2014).

Training enhances efficacy, reduces risk and improves competitive advantage. For example, training will ensure that waste materials are not disposed to streams and rivers (UNESCO, 2006). Similarly, providing training to community women will encourage them to use solar cooker than open cooking on wood fire, ensures major changes in social dynamics and processes (UNESCO, 2006). Training informs society about accepted practices and procedures, and gives them the skills to perform a specific task (Barnes, 2014). Where education transforms people knowledge, skill, value and perspective to live a prosperous life and contributes to the development of the society and nation (UNESCO, 2006).

2.5 Method used by Education to Achieve SD

For ESD both action and behavior are essential aspects. UNESCO (2011) stated that the ultimate purpose of ESD is to empower "*individuals to take charge, collaborate and build a sustainable world*" (p.12). The purpose of ESD is to empower individuals with knowledge and skills to take action on the information they gain and mend the damage

done to the planet rather than just acquiring knowledge and information for examinations and grades (UN-General Assembly, 2010).

According to Howe (2009), effective learning about SD should reflect and articulate changes in student behaviors to promote a sustainable society. However, it is impossible for schools to directly teach specific behaviors or develop solutions for a number of unsustainable problems (Rauch F. , 2002). Therefore, how to achieve SD through ESD is a debatable topic, which will be explained in the next paragraph.

Education is essential for an individual to develop his/her understanding, knowledge and skills of SD (UNCED, 1992; UNESCO, 2011b; Cheng, 2015). According to Holmes (2003), to implement and assess SD a greater knowledge of its principles and a clear understanding of its economic, cultural, and social factors is required. For example, Aipanjigul, Jacobson, and Flamm (2003) found that greater knowledge and understanding of manatees have a positive correlation with the support for the conservation of manatees.

However, it has been noted that the language of experts is "*often act as a barrier to many people and groups*" (Knightsbridgè-Randall, 1999, p. 88), and insufficient knowledge of socioeconomic aspects and lack of understanding in sustainable development, the phrase engaged in the global strategies for SD has been a dominant factor in the ongoing unsustainable crises (Gardner, 2004). Similarly, the important basic skills of SD also need to be developed (Learning and Teaching Scotland [LTS], 2010).

According to UNESCO (2005a), for SD important skills such as creative and critical thinking, collaborative skills, decision-making, conflict management skills, problem-solving skills and planning skills need to be developed. Facing all the above mentioned challenges, education which trains, transmits knowledge and develops skills in individual,

should be able to satisfy all the requirements discussed above to achieve SD. Education is not only the acquisition of knowledge, understanding and skills but also is a source of producing "*new knowledge and understanding in a co-operative and critical process*" (Sauvé, 1996, p. 25).

The 36th chapter of Agenda 21 argues that education should be used in a manner to empower individual with skills to actively participate in the development of sustainable planet (Zhang, 2009). In addition, education is positively correlated with understanding and attitude, known as "*feeling, values or beliefs of individuals*" (Howe, 2009, p. 12). Developing awareness and positive attitude is considered as one of the main goals of ESD. The World Conservation Strategy-'Caring for the Earth stated that a positive change in people's attitude and mind is essential for the development of sustainable society (Tilbury, 2004). Similarly Stimpson and Kwan (2001) cite that the failure and success of SD depend on the individual's knowledge and awareness.

However, many people have little interest and awareness of sustainability to overcome their SD concern (Huckle & Sterling, 1996 cited in Cheng, 2015). Yan (2007) found that a weak awareness of sustainablity resulted in negative attitude towards SD, which is the main cause of environmental degradation, inequity, poverty and other problems. He also argue that education is the only solution to unsustainable problems. Gadotti (2010) states that people's positive awareness and attitudes is essential for SD actions, which largely depends on education.

According to Sterling (2006), education increases people knowledge, and develops skills, values, attitude and comprehension and enables them to actively participate in SD locally and globally to develop a sustainable society. Chapter 36 of Agenda 21, emphasizes

both formal and non-formal education to promote ethical awareness, values and attitudes inherent in SD (UNESCO, 1992 cited in Howe, 2009). According to Kwan and Lidstone (1998), schools are ideal and appropriate places where values and attitudes can be transmitted to achieve SD.

According to Wang and Wang (2004), education not only enhances people knowledge, skills and understanding of sustainability but also shapes their attitude to behave appropriately towards environmental, social and economic development. Although developing knowledge, skills, values, attitude and behavior are conducive for SD but a specific process for adopting a positive behavior is still not very clear (Cheng, 2015). A small number of studies draw the attention to this topic, which are analyzed next.

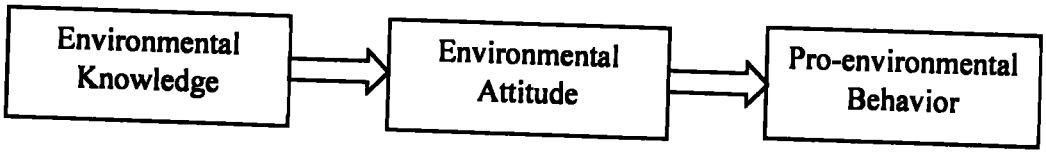
Byers (1996) defines behavior as "*the decisions, practices and actions of people, as individuals and as groups*" (p.1). Research shows that knowledge, skills and understanding of environmental issues alone are inadequate to bring about pro environmental behavior (Kollmuss & Agyeman, 2002). But changing attitude of individuals sometimes change their behavior (Nickerson, 2003). For example, it is founded that knowing about what is affected by environmental conditions and about whether an individual action can reduce such effect, influence pro-environmental behavior (Joireman, Van Lange, & Van Vugt, 2004). Therefore, knowledge of the consequences of environmental degradation, and public information campaigns that inform people about the benefits of individual action, could potentially affect behavior.

There are different models that explain the pro environmental behavior. A simple linear model was developed in the early half of the 20th century, assuming that an individual's knowledge of environment leads to environmental awareness and concern that

consequently result in pro environmental behavior (Kollmuss & Agyeman, 2002). This model suggested that educating people about ecological issues will shape their pro environmental behavior (Burgess, Harrison, & Filius, 1998).It is illustrated in the following figure 2.3.

Fig. 2.3

Simple Linear Model of SD

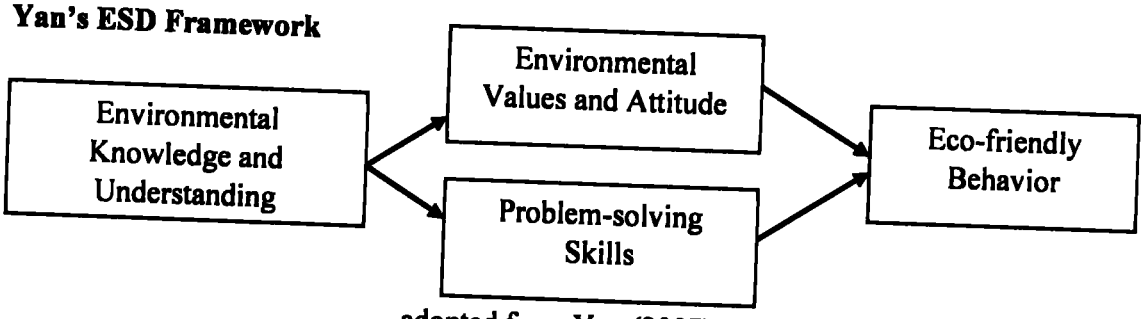


(Adopted from Kollmuss & Agyeman (2002))

Yan (2007) adopted this model, adding that Knowledge, skills, values and attitudes are essential for pro environmental behavior. See figure 2.4.

Fig.2.4

Yan's ESD Framework

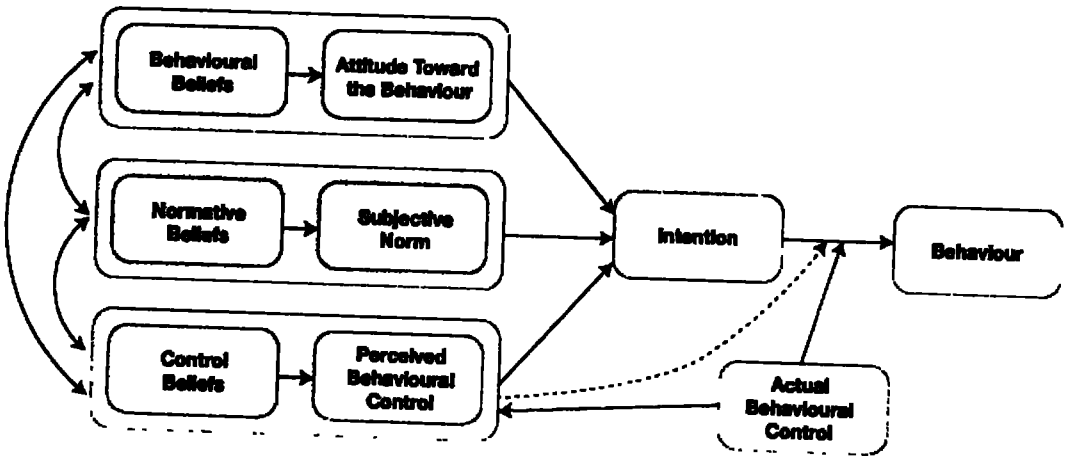


adopted from Yan (2007)

Attitude behavior model is used by theory of planned behavior, assuming that attitude can not change behavior directly but influences the intention of an individual and shapes his/her actions (Kollmuss & Agyeman, 2002). According to this model, the intentions are also influenced by the social pessure. See figure 2.5.

Figure 2.5

Theory of Planned Behavior



To conclude, SD demands a major change in people's minds and behaviors, which cannot be achieved without ESD, to build their capacity (Hann, Bormann, & Leicht, 2010).

2.6 ESD in Primary Schools

Despite the great burden of transmitting basic skills of reading, writing and computing and other tasks such as test, social work and many more on schools and teachers, ESD must be offered in primary schools (Künzli David, Bertschy, de Haan, & Plesse, 2008). Primary school activities should enable children to attain the essential skills for a sustainable future in a well-functioning society. According to UNESCO (2012a)) as a primary agent of transformation, youth and adults are the focal point of ESD, while primary school period is considered very crucial in this regard (Benavot, 2014). Therefore, EFA and UPE directly support policies that eradicate poverty, injustice, and increases prosperity. Similarly, ESD was developed as a complementary framework that promotes EFA priorities and the

MDGs, for example, decade of ESD (2005-14) implementation plan stresses the relationship between ESD and EFA (UNESCO, 2005).

ESD supports the EFA agenda by improving the quality of basic education and helps the nations to adopt modern pedagogical practices to transform the lives of our young ones (Benavot, 2014). At the national level, many policies and programs regarding ESD in basic education have become relevant as they are related to national education priorities, not necessarily deduced from the agenda of EFA. A framework of ESD was developed in Indonesia to promote democratic learning technique (UNESCO, 2011). According to de Leo (2012), in Australia ESD values have been incorporated in those subjects that foster multicultural and indigenous education. The Associated Schools Project Network (ASP.Net) developed a plan to resolve Sri Lanka ethnic conflicts (Korean National Commission for UNESCO [KNCU], 2009).

In such circumstances, ESD policy communicates and answers to local issues related to quality of education, equality and inclusion, environmental education, peace education, health care education, development education, global citizenship, Aids education, values education etc. (UNESCO, 2011b).

According to Benavot (2014), ESD challenged policy makers to move beyond the link between ESD and content-based educational priorities, and considers the role of education in attaining economic, social and ecological sustainability. Therefore, ESD policies and initiatives are significantly different from prior educational reforms, where educational policy hardly tries to integrate social, cultural, and economic policies (UNESCO, 2012a). The main purpose of ESD is to bring change in the attitude and behavior of individuals by implementing integrated policies to promote environmental integrity, economic stability,

and a fair and just society (UNESCO, 2005). Therefore, primary education consists of a complete set of ESD values that defines the content of schools, which plays a significant role in the development of a sustainable world.

2.7 Pedagogies of ESD

ESD pedagogy encourages students to ask questions, "*analyze, think critically, and make decisions*" (UNESCO, 2012a, p. 15). Similarly UNESCO (2012a) describes that ESD pedagogies are students centered pedagogies and promotes participatory learning rather than rote memorization. These pedagogies are mostly place based or problems based, which stimulates critical thinking, social criticism, and analysis of the situation. Therefore, discussion, analysis and values application are the focus point of these pedagogies (USTESD, 2013).

These pedagogies often rely on art such as music, drama and painting to enhance creativity and conceive an alternative future (UNESCO, 2012a). These pedagogies transform students' attitudes towards the development of a just society and sustainable future. According to USTESD (2013) different pedagogical techniques used around the globe are according to ESD criteria. These pedagogies empower students with skills that enable them to actively participate in community development and live a prosperous life after leaving the school. Similarly Partnership for 21st Century Skills [p21] (2009) describes that these techniques are essential for the development of skilled manpower, who could work collaboratively with diverse groups. All those techniques that support collaborative learning and enhance critical thinking fit in ESD criteria (UNESCO, 2012a). Details of some ESD teaching techniques and sample activities are given below.

2.7.1 Class Discussions

This technique transmits knowledge amongst students, and from students to teacher, instead of the traditional way from teacher to student. As we have very diverse classrooms, and students with different life experiences come to our classrooms that can further enhance the teaching of the mandated curriculum. In this way, students can make a great contribution to the discussion of sustainability issues through observations of their neighbors about what is sustainable and what is not. Then this classroom discussion can be used to provide a real life application of the concept.

As the primary purpose of ESD is to develop certain skills in individuals and classroom discussion enhances students' oral communication skills. According to UNESCO (2012a), students with strong auditory learning modalities, learn well from discussions, both from listening and expressing their own ideas. As class discussion is a students' centered technique, promotes participatory learning and enhances students to analyze and think critically, fulfils ESD pedagogical criteria (USTESD, 2013).

Class discussion also required prior planning to get maximum from the activity. It can be built on a set of questions, a problem to solve or complete an activity (UNESCO, 2012a), which requires discussion between group members. There are different forms of discussion ranging from a large group like whole class to small group of two to six students, from teacher led to students led or interactive (Barton & Heilker, 2018). Norms and rules to be set for effective classroom discussion e.g. one person will speak at a time while other will listen (UNESCO, 2012a; Barton & Heilker, 2018). Teacher can use discussion to assess students' knowledge about SD and its three pillars.

Sometimes, one aspect of ESD is obvious than other (e.g. recycling of aluminum cane is good for environment because it conserves the energy) other aspect (such as recycling is beneficial for economy because recycling provides employment opportunities) will not be evident (UNESCO, 2012a).

2.7.2 Simulations

Simulation is a creative pedagogical technique in which the teacher describes the context in which the students interact (Espada, 2014). According to Espada (2014) in simulation technique the scenario is presented in a synthetic environment and opportunity is provided for students to teach the topic instead of passively listening to the teacher. It helps the students to acquire the essential skills through practice (Salas, Wildman, & Piccolo, 2009). Simulation is used as a powerful tool for creating a more realistic, experiential learning environment (Espada, 2014).

In simulation, students' participate in the scenario and collect meaning from them (UNESCO, 2012a). For example, students' think that they live in a small fishing village and must learn how to sustainably manage their fish stocks without reducing the fish stock or starving people. As simulation provides a real life scenario, it motivates and engages students of all ages (Scoullos, et al., 2013). According to UNESCO (2012a), sustainability concepts are often abstract and complex, while simulation diminishes complexity and highlight key aspects by providing concreate examples, which are essential for children and adolescents who are still in the concrete stages of cognitive development (Espada, 2014; UNESCO, 2012a). Simulation fulfils the ESD criteria by involving students in visual, auditory and tactile-kinesthetic teaching methods, thereby promoting equality. Similarly, it promote higher order thinking and addresses real life problems.

Teacher is a mentor and provides constructive feedback, and serves as an arbiter and mediator between difficult lesson and students (Espada, 2014). Similarly, he/she explains the context and rules of the simulation, and reflects on simulation (UNESCO, 2012a). Assessment after simulation can be carried out by asking different questions like (1) what did you learn? (2) How is this simulation like real life? (3) How does the simulation differ from real life? The answers of these questions will provide a great deal of understanding of what students' perceived and learned during simulation.

2.7.3 Issue Analysis Techniques

According to McKeown and Dendinger (2008), teaching technique that is predicted to become more and more central to learning as the world struggles with the complex problems that arises from globalization, and climate change, is issues analysis technique. It is a structured technique used for exploring the root cause of environmental, social, economic and political problems (UNESCO, 2012a). According to McKeown and Hopkins (2010), the hallmark of teachers in the 21st century may be the ability to analyze complex issues that are student-centered and participatory.

Issue analysis helps students identify key arguments about a social issue, as well as identify important stakeholders and their perspectives, goals, and problem-solving assumptions. It looks critically at the proposed solutions and costs - financially and otherwise, and who will pay these costs. It can be done briefly or indepth (UNESCO, 2012). SD is a complex concept and covers environmental, social, economic and political issues and the challenges faced by global community.

Learner must develop the tools and framework to tackle the complixity of SD faced by their community (USTESD, 2013). Similarly, they will have to create solution that are

locally and globally appropriate (UNESCO, 2012a), such as cleaning up local pollution without sending toxic and harmful waste to another country. Issue analysis enables students to apply knowledge in different context. Similarly, it enables students to identify problems in their own comminity as well as in global community.

In the age of ICT, students are in contact with their neighbors around the globe. In addition, the media exposes them to excessive wealth and poverty and many other injustices in the world (UNESCO, 2012). Issue analysis fulfils the ESD criteria by bringing relevance to the curriculum, promoting high order thinking and critical thinking skills. It also stimulates decision making and thinking about the future.

Clarke's (2000) demystification strategy is considered a best strategy for issue analysis at primary school level. It consists of four questions

1. What is the issue about?
2. What are the arguments?
3. What is assumed?
4. How are the arguments manipulated?

According to USTESD (2013), these questions are, especially, useful for studying issues that appear in the media and affect the local community. Students answer the questions for community issues or problems, and clearly define them. It can be carried out in group as well as individually (UNESCO, 2012a).

2.7.4 Storytelling

Storytelling is the true form of teaching (Dujmović, 2006). Stories educate, illustrate, enlighten and inspire the learner. Storytelling has been used for generations to entertain the people and preserve the culture (UNESCO, 2012a). Storytelling makes the listeners and

teller relax and stimulate minds (Dujmović, 2006). Conveying and illustrating ideas of sustainability through storytelling is a fascinating form of education (UNESCO, 2012a). It is a big source of motivation both for teacher and learner (Dujmović, 2006). Storytelling is an effective pedagogy of ESD because values in traditional stories often contain the wisdom of elders or stem from creation stories, which help build respect for cultural heritage and the environment (UNESCO, 2012a).

Storytelling makes textbook ideas, theories and concepts alive. Storytelling enables teachers to develop a deeper connection with learner, and enable them to transmit knowledge, skills and values about SD in an effective way (UNESCO, 2006). Storytelling is, especially, good for students whose preferred form of learning is auditory (UNESCO, 2012a). It is difficult to remember a list of different concepts and definitions, but it is easier for students to recall the story associated with these concepts. It is carried in a non-threating environment which involves the learners and provides a conducive learning environment (Dujmović, 2006).

Storytelling fulfils the ESD criteria by linking traditional and indigenous knowledge and transmitting wisdom from one generation to the other (UNESCO, 2012a). As in traditional stories people express their values, dreams, fears and hopes (Dujmović, 2006). Similarly, express the literary and cultural heritage, and through which this heritage is appreciated, understood and kept alive (UNESCO, 2012a; Dujmović, 2006) and promote equity in the classroom by engaging auditory students. Similarly instill values, skills and attitude of SD (UNESCO, 2012a).

2.7.5 Field Trips

Field trip is considered as one the best teaching method where students observe, ask and learn from actual hands on experience. It helps the learners to learn new experiences in a new and casual environment. The term "field" refers to the natural, cultural, and social environment, consisting of many sites (Scoullos, et al., 2013). These sites must be appropriate to implement ESD plans (UNESCO, 2010). The direct observation of the phenomena provides the opportunity to assess the interrelationship between the different spheres of SD and enable them to bridge the classroom knowledge with real life experiences (Scoullos, et al., 2013).

Similarly, Scoullos, et al. (2013) state that field trip should be conducted with a specific purpose, depending on the learner's age and interest and area of visit. Activities organized for the field trip must be relevant, stimulating which provides learners with an opportunity to interact with the area (Kamarinou , 2000).

For primary school students the purpose of field trip must be, to develop their interest in the environment, especially, through senses (Scoullos, et al., 2013). For example the purpose of a field trip to a small river or lake, where local people allow trash to be dumped should be, to assessed the impact of uncontrolled waste disposal on environment. The activities for primary school childeren should be to observe, collect and classified. Field trip fulfils the ESD pedagogical criteria by developing life-long skills in individuals, renews learning skills and shapes their future (Davis, 2019). Similarly, it develops a sense of equity by engaging each individual in the trip (UNESCO, 2012a).

There are many other participative techniques like problem based learning, classroom exposition, learning through objects, experiential learning, enquiry based learning, values

clarification and analysis, future problem-solving and many more techniques that can be used independently or combining with other techniques to promote both independent and collaborative learning.

2.8 UN and ESD

Education is considered as the main source of confronting future challenges. Although it is not the whole solution of future problems but it certainly plays a vital role in solving these problems, it develops a strong relationship among people, and builds a greater respect for ecosystem (UNESCO, 1997).

Education as a tool for international SD was first recognized at the 1972 Stockholm Conference on the Human Environment. The stockholm declaration recognized the need for a common vision and principles to guide the people around the globe to preserve and protect the Human Environment (Crawford, 2017). The conference adopted 26 principles, the principle 19 of the conference emphasises the need to educate childeren and adults regarding environmental issues to shape their attitude for a better world. Similarly, the 1975, Belgrade Charter and the 1977 Tbilisi Declaration also emphasised environmental education.

All these initiative emphasis on the importance of education for a better world. The early focused of these initiatives were to preseve the environment, therefore, it limited the SD to just ecology and the socio-economic factors were not linked to SD (Baker, 2006). Crawford (2017) stated that the 1960's moment were narrowly focused on restoring environmental balance. According to Spangenberg, Pfahl, and Deller (2002), "previously" each UN report addressed only one international issue.

Opposite to this, the 1987 Brundtland Commission reconciles the two critical problems which was considered as a gap between developed and developing countries: environment and development. During this time, environmental problems developed and became increasingly intertwined with other problems in order to balance the ecological, social, and economic aspects of human development. (UN-WCED, 1987).

In 1992, the world community gathered in Rio for "World Summit" and approved agenda 21 as a plan of action for future development. In this comprehensive plan, a whole chapter (chapter 36) was devoted to education aiming to improve people, knowledge, skills values and attitudes to promote sustainability and enhance their capacity to adress SD issues (Fien & Tilbury, 2002). However, its importance was not recognised by world community until it was considered by commision on SD in 1996 (Crawford, 2017). At that time, education was considered an essential element to change only the unsustainable production and consumption patterns and lifestyle (UNESCO, 1996). Agenda 21 highlighted education as a primary agent of transformation towards a sustainable future.

In 2002, the world community gathered in Johannesburg for World Summit on SD. This summit broadened the vision of Agenda 21, which focused on education that respected the natural environment only, while the Johannesburg declaration emphasized educational reforms that preserve the environment, promotes social justice and improve quality of life, which are essential for SD (UNESCO, 2006). It was remarkable as it demonstrated the growing importance of understanding the relationship between SD and economics. (Crawford, 2017). There was much criticism on ESD after Agenda 21 that most of the projects started after its approval were the extension of environmental and geographic

education (Reid, 2002). To overcome this and other challenges, a strong policy guidance was required.

In December 2002, the UN approved the decade of ESD through resolution 7/254. The decade lasted from 2005 to 2014 and led by UNESCO. Education for all (EfA) was the motto of the decade to bring social justice. Moreover, its purpose was to bring changes in educational policies of industrialized countries (Bourn, 2005).

The main purposes of this decade were to:

- *Facilitate networking, linkages, exchange and interaction among stakeholders in ESD;*
- *Foster an increased quality of teaching and learning in education for sustainable development;*
- *Help countries make progress towards and attain the millennium development goals through ESD efforts;*
- *Provide countries with new opportunities to incorporate ESD into education reform efforts.* (UNESCO, 2005, p. 6)

UNESCO adopted International Implementation Scheme of the UN Decade of ESD, with the purpose to describe goals and objectives for DESD and describe key aspects of the decade. One key aspect was the collection of indicators to monitor progress. The document also describes how the world community can contribute to DESD (UNESCO, 2005).

On September 25th, 2015, UN General Assembly adopted resolution A/70/L.1 for "Transforming our World: the 2030 Agenda for SD", the purpose was to develop a plan of action for post 2015 development. The focus of this plan of action are people, planet and prosperity (United Nations, 2015). The post-2015 agenda includes 17 SDGs and 169 global targets that will be implemented by all countries and stockholders. SDG 4 is about education, aiming to provide quality education and lifelong learning opportunities for all. While the 4.7 of SDG 4 stated that:

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (United Nations, 2015, p. 17)

Agenda 2030, is a universal call of action that will be implemented by global community through collaboration and partnership.

2.9 Transition from MDGs to SDGs

In September 2000, world community adopted the Millennium Declaration (MD) to diminish poverty and hunger, and to tackle ill-health, gender inequality, lack of education, lack of access to clean water and environmental degradation to be achieved by 2015 (UN, Millennium Summit, 2000). The MDGs are derived for this declaration. Each goal had specific targets and indicators. The Eight Millennium Development Goals were:

1. To eradicate extreme poverty and hunger;
2. To achieve universal primary education;
3. To promote gender equality and empower women;
4. To reduce child mortality;
5. To improve maternal health;
6. To combat HIV/AIDS, malaria, and other diseases;
7. To ensure environmental sustainability; and
8. To develop a global partnership for development.

MDGs were considered to be the best efforts ever made by world community to eradicate poverty in its all forms, still it is greatly criticized that these were for developed

countries only (UNESCO, 2011). Most of the countries integrated the MDGs into their national and sub-national development plans and strategies, and implemented specific measures intended to achieve the related targets. However, progress was uneven and, in spite of best efforts, many countries missed one or more of the MDG targets.

As a signatory of MDGs Government of Pakistan formulated three strategic planning documents during the initial five years of the MDGs period that reinforced the commitments to the MDGs in an elaborated and operational manner. Pakistan adopted 16 targets and 41 indicators against which progress towards achieving the Eight Goals of the MDG's is measured (Rabeea, 2015), but some internal and external economic and other challenges hinder in MDGs achievement (Ministry of Planning [MP], 2013) as the other country with the same economic conditions have achieved far better results than Pakistan on MDGs e.g. sub Saharan African countries (Rabeea, 2015).

The natural and man-made disasters, economic development, and political and institutional landscape were considered the biggest hurdles in achieving MDGs (MP, 2013). Another problem was the ever increasing population of the country, which is increasing with a rapid speed of 2.1% (World Bank, 2018).

At the retirement of MDGs and arising of SDGs in September 2015, Pakistan signed the Agenda 2030 "Transforming Our World". This Agenda is a plan of action for people, planet and prosperity (United Nations, 2015). It also seeks to strengthen universal peace in larger freedom. This agenda has 17 SDGs and 169 targets. It is a follow-up of MDGs, and will achieve, what was left in MDGs. They seek to realize the human rights of all, and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and balance the three dimensions of sustainable development:

the economic, social and the environment The goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet (United Nations, 2015). The focus of this agenda is on people, planet, prosperity, peace and partenership.

2.10 Education for Sustainable Development in Pakistan

As a member of UN, Pakistani Government approved the Agenda 21, on March 1, 1992, under National Conservation Strategy to guide SD other initiatives (Dhindsa, 2016) . The federal government coordinated it informally and associated other agencies such as Environment and Urban Affairs Division, The Sustainable Development Policy Institute (SDPI), and was linked with Pakistan Environmental Protection Council for regulatory. Pakistan is a part of the UN environmental education program (IEEP), which led the country to reorient the current education system towards SD with a compulsory element in the curricula at secondary and higher secondary level (Kalsoom, Qureshi, & Khanam, , 2019; Dhindsa, 2016).

With the retirement of MDGs and the elaborative SDGs ready to take field, a national frame work (for SDGs) was proposed in March, 2018 by National Economic Council (NEC). The basic purpose of this frame work was to get maximum result in minimum time in term of economic security, population control, eradication of poverty and hunger, quality education and ecological perspective (Governmet of Pakistan National Frame work[NFW], 2018).

This framework localizes the SDGs, goals and targets that are more important than other in Pakistani context, were identified and prioritized. This framework divided SDGs in three categories.

In category-1 those SDGs were included, which need immediate policy intervention to achieve these goals in short time like food security, healthy life, equitable and quality education, clean drinking water and sanitation, peace and affordable and clean energy.

Category-2 contains those goals, which require a longer period of time e.g. eradication of poverty, reduction of discrimination both in gender and urban rural areas.

Category-3 consists of those goals, that required a "*long gestation periods and will require major institutional reforms*" (NFW, 2018, p. 4). Main objective of these prioitization exercise is to get maximum of all these targets by 2030. Development based on the knowledge economy and promoting effectiveness through education, are central element of this policy. But there are different challenges which can hinder the achievement of these targets.

This frame work also points out the obstacles and constraints, and argues that ever growing population and its pressures on resources affecting economic growth, war on terror, political uncertainty and lack of administrative and financial powers at lower level will hinder in achieving these goals. The greatest problem identified by this framework was, how to create awareness and knowledge about SD in public.

To overcome all these obstacles and achieve these goal, this framework suggested, a strong political, policy and institutional support for the achievement of SDGs. Similarly an effective collaboration with non-government organization and partnership with community organizations and private sector will also be required to achieve these goals (Dhindsa, 2016).

2.11 Summary of the Chapter

The history of SD and ESD as well as an overview of the basic concepts related to SD were explained in this chapter i.e. the three pillars of sustainable development, interdependency of these pillars, ESD and sustainability, nature of education, relationship between nature of education and SD, and challenges of SD. Similarly the chapter outlined the concept of ESD and the methods used by ESD to achieve SD. The chapter also discussed the importance of ESD in primary education as well as the strategies used for implementing ESD around the globe in primary education settings. At the end of the chapter UN role for SD and transition from MDGs to SDGs were also discussed. Similarly, a review of research in the field of ESD in Pakistan was also presented.

Chapter 3

3. Research Methodology

3.1 Paradigm and Worldview

According to Patten (2002), "*a paradigm is a worldview – a way of thinking and making sense of the complexities of the real world*" (p. 69). Paradigms are stem from epistemology, ontology and philosophy of sciences, which guide the research and practices and provides basic assumption about the reality (Willis, 2007; Patton, 2002). This study borrows some aspects from the transformative worldview which believes in multiple realities that are socially constructed (Mertens, 2007).

According to Mertens (2007) values that define these realities must be clear such as "*social, political, cultural, economic, ethnic, racial and gender*" (p. 216). This worldview focuses on the knowledge of social values and skills that provide opportunity to identify the reality that has the potential to bring social transformation and enhance social justice. To be more precise, this transformation will change individuals' behavior and lifestyle to achieve a sustainable future. Students will directly experience this transformation when knowledge, skills, values and attitudes about SD are taught or discussed in the classroom.

From another perspective, the use of mixed methods in the study proposes a pragmatic worldview, pragmatist bases knowledge on social constructs and the reality that we experience in everyday life (Johnson, Onwuegbuxie, & Turner, 2007). According to Creswell (2009), the pragmatism worldview is based on "*action, context and consequences rather than antecedent conditions*" (p. 10), similarly, to the contextual framework of this

study. Creswell (2009) states some characteristics of pragmatism worldview that supports to use it as main worldview for this study. Particularly, it allows the researcher to use mixed methods, which is the basic element of the research design for this study.

Similarly, this worldview provides the freedom of choices, researcher is free to select the methods, approaches and techniques to meet the purpose of the study, and this freedom was used to a large extent because the study consists of content analysis and survey. Thus the pragmatism worldview opens doors to different methods and techniques, data collection and different analysis. According to Creswell (2012), the pragmatists focus on the context in which the research occurs (i.e. social, political, economic etc.), which are essential elements of this study. Furthermore, this worldview answers the "what" and "how" of the research. Since the study is subject to freedom of choice in terms of research methods and techniques, offered by pragmatism and manages to answer the two fundamental questions of what and how.

More specifically, this study answers how the aspects of ESD are included in primary school curriculum, how do primary school teachers understand 'ESD', what is their attitude towards ESD, what strategies they use to implement ESD in their classrooms and finally what are the factors that hinder the implementation of these strategies in the classroom.

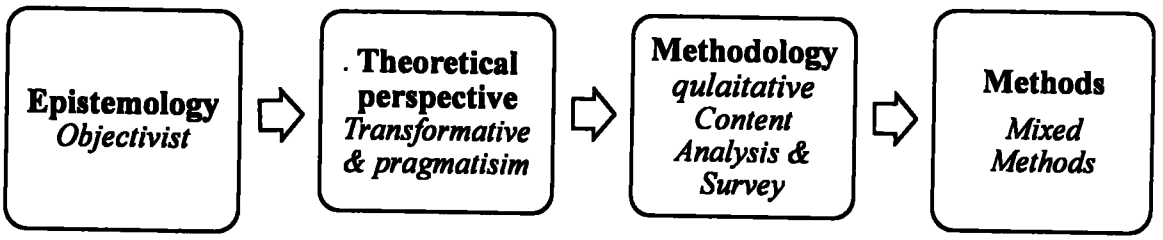
3.2 Epistemological and Ontological Perspective

According to Gray (2014), "*Ontology is the study of being*" that is, the nature of existence and what constitutes reality" (p. 62). The difference between ontology and epistemology is that ontology searches to understand "what is" while epistemology search for "what it means to know". In fact, epistemology provides the philosophical basis for a

research study and helps the researcher to adopt an appropriate research design to conduct the study. It is shown in the following figure.

Figure 3.1

Epistemology to Methods



(Adopted from Gray, 2014)

The figure 3.1 represents the framework for design adopted from Gray (2014). The italicized headings describe the whole process suitable for this study. The objectivist epistemology recognized that the reality is located in a socially and historically complex cultural context.

This study is based on transformative and pragmatism worldview. Transformative worldview believes in socially constructed multiple realities. While, pragmatism worldviews are based on actions, context and consequences. Epistemology and ontology of this study represent philosophical assumption of transformative worldview.

3.3 Research Method

The main purpose of the study was to analyze primary school curriculum regarding ESD and investigate teachers understanding of the term, and their attitude towards SD. To achieve this purpose the study used a mixed methods research approach. "*A mixed methods*

research methodology is a procedure for collecting, analyzing, and 'mixing' both quantitative and qualitative methods in a single study or a series of studies to understand a research problem" (Creswell, 2012, p. 535). Mixed methods use the synergy and strengths of qualitative and quantitative researches to better understand a phenomenon (Gay, Mills, & Airasian, , 2012; Creswell., 2012).

According to Creswell (2012), mixed methods "*consists of merging, integrating, linking, or embedding the two strands*" (p. 535). It allows the researchers to triangulate the data and get better understanding of a problem (Creswell & Creswell, 2018). According to Creswell and Creswell (2018), mixed methods has been used in different fields of social and humans sciences such as "*occupational therapy, interpersonal communication, AIDS prevention, occupational health, mental health, and in middle school science*" (p. 346).

Researchers use mixed methods to build on the strengths of both qualitative and quantitative data and minimizing their weaknesses (Gay et al., 2012; Creswell & Creswell, 2018).

3.3.1 Research design

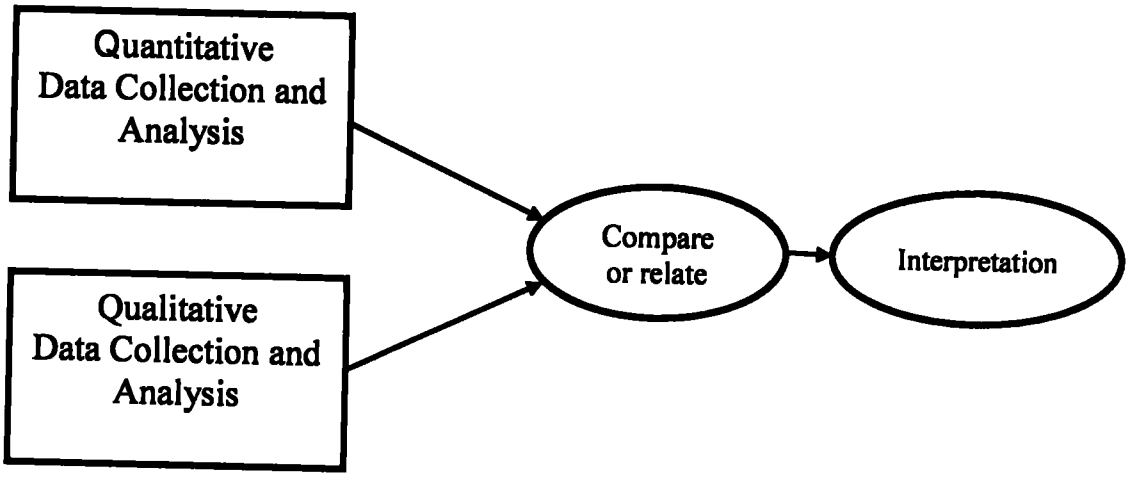
Creswell, Plano Clark, Gutmann, & Hanson (2003) identified a typology of mixed methods designs drawn from different fields of social and human sciences. Depending on study requirements, different mixed methods strategies could be adopted.

This study used a convergent parallel design also known as concurrent mixed methods design. It is a single phase approach, in which the qualitative and quantitative data are collected concurrently, and analyzed separately, and then compared the results to confirm the finding of each other or vice versa (Creswell & Creswell, 2018). According to Creswell and Creswell (2018), in this design "*qualitative and quantitative data provide different*

types of information" but together should give the same results (p. 352). In this design, both qualitative and quantitative are weighted equally (Gay et al., 2012). The quantitative data were collected through ESD literacy test and attitude scale and the qualitative data were collected through content analysis to identify the status of SD and ESD in primary education curriculum. Both types of data were analysed and then tringulated to address the research problem. This one phase convergent design is shown in figure 3.2.

Figure 3.2

Convergent Mixed Method Design



(Adopted from Creswell and Creswell (2018))

The purpose of the study was to analyze the primary education curriculum to find out the status of SD and ESD, to investigate primary schools teachers understanding of ESD, their attitude towards ESD, the strategies they use to implement the ideas of ESD in their classrooms, and the factors affecting the implementation of these ideas. The combination of both quantitative and qualitative methods reveals a more effective approach to achieve these objectives. Therefore, the convergent design of mixed methods was appropriate for

the study as this design compares the quantitative and qualitative findings to create a greater understanding of the research problem.

3.4 Population

The study used a concurrent mixed methods design and both qualitative and quantitative data were collected concurrently. The qualitative data were collected through content analysis, whilst the quantitative data were collected through a questionnaire comprise of an ESD literacy test and attitudes scale. According to Weber (1990, p. 42) for content analysis "*the universe must first be identified*". Therefore, the population for qualitative portion of the study comprises primary school core curriculum adopted by all primary schools of Khyber Pakhtunkhwa [KP].

The population for quantitative portion of the study comprises all primary school teachers (both male and female) in the four districts of KP, Pakistan, namely Malakand , Haripur, Charsadda and Kohat. These districts represent northern, eastern, central and southern parts of KP respectively. The defined population was a total of 10905 primary school teachers as listed by Elementary & Secondary Education Department Khyber Pakhtunkhwa [E&SE] (2019). Table 3.1 shows detailed description of this population.

Table 3.1

Population description

Name of District	Teachers		Total
	Male	Female	
Malakand	1304	892	2196
Charsadda	2,200	1,568	3,768
Haripur	1,306	1,163	2,469
Kohat	1438	1034	2472
Total	6,248	4,657	10,905

3.5 Sample of the Study

The study used a concurrent mixed methods design. The qualitative data are based on the content analysis of primary education curriculum. According to Elo, et al. (2014) in qualitative content analysis sampling method is rarely mentioned but Krippendorff (2004) states that if the "*universe of text be examiend, is too large than the researcher should select a manageable body of text*" (p. 111). Similarly, Creswell (2012) stated that considering sampling methods in qualitative research is important. Purposive sampling technique is commonly used for qualitative content analysis (Ward, 2012; Elo, et al., 2014). Purposive sampling technique is used to select text that can best answer the research questions (Krippendorff, 2004). It helps the researcher to select individuals or text that can provide the relevant information about the research topic (Creswell, 2012; Gay et al., 2012; Elo, et al., 2014).

However, in order to make the sample trustworthy, it is necessary to provide complete information about it (Elo, et al., 2014). According to Krippendorff (2004), using purposive sampling provides the opportunity to select text that has relevant information, and excludes irrelevent text from analysis. In Pakistan primary level consist of six grades. Different basic subjects such as Urdu, English, Mathematics,Social Studies, Genral Science and Islamic Studies are taught in these grades.

The number of subjects varies in the initial grades, and focuses on basic skills such as reading, writing and computing. Therefore, sample for qualitative content analysis was selected from grade 4 and 5. In order to get relevant information about sustainability, a purposive selection of text books was made. Four subjects Urdu, Islamic Studies

(Islamyat), General Science and Social studies of Grade 4 & 5 were selected for analysis purpose. Urdu represents the language subject and has the potential to address both societal and environmental issues. Similarly, Islamic Studies and Social Studies can represent the values aspect of society as well as environmental. General Science present fact based knowledge about the development and environmental issues.

The quantitative data were collected through a questionnaire comprising teachers ESD literacy test and attitudes scale. A proportionate convenience sampling technique was used to select sample for quantitative portion of the study. This technique was adopted because of the literacy test. As convenience sampling enables the researcher to select individuals on the basis of their availability for the study (Creswell, 2012), which makes it, both time and cost effective (Given, 2008). Sample size was selected using 95% confidance level and 5% confidence interval. Applying these condition the total sample for survey was calculated to be 371 (Creswell, 2005).

Due to sustainability literacy test, some non responses were expected, the researcher opted a sample of 400 teachers from four districts of KP. As the numbers of male and female teachers vary greatly, therefore proportionl representation was opted, which is shown in figure 3.3 and table 3.2.

Figure 3.3

Sample Distribution

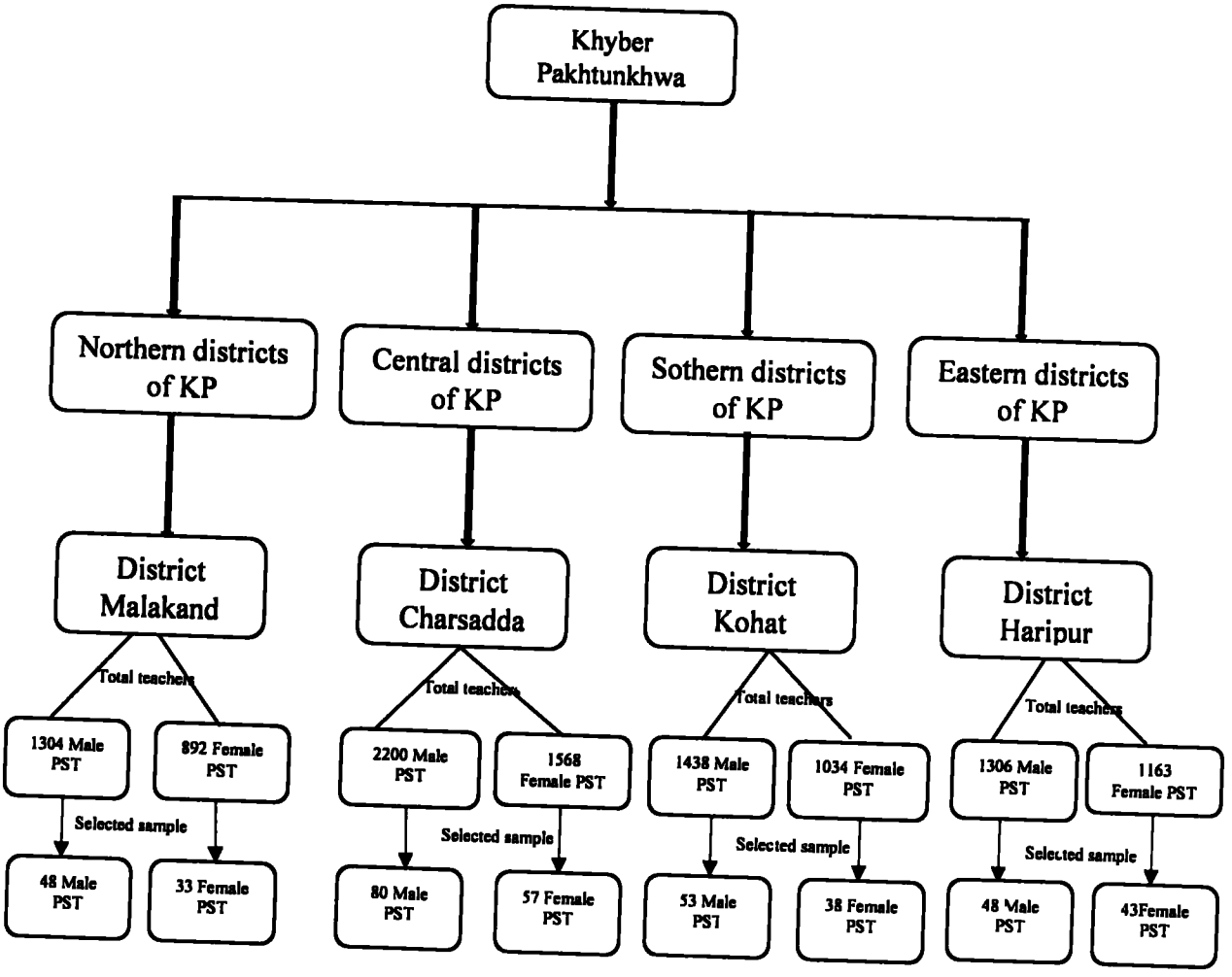


Table 3.2

Sample Composition

Name of District	Teachers		Total
	Male	Female	
Malakand	48	33	81
Charsadda	80	57	137
Haripur	53	38	91
Kohat	48	43	91
Total	229	171	400

3.6 Instrumentation

Data for the study consist of (a) qualitative content analysis, (b) ESD literacy rates (teachers understanding of ESD) (c) teachers attitude rates about ESD (d) implementation strategies and constrains rates. Qualitative data were collected through qualitative content analysis, while quantitative data were collected through a questionnaire.

3.6.1 Units of Analysis

"*The units of analysis are the elements on which data are analyzed and for which, findings are reported*" (Neuendorf, 2017, p. 43). It may be a word, a sentence, a pararaph or an entire text (Krippendorff, 2004). Similarly, Schreier (2014), states that these units can range from a word to an entire book. As the main purpose of the study was to identify knowledge ,skills and value about SD in primary education curriculum. Therefore, the text books of General science, Social Study, Islamic Studies and Urdu were seleced as units of analysis. The formal criteria was used for the coding purpose, which provides a clear criteria for separation (Schreier, 2014). As the purpose of the study was to analyse primary

education curriculum for SD concepts, therefore, paragraphs were used as coding units and single words were not considered.

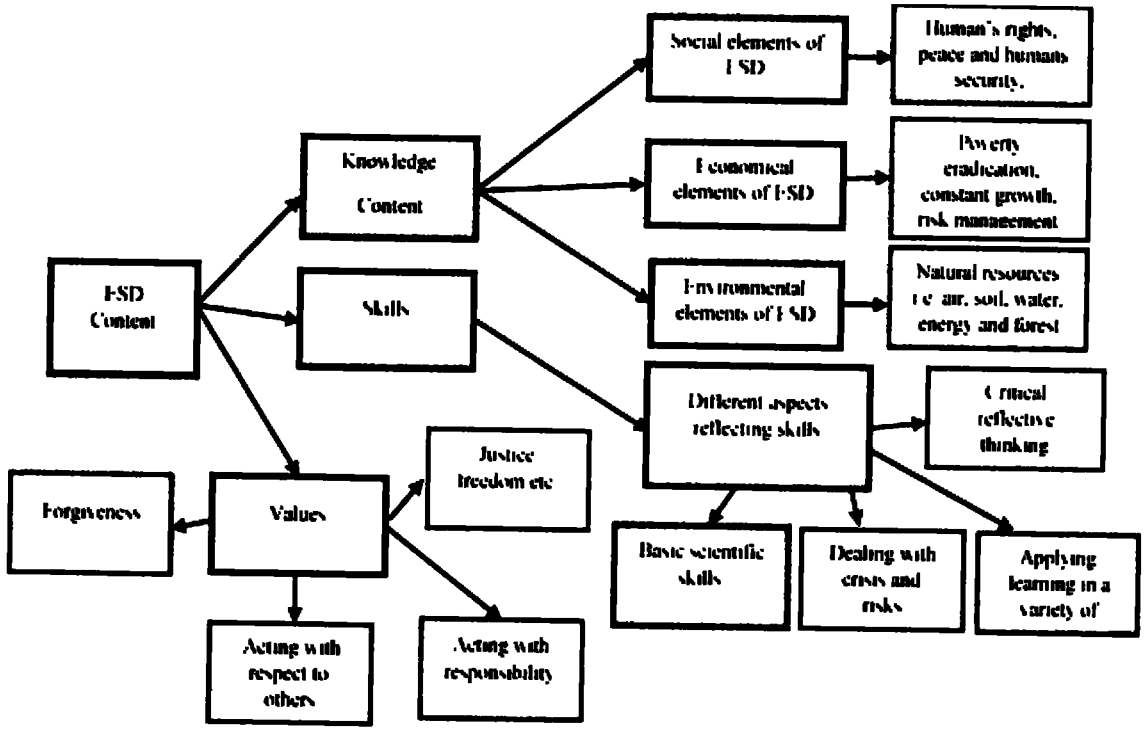
3.6.1.1 Coding Scheme

According to Schreier (2014) for coding scheme materials are first selected, categories are generated and defined, then the scheme is revised and expanded. Coding scheme usually consists of categories and sub categories (Schreier, 2014; Weber, 1990). The coding scheme was developed on the basis of UNESCO (2006) guidelines of ESD and SD indicators presented in UN *Agenda 2030* (United Nations, 2015), following the above mentioned steps. The coding scheme had a hierarchy of three levels i.e. categories, sub categories and supplementary categories. The study used knowledge, skills and values as three main categories for analysis. The knowledge categories had three sub categories and each sub category had supplementary categories i.e. social SD (Human's rights, peace and health, democracy, gender equity, education etc.), Environmental SD (natural resources, water, soil, air, energy, etc.) and Economic SD (Poverty eradication, constant growth, risk management, trainings, accountability etc.).

The value and skills aspects of SD had various sub categories such as acting with respect to others, acting with responsibility, critical reflective thinking, and applying learning in a variety of context etc. The sub categories were the main pillars of SD, while the supplementary categories were derived from the five P's of Agenda 2030 of the United Nations. The five P's represent People, planet, prosperity, peace and partnership. These five P's are the bases of SDGs (United Nations, 2015).

Figure 3.4

Conceptual frame work for coding scheme



All these characteristics represented knowledge, skills and values about the three pillars of SD and were assigned codes. Knowledge about the environment element was assigned K.Eco1, K.Eco2, and K.Eco3 etc. for social element K.S1, K.S2 and K.S3 etc. Similarly, for economy elements codes of K.E1, K.E2 and K.E3 were assigned. The skills characteristics were assigned S.1, S.2 and S.3 etc., while the values aspects were assigned code of V.1, V.2 and V.3 etc. (see appendix A).

While selecting the categories and sub categories the researcher and research supervisor knew that they will not found the terms SD, ESD or its elements directly in the primary school curriculum. As the research supervisor is an expert of curriculum development, while the researcher is a primary school teacher since 2010. Therefore, the curriculum

analysis tool was developed to analyze the primary education curriculum on the basis of above mentioned categories to search for signs and indicators of SD or ESD. This tool was then discussed with the experts and pilot tested with one curriculum in order to include the most relevant features of SD. Some modifications were made on the basis of pilot testing and experts' opinions.

3.6.1.2 Development of Curriculum Analysis Tool

Selecting the categories and sub categories the UNESCO mid-term report (Wals, 2009) and Agenda 2030 were considered, the mid-term report provided a guide line about the reorientation of the curriculum with the aim to enhance sustainability. The main focus of this report was on the relationship between environmental socio-cultural and economic aspects of the curriculum (Wals, 2009). Similarly, the Agenda 2030 provides the guideline for achieving SD by 2030. This agenda also focuses on environmental protection, social and economic aspects of SD but it provides a more holistic approach. Therefore, the tool consists of UNESCO (2006) guidelines and UN, 2015 indicators of SD. The UNESCO guidelines consist of Knowledge, skills and values to reorient the existing curriculum. The aim was not only to educate about SD but also to see and do things in desired way.

The knowledge and skills and values were included in curriculum analysis tool as main categories. The knowledge segment was further divided into three sub-categories i.e. environmental (K.ECO), social (K.S) and economic (K.E). The general elements related to these subcategories were adopted from the Agenda 2030.

The social aspects of SD deal with human rights, peace, and gender equality not only between individuals but also between different social groups (see appendix D, K.S1- K.S6).

The latter one is currently most important and relevant in our country, and needs to be addressed in curriculum. Another important element of social SD is Health i.e. physical, mental and environmental health were included.

The environmental aspects of SD are the largest category of the knowledge content and the most common aspects were included. This section reflects the importance of understanding the material basis of SD, and the current traditions in our education system to incorporate environmental protection issues into formal education. The important aspects of ESD were outlined, and their structure and relationship with other components of ESD were carefully examined.

Therefore, the environmental segment comprises a logical sequence i.e. natural resources, air, water, soil, energy, agriculture, biodiversity and pollution. The purpose was to identify the environmental concept in the curriculum. Similarly, separate references were made about climate change, rural development, natural disasters and waste (see appendix D, K.Eco1- K.Eco11). The economy segment includes references to poverty, planetary boundaries, production and consumption, and a market economy (K.E1- K.E5, appendix D).

The skills and values categories were developed on the basis of UNESCO mid-term report (Wals, 2009). The report outlines 14 learning outcomes but the researcher adopted only 12 outcomes relevant to primary education. The skills category of the coding frame contained critical thinking, future thinking, identifying values, applying learning in a variety of context (see S.1-S.6, appendix D) .The purpose of "acting with responsibility locally and globally" is to identify global issues and take appropriate measures in the local

context to minimize their impact. Another aspect of values segment was "acting with respect for other", other may include other individuals, community or other beings. Identification of justice, trust and forgiveness were also included in values aspect of ESD (see V.1- V. appendix D).

3.6.1.3 Reliability of the Curriculum Analysis Tool

For coding scheme, reliability means consistency of measure (Richards, 2015; Syed & Nelson, 2015; Creswell, 2012). Usually, two methods are used to evaluate the reliability of the coding scheme i.e. inter coder reliability and reliability over time (Elliot, 2018; Richards, 2015). In the last method, the same text is coded by the same researcher over time and identifies the difference (Syed & Nelson, 2015). In inter-coder consistency, two coders (researchers), code the duplicate text and the results are compared to find out any agreement exist between the coders (Richards, 2015; Creswell, 2015). The inter-coder agreement should range between 85% to 90% (Miles, Huberman, & Saldaña, 2013). The kappa coefficient is used to measure the degree of agreement between coders (Creswell, 2015).

The inter-coder consistency method was used to analyze the reliability of the curriculum analysis tool. For this purpose, a Ph.D. student was trained. The researcher and the second coder discussed SD, ESD and their elements. Definitions of categories were clarified and a code book was developed (see appendix A). Both coders coded the first six chapters of the General science of grade 5, and then the Kappa coefficient was calculated for the tool using SPSS 21. The Kappa coefficient make sure to minus the chance agreement (Creswell, 2015). Initially, thirty nine characteristics of SD were included in

coding scheme covering knowledge, skills and values about the three pillars of SD. But later on, it was reduced to 34 characteristics on the basis of pilot testing and experts' opinions in order to increase the inter-coder agreement.

In pilot testing both the researcher and assistant coder agreed to exclude four characteristics from the list, because these were not appropriate for primary school level. Moreover, the researcher wanted to keep basic science skills and planning and managing change in the coding scheme while the assistant coder wanted to exclude it from the list, similarly researcher wanted to exclude "rural development" from the social element of SD, while the assistant coder wanted to keep it in the list. This disagreement resulted in a low inter-coder agreement. To increase the value of Kappa coefficient both the coders discussed the definitions of these segments, and agreed to exclude these three characteristics from the coding scheme.

Table 3.3

Initial Kappa Coefficient

		value	Asymp. Std. Error	Approx. T	Approx. Sig.
Measure of agreement	Kappa	.569	.171	3.283	.002
N of valid Cases		39			

Table 3.4

Final kappa coefficient

		value	Asymp. Std. Error	Approx. T	Approx. Sig.
Measure of agreement	Kappa	.834	.108	4.440	.000
N of valid Cases		34			

According to Creswell (2015), a value of .60 and above are considered to be a good agreement between different coders while a value of .80 and above is considered a perfect

agreement. The initial Kappa value of .56 in table 3.10 shows a low consistency of the tool, while after discussion and exclusion of five characteristics from the coding scheme the Kappa value of .83 with statistical significance *p* value .000 indicates a very strong consistency level of the coding scheme (Table 3.11).

3.6.1.4 Validity of the coding scheme

In qualitative content analysis validity, refers to how well the coding segments represent the concepts of the research question(s) (Schreier, 2012). According to Schreier (2012), in qualitative content analysis validity of coding scheme depends highly on relevant material or categories. The categories knowledge, skills and values were generated from UNESCO (2006) report, and sub-categories of this study were derived from UESCO (2009) mid-term report and Agenda 2030, mean that the coding scheme consists of very relevant categories.

However, despite the fact that the coding scheme consists of relevant concept driven categories, it is intended only to describe the specific data that were analyzed (Schreier, 2012). Thus, when describing specific ESD characteristics and the extent to which they exist in the four subjects of primary education curriculum, the researcher did not extend the analysis to other subjects or level nor to other aspects of SD and ESD. Therefore, the qualitative part of this study is a systematic, descriptive inventory of ESD characteristics about the three pillars of SD in primary education curriculum. The goal was to inform different stakeholder i.e. policy maker, curriculum development, teachers and students about the status of ESD in the primary education curriculum.

3.1.3 Questionnaire

The quantitative data was collected through a questionnaire developed by Michalos, Creech, McDonald, & Kahlke (2009). Permission was sought and was granted by Heather Creech, the program director (see appendix A). The questionnaire consisting of three parts i.e. knowledge of SD, attitude towards SD and behaviour towards SD. The researcher adopted the first two parts of the questionnaire and modified according to Pakistani context. Two separate questions were developed by the researcher to measure the most frequently used strataegies in the classroom and difficulties or constraints that prevent the implementation of these strategies.

Therefore, the proposed questionnaire consists of three parts. Part one consists of SD literacy test, part two contains an attitude scale, while part three comprises of two questions about the most frequently used ESD strategies and constraints or difficulties that prevent the implementation of these strategies. Part one consists of 18 true/false statements about economic, social and enviromental aspects of SD. These represent international as well as national (local) issues. Part 2 is about teachers attitude toward SD. It comprises of 15 items based on 5 point likert scale ranging from strongly disagree [1] to strongly agree [5], while 3 represent Undecided. In part three, 2 separate questions were developed to get teachers responses about the most frequently used strategies in the context of ESD ranking from most frequently used strategy (1) to least frequently used strategy (5). Similarly, teachers were asked to tick 3 main difficulties or constraints that they face regarding ESD.

3.6.2.1 Content Validity of the Questionnaire

According to Straub, Boudreau and Gefen (2004) content validity is "*the degree to which items in an instrument reflect the content universe to which the instrument will be generalized*" (p.68). Content validity is an essential element of an instrument that ensure that all the desirable elements are included and help the researcher to remove undesirable items to a specific construct domain (Taherdoost, 2016; Boudreau, Gefen, & Straub, 2001; Lewis, Snyder, & Rainer, 1995). It is usually developed through literature reviews or experts opinions (Taherdoost, 2016; Straub et al., 2004).

After the adoption, the questionnaire was discussed with two experts in the field i.e Dr Abdul Ghaffar associate professor AWKUM and Dr Amir Zaman associate professor AWKUM for content validity. Based on their seggestions some questions were modified. This questionnaire was then field tested with 41 teachers' on the 5th professional development day at centre 2 of cluster GHSS Sherpao. These teachers were not included in the sample of the study. The results of the piolt test were then used to compute the reliability of the questionnaire. Details of the questionnaire are given in table 3.5

Table 3.5

Detail description of the questionnaire

Scale name	Number of Sub-scale	Range
ESD literacy test	3	18
Attitude scale	3	17
Strategies used for ESD	-	01
Factor affecting the implementation of ESD	-	01
Total numbers of items		37

3.6.2.2 Reliability and Item Analysis of the Questionnaire

The results of the pilot study were used to compute the reliabilities of the questionnaires. The reliability of the scale refers to the correlation of scores between scale items (McCoach, Gable, & Madura, 2013; Fraenkel , Wallen , & Hyun , 2012). There are three main approaches to calculate the reliability of a scale (1) test-retest reliability (2) equivalent form and (3) internal consistency (Fraenkel et al., 2012; Creswell, 2012; Gay et al., 2012). In internal consistency approach, the reliability of the scale is calculated by examining individuals' items of the scale (Gall, Gall, & Borg, 2003). The first two aprroches of reliability required two administrations of the test while internal consistency required only one administration of the test for caculating and interpreting the reliability of the scale (Creswell, 2012; Gay et al., 2012 Fraenkel et al. 2012). The internal consistency approch was used to determine the reliabilty of the questionnaire using SPSS version 21.

According to Gall et al. (2003) alpha coefficient also known as Cronbach's alpha is extensively used to measure and compute the internal consistency of a scale. It represent the mean of all potential splits of the scale (McCoach et al., 2013). Its value should range between 0 and 1. A value of .70 or more of alpha coefficient is considered to be pretty high internal reliability estimate and a value of alpha below .70 is considered below the standard (Creswell, 2009; Fraenkel et al., 2012; Gay et al. 2012; McCoach et al. 2013). In addition to reliability coefficient, item-reliability index also known as item total correlation [ITC] was also estimated. Because items with poor statistic can decrease the reliability of a test . It is used to determine whether an "*item hangs together with rest of the items of the test or scale*" (Gregory, 2014, p. 146). It helps the researcher to select appropriate and

reasonably homogeneous items. According to Gregory (2014), the higher the correlation of an individual item with the rest of the scale items, the greater will be the internal consistency of the test. The ideal value of an item reliability index should range between .30 and .60 (McCoach et al. 2013).

Similarly, McCoach et al. (2013) state that if an item is correlating less than .20 with the other items of the scale then it needs to be revised or eliminated from the scale, similarly a value of .80 of ITC of an item with rest of the items suggests that the item is dupplicated and will decrease the reliability of the instrument.

SPSS 21 was used to calculate the reliability and ITC of the ESD questionaire. The questionnaire consists of ESD literacy test and attitude scale about the three pillars of SD. Reliability of literacy test and attitude scale were calcuated separatly and are presented in the following sections.

3.6.2.3 Reliability of ESD Literacy Test

Table 3.6

Reliability coefficient of ESD literacy test

	Reliability Coefficient	Pillars
ESD Litercy Test	.908	3

Table 3.6 shows the total reliability of ESD literacy test consisting of 18 items and three subscale represented as three pillars of SD. The reliability coefficient of the test was calculated to be .90. Which is pretty high from the recommended value of .70, indicating a higher internal consistency of the test (Fraenkel et al., 2012; McCoach et al. 2013;

Gregory, 2014; Gay et al., 2012). In addition, to total reliability, sub scale reliability and item total correlation of ESD literacy test were also calculated.

Table 3.7

Reliability coefficient of sub scale "knowledge about society"

	Items	Reliability Coefficient	Item-Total Correlations
Knowledge about Society	K.Soc1	.710	.37
	K.Soc2		.46
	K.Soc3		.34
	K.Soc4		.53
	K.Soc5		.38
	K.Soc6		.45
	K.Soc7		.41

Table 3.7 shows that the alpha coefficient of sub scale knowledge about society of ESD literacy test is .71, which is an acceptable value (Fraenkel et al., 2012). The correlation of each item with the rest of the scale was above the recommended value of .20 (McCoach et al. 2013), ranging from .34 to .53, showing that all items of the sub scale have a higher internal consistency and no revision or omission was required.

Table 3.8

Reliability Coefficient of sub scale "Knowledge about Economy"

	Items	Cronbach's alpha	Item-Total Correlations
Knowledge about Environment	K.Envir1	.734	.62
	K.Envir2		.46
	K.Envir3		.56
	K.Envir4		.39
	K.Envir5		.40
	K.Envir6		.36

The reliability coefficient of sub scale "Knowledge about Environment" was estimated to be .73. Similarly, the item statistic shows that all items had a very high internal consistency with the rest of the items. It is indicated by the item-total correlation statistics that range from .36 to .62, higher than the least recommended value of .20. Therefore, revision of any items was not required.

Table 3.9

Reliability Coefficient of sub scale "Knowledge about Economy"

	Items	Cronbach's alpha	Item-Total Correlations
Knowledge about Economy	K.Econ1	.720	.34
	K.Econ2		.52
	K.Econ3		.51
	K.Econ4		.53
	K.Econ5		.47

The alpha coefficient for third sub scale "Knowledge about Economy" of ESD literacy test was calculated to be .72, which is above the recommended value of .70 (Fraenkel et al., 2012). Similarly, the item total correlation statistics of the scale items indicate that all

the items were highly correlated with each other, and there is no need of revision or omission of any items (Gregory, 2014).

3.6.2.4 Reliability of ESD Attitude Scale

The second part of the questionnaire consists of an attitude scale. The scale was developed to measure teachers' attitude about the three pillars of SD. The internal consistency reliability method and SPSS21 was used to calculate scale and sub scale reliability. Table 3.10 shows the reliability coefficient of attitude scale to be .83, which is an acceptable level of reliability.

Table 3.10

Reliability Coefficient of ESD Attitude scale

	Reliability Coefficient	Pillars
ESD Attitude Scale	.839	3

In addition to total reliability of the scale, sub scale reliability coefficient and item total correlation for each items of the sub scale were also calculated.

Table 3.11

Reliability Coefficient of sub scale "Attitude about Society"

	Items	Reliability Coefficient	Item-Total Correlations
Attitude about Society	A.Soc1	.810	.32
	A.Soc2		.70
	A.Soc3		.63
	A.Soc4		.68
	A.Soc5		.62
	A.Soc6		.54

The alpha coefficient of sub scale "attitude about society" was calculated to be .81, which is considered to be very high reliability coefficient (Fraenkel et al., 2012; McCoach et al. 2013). Similarly, the item statistic shows that all the items of the sub scale were highly correlated with the rest of the scale. The item total correlations of the sub scale ranging from .32 to .70 show that all items had a high internal consistency, and no need of any revision or omission of any items because all the items had ITC above the least value of .20. According to Gregory (2014), deleting item with greater ITC than least recommended value will reduce the reliability of the scale.

Table 3.12

Reliability Coefficient of sub scale "Attitude about Environment"

	Items	Cronbach's alpha	Item-Total Correlations
Attitude about Environment	A.Envir1	.751	.35
	A.Envir2		.36
	A.Envir3		.64
	A.Envir4		.42
	A.Envir5		.50
	A.Envir6		.70

The Cronbach alpha coefficient of sub scale was estimated to be .75. Similarly the ITC statistics show that all the six items of the sub scale had a high internal consistency. Item A.Envir1 had the least ITC of .35 and A.Envir6 had the greatest value of .70, indicating that all items had a strong correlation with the rest of the scale.

Table 3.13

Reliability Coefficient of sub scale "Attitude about Economy"

	Items	Cronbach's alpha	Item-Total Correlations
Attitude about Economy	A.Econ1	.751	.65
	A.Econ2		.59
	A.Econ3		.63
	A.Econ4		.35
	A.Econ5		.36

Table 3.13 shows the reliability of the sub scale "Attitude about Economy". The alpha coefficient was estimated to be .75. Which is considered to be relatively high

reliability coefficient (Fraenkel et al., 2012; McCoach et al. 2013). The ITC statistics show that all the items had a high internal consistency.

The results of the pilot study were used for reliability statistics of ESD literacy test and its three sub scales and attitude scale and its and its sub scale. All the 37 items remain in the questionnaire because they have a high internal consistancy with each other. The details are presented in table 3.14.

Table 3.14

Detail Description of the Questionnaire after Pilot Testing

Litercy test	Range	α coefficient	Attiutde scale	Range	α coefficient
Knowledge of society	07	.710	Attitude about society	06	.810
Knowledge of environment	06	.734	Attitude about environment	06	.751
Knowledge of economic	05	.720	Attitude about economic	05	.751
Total items	**18**			**17**	

3.7 Data Collection

3.7.1 Qualitative Data Collection

The qualitative data were based on qualitative content analysis of primary education curriculum. Four textbooks of grade 4 and 5 were selected, and were first unitized into small packages (Krippendorff, 2004), these include sets of sentences or paragraph (Bengtsson, 2016). The predetermined codes were assigned to each package or meaning unit and marked with different color. Then the text was re-read, and compared with the marked text to ensure that all the relevant texts were included.

3.7.2 Quantitative Data Collection

The study used a concurrent mixed methods strategy, the quantitative data were collected through ESD literacy test and attitude scale from both male and female primary

school teachers of KP (Appendix B). On the 6th professional development day of the year 2019, held on 30th of December, four hundred questionnaires were distributed among the participants with the help of four research assistants (two male and two female), with a cover letter, stating the purpose of the study and their voluntary participation (Appendix C).

To facilitate the responses, envelope with a return address was included with each questionnaire. But most of the questionnaires were collected back by the same research assistant. Only 81 teachers used the envelopes with return address (36 male and 45 female), which represents 16% and 26% of male and female respondents respectively. But their responses did not show any statistical significant or practical significant differences in the results.

Chapter 4

4. DATA ANALYSIS

This chapter describes the results of this mixed methods research in relation to research objectives. The study is based on a concurrent mixed methods design, and both qualitative and quantitative data were collected concurrently. The first section of the chapter is based on the qualitative content analysis of primary education curriculum regarding ESD, while the second section of the chapter consists of quantitative data analysis based on teachers understanding of SD, their attitude towards SD and the strategies they used to implement the ideas of ESD in their classrooms. Similarly, to identify the opportunities and constraints that prevent the implementation of ESD ideas in primary school setting.

4.1 Findings from Qualitative Content Analysis

The main purpose of the study was to find out the status of ESD in primary education curriculum. The research question "How the aspects of 'education for sustainable development are included in primary school curriculum?" was formulated. Four subjects of grade 4 and 5 were analyzed for different aspects of ESD. To analyze the curriculum, the text was first unitized into small packages (Krippendorff, 2004). These include sets of sentences or paragraph (Bengtsson, 2016). The predetermined codes were assigned to each package or meaning unit, and marked with different color. Then the text was re-read and compared with the marked text to ensure that all the relevant texts were included. The analysis shows that the primary education curriculum contains some signs and clauses about SD and ESD. Details of analysis about each aspect of SD and ESD with examples of actual sentences or paragraph are presented in the following sections. However, the

examples from text books written in national or mother languages are presented in unofficial translation of English for research purpose only.

4.1.1 Knowledge about Social SD

The coding scheme about the knowledge of social sustainability consisting of six sub categories covering humans' right, peace and security, equity, culture diversity, health and new forms of governance. The reading and re-reading of sample text books provided the opportunity to identify different signs and indicators of SD. A significant number of signs regarding knowledge about different aspects of social SD was found in all sample text books of grade 4 and 5. The greatest number of these signs and indicators was found in Urdu and Social Study, however Islamiat and General Science also have few aspects of social sustainability.

The emphasis of social sustainability in primary education curriculum is mostly on health and hygiene, and "Cultural Diversity and Intercultural Understanding". For example, in Urdu of grade 4 and 5, there are two lessons about the human health (K.S5) i.e. health and hygiene and our environment emphasizing personal and environmental hygiene as essential element for quality and healthy life. Similarly, there are four lessons representing cultures of different eras of sub-continent (K.S4) i.e. Pakistani's traditions, our festivals, Mohenjo-Daro and Masjid Mohabat Khan. However, there are very few signs that indicate human rights (K.S1), peace (K.S2) and gender equity (K.S3).

The social study of grade 4 and 5 have contents about human right, peace and human security, cultural diversity and intercultural understanding, health and new forms of governance. Grade 5, social study has a separate unit with the title *"our country and form of government"*(K.S6), this chapter not only provides the information about the basic

pillars of government but also about their members, their heads and most importantly, how they are selected or elected. Similarly, provides the information about the responsibilities of these pillars and how they operate. In this chapter, under the sub heading of *"Constitution"* human rights (K.S1) such as civil, political, social, cultural, equity, economic and cultural rights are described. Similarly, in social study of grade 5 a separate unit with the title *"culture"* (K.S4) is included to provide information about the different Pakistani cultures, their characteristics, the benefits of a multicultural society and a comparison with Indian culture. It has a sub heading of "The position of women" (K.S3) but only two lines are about the women, stating that women are respected and rest under this sub-heading are about different aspects of Pakistani cultures.

However, this chapter describes the importance roles of different social organizations in the development of different cultures such as family, mosques, schools and Islamic madrassas. The social study of grade 4 covers almost all the aspects of social sustainability. There are separate chapters emphasizing on different aspects of social SD e.g. chapter 4 of grade 4 social study is "Our Government" covering "*System and style of Government*" (K.S6) and "*Rights of Citizens*" (K.S1). The chapter provides information about the structure of provincial and local government and its basic pillars and how they operate. It also provides information about the basic human rights e.g. rights of living, family, education, speech, religion etc. are described. This chapter, also, provides information about different institutions, which work for the protection of human rights. Similarly, chapter 6 is "Culture", which provides knowledge about the basic concept of culture and effects of one culture on the other is provided.

Similarly, the comparison of Pakistani culture with American culture is carry out in the form of two letters, written by a Pakistani friend to an American friend. This chapter has two sub titles dealing with peace and human security (K.S2). The first one is "together, live in peace" which provides information about the international day of peace, effects of peace on our world and causes of conflicts are described in details.

General science of primary education contains contents about human health (K.S5). For example, in general science of grade 4 first unit provides information about the functions of different human body parts and how to keep the body healthy. Similarly, unite three is "food and health" providing information about different groups of food (carbohydrates, protein etc.) and their quantity for a healthy body. While, General science of grade 5 has only one unit "Microorganism" that provides information about the infections or diseases spread by different microorganisms and how these infections can be avoided.

The analysis shows that primary school curriculum emphasizes mostly on health and cultural aspect of social sustainability, and thus vital for students to understand the characteristics of healthy life, and understand and compare different cultures to engage themselves with others at local and global levels. Similarly, the curriculum indicates that understanding human rights and responsibilities at local and global levels are essential for primary school students. It also indicates that tracing the origin of local and global problems and identifying their solutions, are vital for global peace and security, and will prepare the students to actively participate in the development of a sustainable society.

The analysis indicates that the subject Social Study (about 43%) and Urdu (about 39%) have the greater number of signs and indicators regarding social sustainability, while

Islamiat has the least number (6.8%) of signs, which are about human right and peace. Examples from each subject are presented in table 4.1 and frequency of each aspect in appendix E.

Graph 1 : Subject Wise Representiton of social SD

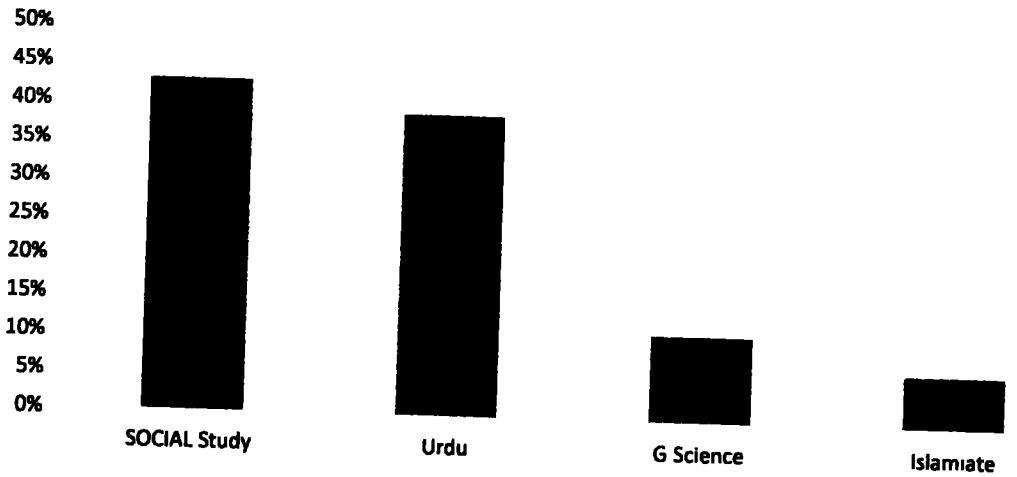


Table 4.1

Qualitative examples of Social SD

Meaning Unit	Code	Subcategory	Subject/Grade/page
As a good citizen, we must respect human rights Our religion Islam also teaches us to respect human rights We should care for our neighbors . .	K S1	Humans Rights	URDU/4th /138
Section 8 28 of the constitution deals with human rights For example, the right of freedom and living, right of profession, right of religion, right of language and culture	K S1	Humans Rights	Social study/5th/ 92
According to Misaqe e Madinah (treaty of Madinah) Muslims and Jews will have full religious freedom and all the stakeholders will have equal responsibilities and rights	K S1	Humans Rights	Islamiat/5th/62
A good citizen always care for others, "he chooses for others, what he chose for himself In societies, where such people are in abundance, love, peace and brotherhood prevail	K S2	Peace and security	Urdu/5th/37
Misaqe Madinah (treaty of Madinah) is the biggest example of tolerance, peace and security	K S2	Peace and security	Islamiat/5th/61
Hazrat Muhammad used to treat servants with special compassion He (PBUH) said " these are your brothers feed them with what you eat and clothe them with what you wear"	K S3	Gender Equality	Urdu/4th/12
women are highly respected in Pakistan	K S3	Gender Equality	Social study/5th/108
right of equity and ownership and protection from discrimination in jobs	K S3	Gender Equality	Social study/5th/93

The guide told them that the ruins of Mohenjo-Daro indicate the lifestyle of that time and show that they inhabited the city with a proper plan .	K S4	Cultural Diversity and Intercultural Understanding	Urdu/5th/62
Pakistani traditions can be divided into two parts i e rural traditions and urban traditions. Other than that each province or area has their own traditions Some traditions are the same throughout the country e g all Pakistanis are hospitable .	K S4	Cultural Diversity and Intercultural Understanding	Urdu/5th/117 Social study/5th/106
Health is a great blessing of Allah Health and cleanliness are closely related Health cannot be achieved without cleanliness and where there is cleanliness there is health	K S5	Health	Urdu/4th/18
Just as good health is essential for human beings, similarly a clean environment is essential for good health	K S5	Health	Urdu/4th/76
Viruses are harmful they spread diseases in humans and animals e g influenza, measles In human beings, bacteria causes tuberculosis, pneumonia in humans, ringworm and athlete foot are the common fungal infections Infection can be avoided by observing cleanliness and Islamic values of washing hands before and after eating, after attending toilet, brushing teeth	K.S5	Health	General science/5th/24-31
If we don't brush our teeth regularly they will get cavities If we don't wash our hand, we will fall ill If we don't exercise we may become lazy and obese	K S5	Health	General science/4th/6
To be healthy not only a balance diet is required but cleanliness is also necessary	K.S5	Health	General science/4th/26
Pakistan is a democratic country and it has a parliamentary style of government	K S6	New forms of governance	Social Study/5th/81
Ansar (helpers) were farmers and Mohajer (migrants) were traders, due to Mawahat Madinah (Brotherhood of Madinah) both professions made progress and so as Islamic society made progress	K S6	New forms of governance	Islamiat/5th/52

4.1.2 Knowledge about Environmental SD

The sub categories for environmental SD were natural resources, air, soil, energy, agriculture, biodiversity, climate change, rural development, natural disasters, pollution and waste. The reading and re-reading of the primary education curriculum shows that there is a significant level of signs and indicators that represents different aspects of environmental SD. Most of these signs and indicators are in General Science, Urdu and Social study but Islamiat does not have any of these signs or indicators.

In General Science of Grade 5, there are two units that deal directly with environmental sustainability i.e. "environmental pollution" and "soil". The first one provides information about the three main types of pollution (K.Eco10), its causes and their effects on humans'

lives. Similarly it also outlines the remedial steps to minimize the effects of different types of pollution and non-biodegradable materials on environment and humans. The second one provides knowledge about the different types of soil (K.Eco3) and its basic components, and how soil helps to maintain the ecosystem. It also provides information about how living things affect and are affected by the soil. Another unit "classification of living organism" in the same textbook provides information about different Species and their habitats (K.Eco6). Similarly, in General Science of Grade 4 content about different habitats and species is included (K.Eco6).

The analysis shows that the emphasis of General Science is mostly on pollution and biodiversity and that other aspects of environmental SD are missing. There is nothing on waste, natural disaster, rural development and other aspects specified in coding matrix. Urdu, has content about agriculture (K.Eco5), pollution (K.Eco10) and waste (K.Eco11), however, the aspects on natural resources, air, soil, energy, biodiversity, climate change, rural development and natural disasters are missing. While, the social study of primary education has content about natural resources (K.Eco1), climate change (K.Eco7) and natural disasters (K.Eco9). Each mentions aspects of environmental SD that has a separate section in social study, where each aspect is described in detail e.g. in Unit Three (geography) of grade 4, section one and two provide information about physical (landform, location and natural resources) and humans (people, cultures and characteristics of places) environment and their impact on each other, in order to make environmental friendly decisions. Similarly, Section three is about natural disasters (K.Eco9), where information about earthquake, flood, tsunami and avalanche, main reasons for their occurrence and steps to save precious lives and property, are outlined. Similarly Unit Two of grade five

(geography) is about physical characteristics of different Pakistani's regions, while unit three has content about climate of different areas and how human's activities affect the climate of these areas. Similarly, the effect of greenhouse gasses on our environment are described in the same unit. It also outlines the importance of individual and collaborative efforts to prevent the bad effects of human's activities on climate. It has content about pollution, waste management, new forms of energy and sensible usage of natural resources. Islamiat does not have any content about environmental SD. When it comes to the environmental SD, the primary school curriculum mostly emphasizes on pollution, natural resources and biodiversity, while air, soil, energy, agriculture, climate change, natural disasters and waste are the least represented elements, still it cannot be said that overall environmental content is underrepresented in the primary school curriculum. Examples from each subject about knowledge of environmental SD are presented in table 4.2 and frequency of each aspect in appendix E.

Graph2: Subjectwise represention of Environmental SD

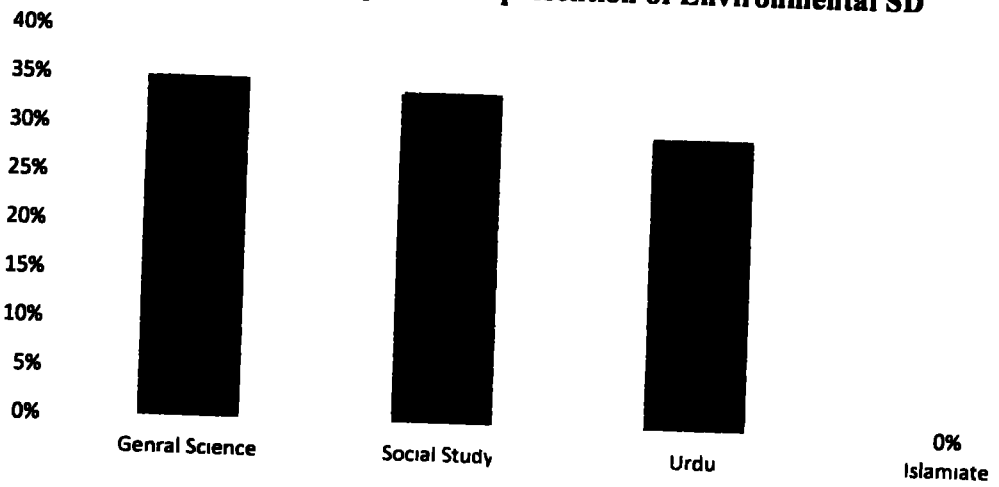


Table 4.2

Qualitative Examples of Environmental SD

Meaning Unit	Code	Subcategory	Subject/Grade/page
Much of our province (KP) is mountainous. The province has high mountains. Many small and big rivers flow out of these mountains and at the edges of these high mountains are lush valleys. Besides the fertile plains, vast desert areas are also located in the province.....	K.Eco1	Natural resources	Social study/4th / 57
....These plain areas are made of very fertile soil and large canals have been dug to irrigate these areas	K.Eco1	Natural resources	Social study/5th/17
Soil makes up the outer most layer of our earth. It supports the growth of plants, roots and provides a living place for different animals..... .....soil is of different types such as sand, clay and silt.....	K.Eco3	Soil	General science/5th/125
The uses of new forms for energy such as electricity and solar energy must be increased	K.Eco4	Energy	Social study/5th/43
Pakistan is an agricultural country. Therefore, agriculture is the biggest profession. Most people work in the fields and earn their living. ..... But now modern methods are also being adopted. Which has significantly increased the yield of our crops. Pakistan is earning a lot of foreign exchange by exporting agricultural commodities to other countries.	K.Eco5	Agriculture	Urdu/5th/53
.....There are many types of environment. All types of environment have two components. Non-living components (air, soil, water, light etc.) and living components (animals, plants, bacteria, fungi)	K.Eco6	biodiversity	General science/4th/31
....Global warming due to greenhouse gasses result in melting the glaciers on poles, rising of the sea level, increase of natural disaster and unexpected change in seasons..... ..	K.Eco7	Climate change	Social study/5th/42
....All of us, use water, air and land to live These things make environment. Our activities pollute this environment. Let's learn, how to keep it clean for life. There are three main types of pollution i.e. air pollution, land pollution and water pollution.	k.Eco10	Pollution	General science/5th/49
.....Disruption of the natural balance or non-maintenance of the natural balance is actually called environmental pollution. There are many causes of	k.Eco10	Pollution	Urdu/5th/80

environmental pollution. But the biggest reason is man himself.....			
....To reduce the effect of greenhouse gasses the world community, especially developed countries must develop a common roadmap. In factories waste must be reduce to minimum level.	K.Eco11	Waste	Social study/5th/43

4.1.3 Knowledge about Economic SD

The coding scheme about economic SD contains sub-categories of poverty, planetary boundaries, production and/or consumption, population growth, market economy (see appendix A). Given its conceptual complexity, economic elements were expected to be among the least represented ESD content in primary school curriculum (Domazet, Dumitru, Jurko, & Peterson, 2012). This did indeed turn out to be the case in Urdu, general science and Islamiat but in social study it is represented as much as environmental aspects of SD. Social studies of 'grade four' and 'five' have separate units with title "Our Economics" and "Economy" respectively. In these units information about how scarcity of resources and choices regarding production, distribution and consumption (K.E3) of goods and services affect the well-being of the individual and society, are given. Similarly, content about Pakistan's economic system (K.E5) is also outlined in these units that how this system work to facilitate production, consumption and exchange of goods and services (K.E3). These units also describe the challenges and benefits of trade for consumers, producers and government. Similarly, it has content about the population and the effect of growing population on basic human needs and economy.

Urdu has content about production and consumption (K.E3) of goods, distribution of services and the role of industries in foreign exchange. General science and Islamiat do not have any content regarding economic SD. The analysis shows that the emphasis of primary school curriculum regarding economic SD is mostly on production and consumption and

other aspects are missing. Examples from each subject about knowledge of economic SD are presented in table 4.3 and frequency of each aspect in appendix E.

Graph3: subjectwise represention of economic SD

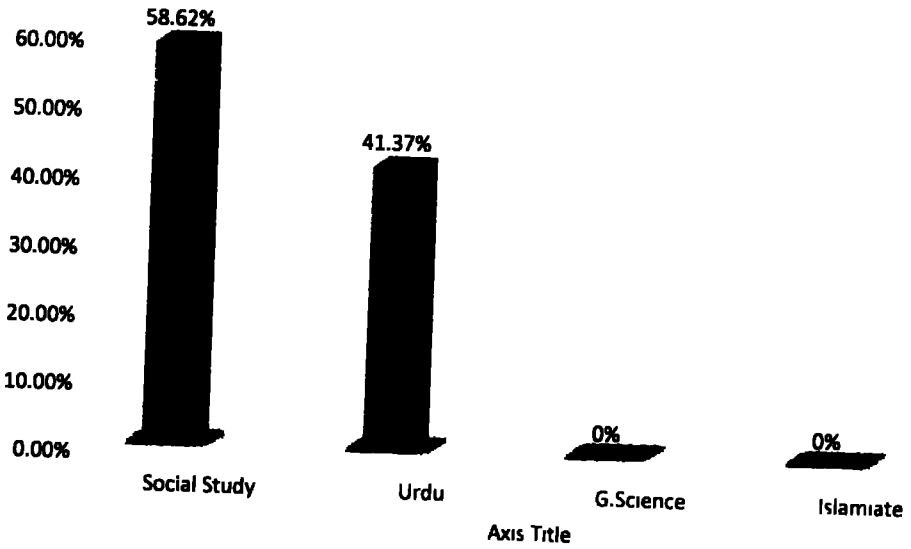


Table 4.3

Qualitative Examples Economic SD

Meaning Unit	Code	Subcategory	Subject/Grade/page
• Agriculture is the backbone of Pakistan's economic system • International trade, imports and exports play an important role in Pakistan's economic development	K E3	Production and/or consumption	Social study/5th /139
Many people in Pakistan earn their living by working in factories and mills. Major cities in Pakistan have factories for textiles, cement, fertilizers, medicines and daily necessities Our industry is slowly developing .	K E3	Production and/or consumption	Urdu/5th/55
Sometimes we make choices among two different things and select the most needed/important one Because it will benefit us more than the other one	K E3	Production and/or consumption	Social study/4th /99
An economic system is a system that runs the country's economy The federal government takes a number of steps to develop the country's economy e g receiving technical, financial support and manpower from other countries . . .	K E5	Market Economy	Social study/5th/138
Pakistan's economic system is a socialist system . .	K E5	Market Economy	Social study/5th /139

4.1.4 Skills Content

The coding scheme for skills content consists of seven codes and sub categories i.e. critical reflective thinking, futures thinking, ability to identify and clarify values,

negotiating and consensus building, dealing with crisis and risks, applying learning in a variety of contexts, basic scientific skills. Some of these are derived from single concepts while, others deliberately expand so as to obtain a more detailed view of the curriculum e.g. Basic scientific skills that have been deliberately expanded to explicit key science processing skills. The coding scheme for skills content was derived from concepts related to ESD definitions, listed in UNESCO mid-term report about DESD (Wals, 2009).

The analysis shows that almost all aspects of the skills content are found in the primary education curriculum. General Science of primary education has the greatest number of these skills followed by Social Study and Urdu respectively. Islamite has the least number of signs or indicators regarding Skills content. Overall, the most represented skill in all the selected text books is the critical reflective skills followed by skill of applying learning in a variety of contexts and then skill of identifying and clarifying values. While, dealing with crisis and risks is the least represented skill in all the selected textbooks. In General Science, however, the most represented aspect of skills content is the basic science skills as it has a large number of content and activities that encourage students to think scientifically (Ministery of Education, 2006b), and develop their skills of performing experiments, writing observation, measuring, labeling, inferring, classifying, predicting and to communicate their finding in a variety of ways.

The second most represented skills content in General Science is the critical thinking skill as it has content that encourage students to think critically to develop their problem solving skills and skill of making appropriate choices. For example, general science of primary education has content that encourages students to ask questions about different

events and objects in the immediate surrounding and develop ideas how these questions might be answered. Similarly, it contains activities that help students to develop solutions to problems through reasoning, observation and investigation (Ministery of Education, 2007).

The social study and Urdu of primary education have content and activities that develop students critical reflective skills (S1), future thinking (S2), ability to identify and clarify values (S3), dealing with crises and risks (S5) and applying learning in a variety of contexts (S6). The analysis of these subjects show that students are expected to ask questions about society, collect data from different sources (such as books, newspapers, community, internet etc.), analyze data in order to answer these questions and make informed decisions (Ministry of Education, 2006a). Similarly, students are expected to present the findings in an appropriate way. Primary education curriculum of social study and Urdu also emphasize local and national problems, and students are expected to understand different perspectives of these problems and take appropriate actions and work collaboratively to address these problems (Ministry of Education, 2007).

The analysis shows that General Science contains 35% of skills content (73% basic scientific skills and 27% critical reflective skills), social study 28% of skills content (40% critical reflective skills, 23% applying learning in a variety of contexts, 11% ability to identify and clarify values, 6% dealing with crisis and risks, and 4% futures thinking) and Urdu contains 26 % of skills content (38% critical reflective skills, 20% applying learning in a variety of contexts, 16% each Ability to identify and clarify values and 4% dealing with crisis and risks, while negotiating and consensus building represents 4% of the total

signs and indicators regarding skills contents of SD. However, Islamiat represents the least number of these signs and indicators. Examples from each subject about skills content of SD are presented in table 4.4 and frequency of each aspect in appendix E.

Table 4.4

Qualitative Examples of SD skills

Meaning Unit	Code	Subcategory	Subject/Grade/page
investigates the effect of heat on particles' motion during change in states demonstrates and explains the process that involves in change of states	S1	Critical reflective thinking	General Science/5th/60
Plan and conduct a campaign to bring awareness to the problem of environmental pollution in their surrounding	S5	Dealing with crisis and risks	General Science/5th/48
Predict what would happen to seed, if conditions necessary for germination are not fulfilled	S7	Basic science skill	General Science/5th/36
Measure and record the body temperature using thermometer	S7	Basic science skill	General Science/4th/52
Design an experiment to show how simple machines make work easier	S7	Basic science skill	General Science/4th/62
Construct narrative of the local past using the local community as a resource			
Gather and interpret information, and draw conclusion using maps and other geographical tools about provinces, country, rivers etc	S1	Critical reflective thinking	Social study/5th/12
Activity Make two groups in the class and discuss the health and education problems of KP	S1	Critical reflective thinking	Social study/4th/48
Make a five- or ten-question questionnaire and talk to people around you about the growing deforestation problem and then pass it on to your peers	S2	Future thinking	Social study/4th/75
Personal values, its development and the relationship of values and attitudes This means that when an individual lives in a community, its values develop Values depend on the structure and culture of the community The culture of each community is different Therefore, the values of each individual are also different	S3	Ability to identify and clarify values	Social study/5th/119
If wars are resolved peacefully, countries will focus on human development rather than gun and ammunition More and more consensus is needed to solve problems - when people unite for achieving their goals, they change the course of the history	S4	Negotiating and consensus building	Social study/5th/66&72
Activity develop a short questionnaire and collect data about your friends family i e total members, numbers of males and females, their profession and education	S5	Basic science skills	Social study/4th/71
Listen to conversations or speeches, listen to instructions and announcements, analyze them, pay attention to important things and perform the desired action.	S1	Critical reflective thinking	Urdu/5th/42
describes any events in their own words and own style	S6	Applying learning in a variety of contexts	Urdu/5th/22

4.1.5 Values Content

In 2000, UN adopted SD values such as freedom, equality, solidarity, tolerance, respect for nature, and shared responsibility, and all the members country are expected to translate these values into SDGs according to their needs. The coding scheme for values content for the research consists of six sub categories i.e. acting with responsibility locally and globally

(V1), acting with respect to others (V2), forgiveness (V3), solidarity and tolerance (V4), justice (V5) and freedom (V6). Being an Islamic republic, it is expected that the national curriculum of Pakistan is to be value laden. It is confirmed by curriculum analysis, as the aim of curriculum is to promote brotherhood, unity, solidarity and tolerance, equity, justice, sincerity, honesty, social welfare and human rights, and students are expected to learn about these values and apply them in their real life (Ministery of Education, 2006a).

The analysis shows that Urdu and Islamiat have the greatest number of signs about values aspect of SD. In urdu, content about acting with respect to others, forgiveness, solidarity and tolerance, justice and freedom are included. It has different easy containing velues content. e.g. in Rahmate Lil Aalameen content about acting with respect to others (V2)and forgiveness (V3) are included. Similarly, in "Darde Dil ke Waste Paida kia Insan" content about acting with responsibility locally and globally (V1) and acting with respect to others are included. Another easy "scouting" contains content about acting with responsibilities locally and globally.

In Islamiat, there is a separate unit, covering honesty, simplicity, forgiveness(V3), tolerance (V4), equality (V5), austerity and Islamic brotherhood. In social study of 5th grade, there is a section with title "values"(translated), but only provides information about how values of different societies develop and how it differs among individuals and nothing else is included in this section of social study that represents sutainable values. However, in Unit four of 5th grade social study under the heading of "Nelson Mendela" there is a single sentence that represents sustainable value of justice (V5). Similarly, "influence of important people on history"(transltd) signs of equity, respect and tolarance are presented.

The analysis shows that 52% of value content are presented in Urdu, 37% in Islamiat and only 10% in social study, while genral science does not contain any sign that represent sustainable value content. Examples from each subject about value content of SD are presented in table 4.5 and frequency of each aspect in appendix E.

Table 4.5

Qualitative Examples of SD Values

Meaning Unit	Code	Subcategory	Subject/Grade/page
. Subhan Allah! Look at the glory of this great conqueror that the servant's son is seated on the camel he is riding	V2	Acting with respect to others	Urdu/5th/13
The prophet (PBUH) says "today, there is no grip on you, you all are free" . . This great prophet (PBUH) has not only conquered Makkah but also the hearts of the people of Makkah due to his great morals and forgiveness	V3	Forgiveness	Urdu/5th/15
In a society where good people abound, an atmosphere of love, peace and tolerance prevails	V1	Acting with responsibility locally and globally	Urdu/5th/ 37
. . . a good man is that, who's useful to other and don't hurt others.	V2	Acting with respect to others	Urdu/5th/37
scout is a students' organization, which helps people in the time of disasters like earthquake and flood etc	V1	Acting with responsibility locally and globally	Urdu/5th/ 43
Islam teaches us forgiveness and tolerance Allah Forgives people and commands them to forgive each other's mistakes and those who forgive have a special place in Islam	V3	Forgiveness	Islamiat/5th/91
.. . . . slam allows people of other religions to live according to their religion and ideology and Muslims are advised to be tolerant when inviting to Islam	V4	Solidarity and Tolerance	Islamiat/5th/97
Nelson Mandela raises voice against racism in South Africa and fought for the rights of their people	V5	Justice	Social study/5th/59

4.2 Quantitative Analysis of Teachers Understanding and Attitude Towards Sustainable Development

In this section of the chapter quantitative data of the study were analyzed. First the participants' demographic characteristics were presented then teachers knowledge of SD, their attitude towards SD followed by most frequently ESD strategies opted in the classroom and lastly factors affecting the implementation of ESD strategies.

4.2.1 Teachers' Demographic Characteristics

The data shows that 57.25 % respondents (teachers) were male, while, 42.75 were female. 16.25% of the respondents have ages between 20 and 25, 11.75% between 26 and 30, 6.75% between 31 and 35, 26.75% between 36 and 39 and 38.5 40 and above. The majority 52% of respondents were primary school teachers (PST), 38% were senior primary school teachers (SPST) and 10% were primary school head teachers (PSHT). Similarly, the data reveals that 44.75% respondent possess a degree equal to bachelor degree followed by Master degree (42.5%). The data also revealed that 5.75% of respondents possess an MPhil degree in different academic discipline. The data also show that most (57%) of the respondents were veteran teachers having more than 10 years of teaching experience, while 25.25% had teaching experience between 6 to 10 and 17.75% had teaching experience between 1 to 5 years (see table 4.6)

Table 4.6

Teachers' demographic characteristics

Variable	Category	Frequency	%
Gender	Male	229	57.25
	Female	171	42.75
	Total	**400**	**100**
Age	20-25	65	16.25
	26-30	47	11.75
	30-35	27	6.75
	36-39	107	26.75
	40-above	154	38.50
	Total	**400**	**100**
Position	PST	208	52
	SPST	152	38
	PSHT	40	10
	Total	**400**	**100**
Education level	FA / FSc	25	6.25
	BA/BSc	179	44.75
	Master/BS	170	42.5
	Ms/ M.Phil.	23	5.75
	Ph.D.	03	.75
	Total	**400**	**100**
Experience	1-5	71	17.75
	6-10	101	25.25
	11-above	228	57
	Total	**400**	**100**

4.2.2 Teachers Knowledge and attitude of ESD and SD

The test of understanding and attitude scale developed by Michalos et al. (2009) was used to meausre primary school teachers' understanding and their attitude toward SD. The test of understanding was comprising 18 questions about the three pillars of SD based on true/false statements.

4.2.2.1 Knowledge about social element of SD

The social aspect of sustainable development was consisting of seven true false statements. The average number of correct answers to 7 social knowledge statement were 198.7 (49.6%) and wrong answers were 201.3 (50.4%) for primary school teachers. If the correct percentage of the subscale is more than 70%, it is taken to identify the adequate knowledge (Makki, Abd-El-Khalick, & Boujaoude, 2003). Therefore, the analysis shows that primary school teachers have less than adequate knowledge of social sustainability (see table 4.7). The low number of correct answers about the first statement of social sustainability indicates that most of the teachers had poor to mediocre level of knowledge about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as 50% of the teachers did not consider a culture of peace, human rights, equity and culture diversity as essential elements of ESD. The result is presented in table 4.7.

Table 4.7

Frequency distribution about Social Sustainability

No.	Statement	Correct Response		no=400 Wrong Response	
		Frequency	%	Frequency	%
1	Economic development, social development and environmental protection are all necessary for sustainable development	189	47.3	211	52.8
2	Education for sustainable development emphasizes education for a culture of peace	213	53.3	187	46.8
3	Education for sustainable development emphasizes respect for human rights	208	52	192	48
4	Sustainable development has nothing to do with social justice.	182	45.5	218	54.5
5	Education for sustainable development emphasizes gender equality.	204	51	196	49
6	Corporate social responsibility is irrelevant to sustainable development.	180	45	220	55
7	Education for sustainable development supports cultural diversity.	215	53.3	185	46.8
	Average	**198.7**	**49.6**	**201.3**	**50.4**

4.2.2.2 Knowledge about Environmental Element of SD

The environmental aspect of sustainable development was consisting of six true false statements. The average number of correct answers to 6 social knowledge statement were 191.83 (47.98%) and wrong (incorrect) answers were 208.16 (52.06%) for primary school teachers. The large number of incorrect answer reveals the inadequate knowledge of primary school teachers about environmental sustainability (see table 4.8). A majority of teachers (63.3%) believe that they cannot slow down the rate of climate change, similarly, 57.8% believe that there is no need to conserve fresh water as KP has plenty of it, indicating the misconception of primary school teachers about the environmental element of SD.

Table 4.8

Frequency distribution about Environmental Sustainability

n=400

No.	Statement	Correct Response		Wrong Response	
		Frequency	%	Frequency	%
1	Sustainable consumption includes using goods and services in ways that minimize the use of natural resources and toxic chemicals, and reduces waste.	216	54	184	46
2	Education for sustainable development seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources	198	49.5	202	50.5
3	We cannot slow the rate of climate change	147	36.8	253	63.3
4	Conservation of fresh water is not a priority in KP because we have plenty.	169	42.3	231	57.8
5	Maintaining biodiversity—the number and variety of living organisms—is essential to the effective functioning of ecosystems.	240	60	160	40
6	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	181	45.3	219	54.8
	Average	**191.83**	**47.98**	**208.16**	**52.06**

4.2.2.3 Knowledge about Economic Element of SD

Knowledge about economic aspect of sustainable development was consisting of 5 true false statements. The average number of correct answers to 5 economic knowledge statements were 210.4 (52.62%) and wrong answers were 189.6 (47.44%) for primary school teachers. Although the majority of the answers were correct still less than 70% indicate an inadequate knowledge of primary school teachers about economic aspect of sustainable development. However, 66.3% believe that Pakistan overall energy is improving and 59.5% believe that non-renewable resources should not be used faster than the rate at which we find substitutes that are renewable (table 4.9)

Table 4.9

Frequency Distribution about Economic Sustainability

No.	Statement	n=400			
		Correct Response		Wrong Response	
		Frequency	%	Frequency	%
1	Pakistan's overall energy is improving.	265	66.3	135	33.8
2	Helping people out of poverty in Pakistan is an essential condition for Pakistan to become a sustainable country.	187	46.8	213	53.3
3	Non-renewable resources should not be used faster than the rate at which we find substitutes that are renewable.	237	59.3	163	40.8
4	Sustainable development is as much about the children in the future as it is about what we need today.	181	45.3	219	54.8
5	Sustainable development does not require that businesses to behave responsibly	182	45.5	218	54.5
	Average	**210.4**	**52.64**	**189.6**	**47.44**

4.3 Teachers Attitude Towards SD and ESD

To answer the research question 3 "What is the primary school teachers' attitude towards 'Education for Sustainable Development'? The attitude scale consists of 17 statements based on five point Likert scale ranging from 'strongly disagree' to 'strongly agree' was used. 1 as strongly disagree, 2 disagree, 3 undecided, 4 agree and 5 as strongly agree. The responses were coded for analysis 1 as a very negative attitude towards ESD and 5 as a very positive attitude towards ESD. Composite ESD attitudes were calculated and higher composite scores indicated that a respondent held more pro-sustainability attitudes. Data were analyzed using mean and standard deviation to find out primary school teachers attitude towards ESD.

4.3.1 Social Attitudes

The average mean score of 4.24 and Standard deviation .651 indicate that primary school teachers had a very positive attitude towards social aspect of SD and ESD. Participants of the study strongly agree that every child should be taught about ESD to ensure the availability of a healthy and productive society for future generation. Similarly, the participants believed that principles of SD should be integrated in national curriculum on priority basis to ensure the soft image of Pakistan where everyone has equal opportunities to actively participate in the development of a sustainable society. The result is presented in table 4.10.

Table 4.10

Mean and Standard Deviation for Attitude towards Social Aspect of ESD

S.No	Item	N	Mean	SD
A.soc1	Every girl or boy should receive education that teaches the knowledge, perspectives, values, issues and skills for sustainable living in a community.	400	4.15	.648
A.soc2	The present generation should ensure that the next generation inherits a community at least as healthy, diverse and productive as it is today.	400	4.37	.607
A.soc3	The teaching of sustainability principles should be integrated into the curriculum in all disciplines and at all levels of schooling.	400	4.49	.664
A.soc4	Adopting sustainable development as a national priority is key to make Pakistan's status as one of the most live able countries in the world.	400	4.28	.654
A.soc5	Citizenship education is an important component of education for sustainable development.	400	4.24	.610
A.soc6	Gender equality has nothing to do with sustainable development (reverse coded in Attitudes Index).	400	4.03	.726
	Average	400	4.24	.651

4.3.2 Environmental Attitudes

The average mean score of 4.03 and standard deviation .77 indicates a very higher composite score of primary school teachers about environmental attitude. The analysis of

the study reveals that respondents of the study held a more pro-environmental attitude. The result shows that teachers are concerned about the miss use of natural resources (item A.Env2). Similarly, they believe that government should encourage the use of environmental friendly vehicles (item A.Env4) and impose strict laws to ensure the environmental protection (item A.Env3). Moreover, they agree that individuals play an important role in the development of a hygienic environment. Item A.Env2 "Overuse of our natural resources is a serious threat to the health and welfare of future generations" got the highest score while item A.Env5 "There is no point in getting involved in environmental issues, since governments and industries have all the power, and can do what they like (reverse coded in Attitudes Index)" got the lowest score. The result is presented in table 4.11.

Table 4.11

Mean and Standard Deviation for Attitude towards Environmental Aspect of ESD

S.No	Item	N	Mean	SD
A.Env1	Manufacturers should discourage the use of disposables.	400	4.15	.819
A.Env2	Overuse of our natural resources is a serious threat to the health and welfare of future generations.	400	4.33	.637
A.Env3	We need stricter laws and regulations to protect the environment.	400	3.79	.777
A.Env4	Governments should encourage greater use of fuel-efficient vehicles.	400	4.20	.781
A.Env5	There is no point in getting involved in environmental issues, since governments and industries have all the power and can do what they like (reverse coded in Attitudes Index)	400	3.68	.842
	Average	400	4.03	.771

4.3.3 Economic Attitude

The attitude scale for economic aspect of ESD was consisting of 4 items the average mean score of 4.02 with a standard deviation of .774 indicates a higher composite score of

primary school teachers on the attitude scale. It shows that respondents of the study held a more pro-economic sustainability attitude. Item A.Econ4 "Taxes on polluters should be increased to pay for damage to communities and the environment" got the highest score while item A.Econ2 "Sustainable development will not be possible until wealthier nations stop exploiting the labor and natural resources of poorer countries" got the lowest score. The result is presented in 4.12.

Table 4.12

Mean and Standard Deviation for Attitude towards Economic Aspect of ESD

S.No	Item	N	Mean	SD
A.Econ1	Poverty alleviation is an important topic in education for sustainable development.	400	4.04	.746
A.Econ2	Sustainable development will not be possible until wealthier nations stop exploiting the labor and natural resources of poorer countries.	400	3.84	.804
A.Econ3	Companies that are environmentally sustainable are more likely to be profitable over the long run.	400	3.98	.819
A.Econ4	Taxes on polluters should be increased to pay for damage to communities and the environment.	400	4.25	.727
	Average	400	4.02	.774

4.4 Commonly used Teaching Strategies by Primary School Teachers, Regarding SD

The research question #4 "What strategies have been adopted by primary school teachers in the context of 'Education for Sustainable Development' was formulated to investigate the most frequently used teaching strategy by primary school teachers. Teachers were asked to mark the five most frequently used teaching method, 1 as most frequently used strategy, 2 as second most frequently, 3 as third most frequently, 4 as fourth most frequently and 5 as fifth most frequently used strategy from the given list of lectures, group discussions, roles-playing, issue analysis techniques, debates, storytelling, field trip,

games, projects and others. 46.25% (n=185) of teachers identified that they used lecture as most frequently teaching strategy in their classroom, 20.5% (n=82) used group discussion, 10.75% (n=43) used role playing and 10.25% (n=41) story telling as their most frequently used teaching strategy in their classrooms regarding SD.

Only 6.25% (n=25) used field trip, 3.75% (n=15) uses games and 2.25% (n=9) uses projects as their most frequently used strategy in their classrooms. A high number of teachers ranked lecture (82.25%), group discussion (64%) and storytelling (43%) as their three most frequently used teaching strategies regarding SD. The result is presented in table 4.13.

Table 4.13

Frequency of Teaching Strategies Regarding SD

Teaching Strategy	Most Frequently N (%)	2nd most Frequently N (%)	3rd most Frequently N (%)	4th most Frequently N (%)	5th most Frequently N (%)
Lecture	185(46.25%)	89 (22.25%)	55 (13.75%)	44 (11%)	22 (5.5%)
Discussions	82 (20.5%)	104 (26.0%)	70 (17.5%)	42 (10.5)	20 (5.0%)
Role-playing	43 (10.75%)	35 (8.75%)	29 (7.25%)	27 (6.75%)	21(5.25%)
Debates	0 (0.00%)	8 (2.00%)	9 (2.25%)	4 (1.00%)	15(3.75%)
Story telling	41 (10.25%)	47 (11.75%)	84 (21.00%)	61 15.25%)	34 (8.5%)
Field trip	25 (6.25%)	43 (10.75%)	22 (5.50%)	30 (7.50%)	51(12.75%)
Games	15 (3.75%)	9 (2.25%)	34 (8.50%)	59 (14.75)	31(7.75%)
Projects	9 (2.25%)	0 (0.00%)	41 (10.25%)	12 3.00%)	0 (0.00%)

4.5 Factors affecting the implementation of ESD strategies in classroom

The research question "What factors affect the implementation of 'Education for Sustainable Development' ideas in classroom?" was formulated to investigate the major factors that hinder the implementation of ESD ideas in their classrooms. Six factors that

were investigated in this study were lack of knowledge and expertise, lack of planning time, lack of resources, lack of staff and administrative support, range of student diversity and parents' expectations. Lack of resources was ranked as the top factor that hinder the implementation of ESD strategies in primary education classrooms, and was identified by 218 teachers (54.50%). The second factor that hinder the implementation of ESD strategies in primary education classrooms was lack of planning time identified by 193 teachers (48.25%), and the third factor that affects the implementation of ESD strategies was lack of knowledge and expertise identified by 108 teachers (27%). The least identified factor was parent expectations, identified by only 3.26% of the respondents (n = 13). The result is presented in table 4.14.

Table 4.14

Factors hindering the implementation of SD ideas in primary school classrooms

Factors	Frequency of teachers responses N	(%)
Lack of resources	218	54.50
Lack of planning time	193	48.25
Lack of knowledge and expertise	108	27.00
Lack of staff and administrative support	76	19.00
Range of Student Diversity	31	7.75
Parents' expectations	13	3.25

Chapter 5

SUMMARY, FINDINGS, DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

5.1Introduction

The chapter comprises summary, findings from both qualitative content analysis and quantitative data discussion and conclusions. Similarly, recommendations and suggestions for further research are also addressed in this chapter.

5.2 Summary

Sustainable development is considered as an urgent and important global necessity by world community. In parallel, UNESCO (2012a) has called for more research to establish the link between SD and quality education, in order to provide evidence that ESD 'works' for changing people's behaviors and lifestyles and thus to promote ESD being mainstreamed. The main purpose of the study was to analyze the primary school curriculum for different aspects of SD to identify the status of ESD in the curriculum. To attain the purpose of the study the following objectives were addressed:

- To analyze the primary education curriculum for different aspects of 'Education for Sustainable Development'.
- To investigate primary schools teachers' understanding of 'Education for Sustainable Development'.
- To measure primary school teachers' attitude towards 'Education for Sustainable Development'.
- To examine the techniques adopted by primary school teachers to implement the ideas of 'Education for Sustainable Development' in their classroom.

- To investigate the constraints in implementing ideas of 'Education for Sustainable Development' in primary schools.

A convergent parallel design of mixed methods was used for data collection. The qualitative data were based on content analysis of primary education curriculum, while the quantitative data were collected through a test of understanding and attitude scale from primary school teachers to measure their understanding and attitude towards SD. Sample of the study comprised of male and female primary school's teachers of four districts of KP namely Malakand, Charsadda, Kohat and Haripur representing the northern, central, eastern and southern parts of the province. A coding scheme was developed for curriculum analysis while quantitative data were analyzed using different statistical tools like frequency, mean and standard deviation, t-test and one way ANOVA, the result from both qualitative and quantitative data were discussed in chapter 4. In the next sections of the chapter findings and discussion are described.

5.3 Findings

The detail findings of this mix methods research were presented in chapter 4, while the major findings of the study are presented here according to the objectives of the study. Important findings of the study are as given below:

Question 1:

"How the aspects (knowledge, skills and values) of 'education for sustainable development are included in primary school curriculum?"

1. The analysis of sample curricula shows that primary school curriculum emphasizes mostly on health and cultural aspect of social sustainability, and thus vital for

students to understand the characteristics of healthy life, and understand and compare different cultures to engage themselves with others at local and global levels. Similarly, the curriculum indicates that understanding human rights and responsibilities at local and global levels are essential for primary school students. It also indicates that tracing the origin of local and global problems and identifying their solutions, are vital for global peace and security, and will prepare the students to actively participate in the development of a sustainable.

2. Knowledge content about environmental aspect of sustainability is well presented in the four sample curricula of primary education. It mostly emphasizes on pollution, natural resources and biodiversity, while air, soil, energy, agriculture, climate change, natural disasters and waste are the least represented elements, still overall environmental content is well represented in the primary school curriculum
3. Given its conceptual complexity, economic elements are among the least represented ESD content in primary school curriculum. This did indeed turn out to be the case in Urdu, general science and Islamiat but in social study it is represented as much as environmental aspects of SD. The emphasis of primary school curriculum regarding economic SD is mostly on production and consumption and other aspects are missing
4. All aspects of the ESD skills content are found in the primary education curriculum, overall the most represented skill in all the selected text books is the critical reflective skills followed by skill of applying learning in a variety of contexts and then skill of identifying and clarifying values. While, dealing with crisis and risks is the least represented skill in all the selected textbooks.

5. Urdu and Islamiat have the greatest number of signs about values aspect of SD. In urdu, content about acting with respect to others, forgiveness, solidarity and tolerance, justice and freedom are included. In Islamiat, there are separate units, covering honesty, simplicity, forgiveness, tolerance, equality, austerity and Islamic brotherhood.

Question 2:

"How do primary school teachers understand 'Education for Sustainable Development'?

6. An average of 49.6% teachers, responded correctly to the seven questions of social sustainability, while 50.4% responses were incorrect. It shows that primary school teachers have less than adequate knowledge of social sustainability. Most of the teachers had poor to mediocre level of knowledge about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as 50% of the teachers did not consider a culture of peace, human rights, equity and culture diversity as essential elements of ESD (table 4.7).
7. The majority (50.06%) teachers' responses were incorrect on six items of environmental sustainability, while 47.98% were correct. The large number of incorrect answer reveals the inadequate knowledge of primary school teachers about environmental sustainability). A majority of teachers (63.3%) believe that they cannot slow down the rate of climate change, similarly, 57.8% believe that there is no need to conserve fresh water as KP has plenty of it, indicating the

misconception of primary school teachers about the environmental element of SD (table 4.8).

8. The average number of correct answers to 5 economic knowledge statements were 210.4 (52.62%) and wrong answers were 189.6 (47.44%) for primary school teachers. Although the majority of the answers were correct still less than 70% indicate an inadequate knowledge of primary school teachers about economic aspect of sustainable development (table 4.9).

Question 3:"What are the primary school teachers' attitude towards 'Education for Sustainable Development'?"

9. The mean score of 4.24 on attitude about social sustainability indicates a very positive attitude of primary school teachers' toward social sustainability (table 4.13).
10. The mean score of 4.03 on attitude scale about environmental sustainability indicates a more pro-environmental attitude of primary school teachers (table 4.14).
11. The mean score of 4.02 with a standard deviation of .774 indicates a higher composite score of primary school teachers on the attitude scale about economic sustainability (table 4.15).

Question 4: "What strategies have been adopted by primary school teachers in the context of 'Education for Sustainable Development'?"

12. Forty six percent (46.25%) of teachers were using lecture method as most frequently teaching strategy regarding SD and ESD, 20.5% discussion, 10.75% roleplaying, 10.25% storytelling, 6.25% field trip, 3.75% (n=15) games and 2.25%

used projects as the most frequently used teaching strategy in their classrooms (table 4.19).

6) **Question 5: What factors affect the implementation of 'Education for Sustainable Development' ideas in classroom?**

13. 54.50% teachers believe that "lack of resources" was the biggest factor effecting the implementation of ESD strategies in primary school classrooms, followed by "lack of planning time" 48.25% and then "lack of knowledge and expertise" 27% (table 4.20).

5.4 Discussion

5.4.1 Qualitative Content Analysis

The main objective of the study was to analyze primary education curriculum to identify the presence of knowledge, skills and values about SD and ESD. The analysis shows that SD or sustainability is not mentioned directly in primary education curriculum. However, when the curriculum was scrutinized and analyzed some content about knowledge, skills and values of SD were found in all subjects' curricula. The content analysis of the primary education curriculum reveals that overall the skills content of ESD is the most represented element of ESD mentioned in the selected four subjects of primary education curriculum followed by environmental content and then social. Given their conceptual complexity, economic elements were expected to be among the least represented ESD cognitive content in primary education curriculum (Domazet et al., 2012).

The socio-cultural aspect of SD refers to issues related to "*human rights, peace and human security, gender equality, cultural diversity and intercultural understanding,*

health, HIV & AIDS and new forms of governance" (Wals, 2009, p. 28). The analysis reveals that the emphasis of social sustainability in primary education curriculum is mostly on health and hygiene, cultural diversity and intercultural understanding and humans' rights, while peace and security, new forms of governance and gender equality are the least represented elements of social sustainability. New forms of governance is represented only 2 time in primary education curriculum, once in Social Study and Islamiat respectively, while Urdu and General Science have zero representation of the concept. This concept is vital for SD because it enables learners to become aware of the inclusion of SD in political decisions making and state ruling (Domazet et al., 2012).

Similarly, gender equality is the least represented element of social sustainability in primary education curriculum. It appears once in social study of grade five stating that "women are respected in our society". It seems that gender equality is not an issue in Pakistani society. It might be because of strong traditional family system, where women play the role of a mother, housewife or a submissive person. It is a big loss to ESD, because gender equality is the main issue of post 2015 discussion and teaching it through curriculum is an essential element of ESD (UNESCO, 2013). Women discrimination is the most common form of discrimination (Domazet et al., 2012).

A prosperous society value education, has strong civic concession and always makes transparent, democratic, equitable decisions, which cannot be achieved without the participation of all citizens. A sustainable society deals all its member fairly regardless of their gender because each individual possess unique qualities and he/she has a role to play for the development of his/her society (UNESCO, 2014a). It is also a big loss for ESD as

without equal participation of all members a democratic and healthy society cannot be developed (Domazet et al., 2012).

Environmental aspects are the second most represented element of SD in primary education curriculum. It seems that primary education curriculum is mostly concerned with pollution and biodiversity, while natural resources, air, soil, energy, agriculture, climate change and waste management has the least representation, still it cannot be said that overall environmental elements are underrepresented in the primary school curriculum. However, to preserve this unique and sensitive planet for our future generations all the above topics must be inserted in primary education curriculum with clear vision and rationale of ESD. Pakistan is an agricultural country and about 64% its population is living in rural areas depending mostly on agriculture (Alvi, 2018). It has a big influence on any country landscapes and the quality of its environment (Domazet et al., 2012). "*Pakistan's agriculture sector plays an essential role in the economy as it contributes 18.9 percent to GDP and absorbs 42.3 percent of labor force*" and also an important source of foreign exchange (Economic Survey, 2018, p. 13) but very few speculation were found about agriculture in primary education curriculum. Similarly, our world has limited resources and humans are consuming these limited resources with a very speedy rate (WWF, 2006; UNEP, 2011) and a change in consumption pattern and human behavior through education is required (UNESCO, 2002) but there is almost zero representation of this aspect in the selected text books of primary education curriculum, which provides ESD an opportunity to be inserted in primary education.

Similarly, there is nothing in the primary education curriculum about fossil fuels which are the main source of pollution and global warming (Denchak , 2018). Similarly there is nothing on renewable or clean energy in the curriculum. Therefore, there is an urgent need of inserting content about this concept according to ESD vision and rationale in primary education curriculum. Outlining the pros and cons of fossil fuels and their potential replacement will help in changing students' attitude towards the use of these sources of energy. The ultimate goal of this concept might be the Speedy transition to a clean, renewable energy, which will help a great deal in reducing the dangerous carbon pollution that causes climate change.

Given its conceptual complexity, economic elements were expected to be among the least represented ESD content in primary school curriculum (Domazet et al., 2012). This did indeed turn out to be the case in Urdu, General Science and Islamiat but in Social Study, it is represented as much as environmental aspect of SD. Social Studies of grades four and five have separate units with the title "Our Economics" and "Economy" respectively. However, the emphasis of these contents are mostly on production and consumption. The overall representation of this concept is so low that no additional statistically significant information about it can be given.

The analysis of skills content reveals that overall the most represented skill content in the primary education curriculum is the critical reflective skills followed by skill of applying learning in a variety of contexts and then skill of identifying and clarifying values. While, dealing with crisis and risks is the least represented skill in all the selected textbooks. In General Science, however, the most represented aspect of skills content is the

basic science skills as it has a large number of content and activities that encourage students to think scientifically (Ministry of Education, 2006b) and develop their skills of performing experiments, writing observation. measuring, labeling, inferring, classifying, predicting and to communicate their findings in a variety of ways.

The second most represented skills content in General Science is the critical thinking skill as it has content that encourages students to think critically to develop their problem solving skills and skill of making appropriate choices. For example general science of primary education has content that encourages students to ask questions about different events and objects in the immediate surrounding and develop ideas how these questions might be answered. Similarly, it contains activities that help students to develop solutions to problems through reasoning, observation and investigation (Ministry of Education).

Being an Islamic republic, it is expected that the national curriculum of Pakistan to be value laden. It is confirmed by the curriculum analysis. According to Ministry of Education (2006a & 2006c) the aim of primary education curriculum is to promote brotherhood, unity, solidarity and tolerance, equity, justice, sincerity, honesty, social welfare and human rights, and students are expected to learn about these values and apply them in their real life. The analysis reveals that the most represented aspect of value content in primary education curriculum is forgiveness followed by acting with respect to others and justice equally and then solidarity and tolerance.

According to UNESCO (2005), a complete ESD requires the integration of social. environmental and economic dimensions, and a curriculum that contains all these aspects of ESD and enables learners to differentiate between sustainability and unsustainability,

and if primary education curriculum provides the foundation for a later appropriate domain specific factual knowledge then the curriculum is on the right track (Domazet et al., 2012). The researcher believes that ESD has many formative resources and it represents an important educational asset, which must be more present in the primary education curriculum of Pakistan.

5.4.2 Quantitative Analysis

5.4.2.1 Teachers Understanding

Demographic information about the teachers was obtained from the test of understanding and attitude scale of the study, comprising gender, age, position, qualification and job experience. Table 4.6 shows the descriptive characteristics of participant teachers. Most of the participants were male primary school teachers, similarly, most of them were above 36 years of age and majority of the respondents had more than ten years of a teaching experience.

One of the main purpose of the study is to find out primary school teachers understanding and their attitude towards SD. The low number of correct answers about all the aspects of sustainability indicates that most of the teachers had poor to mediocre level of knowledge about the three basic pillars of SD and their interrelationships. Similarly, a large number of teachers hold misconceptions about ESD as half of the teachers did not consider a culture of peace, humans' rights, equity and culture diversities as essential elements of ESD and SD. Similarly, the respondents believe that they cannot slow down the rate of climate change and that there is no need to conserve fresh water as KP has plenty of it. According to Tuncer, et al., (2009), to teach the students about SD and ESD,

the teachers need adequate knowledge of environmental issues and their interrelationship with ESD.

The low number of correct responses may reproduce the fact that most of the respondents had never received environmental education or ESD training in their formal education programs (Maidou, Plakitsi, & Polatoglou, 2019). This is understandable since ESD is not part of the teacher education curriculum in Pakistan. According to Kalsoom et al, (2018), "*ESD has not been addressed in key documents of teacher education in Pakistan*" (p. 29). Similarly in a recent study Durrani, Malik,and Jumani (2019) found that the three pillars of SD are not aligned in elementary teachers program which was developed in 2012. According to Jumnai and Abbasi (2015), ESD is missing in Pakistani teacher education and that Pakistani teachers have inadequate knowledge of ESD.

5.4.2.2 Teachers Attitude towards SD

The analysis reveals that despite of inadequate knowledge of SD and ESD teachers' of primary schools had a very positive attitude towards SD, which is very important for effective teaching of ESD in classroom and for the creation of sustainable society (Kennelly, Taylor, & Maxwell, 2008; Stevenson, 2007; Manning, 2009). According to Gayford and Dillon (1995), there is no clear linear relationship between knowledge and attitude. Similarly, Dillon and Gayford (1997, p.284) states that teacher positive attitude "*cannot be treated as though they arise from a common, shared base, but rather that the range of influences on the public in general are likely to be reflected within this sub-group*". In term of SD, social norms play an important role in shaping peoples attitude and work as an agent of transformation. According to Manning (2009);

> *Social norms are the implicit social rules that govern behavior within a community. Norms are not directly established, instead, they develop over time as people go about their daily behaviors, sense people's reactions to those behaviors, and observe what other people are doing. Social norms differ depending on the group of people, community, or culture. What is considered fully normal, even admirable, in one group may be met with disapproval in another (p. 7).*

Similarly, Cialdini (2004) states that peoples use "social proof" as a guide for their behaviours and adopt appropriate beahviour in a given situation, and in a new or ambiguous situation these acceptable proofs are very powerful guides. As the transition to SD brings many new ideas and behaviors with some ambiguity that is why despite of positive attitude, many people don't know how to implement these ideas in their every day lives (Manning, 2009). Findings of the study reveal that teachers are in favor of integration of sustainability principles in the curriculum at all levels. Moreover, they agreed that each individual (both boys and girls) should be empowered with knowledge, skills, values and attitude to preserve the world for next generation. Similarly, the participants are in favor of strict legislation to protect the environment. The participants also believe that the use of fossil fule should be reduced.

5.4.2.3 Teaching Strategies for ESD

A high number of teachers ranked lecture (82.25%), group discussion (64%) and storytelling (43%) as their three most frequently used teaching strategies regarding SD. 26% ranked role playing and 22% field trip among the three most frequently used teaching strategies. While other stratagies like issues analysis, debates and projects etc., a are very less frequently used strategies in primary school settings.

Lecture is used by majority of teachers as one of the three most frequently used strategy in which 46% using it as most frquently, while students centre strategies like discussion,

role playing and project are used by a very few number of teachers as their most frequently used strategies, which are very important strategies for ESD competencies and bring many changes (Maidou et al., 2019). As the aim of ESD is to acquire knowledge, skills values and attitude to empower individuals to actively participate in the development of a just and sustainable society, and it can be achieved only through students centre or action orinted pedagogies (Rieckmann, 2018).

Knowledge, skills, and experiences acquire through participatory strategies lead to greater understanding, enhances ESD competencies and community building (Schusler & Krasny, 2008; Ciobanu, 2018). ESD motivates students, and is a fertile ground for active student participation (Domazet et al., 2012). According to Christie and Afzaal (2005), in Pakistan teachers mostly used teacher, textbook centred and examination orinted strategies because these strategies are easy to implement in pakistani context.

Similarly, Rehmani (2006) found that teachers had knowledge of participatory strategies but due to large number of students and short span of time can not implement these strategies in the classroom. As the majority of the participants were veteran teachers so another explanation could be that vetren teachers resist to adopt new ideas and active teaching stretagies to avoid extra responsibilities (Rehmani, 2006).

5.4.2.4 Factors affecting the implementation of ESD strategies in classroom

The analysis reveals that most of the respondents ranked "lack of resources", "lack of planning time" and "lack of knowledge and expertise of ESD" are the three top factors that affect the implementation of ESD strategies in their classrooms. These finding are in line

with Sianna (2015) and Rehmani (2006). Sianna (2015) found that majority of Hong kong teachers believe that lack of planning time is the biggest hinderance in the implementation of ESD strategies. Similarly, she found that lack of resources is another big hinderance in the implementaion of ESD strategies in classrooms. Rahmani (2006) found that lack of planning and implementaion time and lack of staff and administrative support prevent techers to implement participative approaches in their classroom. Rahmani also states that lack of knowledge and experties about these participative strategies also prevent primary school teachers to implement these strategies in their classrooms.

5.5 Limition of the study

The current study may have some possible limitations. The first one may be that only four subjects curricula of grade 4 and 5 were analyzed, which may not be able to provide a full picture of ESD. Similarly, the test of understanding was based on true false statement which can increase the chance factor and, therefore, can lead to over estimation of the result. It could be measure through multiple choice questions or with open ended questions. Similarly, the measure of teachers attitude was based on teachers self report which can also lead to over estimation of the result. Therefore, generalization of the finding should be done with extensive care.

5.6 Conclusion

The findings of the study lead to important conclusions regarding the status of ESD in primary education curriculum in KP, teachers' understanding and their attitude towards ESD, the strategies used for implementing ESD ideas in their classroom, and the factors affecting the implementation of these ideas. The analysis of the study shows that primary

education curriculum of KP does not have a clear view about SD or ESD although the primary education curriculum was developed in the beginning of UN, DESD (2005-2014). It indicates that the UN, DESD (2005-2014) was not successfully implemented in Pakistan (Kalsoom et al., 2019) and that primary education curriculum was not developed according to the principes of SD. Economic aspect of ESD was the least represented in all the subjects. Environmental aspect was the most represented element of ESD in primary education curriculum followed by social aspect of ESD. The environmental aspect was well represented in all the subjects, while the economic aspect was represented only in Social Study.

Urdu has content about social and environmental aspects of ESD. It also contains content about, sustainability skills and values. Similarly Social Study contains knowledge content (social, environmental and economic), skills content and values content of SD. While general science has a large number of sustainability skills content and has some content about the environmental aspect of SD. However, Islamite contains mostly values content. The emphasis of environmental aspect is mostly on pollution and biodiversity, while social aspect emphasizes health and hygiene, cultural diversity and intercultural understanding, and human rights. Similarly, production and consumption is the main focus of economic aspect in primary education curriculum.

The curriculum contains a large number of examples (activities and exercises) that enhances students ESD skills. Critical reflective thinking is the most represented skill followed by applying learning in a variety of contexts and identified and clarified values. In General Science basic science skills are the most represented skills followed by critical

reflective thinking skills, forgiveness, acting with respect to others, justice and equality and solidarity and tolerance are the ESD values promoted by primary education curriculum

The participants of the study had a relatively low level of knowledge of sustainability as compared to their very proactive attitude towards the social, environmental and economic aspects of SD. They have an unclear perception of what SD is about. However, they believe that sustainability principles should be integrated in primary education curriculum.

Lecturing is a dominant teaching strategy in primary education beside some participative strategies. According to the participants, the main three reasons for not implementing the ESD strategies in their classrooms are lack of resources, lack of planning time and lack of knowledge of these strategies.

5.7 Recommendations

Study findings have important recommendations for policy makers, curriculum and text book developers, teachers' educators, teachers and Pakistani national commission for UNESCO.

1. It is suggested that in the development or revision of primary education curriculum the principles of ESD must be considered. Moreover, when choosing a criteria for textbook development, the Ministry of Education, as an authority, must ensure that textbook authors and reviewers observe the principles of ESD, if the nature of the subject allows these. Similarly, the emphasis of education curriculum is mostly on environmental aspect and the social and economic aspects are generally less represented at primary level (Bratovic, Lepic, & Kadic, 2011), therefore, the

presence of these aspect must be increased in primary education because without these aspects the curriculum is not truly an ESD curriculum (Bregvadze, 2011; Bratovic etal., 2011).

2. There is an urgent need of updating the text books as some of the examples are given to preserve the ecosystem are obsolete. For examples content and activity about renewable resources should be added in curriculum. Similarly, content about gender equity should be included in the primary education curriculum. To ensure the integration of these aspects in primary education, the textbook authors and reviewers must be trained about ESD principles.
3. It is also recommended that primary school teachers should be trained about ESD both at in-service and pre-service levels. In teachers training programs, principles of ESD may be reoriented in curriculum as suggested by many reports (Domazetet al., 2012) or may be introduced through a standalone course (Kalsoom, 2017).
4. Due to the lack of knowledge and understanding of primary school teachers about the term ESD and SD, there is a need for a greater awareness among all educational stakeholders about the importance and value of ESD. In this regard study tour or mobility programs may accelerate the medium level impact change. Similarly the introduction of extra-curricular activities on ESD at school level might increase teachers understanding of ESD.

5.8 Implications of the study

1. To make the primary education curriculum a true ESD based curriculum, findings of the study might be used by curriculum and text book developers to reorient the missing or less represented elements of ESD in the curriculum.
2. In post-2015 discussion ESD is an essential element for sustainability, therefore teachers need to be trained about ESD to implement ESD ideas in their classroom and must be familiar with all the SDGs, especially, with Goal 4: Quality Education and Target 4.7, which aim to equip all the learners with SD knowledge, skills, values and attitude by 2030, the research findings can, therefore, be used to introduce ESD-based courses at teachers training institutions that can enhance both pre-service teachers' understanding and practices of ESD.
3. The continuous professional development programs can be used as a tool to enhance primary school teacher understanding of SD and ESD.

5.9 Suggestion for Further Research"

The current study was limited in different ways and does not provide a clear view of ESD in primary education. The greatest one is that only four subjects' curricula of grades 4 and 5 were analyzed. Therefore, in future researchers may analyzed;

1. The whole subjects curricula offered in primary education using the same coding scheme.
2. Similarly, researchers can use the same coding scheme to analyze secondary and higher secondary education curricula to have a full picture of ESD in the country.

3. The current study investigated only primary school teachers' knowledge and attitude towards ESD, in future, knowledge and attitude towards ESD of secondary and higher secondary school teachers and students enrolled in secondary and higher secondary education may also be investigated.
4. The researcher rely only on quantitative data for teachers knowledge and attitude towards ESD, in future a face to face interview with teachers and other stakeholders can provide a clear picture of ESD knowledge and practices.

5.10 Reflection about the Research

The world is now seven years into United Nations SDGs, specifically marked for focusing on the Earth's ecological, economic and societal future. The researcher questioned what progress was being made to this end in our provincial educational system. The researcher wondered what teachers were doing and how the 2030 agenda of UN impacted their decisions. The definition of ESD for this study was "a transformative learning process that empower individual with knowledge, skills values and attitude to actively participate in the development of a sustainable future" (UNESCO, 2014). The researcher initially chose this definition because it contained an emphasis on latest forms of learning, competence and skills to create a new kind of citizen and a new kind of holistic education. After the study, it was proposed that ESD encompasses all the training, public awareness, and educational activities that enrich people understanding of the connection between social justice and the environment. It incorporates key sustainable development issues into teaching and learning, such as climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It requires teaching and learning methods that

motivate and empower learners to change their behavior and take action for sustainable development.

Schools will be important in preparing and empowering learners to assume responsibility for creating and enjoying a sustainable future. Such an approach involves a vision of education and teaching and learning that seeks to help all learners better understand the world in which they live, to enable them to face the future with hope and confidence. They need to know that they can play a role in addressing the problems that threaten our future such as poverty, hunger, HIV/AIDS, drug, wasteful consumption, environmental degradation, population growth, gender inequality, health, conflict and the violation of human rights. They need to learn to create a better space to live, learn and work for all. They must appreciate and not destroy our most precious resource - the planet, Earth.

The one thing that will make the most difference in teaching students about sustainable development is the teacher's passion. This study has reinforced my commitment to teaching about sustainable development. It provided the richest professional development opportunity for my career. My practice as a teacher has been transformed by my research. I have been introduced to a variety of resources that can be adapted for use in my own classroom and my enthusiasm for teaching about sustainable development has been renewed. As McConnell and Stephen (2005), stated: "*We can only rediscover our human connections with the earth if we begin with our children's education*" (p. 23). Primary schools are the perfect location to begin to teach children about their responsibility toward the Earth. I am even more convinced that this is possible after reorienting SD principles and issues in primary education curriculum. This is important because primary school students are the future of our society. They must be equipped with the skills, knowledge

and values needed to create a fairer and more sustainable world when they enter the society. They must aware of their decisions and actions in the society, especially on issues that concern the future of planet.

In addition, ESD involves more than just teaching the scientific and theoretical background behind the issues. It involves the development of skills, attitudes and behavior for sustainability. Teachers can foster the skills, such as critical thinking, team work and problem-solving in their students by creating problem-based learning, cooperative learning, and group discussion in classroom. In the future, they can transfer these skills into their future workplaces and community.

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APPENDIXES

Appendix A

Permission for the use of the questionnaire

Research Gate

Ijaz Ahmad Nov 13, 2019

I am PhD student studying sustainability under the supervision of professor Dr. N.B.Jumani department of Education IIU Islamabad. I want to use the Knowledge, Attitudes and Behaviors questionnaire developed by Dr. Alex C. Michalos, Heather Creech, Dr. Christina McDonald and P. Maurine Hatch Kahlke. Therefore I want your permission to use this questionnaire

Regards

Ijaz Ahmad

Ph.D. students

Dept. of Education IIUI

Heather Creech to you Nov 14, 2019

Dear Mr. Ahmad,

Thanks for your interest in our research. The work was originally funded through the International Institute for Sustainable Development, under my direction when I was a program director there, so I am more than happy to provide you with permission to use the questionnaire, with acknowledgement of course of its source. Best regards

Heather Creech

APPENDIX B

Questionnaire

Teachers' knowledge/Understanding and attitude towards

'Education for sustainable development'

Name of Teacher _____ Gender Male / Female_____

Name of school_____ Name of District_____

Qualification _____ Designation _____

Experience as a teacher _____

Part A: Teacher understanding of ESD

S.No	**Societal Elements of ESD**	True	False
K.1	Economic development, social development and environmental protection are all necessary for sustainable development.		
K.2	Education for sustainable development emphasizes education for a culture of peace.		
K.3	Education for sustainable development emphasizes respect for human rights		
K.4	Sustainable development has nothing to do with social justice.		
K.5	Education for sustainable development emphasizes gender equality.		
K.6	Corporate social responsibility is irrelevant to sustainable development.		
K.7	Education for sustainable development supports cultural diversity.		
	Environmental Elements of ESD	True	False

K.8	Sustainable consumption includes using goods and services in ways that minimize the use of natural resources and toxic chemicals, and reduces waste.		
K.9	Education for sustainable development seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources		
K.10	We cannot slow the rate of climate change.		
K.11	Conservation of fresh water is not a priority in KP because we have plenty.		
K.12	Maintaining biodiversity—the number and variety of living organisms—is essential to the effective functioning of ecosystems.		
K.13	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		
	Economical Elements of ESD	True	False
K.14	Pakistan's overall energy is improving.		
K.15	Helping people out of poverty in Pakistan is an essential condition for Pakistan to become a sustainable country.		
K.16	Non-renewable resources should not be used faster than the rate at which we find substitutes that are renewable.		
K.17	Sustainable development is as much about the children in the future as it is about what we need today.		
K.18	Sustainable development does not require that businesses to behave responsibly		

Part B: Teachers' attitude toward ESD

SA: Strongly Agree, **A**: Agree, **U.N**: Undecided, **DA**: Disagree, **SDA**: Strongly Disagree

The statements below are designed to find out your attitude toward ESD, therefore answer all the question, there is no right or wrong answer

S.No	Attitude about Societal elements of ESD	S.D.A	D A	U D	A	S.A
A.1	Every girl or boy should receive education that teaches the knowledge. perspectives, values, issues and skills for sustainable living in a community.					
A.2	The present generation should ensure that the next generation inherits a community at least as healthy, diverse and productive as it is today					
A.3	The teaching of sustainability principles should be integrated into the curriculum in all disciplines and at all levels of schooling.					
A.4	Adopting sustainable development as a national priority is key to make Pakistan's status as one of the most live able countries in the world.					
A.5	Citizenship education is an important component of education for sustainable development.					
A.6	Gender equality has nothing to do with sustainable development (reverse coded in Attitudes Index).					
	Attitude about environmental elements of ESD	S.D A	D.A	U D	A	S.A
A.7	Manufacturers should discourage the use of disposables.					
A.8	Overuse of our natural resources is a serious threat to the health and welfare of future generations.					
A.9	We need stricter laws and regulations to protect the environment.					
A.10	Governments should encourage greater use of fuel-efficient vehicles.					
A.11	There is no point in getting involved in environmental issues, since governments and industries have all the power and can do what they like (reverse coded in Attitudes Index)					
	Attitude about Economical elements of ESD	S D.A	D.A	U.D	A	S.A
A.12	Poverty alleviation is an important topic in education for sustainable development.					
A.13	Sustainable development will not be possible until wealthier nations stop exploiting the labor and natural resources of poorer countries					
A.14	Companies that are environmentally sustainable are more likely to be profitable over the long run.					
A.15	Taxes on polluters should be increased to pay for damage to communities and the environment.					

PART C

Strategies and Constrains of ESD

1. What kind of teaching methods do you normally use in teaching about sustainable development in your classroom? Choose *FIVE* and *RANK* in order of frequency (1 = most frequently used and 5 = least frequently used).

   ☐ Lecturing

   ☐ Multimedia

   ☐ Group discussions

   ☐ Role-playing

   ☐ Inquiry based

   ☐ Storytelling

   ☐ Site visits

   ☐ Projects

   ☐ Other (please specify) _____

2. What are the *THREE* main difficulties or constraints that you have encountered in teaching about sustainable development in primary classroom? (Please tick three.)

☐ I lack the necessary expertise on sustainable development.

☐ I don't have enough time to prepare my lessons

☐ I lack the financial resources for outdoor activities.

☐ Some sustainable development issues are too controversial.

☐ It is difficult to assess the effectiveness of education for sustainable development.

APPENDIX C

Cover Letter for Teachers

Dear Teacher

Aslam-o-Alikum,

I am a Ph.D. scholar at Department of Education, Faculty of Education, International Islamic University, Islamabad and conducting a study entitled "**Education for Sustainable Development: An Analysis of Primary Education Curriculum**" under the supervision of **Prof .Dr. N.B.Jumani**. You are hereby cordially requested to fill out this questionnaire. Data collected through this questionnaire will be strictly kept confidential and will be used only for research purpose. Please return the completed questionnaire by hand or dispatch on the mailing address written on the given envelop. Your cooperation will be highly appreciated.

Thanks

Ijaz Ahmad

Ph.D. Scholar

International Islamic University, Islamabad.

Email: ijazsherpao@gmail.com

APPENDIX D

Coding Scheme

I.	KNOWLEDGE CONTENT	
A	***Social SD***	***Description***
K.S1	Human rights	Civil and political rights, economic, social and cultural rights, environmental rights (right for clean environment)
K.S2	Peace and human security	References to benefits and mechanisms of global peace, and securing "freedom from want" and "freedom from fear" for all persons
K.S3	Gender equality	In employment, career and salary; in political and social rights
K.S4	Cultural Diversity and Intercultural Understanding	Tolerance to other values and perceptions
K.S5	Health	Human health, health problems, environmental health, ageing
K.S6	New forms of governance	New ways to manage governing of goods and communities, e.g. environmental governance (environmental aspects considered in decision making); democratic decision making (transparent, involving stakeholders)
B	***Environmental SD***	***Description***
K.Eco1	Natural resources	Minerals, forest, land, soil etc. (amount, location,)
K.Eco2	Air	Ambient air (quality)
K.Eco3	Soil	Agricultural soil, forest soil (quality); soil erosion processes
K.Eco4	Energy	Fossil fuel-based energy, renewable energy (resources, dependence on these sources)
K.Eco5	Agriculture	Role of agriculture (food, employment); position of agriculture within a wider economics system; forms of agriculture (industrial, small scale, organic, sustainable etc.)
K.Eco6	Biodiversity	Species and habitats (ecosystems) - diversity, quality, loss
K.Eco7	Climate change	Global phenomenon; causes and actions
K.Eco8	Rural development	Villages, communities - role, age ratio, employment; position within wider society, economic base
K.Eco9	Natural disasters	e.g. floods, droughts, volcano eruptions, tsunamis, extreme weather events
K.Eco10	Pollution	Air pollution, water pollution, soil pollution; chemical, biological, physical; systemic or accidental
K.Eco11	Waste	Solid waste, liquid waste, waste management; recycling
C	***Economic SD***	***Description***
K.E1	Poverty	Population living below average living standards; sanitation problems, food shortage, health care deficiency, availability of education; relation to natural resources and economics

K.E2	Planetary boundaries	Planet Earth has limited resources for human consumption and emission mitigation
K.E3	Production and/or consumption	Elements of contemporary market economy, role of companies, role of customers; cultural effects, environmental effects, examples from students' everyday life
K.E4	population growth	Growth rate, its effect on economy and GDP
K.E5	Market economy	An economic model; its role in today's global society
II	**SKILLS CONTENT**	
S.1	Critical reflective thinking	Problems solving, making inferences, calculating likelihoods and decisions making skills
S.2	Futures thinking	Developing reasoning about possible, probable and preferable futures, understanding worldviews and myths that underlie them.
S.3	Ability to identify and clarify values	Developing skills in clarifying one's own and others' values, as well as identifying values that lie behind attitudes and statements
S.4	Negotiating and consensus building	e.g. Resolving conflicts
S.5	Dealing with crisis and risks	Learning about responses to crises and about assessing various risks in the environment. Training in managing one's own response to crises
S.6	Applying learning in a variety of contexts	Writing reports on different events, applying the curricular knowledge in everyday life, learning from everyday situations, comparing two different thing, events etc.
S.7	Basic scientific skills	Performing experiments, writing observation, measuring, classifying, predicting and communicating
III	**VALUES CONTENT**	
V1	Acting with responsibility locally and globally	
V2	Acting with respect to others	others' may include other people, other communities or other beings
V 3	Forgiveness	Identification of kindness, empathy and mercy
V4	Solidarity and Tolerance	Statements about unity among individuals, respect of others people view, harmony and peace
V5	Justice	Signs of Equality between gender and racial
V6	Freedom	Freedom of speech, professions, democratic decision-making, freedom from hunger, violence and oppression or injustice

Appendix E

	General science		Islamiat		Social study		Urdu	
	Grade5	Grade4	Grade5	Grade4	Grade5	Grade4	Grade5	Grade4
K.S1	00	00	02	01	02	01	02	05
K.S2	00	00	03	02	03	00	03	04
K.S3	00	00	00	00	03	02	02	04
K.S4	00	00	00	00	13	10	03	02
K.S5	06	09	00	00	07	01	09	05
K.S6	00	00	00	00	02	06	00	06
Total of K.S	**06**	**09**	**05**	**03**	**30**	**20**	**19**	**26**
K.Eco1	00	00	00	00	07	05	00	00
K.Eco2	00	00	00	00	03	02	00	00
K.Eco3	09	04	00	00	00	00	00	00
K.Eco4	00	00	00	00	00	00	00	00
K.Eco5	00	00	00	00	01	01	03	01
K.Eco6	08	07	00	00	00	00	00	00
K.Eco7	00	00	00	00	02	00	00	00
K.Eco8	00	00	00	00	01	00	00	00
K.Eco9	00	00	00	00	07	03	00	00
K.Eco10	11	03	00	00	05	02	12	15
K.Eco11	00	00	00	00	01	01	03	02
Total of K. Eco	**28**	**14**	**00**	**00**	**27**	**14**	**18**	**18**
K.E1	00	00	00	00	00	00	00	00
K.E2	00	00	00	00	00	00	00	00
K.E3	00	00	00	00	06	07	02	03
K.E4	00	00	00	00	00	00	00	00
K.E5	00	00	00	00	03	01	03	04
Total of K.E	**00**	**00**	**00**	**00**	**09**	**08**	**05**	**07**
S.1	09	07	00	00	09	10	09	08
S.2	00	00	00	00	01	01	02	00
S.3	00	00	03	03	02	03	03	04
S.4	00	00	03	01	02	02	02	00
S.5	00	00	00	00	02	01	04	03
S.6	00	00	03	03	06	05	04	05
S.7	21	22	00	00	02	01	01	00
Total of S	**30**	**29**	**09**	**07**	**24**	**23**	**25**	**20**
V.1	00	00	00	00	01	01	02	01
V.2	00	00	05	05	02	00	04	05
V.3	00	00	07	04	00	00	07	05
V.4	00	00	02	02	02	01	06	06
V.5	00	00	05	03	02	00	07	04
Total of V	**00**	**00**	**19**	**14**	**07**	**02**	**26**	**21**

APPROVAL SHEET

Thesis titled "Education for Sustainable Development: An Analysis of Primary School Curriculum" submitted by Ijaz Ahmad, Registration No. 136-FSS/PHDEDU/F17 in partial fulfillment for the requirement of PhD degree in Education with specialization in curriculum and instruction is accepted by the Department of Education, Faculty of Education, International Islamic University Islamabad for the award of Ph.D. degree in Education

Viva Voce Committee:

Supervisor: _____

(Prof. Dr. N. B. Jumani)

Co-Supervisor: _____

(Prof. Dr. Samina Malik)

Internal Examiner: _____

(Dr. Azhar Mahmood)

External Examiner I: ----------

(Dr. Muhammad Ajmal chahdhary)

External Examiner II: _____

(Dr. Saira Nudrat)

Dated: 13/12/2022

Chairman _____

Department of Education,

International Islamic University, Islamabad

Dean _____

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resources 20% to 30% higher than its normal rate and will be three times more by 2050. United Nations Environment Program [UNEP] (2011), warns that earth is running out of some of the essential resources such as oil, gold, copper, fresh water etc., which can cause conflicts among humanity. Similarly, it warns about global warming caused by the industrial development and the deadly effects of global warming on humans' life. With ever increasing population and need for more prosperity to provide basic facilities such as food, water and sanitation, shelter and quality education etc., it is unlike to reduce this unsustainable consumption pattern, particularly in developing countries (Kaklauskas & Kaklauskiene, 2022).

Therefore, there is an urgent need of rethinking the links between prosperity and natural resources to minimize the use of natural resources to preserve the earth for our future generations and provide a peaceful society, where everyone has equal opportunity to live a quality life. To achieve this inter-generational justice, we have to change the behavior, consumption patterns and make awareness in our young generation about a sustainable future. The aim of ESD is to prepare individuals that actively participate in the development of a sustainable future. Therefore, we need to reorient our education and integrate ESD in our curriculum particularly at primary level. Kalsoom (2017) mentioned the lack of knowledge of ESD and strategies used for ESD implementation at all levels. Considering these gaps this study investigated the status of ESD in primary education. Similarly, this study investigated to find out primary school teachers understanding of ESD and SD, their attitude and strategies used for implementing ESD in their classroom setting.

The main reason for choosing primary education for ESD research was that primary education period plays the most important role in the development of an individual life and considered as the base on which the rest of an individual life is built (Musterd, 2000) . Therefore this period of study can be used as a tool to transform the knowledge, skills and values of our young generation and prepare them for their role in the development of a sustainable society.

Another reason is the researcher's own experience as a primary school teacher for twenty years that most of the primary school teachers possess content and pedagogical knowledge but have very limited knowledge of international issues and their possible solutions such as environmental and social justice and human rights etc. They, also, have prejudice attitudes against gender and other cultures. The excessive use of resources such as stationery were also observed, which motivate the researcher to evaluate primary school teachers' understanding and their attitude towards SD and ESD.

1.2 Statement of the Problem

To maintain a sustainable planet for future generations, a change in human behavior, production and consumption patterns are required (Redclift, 1992). According to Kerkhoff and Lo (2006), humans' behavior about environment can be changed through public awareness and education. Similarly, Agenda 21 gives a prime importance to education to develop humans' competencies about a sustainable future (United Nations, 1992). In the 2002 World Summit, it was recognized that "Education is the primary agent of transformation towards SD" (UNESCO, 2002). As primary school period plays the most

significant role in the development of an individual's life and is usually viewed as the base on which the rest of an individual life is built (Musterd, 2000).

Therefore, primary school education can be used as a tool to change students' behavior about the earth. It is clear from the literature that primary school settings are very interested in ESD (Hedefalk, Almqvist, & Östman, 2015). Despite of greater interest, some countries have not yet integrated ESD in their primary school curriculum (Johannesson, Norodahl, Oskarsdottir, Palsdottir, & Petursdottir, 2011). In their reviews of research literature on the ESD, Davis (2009) and Hedefalk et al. (2015) urges for more research on ESD at the primary level. Although some studies have been conducted about different aspects of ESD but most of them were in developed countries.

In developing countries there are scarcity of this type of studies, despite of that they have developed polices to include ESD at all levels and reshaped their curricula. Primary school students, as a future generation of Pakistan, need to be experts of ESD. Therefore, primary school curriculum is a key variable in introducing, engaging and influencing students' knowledge, skills, values and attitude for a sustainable future.

Recognizing the importance of primary education in ESD and the need for ESD research in Pakistan. This study analyzed the status of ESD in primary education curriculum, primary school teachers' understanding of SD and ESD, their attitude towards SD, the strategies they used to implement ESD ideas in their classroom and the factors affecting the implementation of these ideas.

1.3 Objectives of the Study

The objectives of the study are:

1. To analyze the primary education curriculum for different aspects of 'Education for Sustainable Development'.
2. To investigate primary schools teachers' understanding of 'Education for Sustainable Development'.
3. To find out primary school teachers' attitude towards 'Education for Sustainable Development'.
4. To examine the techniques adopted by primary school teachers to implement the ideas of 'Education for Sustainable Development' in their classrooms.
5. To investigate the constraints in implementing ideas of 'Education for Sustainable Development' in primary schools.

1.4 Research Questions

To attain the purpose of the study, the following research questions were investigated.

1) To what extent aspects of 'education for sustainable development are included in primary school curriculum?
2) How do primary school teachers understand 'Education for Sustainable Development'?
3) What is the primary school teachers' attitude towards 'Education for Sustainable Development'?
4) What strategies have been adopted by primary school teachers in the context of 'Education for Sustainable Development'?

5) What factors affect the implementation of 'Education for Sustainable Development' ideas in classroom?

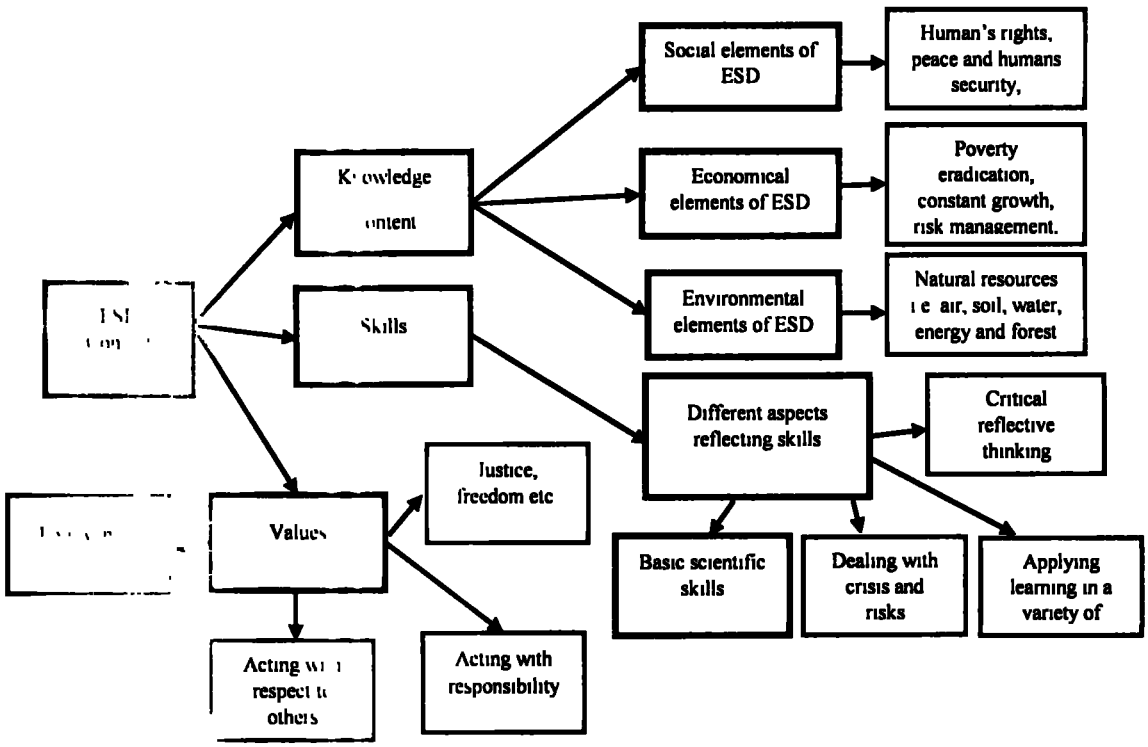
1.5 Conceptual Framework

According to Rogers, Boyd and Jalal (2008), SD is a fusion of environmental, economic and social issues, which are known as three pillars of SD. According to Rogers et al. (Brundtland and Khalid Mansinghe (1992) presented these three pillars as, the economic pillar supports economic increase with a stable or growing stock of capital, while the environmental pillar advocates the preservation of biological and physical systems. Similarly the social pillar believes in humans' dignity and maintains a stable and peaceful society. The social opportunity for all. SD needs a balanced and integrated analysis from these key areas. Each viewpoint represents an area and a process that has its own distinct driving forces and goals (Paul 2015). ESD deals with these domains and systems by improving education and developing community understanding and awareness about SD.

The aim of ESD is to empower individual with knowledge, skills, values and attitudes to play active and responsible role in the development of a sustainable future (UNESCO, 2014). According to Pauw et al. (2015), ESD includes a process that nurtures an individual's knowledge, skills, values and behavior that influence the individual, the school and society to create a sustainable society, in which everyone has equal opportunity for quality economic and environmental security and democracy. Figure.1.1 represents the conceptual organization of the study.

Figure.1.1

Conceptual Framework of ESD



(Adopted from Domazet et al, 2012)

Knowl knowledge feature of ESD deals with the concepts, facts and action related to ti nd space regarding social, economic and environmental elements of SD. The kn it these elements will help the individual to shape their action and find a solu allenges The knowledge feature helps in understanding different SD issues hip between carbon and global warming, poverty and its causes, conflic nd solutions etc.

Skills improve different skills in individuals such as critical thinking skill, applyin in different contexts to preparing students to solve the SD problems and act re spectfully

Values: Our values, attitudes, beliefs and assumptions determine our perception, our philosophy, choices and even our actions. It also affects our feelings. Equity is the main guiding principle of ESD i.e. societal, inter-generational, gender, racial etc. The concept of equity with humans and nature is clearly integrated in SD. Similarly it deals with humans' rights, respect, democracy etc.

1.6 Delimitations of the Study

The study is delimited to;

i. Districts of KP (Pakistan) namely District Haripur, District Malakand, District Kohat and District Charsadda.

ii. Textbooks of Public primary schools of KP.

iii. Curriculum of Urdu, Social Study, General Science and Islamic Studies at the primary level.

iv. Grade 4 and 5 of primary level.

1.7 Significance of the study

This study is first attempt to analyzed primary education curriculum regarding ESD. The outcomes of this research may be used for different purposes, for example' providing relevant data to different national and international organizations about the presence of sustainability in primary school curriculum in Pakistan. The result of the study may raise awareness of ESD understanding in those primary school settings, where it is not being addressed currently. The study may help in the promotion of actions or plans of action adopted by provincial authorities and curriculum designers to achieve the SDG's of the Agenda 2030, by incorporating ESD principles, ideas and practices in every aspect of teaching and learning process of 2030. The finding of the study may be used as a model in future to

conduct ful' ... ment about sustainable development in primary school settings. Finally, the outcom... c research might motivate researchers to create new theories and hypotheses ... the data that is emerged.

1.8 Summ... the Methodology

A mixe... ds approach was adopted to investigate the research questions. The design of th... vas a convergent parallel. According to Creswell (2012) in convergent parallel mi... ods design both the qualitative and quantitative data are collected concurrentl... th data are weightage equally. The qualitative data were based on the content an... rimary education curriculum, while the quantitative data was based on teachers' ... and attitude about ESD.

Popula... e study comprised of primary school core curriculum and all the primary sc... ners (both male and female) in the four districts of KP. The defined population ... tal of 10905 primary school teachers' as listed by Elementary & Secondary ... n Department Khyber Pakhtunkhwa [E&SE] (2018). Textbooks of General s... ial studies. Islamic studies and Urdu were selected as samples for qualitative ... analysis. while for quantitative data a proportionate convenience sampling t... was used to select 400 teachers from selected districts using 95% confidence ... 5% confidence interval.

Qualita... were collected through content analysis from textbooks of primary education. ...itative data a test of understanding and attitude scale developed by Michalos ... 9) was adopted. The qualitative data were analyzed using qualitative