

Education for Sustainable Development and Climate Change Education in China: A Status Report

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Abstract

Recognizing the significance of education in promoting sustainable development (SD), China has developed a number of policies and initiatives relating to education for sustainable development (ESD) and climate change education (CCE). The article first reviews China's national policies and initiatives with regard to SD, climate change, education, ESD and CCE. Second, it investigates the educational approaches adopted in the implementation of ESD and CCE in China, including the establishment of ESD schools and districts, curriculum development, the promotion of the ESD teaching and learning model, thematic activities, and the monitoring and evaluation mechanism. Third, a number of characteristics of ESD in China are analyzed in the article. For example, ESD in China is considered as a way to quality education; and it follows a whole school approach and often requires cross-sectoral cooperation. Last, the article identifies several main challenges faced with the ESD and CCE work in China and provides some feasible solutions to these challenges.

Keywords: ESD, climate change education, China

INTRODUCTION

After decades of tight control and central planning of the economy and foreign trade, the Chinese government commenced to loosen its hold on certain economic activities as part of the Open Door Policy reform in 1978, allowing greater

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freedom in international trade and investments. This market-oriented movement generated successful economic outcomes. China maintained an average growth rate of over 10 per cent each year from 1980 to 2010.¹ In 2010, China surpassed Japan in terms of gross domestic product (GDP) and became the second largest economy in the world (Bloomberg News, 2010; Globaledege).

In spite of its burgeoning economic development, China is confronted with exiguous per capita resources and ecological fragility. As of 2011, the population of Mainland China is 1.34 billion, making China a country with the world's largest population (National Bureau of Statistics of China, 2012). According to China's National Development and Reform Commission (NDRC, 2012), China's GDP per capita is ranked around the 100th in the world, and approximately 122 million people live in poverty. China's rapid economic development (especially its industrialization and urbanization processes) puts great pressure on the environment and natural resources, challenging the sustainability of development.

Considered to be the most powerful and comprehensive commission under the State Council,² NDRC is responsible for studying and developing policies related to economic and social development, including the Five-Year Plans,³ and the coordination and regulation of energy prices and other areas related to sustainable development (SD) (Held et al., 2011). NDRC (2003) identifies several challenges for China's SD, including

the conflict between rapid economic growth and voluminous consumption of resources and ecological deterioration; social development lagging behind economic development; widening disparities between different regions in social and economic development; constraints posed by a large population and scarce resources; and inconsistencies between some existing laws, regulations and policies and actual needs for sustainable development.

In 2007, additionally, China became the world's largest greenhouse gas (GHG) emitter (Guo and Marinova, 2011).

Facing such challenges, consequently, SD becomes a primary national strategy to resolve them (ILO, 2011; Qiao, 2009; Tilt, 2009; Watts, 2010). In China, furthermore, SD encompasses a variety of policies and measures, for example, energy efficiency, water and soil conservation, CO₂ emission reduction, reforestation, etc., which yields positive effects on Climate Change (CC) (Strietska-Ilina et al., 2011). With the rising domestic and international attention on SD and CC, the Chinese government has been actively engaging in CC mitigation and adaptation of policies and programmes.

In raising the public awareness and tackling issues regarding SD and CC, education has long been acknowledged as indispensable and 'essential' (United Nations, 1972). As a result, Environmental Education (EE), ESD and CCE emerged as preferred solutions worldwide, including in China. Especially, the international ESD and CCE work has been accelerated by the endorsement of the United Nations (UN) agencies, particularly the UNESCO Education for Environment, Population and Development (EPD) Project⁴ initiated in 1994 and later the UN Decade of Education for Sustainable Development (2005–2014) (DESD) adopted by the UN General Assembly in December 2002.

Since 1998, and especially after the announcement of DESD, China has been actively implementing the UNESCO EPD Project and promoting ESD ideas. However, there is not sufficient research on China's ESD and CCE-related policies or how education is addressed in China's SD and CC policies since the DESD. In this article, I attempt to review China's national policies and initiatives in regard to SD, CC, education, ESD and CCE. It is beyond the scope of this article to discuss every policy document in detail. What I aim to do is to provide a broad overview of the relevant national policies, major initiatives and educational approaches pertaining to ESD and CCE in China, and to identify the characteristics and challenges of the ESD and CCE work in China.

This article first briefly reviews policies on SD and CC with special attention to how education is acknowledged in China's SD and CC policies. It provides a certain background for understanding China's ESD and CCE initiatives. Second, it presents an overview of the EE and ESD development, and illustrates the recent CCE development in China as well as the ESD-related work in Vocational Education and Technology (VET). It then investigates the educational approaches adopted in implementing ESD and CCE in China. Last, a number of characteristics of ESD and CCE in China are analyzed, followed by a discussion on the main challenges faced with the ESD and CCE work and some feasible solutions to such challenges.

POLICIES ON SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Sustainable Development: A National Strategy of China

In 1994, two years after the first United Nations Conference on Environment and Development in Rio (UNCED), the Chinese government issued 'China's Agenda 21: White Paper on China's Population, Environment and Development in the 21st Century' (hereafter China's Agenda 21), which affirmed that SD was a top priority in China's development and reform agenda. China's Agenda 21 was viewed as a fundamental document for guiding the country's social and economic development (State Council, 1994). Two years later, the Chinese government acknowledged SD and 'Revitalizing the Nation through Science and Education' (Ke Jiao Xing Guo) as long-term national strategies for China in China's Ninth Five-Year Plan (1996–2000) and Long-Range Objectives to the Year of 2010. Later on, China's Tenth Five-Year Plan (2001–2005) connected the two national strategies and proposed that education and science and technology should be seen as strong driving forces to facilitate SD. To promote these two national strategies, the Chinese government formulated the Science and Technology Outline for Sustainable Development (Ministry of Science and Technology, 2002). That is, SD emerged as a national strategy in China's development since 1990s; and education and science and technology became an essential component of the SD strategy.

In 2003, moreover, the Program of Action for Sustainable Development in China in the Early Twenty First Century was promulgated in the wake of the national SD strategy. In the same year, the Chinese government proposed the 'Scientific Outlook on Development'⁵ as its national development philosophy with important

features that are consistent with its SD agenda, such as ‘people-oriented, comprehensive, coordinated, and sustainable’ (Department of Publicity of the CCP, 2006). The significance of SD was once again stressed at the highest level of government. The national strategies and philosophy such as ‘Scientific Outlook on Development’ and ‘Revitalizing the Nation through Science and Education’ underline the core of SD and its related tasks in contemporary China, helping engage SD in official discourses. Subsequent ‘Five-Year Plans’ have reinforced the focus on SD and education as key drivers towards sustainability. SD, consequently, is deeply embedded in the Chinese development agenda and national strategy.

Policies and Initiatives on CC

‘Until the late 1980s, China had almost no history of research or national policy on climate change and therefore no domestic capacity for assessing the potential dangers it may pose’ (Held et al., 2011). In recent years, with the increasing attention on CC challenges, the Chinese government attaches great importance to CC issues. In 2007, the Chinese government established the National Leading Committee on Climate Change (NLCCC). Under the coordination of NLCCC, a series of reports, policies and measures to address climate change were included in the overall national SD strategy (Chinese Government’s Official Web Portal, 2007). In 2007, China launched ‘The National Climate Change Program’, outlining the guidelines, principles and objectives, key areas of actions, as well as policies and measures to adapt to and mitigate climate change. It made China the ‘first’ developing country with a national climate change mitigation programme. In the same year, ‘The National Action Plan for Energy Saving and Emission Reduction’ was issued to encourage communities, enterprises, schools, youth organizations, the military, governments, academia and media to participate actively in energy conservation.

In October 2008, moreover, the State Council issued a white paper on CC—‘China’s Policies and Actions for Addressing Climate Change’, which addressed the main issues related to mitigation and adaptation of CC in China. China’s Eleventh Five-Year Plan (2006–2010) and Twelfth Five-Year Plan (2011–2015) both emphasized the importance of ‘actively tackling global climate change’ on building ‘a resource-saving and environment-friendly society’ (State Council, 2011). In addition, to cope with energy saving and GHG emission reduction issues, the State Council released the Twelfth Five-Year Plan for Energy-Saving and Emission Reduction in 2012 and officially incorporated climate change mitigation into its national development plan.

Education in the National SD and CC Policies

Strengthening education, training and public awareness on SD and CC issues is stated in almost every SD and CC national policy. China’s Policies and Actions for Addressing Climate Change (2008), for example, proclaimed that China would further promote education and training on CC (State Council, 2008). As stated in a number of national SD and CC policies, knowledge, capability and practice in addressing CC and SD should be included in different levels of education, with the focus on fostering awareness of CC and SD among students and the public, encouraging them to change

their lifestyles and consumption patterns, and carrying out energy-conserving and resource-saving activities (State Council, 1994, 2008, 2011). Additionally, a number of CC and SD policies encourage the government to improve the sustainability of education, promote education equality, and integrate SD ideas in students' thinking and curriculum development.⁶ As stated in China's National Report on Sustainable Development, one important goal for China's SD strategy is to enhance the level of development in education and technology (NDRC, 2012).

In general, China has made much progress in setting SD at the forefront of its development strategies. Recently, CC has been officially incorporated in China's national development plan. China is the first developing country with a national climate change mitigation programme. In China, moreover, education is acknowledged as an indispensable component and contributor in achieving the SD and CC plans.

THE DEVELOPMENT OF ESD AND CCE-RELATED POLICIES AND INITIATIVES

An Overview of EE and ESD Policies and Initiatives in China

EE was for the first time carried out in basic education across China in the late 1970s and early 1980s. Following the 1992 UNCED, EE in China was gradually integrated with and reoriented toward EPD, and then ESD (Yi and Wu, 2009). In 1996, China initiated the National Environmental Publicity and Education Program (1996–2010), which served to connect EE with the quality education agenda. The state-supported Green School initiative was launched in the same period to encourage schools throughout China to participate in EE. In 1997, in collaboration with the World Wildlife Fund (WWF) and British Petroleum (BP), the Ministry of Education (MOE) established the nationwide Environmental Educators' Initiative (EEI) to mainstream EE and promote SD in Chinese schools. In 2003, drawing from the experience of EEI, MOE issued the first guiding policy on EE in China—the *Guidelines for Implementing Environmental Education in Elementary and Secondary School*. The issuance of the policy marked the increasing importance of education for environment and sustainability in Chinese basic education.

Although both EE and ESD are present in the Chinese official discourse and national and local initiatives, EE appears to be perceived as an integral part of ESD, mainly due to the initiatives of the UNESCO ESD (previously known as EPD) Project⁷ in China. In other words, the concept of ESD encompasses EE and is gradually gaining more attention among researchers and policy makers in China (Tian, 2008). In 1998, entrusted by the Chinese National Commission for UNESCO, (hereafter Chinese Natcom), the research team in the Beijing Academy of Educational Sciences started to implement the UNESCO EPD Project in China. In December 2002, the adoption of the DESD shifted the international discourse and practice from EPD to ESD. Under the auspices of the Chinese Natcom and MOE, the National Working Committee for ESD in China and Beijing Association of ESD (BAESD)⁸ were established to oversee and coordinate the work of the UNESCO ESD Project in China. In this article, these two organizations are together referred as the National Committee.

Through over 10 years of research and practice, the ESD Project in China has developed a thorough framework for understanding and practicing ESD. The project has been implemented in over 1,000 schools and has created notable educational changes (e.g., ESD-related policies, curriculum development, teaching and learning practice and student behaviours) (Shi and Han, June 2012).

The year 2010 was exciting for ESD in China due to the explicit emphasis on ESD in China's national education strategy—the National Outline for Medium and Long-term Education Reform and Development 2010–2020 (hereafter the National Education Outline 2010–2020). ESD was thus formally incorporated into the national education policy and thereby gained legitimacy. In addition, in 2011, the National Environmental Publicity and Education Program (2011–2015) was developed to better serve the environment protection and SD objectives in the Twelfth Five-Year Plan (2011–2015). At the local level, under the direction of the Twelfth Five-Year Plan (2011–2015) and the guidance of the National Committee, ESD-related policies are incorporated into some district-level educational strategies and action plans, for example, Shijinshan District Educational Development Plan during the Twelfth Five-Year Plan.

In China, a number of policies and initiatives are available for implementing EE and ESD in Chinese schools. Particularly, with the integration of the ESD concept in the National Education Outline 2010–2020 and local policies, the ESD concept is gaining more and more recognition from the Chinese government and other actors. However, there is 'no' official ESD national action plan or other kinds of specific ESD national policy in China. In the absence of a national action plan or guidelines, the ESD and CCE-related policy documents in SD, CC, education and other areas and policies and documents regarding the UNESCO ESD Project in China provide certain guidelines for ESD implementation at multiple levels. For example, the 'Education for Sustainable Development in China Experimental Manual' and the 'Guidelines of ESD for Primary and Secondary Schools in Beijing' serve as the theoretical and practical guidelines for the Chinese ESD schools.

Development of CCE and its Relationship with ESD

As discussed earlier, CC and SD policies and initiatives in China view education as an integral component in raising citizens' awareness on addressing CC and reorienting their behaviours toward sustainability and green development. The development of CCE-related activities⁹ in China is driven mainly by its CC policies and initiatives, rather than by educational ones. The priorities of CCE-related activities are therefore in line with the key national CC adaptation and mitigation priorities—'adjusting the economic structure, changing the development patterns, saving energy and improving energy efficiency, optimizing energy mix and promoting afforestation' (State Council, 2008).

Albeit the increasing emphasis on and awareness of CC, the concept of CCE in China is still in its infancy. CCE is rather peripheral in educational policy and practice. Even though educational elements are included in national CC policies, the CCE concept is not explicitly addressed in the national educational policy or plan. In educational practice, CCE-related activities are mostly carried out under the umbrella of ESD

in China (Shangri-la Institute, 2011; Wu, 2010). Although several CCE programmes and plans are in place, the most common implementation of CCE in Chinese schools is to have CCE as an inherent component of ESD.

ESD in Vocational Education and Training

The Twelfth Five-Year Plan (2011–2015) utilizes the word ‘green development’, a concept similar to sustainable development, and promotes ‘a green economy’ as an important national and local development strategy (State Council, 2011). There are, however, skill gaps in numerous green economy sectors including agriculture, manufacturing, service industries, renewable energy, energy and resource efficiency, environmental construction services and building renovation (Ministry of Human Resources and Social Security, 2010; Strietska-Ilina et al., 2011). In the hope of filling these gaps, the Guidance on Promoting the Development of the Secondary and Higher Vocational Education, issued by the MOE, suggests that the transformation of economic development to a green economy endues new missions for the Chinese VET system. The VET, as ‘a weak link in Chinese education system’ (Ministry of Education, 2011), needed to be reformed to suit the needs of SD and especially to the strategic adjustment of the Chinese economic structure requested by the 18th National Congress of the Chinese Communist Party in 2012.

The MOE proposed several policy measures to reform Chinese VET to equip the youth with green economy skills, for example, The Guidance and the Recommendations on the Teaching Material Construction for Vocational Education during the Twelfth Five-Year Plan. However, as International Labour Organization’s country study shows, China still lacks a national skill development strategy for greening the economy (Strietska-Ilina et al., 2011). The concepts of ESD and SD are rarely presented in the recent national VET policies in China.

Generally speaking, there is ‘no’ official ESD national action plan or other kinds of specific ESD national policy. A number of ESD and CCE-related policy documents and initiatives, however, are in place and serve as theoretical and practical guidelines for ESD implementation at multiple levels. Based on the ESD-related policy documents and UNESCO ESD Project publications, the next section will illustrate the educational approaches of promoting ESD in China.

MAIN EDUCATIONAL APPROACHES IN PROMOTING ESD AND CCE IN CHINA

In China, ESD refers mainly to educating individuals with scientific knowledge, learning capacity, values and sustainable lifestyle to meet the sustainable development needs, with the purpose of promoting the sustainable development of individuals, the society, economy, environment and culture (L. Liu, 2011; Shi, 2010, 2011a; Shi and Han, June 2012; X. Zhang, 2006). ESD in China encompasses a wide range of meanings and actions, such as, EE, energy-saving education, CCE, multicultural education and education for international understanding. Under the guidance of such understandings of ESD, a wide range of educational approaches is adopted. In this

section, I present the main educational approaches in implementing the UNESCO ESD Project in the Chinese context, which sheds light on the approaches utilized in promoting the ESD work in China. These educational approaches include the integration of ESD values into school philosophy, curriculum development, the ESD teaching and learning model and capacity building, ESD and CCE thematic activities, and monitoring and evaluation (M&E).

The Establishment of ESD Schools and ESD Districts

Since the beginning of the ESD Project in China, the National Committee has developed the strategy of establishing three layers of ESD schools, that is, ESD Experimental School, ESD Example School, and National ESD Example School (The National Working Committee for ESD in China, 2011). The three types of ESD schools have been expanding dramatically over the past 15 years. Over 1,000 Chinese schools in 14 provinces have adopted the ESD ideas and become ESD schools. Furthermore, the National Committee is building a number of ESD Experimental Districts across different regions in China. As of May 2013, 10 ESD Experimental Districts have been launched.

In building the ESD schools, as proposed in *The Education for Sustainable Development in China Experimental Manual*, it is pivotal to integrate ESD values and ideas into schools' running philosophy (The National Working Committee for ESD in China, 2011). That is, the ESD concept should be included in the schools' overall planning, development strategy, and the teaching and learning process (Beijing Education Committee, 2007).

Curriculum Development

The National Committee encourages a three-level ESD curriculum development—the national curriculum, local curriculum and school-based curriculum. To help better infuse ESD ideas into curriculum development, Shi and Wang (2006) published a guidebook for developing ESD-related curriculum—*Basic Courses in Education for Sustainable Development*—in China. The national curriculum is designed by the MOE and is mandatory for all schools. The schools and teachers are encouraged to integrate ESD concepts into the daily teaching of the courses required by the MOE (Wu, 2010). Furthermore, local and school-based curricula and teaching materials are developed based on the local situations and become an essential approach to carry out ESD work in schools. According to the 2009 Country Report, by the end of 2005, in Beijing alone, at least 181 sets of ESD local and school-based curricula were developed by ESD schools and districts (The National Working Committee for ESD in China, 2009).

ESD Thematic Activities

The National Committee, together with local committees and schools, designs and carries out a variety of activities regarding two special themes in ESD—environment and resources¹⁰ and society and culture.¹¹ In response to the strategy, the National Committee and schools establish diverse partnerships with communities, enterprises, NGOs and other stakeholders to organize special activities for schools and students,

for example, building energy-saving campus, national and local contests on the two themes, community volunteering service, extracurricular activities, etc. For example, in collaboration with the Toyota Motor Corporation and sections of the national and local government, the National Committee launched the Sustainable Development and Energy Conservation & Emission Reduction Society-School Interactive Project in 2008. The project urges schools and students to participate in energy saving and ESD exhibitions, contests and workshops, improve their school environment, and raise awareness and motivate the families and communities to engage in energy saving activities (The National Working Committee for ESD in China, 2008).

The ESD Teaching and Learning Model

In infusing ESD ideas in teaching and learning practice, the ESD teaching and learning method was developed and summarized into four principles: student-centred, infusion of ESD ideas in classrooms, cooperative learning and connecting knowledge with practice (Shi and Wang, 2006). Particularly, it was designed with three steps to inspire students' creativity and improve problem-solving skills through encouraging enquiry learning and cooperative learning (The National Working Committee for ESD in China, 2011). The three steps underline the importance of students' research and enquiry learning before class, cooperative learning in class and using the knowledge in practice after class (see Figure 1). Experts in the National Committee believe that such an ESD teaching and learning model differs from the traditional teaching model where teachers dominate the classroom and focus on transmitting the knowledge from the book.

In promoting ESD in China, training and workshops are considered a fundamental approach in raising teachers' understanding of ESD and incorporating the ESD teaching and learning methods in their daily teaching practice (Shi et al., 2013; The National

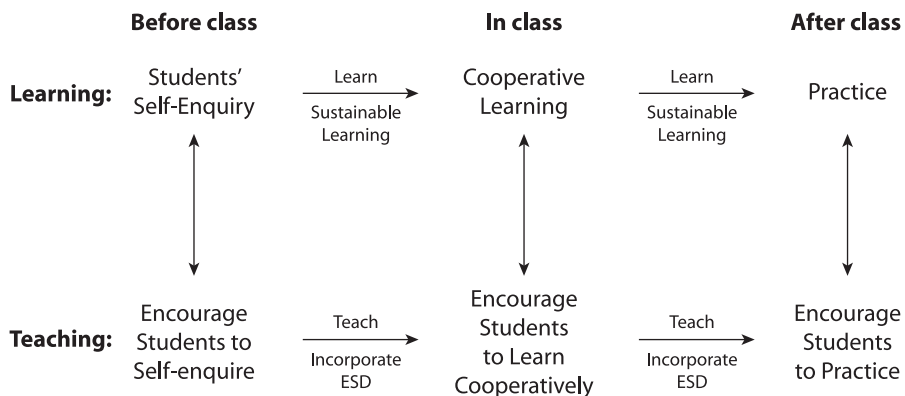


Figure 1 The Three-step ESD Teaching and Learning Model

Source: Shi and Han (June 2012) and Shi et al. (2013).

Working Committee for ESD in China, 2009; Zhang, 2010). Especially, national ESD training and workshops, local training, and school training and classroom demonstration are available for school principals and teachers. A series of ESD workshops and trainings was organized for teachers and school administrators. About 100,000 teachers and school administrators in over 1,000 ESD schools have received the training and guidance provided by the National Committee and its expert team (Shi and Han, 2012; Shi et al., 2013).

Monitoring and Evaluation

In order to meet the need for a national guideline on the M&E for ESD, the National Committee developed the M&E criteria for the UNESCO ESD Project in China with reference to the general requirements from UNDESD and ESD research and experience in China in 2009. In the next year, the National Committee published the M&E Report on ESD in China. The ESD M&E in China consists of national, local, and school-level M&E for ESD programmes. Take the national M&E criteria for example—the main education indicators for the criteria are as follows: national policy and theoretical research, organization and working mechanism, curriculum construction and teachers' training, the promotion of ESD schools; district, national and international cooperation and exchanges (The National Committee, 2011). The local- and school-level criteria follow the general framework of the national criteria yet have their own distinct features.

CHARACTERISTICS OF THE ESD AND CCE-RELATED POLICY AND INITIATIVES

ESD: A Way to Quality Education

'Improving access to quality basic education' is acknowledged by UN agencies as the first of the four thrusts of education to support a sustainable future, identified in Chapter 36 of Agenda 21 and the DESD framework (UNESCO, 2005). In China, the National Education Outline 2010–2020 views quality education as a major strategic theme for its education reform and development; it also pinpoints the goals of Chinese education reforms as promoting equal access to education, improving education quality and boosting SD capacity (Ministry of Education, 2010). The experts in the National Committee link the quality education components in DESD with Chinese national education strategies and advocate ESD as a way to quality education.¹² To promote quality education through ESD, the ESD work in China focuses on fostering students' knowledge, values, attitudes, and behaviour changes. Further, the ESD policies and projects attempt to steer the education function towards the SD of the society and each individual, and cultivate citizenship education qualities, such as critical thinking, problem-solving capability, leadership and communication skills, decision making under conditions of uncertainty and risk, and the competences on social and technological innovation (Y. Liu and Constable, 2010; Shi, 2011b; Yao, 2010).

A Whole-school Approach towards ESD and CCE

A number of international documents and declarations support a whole-school approach¹³ to ESD implementation (Hargreaves, 2008). In practice, a whole-school approach means that schools incorporate ESD and CCE not only through the curriculum, but also through the running philosophy and governance of schools, the ESD teaching and learning methods, community and stakeholder engagement, and sustainability M&E, etc. ESD in China follows a whole-school approach that requires innovative educational approaches. ESD practice in China suggests that ESD does not simply represent a new curriculum area or field of study, but rather encompasses more interdisciplinary and holistic educational approaches to cultivate the knowledge, capacities and values of individuals in a rapidly changing world.

Governance: Mobilization and Involvement of Multiple Stakeholders

ESD and CCE cover various disciplines and domains and often induce cross-sectoral and cross-ministerial cooperation. The governance of ESD and CCE at the national level inevitably involves multiple stakeholders in different sectors. For example, it engages the MOE, Ministry of Environmental Protection, Ministry of Science and Technology, the State Council, ad hoc governmental entities (e.g., the NLCCC), NGOs (e.g., Shangri-la Institute and WWF), and enterprises (e.g., BP, Shell, Toyota). China's ESD and CCE-related policy initiatives suggest that schools, communities, universities, research centres, enterprises, NGOs, government, international organizations, and other organizations need to collaboratively promote ESD, conduct research, share experiences, and encourage individuals to participate in ESD innovation. The White Paper on the Twelfth Five-Year Plan for Energy Saving and Emission Reduction, for example, points out measures to ensure the participation of the entire society in programmes for curbing CC and encourages the civil society to implement energy conservation initiatives and raise public awareness (Ma, 2012).

The Coherence of the ESD and CCE-related Policies

China follows closely the international ESD ideas promoted by UNESCO and other international organizations. Its national SD and CC policies and the ESD and CCE projects frequently make reference to the significant international conferences or agreements. Agenda 21 and the United Nations Framework Convention on Climate Change, for example, oftentimes serve as the guiding documents for the national SD and CC policies. Accordingly, the ESD concept and approaches in China correspond to those in international agreements.

In addition, China's national policies in relation to ESD and CCE are largely coherent. In the national CC and SD policies, for example, education and training are viewed as a fundamental approach to strengthen the national SD capacity and improve the public understanding and behaviour on CC and SD issues; also, education is emphasized in the SD and CC policies as it fuels sustainable economic development by providing skilled and qualified human capital to the labour market. In national education policies, promoting SD and addressing CC are the overarching background and goals of educational reforms; and education is a way to enhance the

all-round development of the students, education quality, and sustainability of the society and individuals. These policies concerning ESD and CCE are hence coherent and are all under the framework of China's development agenda for improvement of the comprehensive national power and the balance between economic development and a sustainable environment and society.

CHALLENGES AND POTENTIAL SOLUTIONS

Although much has been done to establish ESD and CCE policies and initiatives in China, the implementation of ESD and CCE-related initiatives still faces a number of major challenges.

First, there is limited policy and institutional support. Although education is acknowledged as a fundamental component and contributor of China's SD and CC agenda, there has not been any specific national policy or concrete action plan on ESD or CCE. The solution to this issue may seem simple: national policies should be in place to explicitly address ESD and CCE issues and provide support to their implementation. However, it requires strong political will and joint efforts from various governmental entities. In addition, an overseeing body in charge of ESD and CCE should be in place to lead the cross-sectoral cooperation and facilitate interactions among stakeholders from different sectors, and thus ensure the implementation of ESD and CCE policies (Mehlsen, 2009).

Second, the implementation of ESD in China faces the challenge of insufficient awareness among key stakeholders. Many government officials and local practitioners have not realized the meaning or importance of ESD and CCE in promoting quality education and sustainable development of individuals and the society. More awareness raising activities such as ESD and CCE training and workshops need to be conducted for the government officials and school leaders.

Third, the pre- and in-service education and training on ESD for teachers are still inadequate. ESD comprises a wide range of complicated contents and innovative educational approaches; therefore, training for teachers is vital to the ESD work in schools (IALEI, 2009). In China, however, teachers do not receive enough education and training on ESD and CCE issues. There are several ways to cope with such problems: ESD and CCE should be integrated into teacher education; ESD training experts should be available to provide routine guidance for teachers and schools; and the government needs to produce official ESD training manuals and guidelines for teacher education and professional training.

Last but not least, the development of ESD sees a disparity between schools in different regions. Schools in more developed regions, such as, Beijing, Shanghai and Guangzhou, are more engaged and active in ESD initiatives than schools in less developed regions.¹⁴ Furthermore, ESD is mainly implemented at the basic education level. It is rarely included in the post-secondary education policies. More resources need to be allocated in less developed regions in support of balanced ESD development. Similarly, ESD should be promoted in higher education, VET, adult education, special education and informal education.

CONCLUSION

As a country with a rapidly growing economy and an enormous population, China never ceases to seek for a sustainable way of development that reconciles the growing needs of a large population and the need for protecting the environment for future generations. Dated back to the early 1990s, China started to formulate and implement its national SD strategies. It was recently that China focused great attention on CC issues and put forward national policies on CC mitigation and adaptation. China is the first developing country with a national climate change mitigation programme and has been actively investing in CC initiatives. Education, moreover, has become an integral part of the national SD and CC strategies. Inspired by the international agreements such as Agenda 21 and DESD, China actively develops policies and initiatives regarding ESD and CCE. In the midst of increased public awareness and international support, various social entities carried out several nationwide ESD and CCE-related campaigns. In 2010, ESD was eventually recognized by China's policy discourse and incorporated in the National Education Outline 2010–2020. However, the concept of CCE has not been explicitly recognized in any educational policy despite the fact that CCE-related activities are implemented in Chinese schools.

As SD and CC issues emerge and public awareness grows, ESD and CCE are gaining broader attention in China. The political environment is hospitable for ESD and CCE policies. However, the development of policies and the implementation of initiatives regarding ESD and CCE still face a handful of challenges. It requires a strong political will and the consensus of key stakeholders to trade short-term interest for sustainable development in the long run.

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Notes

1. Source: Author's own calculation based on data from the World Bank Database. Available at: <http://data.worldbank.org/country/china>
2. The State Council, or the Central People's Government, is the highest administrative organ in China. Under the leadership of the State Council, the ministries, commissions and administrations are in charge of the administrative affairs in different areas and exercise prescribed state administrative powers.
3. 'Five-Year Plans' are plans the Chinese government makes every five years to lay out the major development projects and reforms, and the direction, vision and key issues in China's economic and social development (China.com.cn). The First Five-Year Plan (1953–1957) was initiated under Mao's government. Currently, China is undergoing its Twelfth Five-Year Plan (2011–2015).
4. In 1994, UNESCO adopted an international project on sustainability—the UNESCO EPD Project. The EPD Project was then carried out in a number of the UNESCO member states, including China. Later on, built on the work of EPD, as the lead agency of DESD, UNESCO carried out the DESD framework worldwide.

5. The 'Scientific Outlook on Development' was raised for the first time in the former President of China Hu Jintao's speech. Later in the Seventeenth National Congress of the CCP in 2007, the 'Scientific Outlook on Development' was incorporated in the Constitution of Communist Party of China as one of the most fundamental guiding theories in China. It highlights the sustainable development and harmony between human and nature.
6. The Chapter 6 of China's Agenda 21, for example, notes that the development of education is fundamental to SD and proposes to 'encourage the idea of sustainable development in students' thinking' and incorporate elements of sustainable development in the curricula throughout the whole educational system.
7. In China, the implementation of the EPD Project and DESD are altogether acknowledged as the implementation of the UNESCO ESD Project.
8. The National Committee and BAESD are housed in the Beijing Academy of Educational Science in Beijing, China. The two organizations share the similar missions and goals. National Committee is an ad hoc working committee under the leadership of Chinese Natcom. BAESD is a non-profit organization and serves as the secretariat of the National Committee.
9. In recent years, several nationwide CCE-related programmes are initiated by a number of governmental, private, and non-governmental entities, e.g., the Climate Change Education for China programme by the Shangri-la Institute, the Youth Sustainability and Energy Education Programme founded by Shell, and Climate4Classroom by China's National Institute of Educational Science and the Cultural and the British Embassy.
10. The thematic activities on environment and resources may include two aspects: the cultivation of lifestyle featuring energy saving, emission reduction and low carbon; and the energy saving and emission-reduction scientific and technological innovation education.
11. The activities on society and culture may have two major areas of interests: Chinese traditional culture; and multicultural education and education for international understanding.
12. Quality education refers to 'an education that provides all citizens with the knowledge, skills, values and perspectives that will assist the achievement of a just, equitable and ecologically sustainable future' (Beijing Consensus, 2011).
13. 'A whole-school approach to ESD calls for sustainable development to be integrated throughout the formal sector curriculum in a holistic manner, rather than being taught on a standalone basis' (Hargreaves, 2008).
14. Based on interviews and personal communications with ESD stakeholders in China.

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