**Title**: A Model for Sustainability Education in Developing Countries: Case of Nepal

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**Abstract**

One of the United Nations priorities is to ensure that by 2030 ensure all learners acquire knowledge and skills needed to promote sustainable development (SDG 4.7)   Two major indicators of realization of this goal are: percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability, and percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience.   When it comes to education for sustainable development, schools are the major stakeholder, and different models and frameworks are available for them to follow. However, each school in a region may have different requirements and capabilities available to them to implement**.**

To understand the capabilities and barriers of the schools in rural areas of Nepal, we conducted a pilot qualitative study. Global Network for Sustainable Development (GNSD), developed a model to approach ESD among schools of Nepal.  Based on the principle of "learning by doing", GNSD created a plan of establishing Sustainability Clubs in schools.  In form of extra-curricular activities, schools are involving students in community projects related to realization of Sustainable Development Goals. Through this model, schools from Nepal are creating partnership with schools in developed countries (Sister Schools Project) to provide an opportunity for global communication regarding sustainable development.

The paper highlights the barriers and capabilities of the schools in Nepal, introduce the model through which we can engage students on SDGs, and presents the first set of data on the impact of the project. This study has implications for both practitioners and researchers, and is significant for implementation of in other developing countries.

**Keywords:** ESD, SDG 4.7, Schools, Implementation barriers, Impact

## Introduction

The world faces significant, complex and interlinked development challenges. The speed and magnitude with which these challenges are accelerating in different parts of the world makes the situation not only critical but also requires immediate action to bring transformative changes (IPCC 2013; UNEP 2012). These global issues have an even greater impact on countries which are already struggling to meet the basic demands of its people. Public awareness, education, and training on sustainable development are considered as important tools to bring the desired change (UNESCO 2006). Education for Sustainable Development (ESD) is part of the 2030 Agenda as SDG 4.7 and is recognized as a key enabler of sustainable development and quality education.

Nepal is one of the 48 least developed country in the world, and like no other country suffers from many developmental issues (UNDP Nepal 2014). Risks related to natural disasters are also high. They may impact Nepal's growth trajectory, and requires action to ensure that sources of growth are resilient to climate changes (Ezemenari and Joshi 2019). Moreover, to improve its economy, it is essential to invest in human capital, especially through education (UNDP Nepal 2014). Poor quality of public education, and the disparity in access to educational resources are the two main problems facing Nepal's school education sector today. There are many schools in Nepal that have extremely poor infrastructure. The recent trend to create smart schools and smart learning environment seems on one side increase effects of education in developed countries, at the same time creating even bigger disparity in the access to education for children in developing countries. Without electricity, and connection to the internet, they are left behind.

To successfully implement ESD in Nepal, it is essential to understand the challenges, capabilities and existing approaches used by schools in facilitating education for sustainable development. Through this paper, we identify the barriers and capabilities of schools in Nepal for implementing ESD. The paper first reviews the literature for existing approaches used by schools for ESD. Then based on qualitative research, the work identifies the barriers and capabilities of schools in Nepal. On the basis of our results, we developed a framework for implementing ESD at various levels of education.

## Review of Literature

Long before the inception of the term 'Education for Sustainable development' (ESD), the curriculum for students included environmental education (EE). EE emerged in 1960s as a response to environmental problems associated with rapid industrialization, urbanization and consumerism. The objective of EE was to produce motivated, knowledgeable people concerning the environment, its problems, and their solution (Gough 2013) . However, with the emergence of more socioecological issues, environmental education appeared to be inadequate to address the complex multi-layered and interlinked problems (Kyburz-Gruber 2013). In 1992, UN Earth Summit in Rio de Janeiro, and subsequent Agenda 21 Report (World Commission on Environment and Development), reiterated the importance of education in achieving sustainability (Tilbury et al. 2002). The UN Decade of Education for Sustainable Development (UNDESD) was launched in 2005 with the goal to integrate knowledge about sustainable development into all aspects of education (UNESCO 2006)

ESD encompasses education for environmental, social and economic issues of the current world (Bolsch and Hauenschild 2006). ESD involves the development of attitude, skills, and knowledge allowing individuals to make informed choices, and develop solutions for the complex challenges present across boundaries (Bourn 2008; Reid 2002; Fien 2001; Gough 2006). ESD, as described in Chapter 36 of Agenda 21, considers four major goals: (1) improve basic education, (2) reorient existing education by addressing sustainable development, (3) develop public understanding, awareness, and (4) training.

From Millennium Development Goal (MDGs) to adopting Sustainable Development Goals in September 2015, education has always been part of the UN agenda (UN 2015 Report). However, the SDGs are more detailed and inter linked than MDGs. For example, SDG 4 on education that aims to "ensure inclusive and equitable quality education and promote life-long learning opportunities for all" consists of 10 targets. SDG 4.7 lays emphasis on education for sustainable development and global citizenship (GC) as overarching tools to meet target 4.7. ESD and GC are two different concepts (Mochizuki 2016), and so the work presented in this paper is only focused on ESD.

The implementation of ESD varies across the globe, and is a subject of study by many experts (Biasutti, De Baz and, Alshawa 2016; Egne 2014; Green and Somerville 2015; Olsson, Gericke and Chang Rundgren 2016). UNESCO (2014) broadly describes ESD to be interdisciplinary, holistic, value-driven, implementing critical thinking and problem solving. Many authors have studied the use of various pedagogical approaches in teaching students about sustainability (Scott 2008; Ketlhoilwe 2010; Jeronen, Palmberg and Yli-Panula 2017; Reid 2002; Tilbury 2011). ESD requires acquiring knowledge and developing solutions and so it seems that the traditional single directional system of education is insufficient (Didham and Ofei-Manu 2012a). The participatory active teaching methods (such as problem solving, discussions, fieldwork, experiments and project work) generate the interest in students, impacting both cognitive and affective learning (Scott 2008; Corney & Reid 2007; Jeronen, Palmberg and Yli-Panula et al. 2017). Some ESD pedagogies promote collaboration to solve real-world problems using multiple perspectives (McKeown and Hopkins 2010; Nolet 2016; Littledyke 2008).

Transdisciplinary approach has often been used in teaching ESD (Peterson and Warwick 2014). Green and Somerville (2015) described the materiality of local places as an essential part of sustainability education. They identified ESD practices within the four sets of relations: the materiality of school grounds; connections with local places; partnerships with community; and creative processes. Olsson, Gericke and Chang Rundgren et al. (2016), mentioned the role of teachers in articulating different ways of utilising the curriculum, and enacting pedagogies relating to complex global issues. Norden (2018) investigated the transdisciplinary teaching of ESD with a global dimension at an upper secondary school in Sweden. The study identified two main approaches to transdisciplinary teaching used by teachers. In one group teachers contributed to ESD, but struggled with the transdisciplinary aspect of ESD. In the other group teachers displayed ownership, and were able to reconceptualise the project as a whole. Monroe et al. (2016) identified two themes that most environmental education programs are focusing on: personal relevance and use of active and engaging teaching methods.

Mogren and Gericke (2017) conducted a study in Swedish schools, and identified principal quality criteria that could be important tools for schools intending to implement ESD. They combined the 26 identified quality criteria into four groups. The identified criteria were: interaction and school development; student centred education; cooperation with local society; and proactive leadership and continuity.

The above discussion proves, that the authors conceptualize ESD in a variety of ways (Reid 2002). ESD implementation is complex because of the many interlinked factors involved in the process of its implementation. Studies have explored the constraints faced by teachers in implementing ESD in schools, and these have been identified as complex conceptualizations of ESD, a lack of knowledge on ESD, over-crowded curriculum, lack of financial resources, lack of teaching competency, lack of expertise, attitude of leadership, low motivation among teachers, lack of support from the management, lack of time, and resources (Wright and Horst 2013; Filho 2000; Spiropoulou 2007; Reid and Petocz 2006; Kang 2019; Corney and Reid 2007; Effeney and Davis 2013; Borg et al. 2012; Summers, Childs and Corney 2005; Lee, Son, and Bang 2017).

**Purpose of the study**

It seems that over time schools have witnessed a change in terminology and practices related to ESD. With the growing amount of literature and variety of pedagogical approaches, it is compelling to understand the challenges, capabilities, and the existing approaches the schools are using in facilitating education for sustainable development. Our study therefore attempts to describe the barriers and capabilities of Nepal schools in their efforts to implement ESD. Based on the pilot study we attempt to create a framework of key enablers, barriers and capabilities that should be considered by researchers in other regions of the developing world.

**Method**

The objective of this work was to gain insight into the barriers and capabilities of schools in Nepal. The study uses qualitative approach which is often used to generate a deeper understanding of the topic under study (Mweti and Van Wyk, 2005) After the review of literature presented above, we designed a questionnaire consisting of seven open-ended questions. The respondents were school teachers and principals of schools in Nepal. A prior consent from the respondents was taken, and the confidentiality of all the respondents was maintained. The data were collected through a semi- structured interview method. Sample size of 15 respondents were interviewed over telephone for approximately 30 to 40 minutes. Comprehensive notes were taken, and summary of the discussion witch each the participant was made. The transcribed data were then analyzed for themes and codes using Atlas Ti., a software for qualitative study (Schurink, Fouché, and De Vos 2011).  Across the entire research period, the biasness is avoided to the possible extent.

The questionnaire consisted of the following questions:

1. How long have you been working with this school?
2. Can you describe the needs of the school? Is there anything missing which you feel is essential for students?
3. How do you teach sustainability to students?
4. Can you tell us some of the activities which you do with the students?
5. Can you describe any social initiatives taken by the students?
6. Can you tell us the difficulties/issues you face in school especially in incorporating environmental/sustainability education?
7. Can you describe some of your strengths that can help in teaching sustainability?

**Results and Discussion**

*Barriers to ESD implementation in Nepal Schools*

From the study we identified the barriers to ESD in Nepal schools (Table 1.). The barriers identified are grouped into four categories on the basis of the sequence in which they should be addressed. The barriers should be resolved as per the priority sequence mentioned below in Table 1(1 being resolved first and 4 being resolved at the end).

The first line of barriers which should be addressed first for successful ESD implementation are the inadequate infrastructure facilities.  The schools lacked in benches -chairs, no proper sanitation facilities, lack practical labs, computers and internet.

The second line of barriers to be addressed is those present among the teachers. Focus on curriculum-based learning, lack of motivation, lack of time, limited access to information and resistance to change were some of the identified issues.

Among students, the barriers identified were- lack of awareness, poor financial background, focus only on scores, low job opportunities, migration to foreign countries, and lack of motivation.

The role of community is strong in practicing sustainability. Teachers reported that due low income, the people only expected financial support from any social initiatives taken by the school. Agrarian society, cultural differences and lack of awareness on sustainable practices were other issues reported by the teachers.

The identified barriers have varying level of complexity and interlinked to each other. To successfully implement any ESD program it is imperative to address these issues.

| Priority Level | Category | Barriers | Quotes from the interview |
|---|---|---|---|
| **1.** | School Organisation | 1. Lack of basic infrastructure<br>2. Low financial support<br>3. Lack of technology | *"Our school is unable to provide adequate number of tables-benches, sports facilities, and library to students."*<br>*"The number of students enrolled is increasing and we don't have the adequate student-teacher ratio. How can we ask our teachers to do more than finishing the syllabus?"*<br>*"We are striving hard to meet the basic resources; we are only thinking about this. How can we go beyond this issue?"* |
| **2.** | Teachers | 1. Teachers skills/knowledge<br>2. Lack of faculty training<br>3. No motivation<br>4. Lack of time<br>5. Crowded curriculum and traditional teaching practices<br>6. Lack of access to information on global issues and sustainability<br>7. Resistance to change | *"The teachers are teaching for more than 20 years, they don't want to change their teaching methodology and the burden to complete the syllabus is also there."*<br>*"The teachers are good by heart but they need to know about the issues and current trends. The problem is they are striving hard to manage their resources at family front and are not incentivised enough to do something extra."* |
| **3.** | Students | 1. No motivation<br>2. Lack of awareness on global issues<br>3. Low job opportunities<br>4. Migration to foreign countries<br>5. Focus on tests | *"Students want to perform well in exams and move out of the country. They consider these extra activities as a waste of time."*<br>*"The kids come from poor family background. Many of them leave the school and work with their parents in the field."*<br>*"These sustainability activities are treated as a one day event, we do understand that it should be practiced every day, it should be a habit but there is no motivation to do so."* |
| **4.** | Community | 1. Poverty in the community/Low income families<br>2. Agrarian<br>3. Lack of awareness<br>4. Traditional mindset<br>5. Cultural differences | *"The focus of parents is on earning money and they don't want to waste their child's time and money on education."*<br>*"Primarily the occupation of the parents is agriculture and they want their kids to also work in the fields."*<br>*"The community expects help in the form of financial support and don't understand other things."* |

Table 1: Barriers to ESD implementation in Nepal schools.

### Capabilities of Schools in Nepal

A school should possess few capabilities in order to implement ESD in their schools. However, it is also essential to identify the unique capabilities the school already possess so as not to reinvent the wheel and waste resources on already existing capabilities. Through this study, we identified the unique capabilities possessed by schools in Nepal presented in Table 2.

One of the capability prevalent in Nepal school is the traditional knowledge present in the community and teachers on sustainability. The teachers said *"Our ancestors practiced sustainability through water conservation, recycling of waste and soil conservation. They lived a sustainable life with limited resources. However, it got lost over a period of time."*

The other capabilities identified during the study were cultural cohesiveness, teaching sustainable agricultural practices, vocational training programs, social cohesiveness, trust among people, close knit community, programs for affected parties of climate disasters, field visits, community interaction, and other extra-curricular activities.

| Capabilities | Quotes from the interview |
|---|---|
| Traditional knowledge on sustainability | *"Our ancestors knew about preserving land, water and mother earth but somehow that traditional knowledge is lost over a period of time."*<br>*"We have traditional agricultural practices which we are again practicing with students on their farms. This way we are able to show them the benefits of sustainable agriculture."* |
| Vocational training programs | *"Students are from poor financial background and look for job opportunities. To meet their needs, we have developed special programs in electrical, computer."* |
| Social cohesiveness, respect, trust, close knit community | *"We are a close-knit community and are ready to help each other. We are running this school to serve the society-our people."*<br>*"There is respect and trust in people for teachers. They believe in us and we want to support them."* |
| Developed programs for affected parties of climate disasters | *"Nepal has suffered from any climatic disasters which has affected the people in many ways. The school with the students has supported the impacted parties."*<br>*"We teach students about climate issues and associated risks. We are the sufferers- it is important that we teach students about it."* |
| Field visits, community interaction, extra-curricular activities | *"We do understand that these field visits connect students to the external environment and its importance."*<br>*"There are environmental day celebrations, eco clubs, literary club, yoga club. But the problem is that sustainability is taken as a celebration and is not practiced every day"* |
| Teaching sustainable agricultural practices to the students | *"Many students are from agricultural background and teaching them about sustainable agricultural practices help them to support their families. They also learn and practice it at the same time."* |

Table 2: Identified capabilities of schools in Nepal.

**Framework for implementation**

Sustainability education is interdisciplinary and expansive. Many authors have posited that one single delivery system of knowledge is not enough to develop the knowledge, skills, and values that support sustainable development (Reid 2002; Nolet, 2009).

To combat the complex challenges associated with ESD it is required to develop a strategic approach for ESD that entails programs for students, teachers, school management and the community. The conditions of every school are different and so it is implicit that the implementation of ESD will also vary. The approach described here is developed by keeping in mind the schools of Nepal.

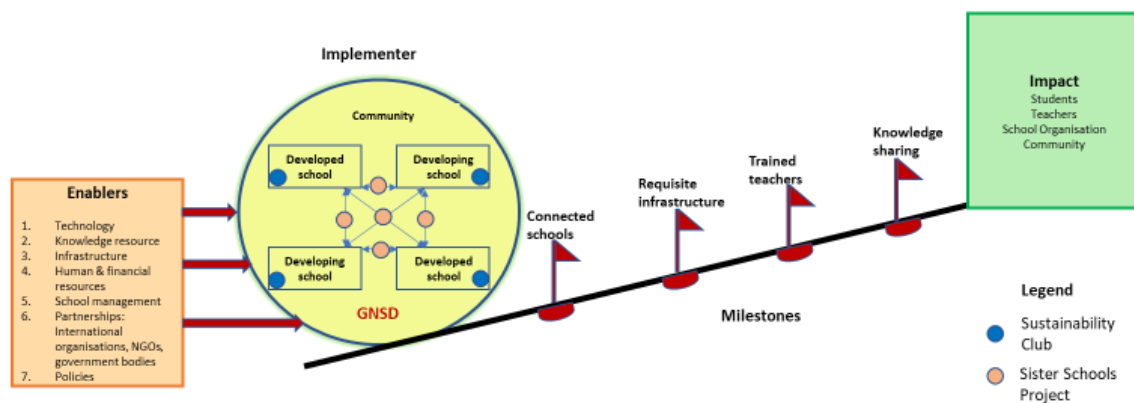The framework for implementation is described in Figure 1.



Figure 1: Implementation Model of ESD in schools

For implementation purpose we identified enablers as: technology, knowledge resource, infrastructure, resources (human and financial), school management, policies, international organisations, NGOs, and government bodies.

GNSD (over here the round ball) is the implementing body responsible for developing partnerships between schools through its Sister Schools Project and installing Sustainability Club in each school.

The schools under this implementation approach are classified into two broad categories - Developed and Developing on the basis of resources available.

***Developed school*** has the adequate financial and human capital for implementing ESD in schools.

***Developing school*** lacks the minimum/threshold level of financial and human capital to provide quality education and implement ESD in schools.

The model suggested here is based heavily on collaboration among the above type of schools with two basic objectives:

a. To support other schools which are unable to meet their basic requirements for quality education and

b. To increase the knowledge in students about sustainability.

***Sustainability club***: Every school as part of this model will have a sustainability club. The club will consist of a group of students along with teachers as mentors. The students learn about SDGs, identify an issue related to SDGs in their school or community, develop and implement a solution for the identified issue.

***Sister schools project***: Sister schools project is to connect schools in different regions. Two schools can collaborate to meet the infrastructural needs of one of the schools. This school by providing resources to the school in turn is providing quality education to students. Through, sister schools project, students from two different sustainability clubs can also connect to exchange knowledge, skills and develop solutions.

Through these partnerships, the schools will be connected together leading to sharing of content and knowledge, better infrastructure facilities, and trained teachers. These outcomes are referred to as milestones in the figure 1 as they together lead to the desired impact on the different stakeholders involved in this project.

### Impact on the participating schools

***Students***: The students through sustainability club will develop the requisite knowledge and skills about SDGs and global issues. Students from schools supporting a developing school in Nepal may learn many things about different social, economic and cultural reality. Seeing results of their support they may develop a sense of purpose and prosocial motivation. They may learn how to organize social actions that are targeting the SDGs. Students from supported schools may improve quality of their education, gain new perspective on life, develop friendships across the borders, and develop the feeling of belonging to the global village. Students from different clubs when connected can work together will develop a sense of global citizenship. This process may help students feel empowered to engage in sustainability work and systemic transformation on a larger scale.

***School management, teachers***: Partnership among schools may significantly benefit both parties at many levels. The management, staff members can exchange and guide each other on developing solutions for the identified problems in their school and community. Such joint projects can enhance the skills and knowledge of the teachers. Though, sister schools project, the social and infrastructural barriers identified previously in this study can also be addressed. The schools can be leaders in sustainability education and can set example for others.

***Community***: As part of this project, students are required to apply their learning in a community-based setting this will increase the awareness among the community members and also reap tangible benefits to the community.

## Conclusions

Education for sustainable development is complex and interdisciplinary, and makes its implementation arduous. As discussed above, ESD should enable learners to not only gain knowledge and skills, but to bring the desired transformative change. To get the anticipated results through education, it is essential that students embrace sustainability in every realm of life.

The present study has attempted to understand the barriers and capabilities of Nepal schools for ESD implementation. The results indicate that although some schools have progressed in

attempting to implement ESD using approaches like field visits, project work, competitions etc, many are still struggling to support the basic requirements to provide quality education.

Traditional knowledge of the environment and community cohesiveness have been identified as the two main areas of strength. The model suggested is based after understanding the barriers and capabilities of Nepal schools and is mutually beneficial to both the school categories. The approach will empower the learners to collaborate, attain knowledge and provide solutions to global challenges.

The findings of this work may be of interest to school management, teachers and researchers for implementing ESD in schools.

**References**

Biasutti, M., De Baz, T., and Alshawa, H. 2016. "Assessing the infusion of sustainable principles into university curriculum." Journal of Teacher Education for Sustainability 18(2): 21- 40.

Bolsch, D., and Hauenschild, K. 2006. "From environmental education to Education for Sustainable Development in Germany." Environmental Education Research 12(1): 7 18.

Borg, C., Gericke, N., Höglund, H., Bergman, E. 2012. "The barriers encountered by teachers implementing education for sustainable development: Discipline bound differences and teaching traditions." Res. Sci. Technol. Educ. 30: 185–207.

Bourn, D. 2008. "Education for Sustainable Development in the UK: Making the Connections Between the Environment and Development Agendas." Theory and Research in Education 6 (2): 193–206.

Corney, G., and Reid, A. 2007. "Student teachers learning about subject matter and pedagogy in education for sustainable development." Environmental Education Research 13(1): 33-54.

Didham, R. J., and Ofei-Manu, P. 2012 a. "Education for Sustainable Development Country Status Reports: An Evaluation of National Implementation during the UN Decade of Education for Sustainable Development (2005- 2014) in East and Southeast Asia." Hayama, Japan.

Effeney, G., and Davis, J. 2013. "Education for Sustainability: A Case Study of Pre-service Primary Teachers Knowledge and Efficacy." Aust. J. Teach. Educ. 38.

Egne, R. M. 2014. "Representations of the Ethiopian multicultural society in secondary teacher education curricula." Journal of Teacher Education for Sustainability 16(1): 54 -75.

Ezemenari, K. M., and Joshi, N. K. 2019. "Nepal Development Update: Investing in People to Close the Human Capital Gap (English)." Washington, D. C.: World Bank Group.

Fien, J. 2001. "Education for Sustainability: Reorienting Australian schools for a sustainable future." Tela series. Fitzroy, Victoria: Australian Conservation Foundation.

Filho, L. 2000. "Dealing with misconceptions on the concept of sustainability." Int. J. Sustain. High. Educ.1: 9 -19.

Gough, A. 2006. "Working at the margins of sustainability: Implementing ESD in Victorian government schools." Paper presented at the University of Bath Centre for Research in Education and the Environment.

Gough, A. 2013 b. "The emergence of environmental education research: a 'history' of the field. In International Handbook of Research on Environmental Education, edited by Stevenson, R. B., Brody, M., Dillon, J., and Wals, E.J., Routledge, 13–22.

Green, M., and Somerville, M. 2015. "Sustainability education: researching practice in primary schools." Environmental Education Research 21(6): 832- 845.

IPCC. 2013. "Climate Change: The Physical Science Basis." Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental.

Jeronen, E., Palmberg, I., & Yli-Panula, E. 2017. "Teaching methods in biology education and sustainability education including outdoor education for promoting sustainability - a literature review." Educational Sciences 7(1).

Kang, W. 2019. Perceived Barriers to Implementing Education for Sustainable Development among Korean Teachers. Sustainability 11(9): 2532

Ketlhoilwe, M. P. 2010. "Education for sustainable development in higher education institutions in southern Africa." International Journal of Scientific Research in Education 3(3): 141- 150.

Lee, E., Son, Y., and Bang, D. 2017. "Analysis of elementary and secondary school teachers' perceptions of education for sustainable development (ESD)." J. Fish. Mar. Sci. Educ. 29: 1584–1599.

Littledyke, M. 2008. "Science education for environmental awareness: Approaches to integrating cognitive and affective domains." Environmental Education Research 14(1):1- 17.

Mochizuki, Y. 2016. "Educating for Transforming Our World : Revisiting International Debates Surrounding Education for Sustainable Development." Current Issues in Comparative Education 19(1).

McKeown, R., and Hopkins, C. 2010. "Rethinking climate change education: Everyone wants it, but what is it?" Green Teacher 89:17- 21.

Mogren, A., and Gericke, N. 2017. "ESD implementation at the school organisation level, Part 1 – investigating the quality criteria guiding school leaders work at recognized ESD schools." Environmental Education Research 23(7):972-992.

Martha, C. M., Richard R. P., Annie, O., Alison, B., and Willandia, A. C. 2017. "Identifying effective climate change education strategies: a systematic review of the research." Environmental Education Research.

Mweti, I., and Van Wyk, H. 2005. NSSC Development Studies. Module 2. Cambridge: Cambridge University Press.

Nolet, V. 2009. "Preparing Sustainability-Literate Teachers in Teachers College Record." New York 111(2): 409-415.

Nolet, V. 2016. "Education for sustainability: Principles and practices for teachers." New York: Routledge.

Nordén, B. 2018. "Transdisciplinary teaching for sustainable development in a whole school project." Environmental Education Research 24(5): 663-677.

Olsson, D., Gericke, N., and Chang Rundgren, S.N. 2016. "The effect of implementation of education for sustainable development in Swedish compulsory schools- Assessing pupils sustainability consciousness." Environmental Education Research 22(2): 176- 202.

Peterson, A. and, Warwick, P. 2014. "Service or service learning - a review of recent citizenship teaching and learning accepted educational policies in England." Citizenship Teaching and Learning 9(3).

Reid, A. 2002. "Environmental change and sustainable education." In Teaching geography in secondary schools, edited by M. Smith, 225-244. London: The Open University.

Reid, A., and Petocz, P. 2006. "University lecturers' understanding of sustainability." High. Educ. 51: 105-123.

Schurink, W., Fouché, C. B., and De Vos, A. S. 2011. "Qualitative Data Analysis and Interpretations." In Research at Grass Roots. To the Social Sciences and Human Service Professions, edited by A. S. De Vos, H. Strydom, C. B. Fouché, and C. S. L. Delport, 397-423.

Scott, S. 2008. "Educational research: Quantitative and qualitative and mixed approaches." Boston: Allyn and Bacon.

Spiropoulou, D., Antonakaki, T., Kontaxaki, S., and Bouras, S. 2007. "Primary teachers' literacy and attitudes on education for sustainable development." J. Sci. Educ. Technol. 16: 443 - 450.

Stapp, W. 1969. "The concept of environmental education." Journal of Environmental Education. 1 (1):33- 35.

Summers, M., Childs, A., and Corney, G. 2005. "Education for sustainable development in initial teacher training: Issues for interdisciplinary collaboration." Environ. Educ. Res. 11:623-647.

Tilbury, D., Stevenson, B. R., Fien, J., and Schreuder, D. 2002. "Education and Sustainability Responding to the Global Challenge." IUCN Commission on Education and Communication CEC.

Tilbury, D. 2011. "Education for sustainable development: An expert review of processes and learning." Paris: UNESCO.
Retrieved from http://unesdoc.unesco.org/images/0019/001914/191442e.pdf

United Nations Environment Programme. 2012. GEO5 global environment outlook: Environment for the future we want.

UNDP Nepal. 2014.
http://www.np.undp.org/content/nepal/en/home/operations/projects/poverty_reduction/snpc/nepal-braces-for-graduation-from-an-ldc.html

UNESCO. 2006. "Framework for the UNDESD international implementation scheme.",
Retrieved from http://unesdoc.unesco.org/images/0014/001486/148650e.pdf.

UN Agenda 21 in English version is available at:
http://www.un.org/esa/sustdev/documents/agenda21/english/Agenda21.pdf

UN. 2015. "Transforming our world: the 2030 Agenda for Sustainable Development."
Retrieved from: https://sustainabledevelopment.un.org/post2015/transformingourworld

UNESCO. 2014. "World Conference on Education for Sustainable Development calls for renewed commitment by all countries." Retrieved from http://www.unesco.org/new/en/mediaservices/singleview/news/world_conference_on_education_or_sustainable_development_calls_for_renewed_commitment_by_all_countries/back/9597/#.VXrYclyeDGe

Wright, T., and Horst, N. 2013. "Exploring the ambiguity: What faculty leaders really think of sustainability in higher education." Int. J. Sustain. High. Educ. 14: 209- 227.