



The Role of Education in Achieving the Sustainable Development Goals (SDGs): A Global Evidence Based Research Article

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ABSTRACT

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Education under multiple global initiatives has been playing significant role in overall sustainable development in the era of knowledge economy and knowledge society. But, practical evidences have not been well noticed under each sustainable development goal. Accordingly, this paper explored the role of education for sustainable development (ESD) and Education (SDG-4) in achieving the seventeen and sixteen sustainable development goals (SDGs) respectively using qualitative research design and approach supported with quantitative evidences collected from secondary sources such as UN flagship reports from the UN system including the World Bank, compiled by the United Nations Department of Economic and Social Affairs (DESA), publications compiled by Educate a Child (EAC), and other publications identified through internet searches, as well as searches of specific organizational websites. The finding of this paper revealed that education for sustainable development (ESD) can enable the achievement of the 17 SDGs by raising the awareness of the 17 goals in education settings; promoting critical and contextualized understanding of the SDGs; and mobilizing action towards the achievement of the SDGs. It also explored that enough quantitative facts and evidences have not been addressed in the UN reports and other sources about the role of education in SDG-9 (Resilient Infrastructure), SDG-14 (Life below Water), and SDG-17 (Partnership for the Goals). Despite these limited evidences, education primarily planned under SDG-4 plays great role in achieving each of the sustainable development goal. Investing on education is investing to achieve all the SDGs for people to transform themselves, their families, their communities, their nations and the world at large. For more elaborative role of education in achieving each of the SDGs, researchers and global reporters better to invest more effort in compiling facts of education under each sustainable development goal.

Keywords:

Education, Development, Sustainability, Sustainable Development, Education for Sustainable Development, Sustainable Development Goals

1. INTRODUCTION

1.1. Problem Statement

Humanity faces many sustainability challenges, products of complex, often nonlinear, interactions between people and the environment. Our understanding of them is often incomplete and in part clouded by profound uncertainties (Voulvoulis et al, 2019). Human behaviour, although not intentionally malicious, is widely recognized as the root cause of most sustainability challenges. Individual and collective choice can exacerbate environmental, economic and social

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problems (De Pauw, 2015). Consequently, addressing pressing sustainability challenges, such as transgressing critical planetary boundaries (Steffen, 2015) requires changes in public perceptions, values, attitudes and behaviours, and the right conditions for these changes to happen (UNESCO, 2017; Scoones, 2018). It requires fundamental changes in the way we think, act, and relate to other biotic and abiotic systems.

Arguably, education is the most important tool to reshape worldviews and values and has enormous potential to address the sustainability challenges facing humanity (Vasiliki and Nikolaos, 2019). It can empower learners to embrace sustainability as a lifestyle choice (UNFCCC, 2015; IIASA, 2018). In response to these global challenges, the world leaders have been launching and endorsing global initiatives such as Environmental Education (EE) in 1977; Education for

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Sustainable Development (ESD) in 1992; Millennium Development Goals (MDGs); Education for All (EFA); Decade for ESD in 2002; Global Action Programme (GAP) for ESD in 2014; and the Education 2030 (Vasiliki and Nikolaos, 2019). These initiatives spurred considerable efforts to improve education globally, and significant progress has occurred (UN, 2012; CIDA, 2013; McArthur, 2013).

However, despite the good records of the global initiatives, many challenges persist such as a serious barrier remains to reach the most disadvantaged children (United Nations, 2012). The priority on educational access ignored the content of learning and teacher competency, and many students finish school without basic competency in numeracy or literacy (McArthur, 2013; UNESCO & UNICEF, 2013; UN, 2013). The capacity gaps created by under-trained teachers, particularly in developing countries, continue to contribute to poor learning outcomes (UNESCO & UNICEF, 2013). Gender disparities continue to exist in some regions (UN, 2012). While rapid population growth in some regions overstretch limited resources, a worrisome decline in aid for education development has appeared in recent years (UNESCO Institute for Statistics, 2013).

The need to further institutionalize ESD and better align the education and sustainable development paths remains a challenge (Buckler & Creech, 2014). It is also unclear whether these initiatives have been successful in transforming curricula and teaching approaches towards sustainability (UNESCO, 2014). Empirical studies on the effectiveness of ESD have been limited and these limited evidences highlighted discrepancies, incongruence of approaches and deficits in curricula; educational strategies and policies recommendations have had limited positive impact; learners increasingly disengaged from ESD; and students and teachers often feel overwhelmed by sustainability concepts (UNESCO, 2012; Mckeown, 2019; Scott, 2015; De Pauw, 2015; Thomas, 2004; Lourdel et al, 2006; Seatter et al, 2017). Sustainability has often been used to maneuver students into particular viewpoints, rather than empowering them to reach their own conclusions based on critical reflection of the available opinions and evidence (Carew et al, 2008).

Recently, to resolve such challenges, the importance and prioritization of education within the post-2015 development agenda was well supported with the clear indication that SDG 4 would provide a standalone goal with the aim to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (Kutesa, 2015; UNESCO, 2015a). The Sustainable Development Goals (SDGs) agenda of the United Nations adopted by world leaders in 2015 acknowledges Quality Education (SDG#4) as a means for achieving the remaining SDGs, with sustainability as a goal for education in target 4.7 (Steffen, 2015). Thus, this paper tried its best to fill the gap on how education contributes for the achievement of each of the 16

SDG rather than researching the role of education on general sustainable development as stated in the above problem.

1.2. Objectives and Scope

The general objective of this paper is to discover the overall impact of education on sustainable development and is focused on specific objectives such as (1) To discover the influence of the Education for Sustainable Development (ESD) in achieving the 17 Sustainable Development Goals (SDGs), and (2) To explore the role of education (SDG-4) in achieving the other 16 sustainable development goals. The scope of this paper is scoped with education for sustainable development and SDGs using globally available literatures and reports referencing developed and developing countries in a comparative analysis approach.

1.3. Significances

More evidences have been explored that education has played great role on sustainable development through multiple initiatives and strategies that the world leaders have been initiating with. But, specific contributions of ESD and education to the achievement of each of the respective 17 and 16 SDGs especially qualitative supported by quantitative reports and evidences have not been received attentive efforts. So, this paper contributes to the global knowledge in discovering and presenting specific quantitative evidences regarding the contribution of education under SDG4 for the effective achievement of the rest of SDGs. This helps for global learners, educators, researchers, investors, policy makers, and leaders to understand the return on investment of education and the great role in achieving each of the sustainable development goal.

1.4. Methodology

To discover and explore the role of education for sustainable development (ESD) and Education in achieving the 17 SDGs and 16 SDGs respectively, this paper followed qualitative approach evidenced by quantitative facts. Data have been collected from secondary sources from different articles, reports, resolutions, and other research findings available at digital resources. From the rich digital resources of the population size, a sample of 37 published UN flagship reports from the UN system including the World Bank, compiled by the United Nations Department of Economic and Social Affairs (DESA, 2015), 17 publications compiled by Educate a Child (EAC, 2016), and other publications covering a wide range of primary topics were selected and reviewed in this paper. Publications were identified through internet searches, as well as searches of specific organizational websites.

The collected data have been analyzed based on thematic areas such as education, development, sustainability, education for sustainable development, and the role of ESD and education for achieving the 17 sustainable development goals. First, through primary content analysis, All the ideas in the reports that referred to education were identified. Basic automated keyword search procedure was complemented

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with manual individual analysis of each occurrence to ensure relevance of factual reports and in depth coverage. Then, the factual reports that contained analytical statements and conclusions were extracted in verbatim form. Second, once the list of all the factual reports was compiled, each of them was connected to one or several of the seventeen thematic areas of the SDGs. For the purpose of this paper, which focuses on the role of ESD and education in achieving the other SDGs, statements referring only to education were not considered further. Thus, only reports explaining the role of education to the achievement of the sixteen other goal areas are part of the list. Some reports and evidences fit into one thematic area (e.g. "education helps eradicate poverty" were placed under SDG 1 on poverty eradication). Other evidences fit into several areas were placed under multiple SDGs. Finally, the compiled and placed evidences under each SDG were organized in a consistent and logical arrangements so as to give a comprehended evidence of the role of ESD and education in achieving the 17 SDGs and 16 SDGs respectively.

1.5. Limitations

It would have been great if evidences regarding the role of education in achieving each of the sustainable development goal for specific regions and countries have been explored specifically. But, due to the limit of internet communications created by the ongoing war between Tigray and Ethiopia and the blockade placed in Tigray; exploring complete reports of the SDGs by specific regions and countries have not been done. Again, recent SDG reports such as 2021 and 2022 reports were missed due to the current hard situation explained. As a result, this paper is delimited to the available digital resources compiled by UN agencies, journals, articles, and other reports by local and international organizations in developing and developed countries as a general.

2. LITERATURE REVIEW

2.1. Education and Development

Education is the socially organized and regulated process of continuous transference of socially significant experience from previous to following generations and can be seen as a Spiritual Pursuit, Development of Innate Human Potentialities, and as Social Orientation of the Human Being (Naziev, 2017). The education of today is crucial to enhancing the ability of the leaders and citizens of tomorrow to create solutions and find new paths to a better, more sustainable future. Unfortunately, our current collective pool of human knowledge, skills, and experience does not contain the solutions to all the contemporary global environmental, societal, and economic problems. Education is therefore central to learning and to a more sustainable future (UNESCO, 2012).

The academic debate about the concept of development is quite rich, especially about the differences between economic growth and development. However, "despite the differences

between the concepts of development, they are not mutually exclusive. In fact, at some points, they are complementary" (Scatolin apud Oliveira and Souza-Lima, 2006). Development has various meanings, but often been confused with "economic growth as measured solely in terms of annual increases in pre-capita income or gross national product, regardless of its distribution and the degree of people's participation in effective growth" (Mahmoud, 1991; Matowanyka, 1991; Reem Abuiyada, 2018). Seers (1972) asserted that "development means the conditions for realization of the human personality. Its evaluation must therefore take into account three linked criteria: where there has been a reduction in (1) poverty, (2) unemployment, (3) inequality".

According to Pearson (1992), development involves "An improvement qualitative, quantitative or both - in the use of available resources". He also asserts that development does not refer to one particular perspective on social, political and economic betterment. Instead, it is a hybrid term for a myriad of strategies adopted for socio-economic and environment transformation from current states to desired ones. In the most recent debates, development is being addressed in a more comprehensive, recognizing, and economic growth, improved quality of life. This criterion introduces to the development parameters the possibility of improving the economic and social indicators such as poverty alleviation, unemployment, inequality, better food, health, housing and education (Gisele, 2014).

2.2. Sustainable Development

The term sustainability does not have an exact and unanimously definition accepted by different sectors of society rather its vagueness of the term makes possible its common use in different discourses and actions (Ignacy, 1997; Gisele et al, 2014). One of the first definitions of the concept of sustainability was written by Lester Brown in World Watch Institute (WWI) in the early 1980s. Lester wrote that "a sustainable society is one that can meet their needs without compromising the chances of survival of future generations" (Brown, 1980; Andrade, 2004). Others also associated it with sustainable development, sustainable society, and sustainable of a system (Bossel, 1998; Bellen, 2005; Brundtland Report, 1987). The more the system remains stable it is bigger its resiliency capacity.

For Clovis Cavalcanti (2003) sustainability "means the possibility of obtaining continuously conditions equal to or greater life for a group of people and their successors in given ecosystem." Ignacy Sachs (1997) understands sustainability as a dynamic concept that encompasses a process of change and the concept is subdivided into five dimensions: social, economic, ecological, geographical and cultural. Although there is no consensus on these dimensions it can be considered that they are quite broad and allow for a complex study on the sustainability concept. This division by Ignacy Sachs is opposed by the sight of Schumacher (WCED, 1991),

which ranks only environmental, economic and personal sustainability. But these two views differ mainly in the definition of the expression environment, as Schumacher refers to the rational use of the resources, while Sachs refers to the recovering capacity of ecosystems in the face of human aggression. So, Sustainability is a paradigm for thinking about a future in which environmental, social and economic considerations are balanced in the pursuit of development and an improved quality of life.

The term ‘Sustainable Development’ was first coined in 1972 at the United Nations Conference on Human Environment at Stockholm. The most important piece of writing on Sustainable development is in the publication by the World Commission on Environment and Development (WCED) in 1987 titled, *Our Common Future*. In 1992 at the Earth summit at Rio-de-Janerio, 170 countries signed many important documents on sustainable development pledging preservation of environment. There are numerous definitions for Sustainable Development (Gisele et al, 2014), but the best known and generally-accepted one belongs to the Brundtland Commission: “sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future” (WCED,2019). It is the development that meets the needs of the present (people) without compromising the ability of future generation to meet their own needs. The European Commission (2019) also explained the role of SD: “it provides a comprehensive approach bringing together economic, social and environmental considerations in ways that mutually reinforce each other”.

2.3. Education for Sustainability Development (ESD)

Education for Sustainable Development (ESD) evolved from environmental education (EE), and added to it an integrated sustainable development perspective with stronger focus on social and economic dimensions. EE came to international prominence in the Stockholm Declaration in 1972 and was further elaborated in the Belgrade Charter in 1975 and the Tbilisi Declaration in 1977. However, since the Rio Declaration on Environment and Development in 1992 recognized the importance of education as a primary mechanism for achieving sustainable development, there has been a gradual blending of EE and ESD. The World Summit of Sustainable Development in 2002 and the subsequent agreement on Decade for ESD (DESD) further propelled ESD and ‘learning for a sustainable world’ as an overarching objective of education (UNESCO,2005; UNSG,2012).

Education for sustainable development (ESD) is then defined as a collection of diverse disciplines, like climate change, the management of the effects of social and economic changes, environmental economics, and others (UNESCO,2019). In this sense, ESD can be seen as a holistic approach, involving the integration of major sustainable development issues into all teaching and learning strategies (Goian,2010). It focuses

on participation, cooperation, and engagement in teaching and learning (Pauw et al, 2015). Consequently, ESD is a means of promoting key competencies for sustainability, such as critical thinking, systematic thinking, self-awareness, problem solving, etc. It is learning to think about and work towards a livable world, now and in the future, for ourselves and for others, here and elsewhere on the planet (Van and Loones,2011) in order to be able to provide skills and competences that enable people to cope with this complexity and uncertainty (Lambrechts and Hindson, 2016; UNESCO,2019, 2012,2005).

3. DISCUSSIONS AND RESULTS

3.1. Education for Sustainable Development (ESD) in Achieving the 17 SDGs

Education for sustainable development (ESD) includes a large number of concepts, theories, policy prescripts and practical methods/tools aimed at reshaping education systems to address the socio-economic and ecological dimensions of sustainable development (Lenglet, Fadeeva, & Mochizuki, 2010). The synthesis report of the UNSG on the post-2015 development agenda stated that “high-quality education and life-long learning” and the capacity of teachers are key factors in empowering youth as a “globally connected engine for change” (UNSG, 2014). In fact, many people around the world believe that education is the most important goal for this agenda. At My World (2015), individuals were asked to rank their top priorities for the agenda. Over 7.6 million people have voted, and of the sixteen potential priorities, provision of good education is consistently ranked as the highest priority across all cohorts and has received prioritization by over two-thirds of all voters. Many now agree, quality education for sustainable development reinforces people’s sense of responsibility as global citizens and better prepares them for the world they will inherit” (Buckler and Creech, 2014).

The International Commission on Education for the Twenty-first Century highlighted education as one of the principal means available to foster a deeper and more harmonious form of human development and thereby to reduce poverty, exclusion, ignorance, oppression and war” (Delors, 1996; Polacheck, 2007; Hanushek & Woessmann, 2008, 2015; EFA, 2011). Education contributes to improvements in health, disease prevention, and social equity (Lochner, 2010; EFA,2011; Mattos et al, 2012). Strong links between increased education and improvements in civic participation and political stability have also been demonstrated (Center for Global Development, 2006; Collier and Sambanis 2005; IFPRI, 2005; UNFPA,2014).

In recent years, numerous studies compiled by Grosbeck et al (2019) have shown that the interest in research concerning Education for Sustainable Development (ESD) has grown considerably. As it expands rapidly, this sector is becoming more visible and significant in a global world affected by

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serious environmental issues and by growing social, economic, and political inequality. Hence, sustainable development is a real challenge for our society. Climate change, global warming, depletion of natural resources, desertification, pollution of bodies of water and air, high carbon emissions, food shortages, and other threats to our world's future demand more sustainable societies, lifestyles, and economies (Gadotti, 2009). For this, it is true that, on its own, education does not bring a more sustainable future. However, it is equally true that, without education for sustainable development, we cannot manage to create a sustainable future (Sterling, 2016; UN Agenda, 2019; Boeve-de Pauw et al, 2015; UNESCO, 2020).

The first main feature of ESD for 2030 was the emphasis given to the role of education in the achievement of the interconnected 17 SDGs. UN General Assembly Resolution 72/222 (2017) noted ESD as 'an integral element of SDG 4 on Education and a key enabler of all the other SDGs', while Resolution 74/233 (2019) reinforced this by calling upon countries to enhance their ESD implementation (UNESCO, 2020).

So, ESD can enable the achievement of the 17 SDGs directly or indirectly. ESD raises the awareness of the 17 goals in education settings. It enhances the understanding of learners and the general public on what the SDGs are and how these goals connect with individual and collective lives. ESD promotes critical and contextualized understanding of the SDGs. Sustainable development often requires a balancing act among diverse views and priorities. ESD raises questions on the inter-linkages and tensions between different SDGs and provides learners with the opportunity to navigate the required balancing acts with its holistic and transformational approaches. ESD mobilizes action towards the achievement of the SDGs. Its efforts address sustainable development issues, more specifically the SDGs. These efforts continue to mobilize action for sustainable development in education settings, in particular in communities, through whole-institution approaches to ESD (UNESCO, 2020).

3.2. Education for Achieving the 16 Sustainable Development Goals

In 2015, all United Nations Organization (UN) member states adopted Agenda 2030 for SD. It represents the social and economic contract of the 21st Century, the new global sustainable development framework that redefines the way in which the international community works together to ensure a different future for people and planet Earth (European Commission, 2019). Agenda 2030 comprises 17 Sustainable Development Goals (SDG). These objectives are global, generally applicable, and interconnected, although each of them has its own targets (169 in all). The SDGs cover a wide range of issues connected to social and economic development, including, among others, combating poverty and famine, ensuring health and education, sustainable management of natural resources, climate change, gender

equality, cultural diversity, rural and urban development, social justice, security, human rights, peace, ethics, civic responsibility at the local, regional, and global level, the economy, democracy, and governance (UNO, 2015). In this regard education under SDG4 significantly contributes in enabling the achievement of each of the 16 sustainable development goal (SDGs) discussed and evidenced below.

3.2.1. Education to End Poverty (SDG-1):

There is strong relationship between quality education and reduction of poverty. According to the report of UNESCO "171 million people could be lifted out of poverty if all students in low-income countries left school with basic reading skills – that is equivalent to a 12% drop in the number of people living on less than \$1.25 a day" (UNESCO, 2015). There was a strong correlation between mean years of schooling for ages 25–34 and poverty, when poverty was measured at less than \$2.00 per day. Poverty rates were nine % lower for each year of schooling (UNICEF, 2015). One extra year of schooling increases an individual's earnings by up to 10%, and each additional year of schooling raises average annual gross domestic product by 0.37%" (UNESCO, 2011). While the increase in average schooling raises 0.58% national GDP. According to Hanishek and Woessmann (2008 & 2009) with quality improvement in education led the 2% higher GDP per capita growth rate. Children with parents that had some formal education and inherited property were "more likely to find off-farm employment and so escape poverty... sons of educated mothers in rural areas were 27 % more likely to find off-farm employment" (UNESCO 2014).

Education breaks inter-generational cycle of poverty. For instance, rural households in Ethiopia where the household head completed primary school were 16 % less likely to be chronically poor, between 1994–2009. Household heads in rural Vietnam with greater than primary schooling were 24 % more likely not to be poor four years later than households with no schooling (UNESCO, 2014). Among lower income households in 12 Sub-Saharan African countries, the chance of being poor is 28 % for households headed by adults with primary schooling (compared to 50 % with no education) (UNICEF, 2015). Education has an impact on income and assets. For example, owners of home businesses in Uganda with complete primary education earned 36 % more than those with no education. More highly educated households in Thailand were more likely to invest profits; returns from household assets increased by seven % for each year of education (UNESCO, 2014).

Thus education can help in eradication of poverty in effective ways by increasing people's income (Mohammed, 2017; World Bank, 2014/15; UNESCO, 2015; UNDP, 2010). People are vulnerable to poverty if they are below or at risk of falling below a certain minimally acceptable threshold of critical choices across several dimensions, such as education (UNDP, 2014). Education increases resilience to adverse

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shocks (UNDP, 2010, 2014; UNISDR, 2015). Girls' education prevents an intergenerational transmission of poverty by breaking the cycle of early marriage and childbearing and health and other risks associated with these events (UN Women, 2011/12; UNDP, 2014; World Bank, 2007, 2014/15; Katia & David, 2015). Thus, education highly contributes to end poverty in all its forms everywhere (SDG 1).

3.2.2. Education to End Hunger (SDG-2):

Education is an essential element of efforts to reduce malnutrition and hunger (UNESCO, 2013/14; FAO 2014a). There is evidence that education increases the opportunities of saving the life of the people particularly children. The study of UNESCO (in 2013) which "shows that there are approximately 47 million children in low-income countries who are stunted as a result of malnutrition in early childhood. If all mothers in those countries had a primary education, 1.7 million children would be saved from stunting. If those mothers had a secondary education, 12.2 million children would be saved from stunting" (UNESCO, 2013). In India, during the first year of life, children whose mothers reached lower secondary education were 48 % less likely to suffer from stunting, compared to children of mothers with no education. The same figure for Peru was 60 % (UNESCO, 2014). In Indonesia, 95 % and 61 % of households where mothers completed lower secondary education used iodized salt and vitamin A supplements for their children (respectively), compared to 51 % and 41 % with no education (respectively). "Evidence from Australia, Canada, the Republic of Korea and the United Kingdom shows that education contributes to lower obesity levels" (UNESCO, 2014).

The FAO report stresses the importance of basic education for improving agricultural productivity and farm incomes and highlights that agricultural education and training raises agricultural productivity by developing producers' capacities, fostering the development of people's skills and competencies for innovation, and generating human capital for research and advisory services. It also mentions that farmers need to attain more advanced levels of education to make use of new ICT-based information sources and technical advice and to respond to new market opportunities and environmental change (FAO, 2014). The World Bank points out that as education levels for rural youth improve they can enter a broader range of nonagricultural occupations (World Bank, 2007; Katia & David, 2015). From these studies, we can understand a remarkable impact of education on ending hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2) (Mohammed, 2017).

3.2.3. Education for Good Health (SDG-3):

Many studies found the relationship between education and health. Education reduces infant and maternal mortality. According to UNESCO reports that "each extra year of a

mother's schooling reduces the probability of infant mortality by as much as 10% and that a child whose mother can read is 50% more likely to live past age five" (UNESCO, 2011). Based on data from 10 African countries, the rate of women who completed primary education who saw a health-care professional for prenatal care was significantly higher than unschooled women, in most cases. Women with primary education had on average 0.7 fewer live births than women with no education (UNICEF, 2015). A literate mother was 23% more likely to have a skilled attendant at birth in which the probability of a child receiving immunizations for diphtheria, tetanus and whooping cough would increase by 43% if all women in low and middle income countries completed secondary education (UNICEF, 2014). If all women had completed primary education, maternal mortality "would have fallen from 210 to 71 deaths per 100,000 births (66%)" (UNESCO, 2014). In Colombia it was estimated that achieving UPE would reduce the infant mortality rate from 15 to 11 per 1,000 (EAC, 2016).

Education reduces adult mortality rates. In the Democratic Republic of Congo (DRC), odds of bed net use were about 75% higher if the household head completed primary education level, controlling for other factors. Across 11 Sub-Saharan Africa (SSA) countries and in areas with a high rate of malaria transmission, the odds of malaria presence in children were 22% lower when mothers completed primary education (UNESCO, 2014). Separate studies in Bangladesh and Vietnam found significantly higher mortality among uneducated older adults compared to higher educated comparison groups. In developing countries outside of Africa the mortality rates for women with at least primary education were "36% lower than for women with less than primary education," and in Africa this figure was 14% less (UNICEF, 2015).

Thus, education affects health and well-being, reflecting a shared understanding that education is a powerful lever for improving people's health (Mohammed, 2017). Educated people are better informed about diseases, take preventative measures, recognize signs of illness early and tend to use health care services more often (UNESCO, 2013/14; UNFPA, 2014). Basic education supports universal health coverage by enabling healthy lifestyle choices and informing health-care decisions (WHO, 2013). Better education for women tends to result in better health outcomes for them and for their children and accelerates their countries' transition to stable population growth (World Bank, 2007; UNDP, 2011, 2013). More educated youth are more willing to control family size and invest in the health and well-being of their offspring. The impacts are particularly strong for women. Education is considered a way to protect young people from engaging in risky behaviors (World Bank, 2007; Katia & David, 2015). Thus, one can conclude that education can ensure healthy lives and promote well-being for all at all ages (SDG 3).

3.2.4. Education for Gender Equality (SDG-5):

The role of education in context of girls and women is dynamic. The quality education provides opportunities for full development and reduces gender disparities at every level (Mohammed, 2017). Education has an impact on the demographic and labor market trends of gender equality. Investments in education can help accelerate demographic transition (UNESCO, 2013/14; UNDP, 2010, 2011, 2013; UNFPA, 2014; World Bank, 2007). Trends indicated that higher education for girls was associated with delayed marriage, fertility and childbirth. It was projected that if all girls had secondary education attainment in sub-Saharan Africa and South/West Asia, child marriage would fall from 2.9 million to one million (64%), while early births would fall from 3.4 to 1.4 million (59%). In Brazil it was estimated that 70% of the decline in fertility rates from 1960–1980 were explained by education improvements (UNESCO, 2014).

Education improves the attitudes and decision-making skills of girls and women. Education enhances girls' social status, increases their bargaining power within marriage (UNFPA, 2014). A host of country-level studies indicated that investments in education for women resulted in attitudes and decision-making that were consistent with gender equality. In Sierra Leone, "an additional year of schooling reduced women's tolerance of domestic violence from 36% to 26%". In Pakistan 30% of women with no education believed they had a say over how many children to have, while 52% with primary education did. Similarly, in India, young females were 30% more likely to have a choice regarding their spousal partner compared to women with no education (UNESCO, 2014). In Mauritania, 79% of women with no education viewed female genital cutting favorably, compared to 41% with lower secondary education (UNICEF, 2015).

Education increases the income of women by up to 20%. How effective is of girls' education, can be seen from the reports of "Paying the price, the economic cost of failing to educate girls" of Plan international which states that "Based on World Bank research and economic data and UNESCO education statistics, it estimates the economic cost to 65 low and middle income and transitional countries of failing to educate girls to the same standard as boys as a staggering US\$92 billion each year. This is just less than the \$103bn annual overseas development aid budget of the developed world" (UNESCO, 2017). Gender-based patterns of vulnerability are shaped by the value of and entitlement to assets, access to financial services, education level, social networks, and participation in local organizations (World Bank, 2010). Countries that focused on female education suffered far fewer losses from extreme weather events than less progressive countries with equivalent income and weather conditions (UNDP, 2011; Katia & David, 2015).

Thus, reports put forward several links describing how education affects gender equality and women empowerment. Education expands opportunities for girls and young women

and raises their aspirations for work outside the home (UNFPA, 2014; World Bank, 2007). As women acquire more education, they increasingly move out of traditional household or agricultural production activities and enter wage work (World Bank, 2007). Policies to ensure that women and girls can access services including health and education have contributed to significant advances in women's standard of living (UN Women, 2011/12). Greater educational attainment shapes attitudes of both girls and boys to gender equality, with greater education leading to more positive attitudes towards gender equality among both males and females (UNFPA, 2014; UNESCO, 2013/14). Education can empower women to overcome discrimination and claim their rights and overcome barriers that prevent them from getting a fair share of the fruits of overall progress (UNESCO 2013/14; UNFPA, 2014; UNDP, 2010). As a result, education is evidenced to achieve gender equality and empower all women and girls (SDG 5).

3.2.5. Education for Clean Water and Sanitation (SDG-6):

Education affects availability and sustainable management of water and sanitation. There is strong link between education and sanitation resulting in the improvement in health (Mohammed, 2017). Sources showed that in China, educated farmers were more likely to use "rainwater harvesting and supplementary irrigation technology" in times of drought (UNESCO, 2014). In urban India, when the adult household head completed primary schooling, the probability of water purification through filtering or boiling increased by 9%, relative to no schooling. The increase was 22 % when the household head completed secondary schooling (UNESCO, 2014). Thus, education and information programs are viewed as enabling conditions to promote integrated water resource management. Among water users, there is need for a cultural change through education and economic incentives. (UNEP, 2012; Katia & David, 2015). Thus, education contributes to ensure availability and sustainable management of water and sanitation for all (SDG 6).

3.2.6. Education for Clean Energy (SDG-7):

Looking at the links from education to energy reports agree that changing behaviors and lifestyles to achieve low-carbon societies will take a concerted educational effort (including technical training) over many years (World Bank, 2010; IIASA, 2014). The Global Energy Assessment sees education as part of a package in order to achieve this effort, along with feedback, information, and advice (IIASA, 2014). It emphasizes the importance of targeting youth to provide the knowledge and skills about energy use that will allow them to make informed choices as energy users (IIASA, 2014). It also takes stock of the importance of education and training in programs focused on clean energy provision in developing countries (Katia & David, 2015). Across OECD countries, research showed that those with higher education levels were more likely to employ sustainable household practices related

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to energy. For example, in the Netherlands higher educated people used less energy, and across 10 countries those with more education were more likely to save water (UNESCO, 2014).

There is needed energy particularly, clean energy for the socio-economic development to save the world from environmental pollution. The education provides such technologies which can enhance the availability of clean energy and change the life pattern of the people to save the energy. As per an estimate of Global Goals “Since 1990, global emissions of CO₂ have increased by over 46%” (Global Goals, 2017). This condition has alarmed the world community to enhance the quest for clean energy and education plays the role significantly for this goal (SDG7) (Mohammed,2017).

3.2.7. Education for Good Jobs and Economic Growth (SDG-8):

There is strong relationship between education and economic growth. No nation of the world can develop without education (Mohammed,2017). Many reports state the importance of education for employment and growth in general. Channels emphasized include the impact of education, particularly at secondary and tertiary levels, on workers’ productivity and productive capabilities (World Bank, 2013; UNFPA, 2014; UNDP, 2013; ILO, 2014, 2014/15; UNESCO, 2013/14) and higher earnings (UNESCO, 2013/14; UNIDO, 2013; World Bank, 2013); the importance of education as a determinant of knowledge spillovers and entrepreneurship (World Bank, 2013), both in the wage and non-wage sector (World Bank, 2007).

Education impacts Gross Domestic Product (GDP) growth. A rich range of literature explained the impact of education on macroeconomic growth. While estimates vary, 14 recent studies determined that each additional year of schooling was associated with a median 13% increase in GDP (UNICEF, 2015). Controlling for macroeconomic factors, an increase of one year would be expected to increase per capita income by 26% over the working lifespan (UNESCO, 2014). Another stream of literature sought to account for initial education levels in GDP growth. For example, differences in initial education levels explain half of the difference in growth rates over a 45-year period between East Asia and sub-Saharan Africa, as well as two-thirds of the within-region growth in Latin America and the Caribbean between 2005 and 2010 (UNESCO, 2014). In Colombia, achieving universal primary education was estimated to increase Colombia’s GDP by 2.1% per year, which is equivalent to half its 2013 growth rate (EAC,2016). The Human Development Report shows how education led the overall growth of a nation. According to a study the GDP of a nation increases by 0.37% with each additional year of schooling (Hanushek and Woessmann, 2015)

Education impacts private returns. Additional literature sought to estimate the rates of private (individual

wages/income) return to education. One recent study found that an additional year of school led to a 10 % increase in income across 139 countries. Returns were estimated to be higher for low and middle income countries and for women (UNICEF, 2015). The Copenhagen Consensus published the benefits and costs of education targets for the post-2015 development agenda. It included increasing pre-school enrollment in Sub-Saharan Africa from present 18–59%; for every dollar spent the benefit was 33 dollars. Increasing primary enrollment from 75 to 100% yielded a seven-dollar return on each dollar spent, and improving school quality by increasing student test scores by one standard deviation yielded benefits worth four times the cost (Copenhagen Consensus,2016).

Education influences productive employment. Demographic trends indicate that as disadvantaged groups such as women and rural populations gained access to education, they shifted from a choice between agricultural or household-oriented work to an increased supply of labor choices (UN DESA,2015). Higher levels of schooling for mothers in Guatemala resulted in higher education for their children, and each grade completed for their children led to an increase of wages of 10%, “while an increase in the reading comprehension test score from 14 points to the mean of 36 points raised their wages by 35%” (UNESCO, 2014). Education bearings inequality and wage/employment returns. Forthcoming research estimated the impact of closing education gaps between marginalized groups on the productive capacity of a workforce. For example, in Nigeria the gender gap in education attainment cost the Nigerian economy \$538 dollars (Purchasing Power Parity) per working age female, which translated to \$17 billion dollars in foregone earnings for the country. In South Africa, disparities between racial groups amounted to \$5,768 dollars per working age non-White individual (FHI 360 EPDC,2016). As a result of these evidences, we can fully conclude that education strongly contributes to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8).

3.2.8. Education for Resilient Infrastructure (SDG-9):

The role of education in supporting industrial development and economic transformation, along with other factors, is recognized in several reports (UNIDO, 2013; ILO, 2014; WTO, 2014; World Bank, 2010). Special emphasis is made on the role of education as influencing innovation capacity (World Bank, 2010; FAO, 2014; UNIDO, 2013) and providing the foundation for technology absorption processes (World Bank, 2010) and diversification (UNIDO, 2013). Specialized knowledge and experience in science and engineering may matter more than general managerial capabilities and intermediate-level technical skills in explaining innovation excellence by high-tech firms (UNIDO, 2013). It is noted that the development of wireless

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telecommunications and wireless education has enabled countries lagging behind to leapfrog over the expensive investment in infrastructure that mobilized the finances of developed countries in the 20th century (UNESCO, 2010; Katia & David, 2015). Better education opportunity provides the better human development, technology and planning for the development of infrastructure of a nation. A nation is integrated well with the use of modern infrastructure. In many studies, it is found that infrastructure facilitates the multiple development of the country particularly in the development of market economy (Mohammed, 2017). Despite scarce of quantitative facts, education is highly required to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (SDG 9).

3.2.9. Education to Reduce Inequalities (SDG-10):

Links between education and inequality are explored by several reports. Education is seen as both a factor that conditions inequalities later in life, for example access to formal jobs (World Bank, 2013), and a powerful instrument for advancing equity (UNDP, 2013). Inequality of opportunity in education for children is seen as having a negative impact on per capita income (World Bank, 2007, 2014/15). Other reports point to the role of education as a tool for people's empowerment (UNESCO, 2013). Finally, basic education provides the foundation of any technology absorption process and reduces economic inequity (World Bank, 2010; Katia & David, 2015).

One of the major problems in the present world is the existence of inequalities in social, economic and educational spheres. Education provides the tool to bridge the gaps. As per a study "a 0.1% improvement in a country's education equality can, over forty years, raise its per capita income by 23% higher" (UNESCO, 2017). The case of Vietnam is an example which has improved its economic performance due to improvement in quality education (Mohammed, 2017). Across 114 countries for the period 1985–2005, an extra year of average education was associated with a reduction of the income Gini coefficient (a measure of inequality between individuals) by 1.4% (UNICEF, 2015). In France, Malaysia and Brazil, the Gini coefficient decreased by roughly seven % over two decades as the share of the population with secondary education grew (UNICEF, 2015). On average, in low-income countries, 46 % of public education resources were allocated to educate the 10% of students who were most educated. In lower middle income countries, the percentage was 26 and in upper middle and high income countries, the percentage was 13 (UNICEF, 2015). Accordingly, inequality within and among countries will be reduced by education (SDG 10).

3.2.10. Education for Sustainable cities and communities (SDG-11):

Links from education to cities focus on disaster risk reduction and management. Building disaster preparedness requires

significant long-term investments in education (UNDP, 2014). Greater levels of literacy and primary education will strengthen people's understanding of warnings and disaster preparedness plans (UNISDR, 2015; UNDP, 2017; Katia & David, 2015). The education plays an important role in development of sustainable cities and communities. The quality education gives technology, creative solution, better management technique and planning for the development of sustainable cities and well aware citizens. The quality provides strong civic sense which is important for the development of the nation (Mohammed, 2017). In the U.S., a 1% increase in the proportion of tertiary education graduates living in a city was associated with a 0.5% increase in output (UNESCO, 2014). Negative findings included the fact that higher educated individuals in the fastest growing cities were more likely to possess a private vehicle and less likely to give up use despite traffic congestion and air pollution problems (UNESCO, 2014). Higher levels of education were associated with strengthened understanding of warnings and disaster preparedness plans (UN DESA, 2015). Thus, quality education helps in making cities and human settlements inclusive, safe, resilient and sustainable (SDG 11).

3.2.11. Education for Responsible Consumption (SDG-12):

Education is a central theme in global efforts to promote a paradigm shift on SCP patterns, to change behaviors and lifestyles and achieve low-carbon societies (UNESCO, 2009, 2012, 2014; UNEP, 2012, 2014; World Bank, 2010). Consumer education can promote lifestyle changes and more informed choices (World Bank, 2010; UNEP, 2014). Consumers must be guided in choosing green energy options, housing options, household goods and environmentally and socially responsible services in order to advance greener economies globally (UNESCO, 2014). Many governments, NGOs, UN agencies and companies are increasingly emphasizing the importance of learning and capacity-building as they search for solutions to sustainability challenges including climate change, disaster risk management, biodiversity loss and sustainable production and consumption (UNESCO, 2012). Civil society organizations (CSOs) have promoted SCP through a wide variety of activities, including research, advocacy, training, awareness-raising, education, networking and catalyzing multi-stakeholder partnerships. (UNEP, 2014; Katia & David, 2015).

There are many studies which show that with the additional year of schooling the awareness and concern increase towards the important problems of the world. As per the UN "each year about one third of all food produced equivalent to 1.3 billion tones worth around \$1 trillion-ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices, something that businesses need to address" (UN, 2017; Mohammed, 2017). A survey of farmers in 10 African countries showed that each

additional year of education reduced the probability of no adaptation practices (to climate change) by 1.6% (UNESCO 2014). As a result, it is evidenced that education helps to ensure sustainable consumption and production patterns (SDG 12).

3.2.12. Education to Protect the Planet (SDG-13):

Education has a vital role in limiting the causes and effects of climate change (UNESCO, 2013/2014). The impacts of climate change and extreme events depend on education, among other factors (UNEP, 2012). Education and investment, especially for the very young, can equip people to adapt when a natural disaster takes away their livelihood (UNDP, 2014). Education is critical for helping people adapt to the consequences of climate change, especially in poorer countries, where farmers dependent on rain-fed agriculture feel the threats most strongly (UNESCO, 2013/14). Education can help drive behavioral change needed to combat climate change (World Bank, 2010). Basic education provides the foundation of [carbon-friendly] technology absorption process, but a large enough pool of qualified engineers and researchers is also crucial (World Bank, 2010; Katia & David, 2015). As per UNO the “Global emissions of carbon dioxide (CO₂) have increased by almost 50% since 1990” (UNO,2017). Now there is need to curtail the emission of the gases to save the planet and only the enlightened world citizen can save the world. The education can aware the people about the immediate danger to our planet and pave the way for collective efforts to meet the challenges (Mohammed,2017).

In the 30 OECD countries that participated in the 2006 assessment, a one-unit increase in the awareness index (of complex environmental issues) was associated with an increase of 35 points on the environmental science performance index (UNESCO, 2014). In 47 countries covered by the 2005–2008 World Values Survey, the higher a person’s level of education, the more likely she was to express concern for the environment. Furthermore, in the 2010–2012 World Values Survey, when forced to choose between protecting the environment and boosting the economy, those respondents with secondary education favored the environment more than those with less than secondary education (UNESCO, 2014). Data from the International Social Survey Programme on 29 mostly high income countries similarly showed that the share of those disagreeing with the idea that people worry too much about the environment rose from 25% of those with less than secondary education to 46 % of people with tertiary education (UNESCO, 2014). With these evidences, we can conclude that education contributes to take urgent action to combat climate change and its impacts (SDG 13).

3.2.13. Education for Life below water (SDG-14):

In recent times, due to coming of modern technology, the exploitation of oceans, seas and marine life has been increasing. The exploration for oil and gas has further increased the exploitation of the oceans and seas. The expanding culture of sea foods and adventurous life of modern men and women have complicated the life below water. As per a report “The oceans and seas are essential for national and global economic well-being. The global ocean economic activity is estimated to be between US \$3 trillion to US \$6 trillion, contributing to the world economy in many important ways” (UN,2017; Katia & David, 2015). Many countries by use of modern technology and multinational companies with their vast resources are exploiting oceanic life recklessly. As a result, the problem of over exploitation and pollution has increased alarmingly which threatening the collapse of marine life. Acknowledging these problems, now the world community has given special attention towards saving the life below water and preserves the marine life on the large scale. The curriculum of education from school to the university have been given due importance towards the awareness about the marine life and need for their protection (Mohammed, 2017). Though more quantifiable evidences have not been found, education plays a qualitative role to conserve and sustainably use the oceans, seas and marine resources for sustainable development (SDG 14).

3.2.14. Education for Life on land (SDG-15):

As with climate change and SCP, various reports emphasize the importance of education for raising awareness and changing beliefs, attitudes and behaviors towards environmental issues (UNESCO, 2013/14; CBD, 2010). Education is seen as a key component of efforts to promote more effective environmental governance, including for protected areas (UNEP, 2012; Katia & David, 2015). Quality education is important in the protection of environment and wellbeing. Many studies show that the concern for environment has increased with the higher level of education. According to a study “Across 29 mostly developed countries, 25% of people with less than secondary education expressed concern for the environment, compared with 37% of people with secondary education and 46% of people with tertiary education” (UNESCO, 2017). This shows that with higher education, the concern for the environment has been increasing (Mohammed, 2017). In almost all countries participating in the 2010 International Social Survey Programme, respondents with more education were more likely to have signed a petition, given money or taken part in a protest or demonstration, in relation to the environment. In Germany, while 12 % of respondents with less than secondary education took such political action, the share rose to 26% of those with secondary education and 46% of those with tertiary education (UNESCO, 2014). Thus, education contributes to the SDG 15 to protect, restore and promote

sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

3.2.15. Education for Peace and justice (SDG-16):

Education is widely perceived as a tool to promote peace, justice and equality for sustainable development. Higher capabilities, particularly in education, advance human agency—people’s capacity to make choices (UNDP, 2014). Education has a significant role to play in shaping the values of future generations, redirecting societal preferences and inclinations, and instilling the empowering skills to enact them. It helps people understand democracy and deepens its foundations, promotes the tolerance and trust that underpin it, and motivates people to participate in politics (UNESCO 2013, 2013/14; World Bank, 2007, 2013; UNDP, 2010, 2013). Educating girls and women, in particular, has unmatched transformative power by boosting their own chances of getting jobs, staying healthy and participating fully in society (UNESCO, 2013/14; Katia & David, 2015). Public opinion surveys across 36 low and middle income countries showed that there was a relationship between education and higher levels of voting, and that the relationship was stronger in countries with lower levels of education. In India, halving the gender literacy gap would likely increase the share of female candidates by 21% and the share of votes obtained by women candidates by 17% (UNESCO, 2014). In Brazil, 53% of voters said they would vote for a competent but corrupt politician, while 25% of respondents with at least some college education said they would do the same. In 31 countries, as part of the World Justice Project (2009–2011), those with secondary education were one-sixth more likely to complain about poor government services (UNESCO, 2014). Across 18 Sub-Saharan African countries, voters with primary education were 1.5 times more likely to express support for democracy than those with no education (UNESCO, 2014). In Colombia, it was estimated that if all out of school children completed primary school, they would be 1.5 times more likely to vote and their propensity to vote in the next presidential election would increase from 31% to 47% (EAC/R4D Colombia, 2016).

The degree to which people express intolerance in values surveys decreased with increasing education levels. In Latin America, those with secondary education were 47% less likely to express intolerance of other racial groups, and in Arab States people with secondary education were 14% less likely to express intolerance towards other religions (both compared to primary) (UNESCO, 2014). In Sub-Saharan Africa, those with secondary school completion were 23% less likely to express intolerance towards those with HIV and in Central/Eastern Europe those with secondary education were 16% less likely to express intolerance towards immigrant groups (UNESCO, 2014). Many studies have

shown that “people with secondary educations are more likely than those with only primary education to show tolerance for people who speak another language (a 21% difference in Latin America and 34% among Arab States), immigrants (26% and 16%, respectively), homosexuals (32 and 1%), people of a different religion (39% and 14%), people with HIV (45% and 12%) and people of a different race (47% and 28%)” (GP, 2017; Mohammed, 2017).

A study of over 100 low and middle income countries from 1960–2010 showed that countries with high rates of education inequality were twice as likely to experience conflict in the following years. A subsequent study found that conflict exacerbated education inequalities by gender, wealth and other dimensions. For example, conflict worsened gender equality in educational attainment for females by 5.4% in fragile countries. The study found that the effects increased over time (FHI 360/EPDC, 2014, 2015). If the male secondary school enrollment rate was 10% higher on average, the risk of war would decline “by a quarter... In a country with a high ratio of youth to adult population at 38 %, doubling the percentage of youth with secondary education, from 30 to 60 %, would halve the risk of conflict” (UNESCO, 2014). In 55 low and middle income countries, a two-fold increase in education inequality doubled (3.8 % to 9.5 %) the likelihood of conflict (UNESCO, 2014). In 2010 children in conflict-affected countries were three times more likely to miss primary school than other children (UNICEF, 2015; Mohammed, 2017). Having these evidences, education highly play a role to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (SDG 16).

3.2.16. Education for Partnerships for the goals (SDG-17):

Substantial public investment in social infrastructure such as education is seen as a prerequisite for effective sustainable development, and therefore an important component of the SDGs. (UNCTAD, 2014; UNDP, 2013). Investments in learning need to happen during childhood and adolescence; failures to invest at this stage are very costly to remedy later (World Bank, 2007). Countries with high spending on health and education were more resilient in the face of financial crises (UNDP, 2014). The encouragement of responsible financial behaviour through prior saving and affordable loans has made valuable contributions to consumption, health and education (UNCTAD, 2014). UNCTAD further states that “the corporate contribution in both developed and developing countries in education is small to negligible and likely to remain that way” (UNCTAD, 2014; Katia & David, 2015).

A collective effort through partnership is required for achieving Sustainable Development. The partnership provides trust, cooperation and advices for implementing the SD programmes and policies. According to the U.N. High-Level Panel of Eminent Persons on the post 2015

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Development Agenda declared in 2013, states that "The Global Partnership for Education is getting quality education to marginalized children, coordinating education's many players, offering aid without wasteful replication and following local leadership... GPE is single-sector [education] but shows how collaboration can bring better results. Similar models might prove useful in other areas" (UN,2013). The world communities have acknowledged the role of the quality education in Sustainable development and many studies have found that how education can promote peace and strengthen the efforts in achieving the Sustainable Development.

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