CCICED at 30

Working for China's Environment and Development Transformation

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Working for China's Environment and Development Transformation

Foreword

CCICED has been woven into the fabric of China's environment and development policy process for the past 30 years—the length of an entire generation. It is also consistent with the most rapid shift in modernization of any nation's economy–environment relationship. This report provides insights into not only how CCICED operates and some of its many successes but also a general picture of how changes in China's approaches to environment and development have taken place. CCICED at 30 is therefore a helpful account for future directions of what must be a long-term process.

Since its inception, CCICED has emphasized economy, ecology, energy, and their relationship to the environmental changes and meeting people's needs. CCICED laid the groundwork for meeting today's concerns about high-quality, sustainable development, ecological restoration, and, above all, the path to ecological civilization as a central objective for China's green development future.

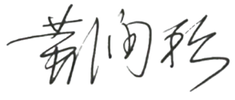
CCICED has been an important instrument for opening relationships with many of the world's environmental and development leaders and institutions. In the process, China also has been able to build a better understanding of its goals, achievements and aspirations with other countries, United Nations agencies, and leading environment and development international organizations. The same is true within China, as CCICED has engaged so many domestic research, academic, and policy bodies.

The State Council designated China's national environmental agency as the administrative unit responsible for CCICED's initiatives. This approach maintains linkages to the Office of the Premier and to the Vice Premier, who chairs CCICED. A succession of environment administrators and now ministers has been responsible for the smooth, effective operation of CCICED. I am pleased and honoured to take part in CCICED's work.

Environment and development action relies upon the whole of government, and, really, the whole of society for success. This is why CCICED draws upon many types of skills and interests for its members and researchers. Many governmental departments, Chinese academies, universities, and other organizations participate.

International and Chinese funding partners have played essential roles throughout the history of CCICED. Their roles, however, often go far beyond providing financial support. They help in locating suitable expertise, provide in-kind support, and enthusiastically participate as CCICED members and in other ways. We appreciate their many inputs.

Thousands of people have participated in CCICED activities. It is not possible to highlight all of their contributions in CCICED at 30, but I do want to extend heartfelt thanks to all these individuals and organizations that have shaped CCICED. I look forward to a future with continued growth in the value of this remarkable Council, not only for China but also for strengthening partnerships globally, accelerating the implementation of the UN 2030 Agenda for Sustainable Development, and jointly promoting a more balanced, coordinated, and inclusive global development.



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Preface

The China Council for International Cooperation on Cooperation and Development (CCICED) was started in 1992 with high hopes and big ambitions. The timing seemed perfect from a global perspective—UNCED (June 1992 Rio Earth Summit) was about to happen after a long gestation that stretched back to the famous 1987 Brundtland Report, Our Common Future. China's planners and scientists at high levels had come to a tentative but still highly significant realization that the success of future economic growth might become more and more dependent on finding pathways that also enhance quality of life, security, and ecological systems and natural resources, and that mitigate risks from pollution and other environmental impacts. Indeed, there was already a national law for environmental protection, and some programs such as tree planting were already in place.

With China's "Reform and Opening Up," there was both motivation and incentives to drastically shift the emphasis on industrialization, urbanization, and improvements in governance. These shifts, with the ensuing rapid rise in foreign investment, GDP, and international trade during the 1990s, and especially after China's December 2001 entry into the World Trade Organization, created an unprecedented demand for electricity, resource use, and infrastructure development that has rarely, if ever, been as great for any other large nation over such a short period. The economic advances led to an ever-increasing national ecological and environmental debt sufficient, according to some calculations, to considerably reduce the net value of rapid GDP growth. Well before the second decade of the 21st century, the socio-ecological alarm bells were ringing.

Sustainable development was embraced through the globally negotiated Agenda 21 and the Rio Earth Summit Conventions on Climate Change, Biodiversity Conservation, and Desertification. China became a leader in poverty reduction, including participation in the UN Millennium Development Goals and in international environmental efforts such as the United Nations Environment Programme's Cleaner Production Programme and the Clean Development Mechanism associated with the United Nations Framework Convention on Climate Change Kyoto Protocol. Yet, for much of the first decade of the 21st century, China struggled to keep up with the environmental impacts of rapid economic expansion. Pollution worsened and changed in its character and the extent of its impacts despite continuously enlarging national investment in environment and development (E&D) initiatives. Earlier shocks, such as the massive damage in the Yangtze River Basin due to the 1997–1998 floods, had led to major changes in land and water use and ecological restoration. But on this and other environmental risk issues, many more changes were needed.

New ideas emerged, including concepts such as eco-compensation, ecological construction, circular economy, ecological civilization, eco-cities, etc. The ideas were often a collage of theories and concepts borrowing from current western thought and practices such as environmental impact assessment (EIA), ancient Chinese ideas such as Xiaokang, and practical advice from on-the-ground experience within China on recycling, polluter pays, and designation and management of nature reserves. Trade and environment, a low-carbon economy, and clean production became major topics.

By the start of the second decade and continuing to the present time, China's emphasis on integrated management of eco-environmental issues strengthened quite dramatically. It became clearer that major investments in E&D matters paid essential dividends and that these dividends can be used to improve the quality of life for all citizens of China and for people elsewhere in the world. Green is Gold is a phrase widely used in policy circles within China, and green development is recognized as a driver for a higher quality of development. There is recognition that cross-sectoral cooperation and coordination are essential. Synergies can be found to address problems such as pollution, climate change, and improving ecological services.

Steps taken during China's 12th and 13th Five-Year Plans have been very important for establishing a new relationship between the environment and the economy for the benefit of both people and nature. Important changes are taking place that can be accelerated during the 14th Five-Year Plan and well beyond. China has far to go in its efforts to become an ecological civilization, but the base for doing so is very different from 30 years ago when CCICED provided its first advice to the State Council of China.

Never once over these past three decades has CCICED stopped being an observer of what is one of the most complex and important environmental and development transformations seen in the modern world. More importantly, this body has been privileged to play an ongoing role in helping to shape and advise on policies and mechanisms regarding many of the innovative approaches put in place. CCICED is recognized as the senior advisory source linking Chinese and international inputs concern-

ing this broad field of E&D. CCICED is a council "owned" by China but operated as a collective that deeply involves both Chinese and international expertise in all of its work.

We recognize that CCICED is only one voice among many, but through its structure and long-standing experience, it is unique. CCICED is a trusted source in how it gathers and assembles its knowledge base. It has demonstrated success in how this knowledge can bring new insights of value to both the Government of China and international circles. Further, it operates on the principle that the information is accessible to all who choose to use it.

This CCICED at 30 report goes deeper than skimming the surface, but it is still incomplete in many ways. The document provides a broad overview of how the Council was established, its structure and intended functions, quite a bit of detail on the work according to topics, and some of the outcomes influenced. We have tried to identify many of the people involved at various points in the work. Donor partners and other partners, both Chinese and international, have shown great faith over the years in the guidance and trust they have placed in the organization. For reasons of space and the purpose of the document, it is impossible to be as comprehensive or analytical as we would like to be.

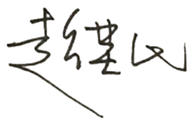
We hope the document will be of use as CCICED plans and conducts its future activities, especially those to be carried out during Phase VII, starting in this current year, 2022. To that end, we provide our insights on particularly important topics. There is much more spirit now for opening opportunities to transfer China's E&D experience to other countries and regions. China also wishes to play a larger role in global governance on E&D. It will have to prove itself by building an international understanding of its achievements and by assisting others in concrete ways. CCICED's linkages to many international organizations and countries may prove valuable for this goal.

What we value very highly in our efforts with CCICED is the ability to work with so many leading figures related to a wide range of E&D issues. Over the decades, this has amounted to thousands of individuals drawn from many organizations who bring many types of experience to the table. Trying to compress their wisdom into policy advice that is helpful to China and the world can be challenging, but it is always interesting.

One chapter of our report provides insights into the views of various participants associated with CCICED regarding this unique body. We appreciate the hard work of so many people from a wide range of institutions who have devoted large amounts of time to share their expertise to move China into a situation where it can not only cope better with its own E&D concerns but now also work to share this experience with others and contribute to solutions for problems that affect the whole world.

Readers will recognize that it takes senior leaders; people in all sectors with diverse backgrounds in science and business; local and national administrators; and those in civil society to bring about sustainable development and improve the quality of natural systems and our socio-economic well-being. We hope the CCICED at 30 report will enlighten this particular model of international cooperation.

Finally, we wish to extend our thanks to officials, donor organizations, international and Chinese institutions, administrative bodies, and individuals who have contributed their time and effort to building and maintaining the organization for over three decades. Many are noted in our document, but certainly not all. We are particularly grateful to Mr. Guo Jing, recently retired International Director General of the Ministry of Ecology and Environment (MEE), who has contributed greatly to the success of CCICED and who proposed that we prepare this report.



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CCICED at 30 Executive Summary

Why CCICED Matters

China took initial steps during the 1970s and 1980s to improve environmental protection and address the restoration of its damaged ecosystems. A start was made on legislation and other administrative measures to address such issues. Like most other developing nations, China was well behind the higher-income western nations in setting out necessary policies and organizational means, and there were concerns that environmental measures would interfere with rising economic growth rates and development. However, by the early 1990s, there was both national and international pressure for China to strengthen its environmental management efforts.

The China Council for International Cooperation on Environment and Development (CCICED) was established by China in 1992 with the intention of drawing upon both Chinese and international experience to address what was seen as a matter of growing significance within China and globally. CCICED has witnessed and played a unique role in China's sustainable development process. It has become an important platform for communication and mutual learning between China and the international community in the field of environment. During this period, it was believed that China would need to draw on international experience to leapfrog. There was a belief on the part of at least some experts within China that this would require transformative policy changes since the central focus since the 1978 start of "Reform and Opening Up" had been an unimpeded high rate of economic growth.

CCICED was initiated at a high level within the Chinese government to serve the needs of senior officials for independent knowledge as they constructed the institutional and policy base to address a wide range of issues related to natural resource use, infrastructure, industrial development, urbanization, and conservation of China's varied landscapes, rivers and lakes, and coastal areas. The country was undergoing many transitions, and most had potential impacts, positive and negative, on the environment—hence the need to embrace a transformative approach crossing many sectors and involving impacts on the whole of society. Coming in the same year as the first Rio Earth Summit, the start-up years of CCICED were influenced by the new international accords, such as the Global Convention on Biodiversity, the Framework Convention on Climate Change, and the Agenda 21 blueprint for Sustainable Development.

Various countries and international organizations expressed considerable interest, leading to the rapid formulation of the purpose, structure, and general approach of CCICED as a body under China's State Council. CCICED would have approximately the same number (about 25 to 30 each) of distinguished Chinese and international members drawn from a number of relevant fields. Policy recommendations derived from research and policy analysis by CCICED task forces and fine-tuned by CCICED members would be channelled directly to the highest levels within the State Council cabinet apparatus. CCICED's Chair is a member of the Politburo Standing Committee, at the level of the Vice Premier. This has made it possible on many occasions to discuss recommendations at the level of China's Premier, who heads the State Council.

A small Executive (the CCICED Bureau), headed by China's Minister for Ecology and Environment and by a person of equivalent rank drawn from the international community, provides oversight. Funding is provided by China and donor partners. Canada became the lead donor with funding from the Canadian International Development Agency (CIDA), and a range of other donors, such as Norway, Sweden, the United Kingdom, and many others quickly followed. A small Secretariat was established in Beijing with an international support office (SISO) at Simon Fraser University located in British Columbia. Since April 2019, SISO has been located at the International Institute for Sustainable Development (IISD).

Since its inception, CCICED has been considered unique for several reasons: (1) it is a national–international collaborative body on environment with a direct long-term and two-way channel to the most senior levels of government in the world's most populous country; (2) CCICED's operation at the boundary between science and policy; and (3) the assurance and evidence of China's government that recommendations would be highly valued and, where appropriate, acted upon. Built into the expecta-

tions was a desire that CCICED results would be open and lead to a better international understanding over time of Chinese needs and approaches to E&D.

Now, 30 years later, CCICED is still perceived by China's government to be of high value as a senior advisory body. Over this time span, CCICED has provided many recommendations and inputs regarding transformative policy processes that have helped to make China a leading country in many elements of E&D and an important participant in global sustainable development governance. CCICED is still considered a globally unique partnership, reflective of a new kind of sharing based on trust, expertise, and mutual understanding. CCICED is initiating its seventh 5-year phase (2022–2026).

CCICED's very extensive digital trail of Working Group, Task Force, and Special Policy Study research reports, roundtables, and other special session documentation, plus Annual General Meeting recommendations to the State Council and other important documents have been well tapped for this 30th anniversary report. In preparing for the report, many speeches, research presentations, peer-reviewed scientific and policy books and journal articles and other documentation were reviewed. In addition, we have referenced some of the independently published literature about China's E&D progress and challenges, plus the roles and approaches China takes on international stages. Together, this information has provided a solid knowledge base to ensure the accuracy of CCICED at 30. There are three major Internet sites involving CCICED: cciced.net (the official CCICED site maintained by the Secretariat in English and Chinese); cciced.eco (which provides the international community with updates on activities and research development); and sfu.ca/china-council/cciced-at-sfu.html (which houses archived materials from 1992 to early 2019). These were invaluable sources covering the 30 years of work by CCICED.

For the several thousand individuals who have participated in one or more CCICED activities, new windows have been opened, friendships and linkages developed, and new ways worked out for understanding and solving the formidable challenges of E&D issues. Some of CCICED's members, experts, funding bodies, and other partners have been involved with CCICED over its entire 3-decade existence. The report cannot hope to cover the full range of initiatives carried out by CCICED, and it is not intended to serve as an assessment or program review document. Furthermore, with so many initiatives and people involved, it has been possible to acknowledge only a portion of the outstanding contributions and full extent of the hard work involved.

International and Chinese donors and other partners who support CCICED's activities have played an essential role. Some have been involved for the entire three decades. Others have come in more recently, and some have dropped off but remain interested in CCICED. The largest contributor is China. The lead donor internationally has been Canada. Norway has also played a consistent, long-term role along with many other donors, including international bodies such as the United Nations Environment Programme (UNEP) and the Environmental Defense Fund (EDF). The value of having a dozen or more funding contributors at any one time is that CCICED can tap into a range of expertise and a wide range of networks, for example, via the European Union and through organizations such as WWF, WBCSD, and, of course, UN bodies such as UNEP. CCICED members serve in their individual capacity, but having many heads of major organizations as members is very helpful.

China at 30 should be of interest not only to individuals already familiar with CCICED but also to others who want to understand how China has been able to construct its E&D initiatives in an adaptive planning and management approach. This type of partnership approach may be of special value to other nations, such as those engaged with China on the Belt and Road Initiative (BRI) and those dealing with environment and trade, circular economy, green development, soft commodity trade, and green technologies. While CCICED at 30 introduces the evolution of China's E&D history, its key value is describing the construction, operation, and outcomes of a trust-based, robust national mechanism for international cooperation on E&D. It is a remarkable story about the complexity of changes in thinking, policies, and actions as China commits itself to the global environmental governance.

CCICED efforts and accomplishments

CCICED at 30 explains and celebrates what has been accomplished through CCICED's international cooperation approach and how it has been done. The CCICED approach includes: (1) pursuing major policy topics, often over very extended time periods; (2) undertaking integrative approaches to formulating policy recommendations covering a range of specific concerns and linking these to bigger pictures defining environmental and developmental progress; and (3) defining and recommending innovative policy shifts at scales from local to national and global. In fact, CCICED work extends to underpinnings/drivers such as national and international laws and regulations, market and economic approaches, finance, investment and trade, institutional strengthening, and public participation. Many of these aspects are now identified under the umbrella of the UN 2030 Sustainable Development Goals, which is helpful as China and most other countries move towards integrated approaches to E&D.

CCICED has helped with advice for new pathways and other means to accelerate progress on major economic, fiscal, legal, and social reforms that can improve environmental and ecological conditions, as well as matters related to organizational needs, strengthened research and development, and mechanisms for piloting and scaling up, and identifying adaptive planning and management needs. In addition to people from government bodies, its sources of expertise come from research institutions, universities, academies, civil society organizations, UN and other international agencies, development banks, and leading Chinese and international enterprises. Always, CCICED's output is based on inputs from a combination of Chinese and international sources.

Mainstreaming of the environment into public policies is needed in order to build a better relationship between environment and economy, and to seek a "harmonious relationship between people and nature," which is a long-term goal now in China and also for the global Convention on Biological Diversity (CBD). The CCICED at 30 report emphasizes how popularizing these concerns has been a significant component of the organization's efforts from its early years onwards.

Chapters 4 and 5 examine the flow of research studies and demonstrate how some topics consistently reappear, as might be expected, but have seen major changes in emphasis over time. As an example, early CCICED studies on energy use demonstrated the high potential of wind and solar sources, then the economic feasibility of capping coal use, and the value to China of pursuing a low-carbon economy approach initially by setting carbon intensity targets. Later efforts examined carbon taxes and the establishment of the present-day carbon trading system, and currently, they highlight additional mechanisms for achieving the goals of the United Nations Framework Convention on Climate Change Paris Agreement. Similar stories are described for other major topics, for example, on natural resource management, ecological restoration, and biodiversity conservation—and the difficult situations regarding land, freshwater, and marine pollution. Also highlighted are topics regarding environmental risks and how they can be addressed, including oil pollution, mercury contamination, agricultural pollutants, plastics in rivers and ocean settings, and very importantly, topics related to China's "War on Pollution" (air, water, soil).

Studies on key supporting and enabling elements needed for successful E&D efforts have been among the most successful in policy uptake by government. These include recommendations on environmental legislation and regulation, including circular economy, trade and environment, market-based instruments, sustainable ocean use, river basin management, and green development topics for cities and rural areas. Institution-strengthening suggestions accompany these specific topics. A prime example is ways to address difficulties and improve decision-making between different levels of government. Another is to strengthen the capacity and influence of environmental bodies in government. A third is to seek synergies among sector-based efforts such as climate change and pollution control, nature-based solutions, engineered infrastructure in urban and rural development, and innovative mechanisms for green development.

Emphasis has been placed on incentive systems such as improvements to eco-compensation, the greening of China's entire financial sector, and green tax reform. In CCICED Phase VI, major areas for studies and recommendations have included an emphasis on sustainable production and consump-

tion with a focus on consumer choice, BRI country interests in E&D investments, and other topics where there are major cross-cutting issues that require comprehensive planning and fresh views, such as green tech innovation and green urbanization and production.

Chapter 5 of the CCICED at 30 report analyzes and reviews past work in some detail. The material is presented according to five categories that allow for a snapshot of some important themes. They are: Harmonious Relationship of People and Nature; Comprehensive Pollution Control and Prevention; Energy, Climate Change, and Low-Carbon Economy; Green Finance, Investment, and Trade; Environment and Development Governance.

For each CCICED Annual General Meeting (AGM), at least five to as many as 10 individual research teams present their summary of findings and recommendations. These research reports are circulated both within and outside of government departments and accessible to anyone who wishes to read them via the Internet. There is always a considerable volume of material to draw from during the preparation of CCICED's annual recommendations report for submission to the State Council. CCICED members review and provide further inputs to the draft recommendations report circulated in advance of the AGM. The draft document is discussed and revised before acceptance at the conclusion of the AGM. This careful process ensures progressing from individual research teams' research inputs to a coherent and agreed-upon consolidated set of policy-oriented recommendations linked to the overarching AGM theme. The whole process—from the initiation of research teams to completion of their summary reports, CCICED member inputs and final AGM recommendations to the State Council—takes somewhere between 10 and 24 months—and sometimes longer. There also have been some situations where special meetings are called for direct inputs to senior leaders where necessary.

Chapter 6 describes partnerships and other activities by which CCICED enriches its capacity to broaden immediate access to expertise and opinions, while at the same time building strategic outreach channels inside and outside of China. This effort has been well placed in creating a larger role in CCICED for enterprises and their associations, leading sustainable development institutions, green financial investment organizations, and a range of organizations in China and outside associated with the burgeoning influence of information technology (IT), Big Data, and other Internet aspects relevant to E&D. CCICED also has placed greater priority on communications and capacity development with selected groups, such as provincial and local officials. This is a means to improve officials' understanding of transformative change for better E&D outcomes and to learn more about their needs and concerns on E&D. CCICED organizes special events outside and within China, usually with very specific topics and outcomes in mind. Especially in the recently completed Phase VI, CCICED began to put more emphases on China's international roles, serving as a platform for exchanges on E&D policies between China and the international community.

Alignment with high-priority topics in China's Five-Year and longer-term plans

The timeline of CCICED's work is influenced to a considerable extent by China's Five-Year Plans (FYPs). Topics selected for study and the themes of CCICED AGMs are of strategic significance so that the content and recommendations can be aligned with the government's priorities. Special CCICED sessions to develop such inputs have generally taken place a year in advance of new FYPs. Through scenario development and modelling, CCICED can take longer-term looks that are informative but also very difficult to credibly produce, given the many changes taking place simultaneously and rapidly within China and the global turbulence that exists for many environment and other issues.

Transformative Change

CCICED advice has been used to bring about transformative change, sometimes quickly, but sometimes in a stepwise approach lasting the full three decades. Drivers of policy transformation, notably those with both domestic and international elements, can create new opportunities but also highlight the complexity of challenges. Hence, policies seen to be useful at one point often have later been reopened by CCICED for review and improvement, sometimes with drastic changes suggested.

Transformative change toward green and sustainable development has become an overarching objective within China and globally. Over the three decades of CCICED work, certainly many positive major changes in E&D relationships have been observed. But major challenges remain and demand comprehensive actions across governments and in entire societies. Since about 2015, and certainly continuing until 2035, a concerted effort has been underway to build an ecological civilization within China as the fundamental path for future prosperity and security. This two-decade period will lead to new green technology, development priority shifts, and behavioural changes in production and consumption planning and management. For China, this is intended to shape the country's position in the world, as well as complete its transition to becoming a "modernized" country.

From CCICED's beginning to its recently completed Phase VI, nature (including biodiversity conservation and natural resource management, ecological services, and ecological restoration) has played a very significant role in CCICED's work. Over this 30-year period, we have seen dramatic shifts in how ecological protection can be set in place, ranging from logging and fishing bans, transformative shifts in approaches to workable systems for nature reserves, ecological redlining, protection and enhancement of ecological services, and integrated river basin and coastal zone management. For each of these topics, CCICED has carried out studies, drawing upon many individuals and organizations.

Such work has been backstopped by the importance accorded to ecology in recent governance shifts, including improved administrative arrangements at national to local levels (e.g., 2018 transformation of the Ministry of Environmental Protection (MEP) Department to become MEE, the 2016 emphasis on ecological sustainability for the YREB), and various fiscal measures. CCICED has always attached great importance to ecological civilization and has supported the shifts in national policies resulting from this value-driven approach. One important lesson learned is that ecological civilization can provide an umbrella for bringing together various actors within a sector during their green transformation. An example is the CCICED work with the financial sector in the period 2015–2017 and onwards. The CCICED recommendations involving banks, regulatory commissions, and others in the sector were the basis for a transformative guideline to which they agreed as part of their efforts towards ecological civilization.

Transformative change insights can be of real value when examining issues "at the edge" of or on the borders between systems. One of the most difficult situations is the interphase between urbanization and rural vitalization efforts.

Drawing on CCICED's experience and insights on tackling transformative change as a central focus and need, further consideration might be given to the following points:

(1)For many of the subjects CCICED has covered, there is no single endpoint. More likely, transformative change will be an ongoing effort with changing goals and approaches over years and decades. Therefore, an adaptive planning and management approach is needed.

(2)Transformative change is costly for some Chinese E&D problems, but if the full costs of inaction are incorporated, along with the full costs of health, environment, or other externalities, it may still be cheaper to pursue transformative change pathways.

(3)The length of time for achieving initial benefits of some transformative change efforts, especially of national "scaling up" after initial pilot efforts, behavioural change, new technological adoption, or even changing problem definitions, has generally been too long, even measured in decades. The use of leading groups and other special mechanisms to overcome these types of hurdles can be valuable.

(4)A common expression of concern is that green technology often is slow in moving from laboratory to commercialization to meet urgent needs. It is also a somewhat surprising concern, considering China's successes with wind and solar energy within and outside of China. Also, the relatively short time by comparison to many other countries regarding China's fast-rising production of electric-powered vehicles of many types and sizes.

(5)China's great reliance on trade and investment, especially after its entry into the WTO and in signing various bilateral and other trade agreements, sped up the economic side but likely slowed progress on at least some of the E&D transformational needs. There also are major opportunities for accelerating the pace of transformative change within China's international development approaches, especially for BRI countries.

(6)It is widely recognized that the major impacts of COVID-19 on all countries also hold the key to some transformative changes, whether related to new forms of globalization, national economic and social recovery, or the need for improved ecological management to prevent future pandemics from happening. The idea of "building back better" appears to be taking hold, and the means to do so are at least partially at hand. Accelerated efforts to meet the UN 2030 Sustainable Development Goals are urgently needed as the basis for addressing current "emergencies." This will require greater attention to integrated development strategies, no matter how difficult that can be at times.

The foundation for China's future transformative change continues to be wrapped up in bundling together socially and politically acceptable combinations of institutional capabilities, financing, and legal frameworks to enable innovative change mechanisms to flourish. Improved community and individual participation, plus feedback loops on what is actually working and whether benefits can be clearly defined and delivered, are needed. CCICED's past experience and insights will be valuable in the future to provide advice concerning the areas highlighted above.

A Challenging Time Ahead: 2035 and Well Beyond

CCICED's 30th anniversary comes at a challenging time for E&D. Recently, UNEP declared that there are three global environmental "emergencies" of an existential nature: pollution, climate change, and biodiversity loss. The severe impacts of the COVID-19 pandemic and other factors are causing countries everywhere to examine facets of resilience, globalization, and "building back better" (and greener). UN global initiatives, notably the 2030 Sustainable Development Goals, are intended to provide countries and the international community with a roadmap for a sustainable future to address these and other issues. In China, there has been a shift from structural changes that have dominated policies over past decades towards the new green development transformational approach labelled as ecological civilization. In Chapter 7, it is suggested that these and other recent international E&D matters will take front stage for much of CCICED's work during this current decade.

China plans for another full generation of transformative changes between now and 2060, with continued emphasis on green and sustainable development. New Chinese efforts are intended to bridge "Two Centuries," the first being the now-completed time frame from 1921 to 2021 devoted to forming a new nation and its initial transformation into a "moderately prosperous" society where extreme poverty has been eliminated. The second century refers to the period from the "New China" era starting from 1949. The expressed goal is to build a comprehensively prosperous, modern nation with leading characteristics in technology, etc., by 2049. Basic modernization requiring transformative changes towards building an ecological civilization is to be in place by 2035. These Chinese aspirations also include questions on how China's experience can be of value to other countries, especially those in developing regions. China also wishes to play a larger role in global environmental governance in the coming years.

China has signalled its intention to become carbon neutral by 2060, addressing the global climate change crisis. By hosting the global CBD COP 15, China is demonstrating its concern for ecological security. This is in line with the global CBD 2050 objective of achieving a harmonious relationship between humanity and nature. We can assume that the post-COVID style of globalization will be very different from earlier periods, especially from the globalization style practised from the mid-1990s onwards under the World Trade Organization (WTO) and regional trade agreements. Green growth and investment, green development, and other expressions of high quality, inclusive development are needed for an environmentally secure global future. What happens in China over the coming half-decade and well beyond is critical for success in meeting global needs such as those covered by the UN 2030 Sustainable Development Goals. These topics are highlighted in various chapters.

For a detailed consideration of CCICED's past work and how early studies have related to these more recent topics, CCICED at 30 examines opinions provided by specific review efforts at the end of Phase III (Special Task Force) and Phase VI (Capstone Report of this Phase). In addition, readers are directed to an annual policy report released at CCICED AGMs since 2008, where China's policy shifts on E&D are compiled, and, to the extent possible, note how they compare to CCICED recommendations. CCICED has produced an Issues Paper for each AGM since 2002, highlighting major Chinese and international decisions and emerging shifts.

For the years ahead, CCICED is well positioned to continue in its role as a think tank with important inputs to the State Council and others. CCICED has become more accessible to inputs from a broader array of interest groups by holding roundtables with business and open forums at its AGMs and by continuing to strengthen linkages with significant organizations such as the World Economic Forum and other international bodies like the Children's Investment Fund Foundation, the Energy Foundation China, and Client Earth, an environmental law non-profit organization. Within China, CCICED has built relations with several of the major social media enterprises.

Certainly, by comparison to the first three or four phases, there is now a larger interest and perhaps need for how CCICED might put a greater amount of its effort into China's international roles. The Mission Statement in the CCICED Phase VI Charter allows for this:

Inspired and driven by a vision of building towards a more beautiful China and a green and bountiful world, CCICED is committed to promoting ecological civilization and sustainable development by serving as a platform for exchanges on E&D policies between China and the international communities, for promoting collaborative efforts to achieve ecological civilization, and for advocating innovative and better governance system of the global environment.

As China develops, it is playing an increasingly important role in global environmental governance. Chapter 7 provides a number of other thought-provoking ideas about CCICED's future directions, study topics, and also the changing needs as China becomes a rich nation that can play a significant role internationally in E&D matters. Specific examples include South–South Cooperation, BRI, trade, and investment topics, including green supply chains, especially for soft commodities, etc. In its final set of Phase VI recommendations to the State Council in 2021, CCICED indicated that "a once in a generation transition is underway," "towards a green development epoch: low carbon, inclusive and harmonious with nature." CCICED highlighted four major recommendations: "value the integrity of global ecosystems, develop a new model for green urbanization, jointly promote sustainable consumption, align domestic green targets and measures with multilateral and international cooperation." Also described in Chapter 7 are recommendations submitted to the State Council by CCICED in 2019 regarding China's 14th FYP—the bridge to longer-term full green development of the country and further advances through international partnerships.

Perceptions about CCICED

The supply side of CCICED can provide good advice based on solid studies, but what about the demand side, which focuses on the relevance, feasibility, and timeliness of recommendations? Are they designed taking into account Chinese characteristics? Will they have major impacts on the economy or cause social issues? How do they fit with international and Chinese perceptions of China's role? These are among the many concerns aired and debated during all stages of CCICED work—by all who are involved, including those in the implementing bodies of government, policy analysts in the many partner organizations of CCICED and others who may be affected by transformative changes.

Also, what has been the impact of working on various aspects of CCICED's initiatives over prolonged periods meant for those close to the organization? In Chapter 8, a limited number of people with long-term involvement were asked to provide their observations and opinions. In addition, from speeches and other available material from leaders, their views on CCICED were abstracted. This is by no means a complete survey, and it is mainly directed towards seeking Chinese views.

Conclusion

For CCICED, the coming 5–10 years may become the most significant period of its existence. As noted, pressing issues such as climate change, biodiversity conservation, ecological restoration, and pollution are now mainstreamed at all levels, local to global. This new decade, to 2030, offers the opportunity for accelerating the pace of transformative change towards sustainable green development. China is much better equipped now to deal with such an effort than it was a decade ago. And by comparison to the start in 1992, the capacity to deal with these issues has increased remarkably. On the other hand, the issues within China and globally now are greater in complexity, scale, and consequences if efforts falter.

Chapter 9 of CCICED at 30 includes content from a 22 February 2021 State Council Circular urging "efforts to build an economic system featuring green, low carbon and circular development, and to promote an overall green transformation of the economy and society." Every item in the Circular, in one way or another, draws on views advocated by CCICED in its work over these past three decades. It is a fitting way to close this document and to celebrate the efforts of all involved.

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Glossary of Abbreviations and Definitions

ADB	Asian Development Bank
Agenda 21	Comprehensive Plan of Action for Sustainable Development based on UN 1992 Rio Earth Summit outcome and applicable at both global and national levels
AIIB	Asian Infrastructure Investment Bank. A multilateral development bank proposed by China that started operation in 2015 with HQ in Beijing.
Alien Invasive Species	Potentially harmful non-native plants, animals, pathogens, and other life forms introduced to native ecosystems
APEC	Asia-Pacific Economic Cooperation. A regional cooperation forum started in 1989
'Beautiful China'	Aspiration for China's sustainable development and human-nature harmony
Big Data	Data collected from multiple sources such as large enterprises, individuals and households, local and national government, and obtained via IT analysis to track behaviour patterns, consumer choice, spending and saving, etc. Such information compilations can be used in many ways including for the 'common good' of society.
Biodiversity	Variety of life forms on Earth at genetic, species and ecosystem levels
Blue Economy	Sustainable economic and livelihood aspects of the world's oceans and seas
BRI	Belt and Road Initiative. Chinese-originated overseas development and trade initiated in 2013 primarily for developing countries in many parts of the world
BRIGC	BRI for International Green Development Coalition
BRIGDI	Belt and Road Initiative Green Development Institute jointly started by MEE and international partners as a policy dialogue and communication platform
BRICS	New Development Bank; involving Brazil, Russia, India, China, and South Africa
BTH Region	Beijing-Tianjin-Hebei economic and environmental development region
Carbon Intensity	Greenhouse gas emissions per unit of GDP
Carbon Neutrality	A state of net-zero greenhouse gas emissions (based on CO2 equivalent emissions)
Carbon Trading	Buying and selling of credits that permit an entity to emit a designated GHG amount
CBD	United Nations Convention on Biological Diversity
CCICED	China Council for International Cooperation on Environment and Development
CCICED AGM	CCICED Annual General Meeting
CDB	China Development Bank, major financial entity operating within and outside China
'China Dream'	Vision for China's rejuvenation promoted by President Xi Jinping
CELAP	China Executive Leadership Academy in Pudong for rising 'cadre' and entrepreneurs
China National Parks System	Limited number of designated national parks managed by provinces, by province and central government, or by central government. System expected to become largest in the world
'China New Era'	Post-2017 terminology for a new era of socialism under Xi Jinping leadership
China State Council	The highest administrative council of the PRC, chaired by the Premier; includes all Ministerial Heads of Government Departments (26), Chair of CCICED and some other Vice Premiers, and several state councillors
CDM	Clean Development Mechanism of the 1997 UNFCCC Kyoto Protocol; entered into force in February 2005), and action in 2006-2007 onward
Cleaner Production Initiative	UNEP flagship program to reduce industrial pollution that was widely adopted within China and other countries during the 1990s and beyond
Climate Change	Changed global or regional climate patterns, including those related to human influences
CNCPC	China National Cleaner Production Center; established in 1994 to transform industrial initiatives towards pollution prevention, and more recently, to support 2003 China Cleaner Production Promotion Law
CNEMC	China National Environmental Monitoring Center
CPC	Communist Party of ChinaChina National Environmental Monitoring Center
Circular Economy	Economic system based on "designing out waste and pollution, keeping products and materials in use, and regenerating natural systems"
Comprehensive Pollution Control and Prevention	Shift from addressing a single type of pollution to multiple sources/types
COP 15 and COP 26	Environmental Global Conventions periodic Conference of the Parties, e.g., UNCBD COP 15 held October 2021 in Kunming, China, with follow-up meeting to be held in 2022; UNFCCC COP 26 held in November 2021 in Glasgow, Scotland
COVID-19	Infectious disease caused by SARS-CoV-2 virus responsible for current global pandemic
CSR	Corporate Social Responsibility (see also EPR)
Donor Partners	Financial contributors to CCICED (see Annex 1 for Phases I to VI contributors)
DFID	UK Department for International Development (now called the Foreign, Commonwealth and Development Office)
Dual Circulation	"Internal circulation" prioritization of domestic production, distribution, and consumption, while continuing to promote "external circulation" through international trade and investment
Ecological Civilization	Term introduced in China in 2007 and now the ultimate goal of China's environment and development efforts for harmony between people and nature and environmental sustainability. Enshrined in CPC Charter and in China's Constitution

Eco-compensation	Various forms of payment in China for protecting ecological services and ecosystem restoration; government-sourced compensation for ecological damage from pollution, etc., when offender is unable to pay or cannot be located
Ecological Security Barriers	Physical feature, or "ecological security barrier," that protects or hinders passage, e.g., wetlands in upstream areas of rivers, forested mountains or hills that protect downstream areas. The national ecological security pattern is considered as "ecological belts" comprised of the southern hill and mountain belt, northeast forest belt, northern sand prevention belt; and "ecological shelters", the Tibet Plateau, and the Chuan-Dian Loess Plateau
Ecological Corridors	Functional zone of passage between several natural zones allowing for migration of species as needed for food sources and reproduction. Examples are upstream-downstream connections within major rivers such as Yangtze and Yellow, and individual nature reserves for giant panda connected via vegetated corridors
Ecological Construction	Chinese investment in ecological restoration and sometimes new ecosystem-building such as forests and wetlands in urban and rural settings
Ecological Deficit/Debt	Overuse of natural resources and ecological services beyond their natural capacity for regeneration
Ecological Footprint	Accounting for demand and supply of nature-based products within countries and how fast resources are consumed and waste generated. Sum of these accounts is used to determine whether we are using more of the Earth's resources than is ecologically sustainable
Ecological Province	Provincial models for implementation of ecological civilization approaches. Zhejiang Province is frequently cited for its success with its 'Two Mountain" theory and practices with equal emphasis on "clean, clear waters and lush mountains" and "gold and silver mountains."
Ecological Restoration and UN Decade of Ecological Restoration 2021–2030	The UN General Assembly has designated 2021 to 2030 as the Decade of Ecological Restoration. Key areas for Chinese eco-restoration are forests, grassland, shrubland, wetland, artificial ecosystems, deserts, and farmland.
ECRL	China Ecological Conservation Red Lining is an initiative began in 2011 for the identification and protection of important ecological systems in order to protect rare and endangered species and habitats, and important areas for ecological services. Eventually about 25% of the country's land will be designated under the ECRL approach, along with aquatic and marine areas.
E&D	Environment and Development
EDF	Environmental Defense Fund, a leading international environmental organization founded by environmental scientist more than a half-century ago. A long-standing partner of CCICED

EIA	Environmental Impact Assessment
Environmental Kuznets Curve	Hypothetical curve of an inverted relationship between pollution action and per capita income, suggesting a trade-off of environmental quality in favour of higher economic growth until a reasonable income per capita is achieved. Various views have been expressed in China for and against this hypothesis.
EPB	Environmental Protection Bureaus in China, provincial to local levels. Coordinated by five regional centres controlled by MEE
EPR	Extended Producer Responsibility. Producers of goods are given significant responsibility for treatment or disposal of post-consumer products and for green production and consumption more generally. An important element for a circular economy and for CSR
ESG	A set of standards regarding environmental, social and governance criteria for specific companies so that socially conscious investors can assess whether potential investments are worthwhile
EU	European Union; European Commission (EC) is the Executive and Administrative Branch of the EU
'Five in One' Plan	"Socialist modernization," including construction of economic, political, cultural, social, and ecological systems as noted in 2012 18th CPC National Congress
FYP	Five-Year Plan, as used in China and some other countries
GEP	Gross Ecosystem Product, a measure summarizing the value of the contributions of nature to economic activity
Gender Equity	Process of being fair to both women and men. Gender equality can be the outcome of applying gender equity principles. Such equality requires equal enjoyment by women and men of socially valued goods, opportunities, resources, and rewards
Greater Bay Area	Guangdong-Hong Kong-Macau Development Area
GHG	Greenhouse gas emissions such as carbon dioxide (CO2) and methane (CH4)
GIZ	'Geselschaft für Internationale Zusammenarbeit' GmbH; a non-profit company serving German international implementation efforts
Green Development	Greener, more environmentally sustainable, high-quality development. Operational means for achieving ecological civilization
Green Economy	Low carbon, resource-efficient, and socially inclusive economy
Green Finance System in China	Capital incentivized for green development including green bonds, green subsidies, accompanied by guidelines to banks for loan assessment, greening of securities market, greening of insurance system, green trading systems, environmental disclosure system of listed companies and bond issuers

Green Lifestyles Campaign	The month of June is "National Ecological Civilization Month," encouraging moderate consumption, sustainable procurement and recycling practices, and other environmentally friendly practices.
Green is Gold	"Ecological environment is the economy" and fundamental to prosperity
Green Supply Chain	Operational management at each stage to reduce environmental impacts of products throughout their life cycle, including accessing raw materials, production methods, transportation, sale, use, reuse, and final disposal responsibility
Green Transformation	Action for addressing eco-environmental concerns requiring major shifts in behaviour, new technology introductions, or other changes well beyond minor transitions and "business as usual."
'High Quality Green Development'	Phrase used in China's 14th Five-Year Plan and other policy documents to emphasize overall quality of development and the need for green development, in addition to quantitative aspects of economic growth such as GDP.
HFCs	Banned hydrofluorocarbon chemicals formerly used in refrigeration, aerosols, etc., that damage the atmospheric ozone layer and are potent greenhouse gases
Hukou System	Permanent household registration system according to birthplace and parents' birthplace in some cases. Affects capacity to move freely and access full social benefits in a new location. The system is under long-term reform to reduce significant rural-urban disparities.
IMF	International Monetary Fund
Industry 4.0	Fourth Industrial Revolution production based on digital technology advances
IPBES	Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services that supports the CBD
IPCC	Intergovernmental Panel on Climate Change, which is the UN body for assessing science related to climate change
IRBM	Integrated River Basin Planning and Management
IRENA	International Renewable Energy Agency
IUCN	International Union for the Conservation of Nature
Low Carbon Economy	Mainstay of the 2015 Paris Agreement to reduce use of fossil fuels and other impacts resulting in global warming from greenhouse gas atmospheric emissions
Mainstreaming	Placing environment and development issues centrally in societal decision making
MPA	Marine Protected Area
MDGs	UN Millennium Development Goals (2000–2015)
MEE	China Ministry of Ecology and Environment (from 2018 to present)
MEP	China Ministry of Environmental Protection (2008-2018)

SCEPs	MEP/MEE Regional Supervision Centres for Environmental Protection (Since 2017 now called Inspection Bureaus)
Minamata Convention on Mercury	Global Agreement adopted in 2013, entered into force 2017, ratified by 137 Parties including China
Montreal Protocol	Landmark multilateral agreement regulating production and consumption of almost 100 chemicals damaging ozone depleting substances; the only UN treaty that has been ratified by all UN Member States
Mountain to Sea	Approach to environmentally oriented river basin planning and management covering entire area from river origin to its discharge in the ocean
National Green Development Fund Company	Fund established in 2020 initiated by China Ministry of Finance, Ministry of Ecology and Environment, and Shanghai municipalities to invest in green solutions and technologies and for promotion of green economic transformation. Focus is on green development in the Yangtze River Economic Belt, including contributions from 11 provinces and cities, plus banks and private enterprises
NBS	Nature-based solutions and nature-positive solutions, especially for climate change, biodiversity and ecological services
Natural Capital	Stocks of natural assets that provide provisioning, cultural, regulating, and support ecological services
Nature Reserves	China's traditional term for its protected ecological areas, large and small
NDC	Nationally Determined Contribution for individual country climate change action
NDRC	National Development and Reform Commission of the State Council
National 'New Urbanization' Plan (2014-2020)	Basic strategy for ongoing new urbanization initiatives. Follow-up will be 14th Five-Year Plan commitments for urbanization
"New Era" China	A distinctive period first described in a 2017 speech by President Xi Jinping as a follow-on to the "Reform and Opening" period started in 1978
New Infrastructure Stimulus	COVID-19 economic recovery focused on stimulating job creation in China and preparing for a new global economy, e.g., technology advances such as digital infrastructure and meeting sustainable development goals
Nonpoint Source Pollution	Diffuse contaminants not originating from single discrete sources; often associated with pollutants in water runoff from agricultural crops and animal husbandry
One Health	Collaborative approach to optimizing health of people, animals, and environment
Paris Agreement	2015 legally binding international treaty on Climate Change.
Peak Coal	Maximum demand for or production of coal, at a national or global level
PBL	'Planbureau voor de Leefomgeving' Netherlands Environmental Assessment Agency
Planetary Boundaries	Nine socio-ecological boundaries defining a "safe operating space" for humanity's impacts on our planet earth

PM2.5	Dangerous air pollution particles, 2.5 microns or less in size, causing smog
Politburo	Executive committee for the CPC; top level is the seven-member Standing Committee
PPP	Polluter-pays principle; also public-private partnerships often for infrastructure construction and/or operation
PRC	People's Republic of China, formal name of the Government of China since 1949
River Chief System	Institutional innovation for creating public participation and local accountability on river environmental protection through a four-level system (provincial to township). The system has been expanded to also include Lake and Bay Chiefs.
Rule of Law	Equality of all citizens and entities, independently adjudicated before the law
'Rural Vitalization'	Major Chinese policy for rural and agricultural industry improvement, "Beautiful Landscapes," prosperous farmers, and rural communities with 2020, 2035, and 2050 goals
SEA	Strategic Environmental Assessment
SEPA	China State Environmental Protection Administration from 1998 to 2008' preceded by NEPA, the National Environmental Protection Agency
SFU	Simon Fraser University, British Columbia, Canada
Sharing Economy	Socio-economic model with potential to reduce environmental burdens and ecological footprint size by sharing produced goods and services, structures, and knowledge
SISO	CCICED secretariat international support office (at SFU 2092-2019; since April 2019 at IISD)
SLCP	Sloping Land Conversion Program to reclaim land from croplands to forests
SMEs	Small and medium-sized enterprises
'Socialist Market Economy'	Economic system and model of economic development being followed in China
SOE	State-owned enterprises
SOx	Sulphur oxides from coal burning, etc., causing pollution such as acid rain; and large air borne particles (PM10) contributing to poor air quality
South–South Cooperation	Technical cooperation among developing countries in the Global South, with China as an important leader with specialized funds and programs supporting poorer countries such as climate change cooperation.
Sponge City	Nature-based solutions for retaining rainwater, groundwater, and water related to extreme events such as storm water and floodwater absorption by soil, wetlands, etc. Used in China on a pilot basis since 2015–16, for example, in Xiamen
Stockholm Environment Conference	First UN Conference on the Human Environment, Stockholm June 1972; led to the establishment of UNEP and to the string of Earth Summits since then
SEI	Stockholm Environment Institute
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs
TATA	ERI TATA Energy and Resources Institute
TCM	Traditional Chinese Medicine

"Three Transformations" from 6th National Conference on Environmental Protection	Premier Wen Jiabao indicated the need for: (1) transformation of economic growth to give equal attention to environmental protection; (2) synchronization of environmental protection with economic development with no lags; and (3) transformation from using mainly administrative approaches for solving environmental problems to a broader range of legal, economic, and other tools
TVEs	China Town and Village Enterprises (1984–1996). These produced many legacy pollution problems as a result of poor environmental management of local smelters, coal burning electrical generating facilities, and other enterprises.
Tipping point and turning point	Threshold (tipping point) for rapid and dramatic shift in system conditions (e.g., Beijing air quality 2013); the turning point is when there is concrete evidence of a return to better quality conditions
Two Centuries	100-year time line from 1921 establishment of the CPC to 2021 achievement of a 'Xiaokang Society'; and 100-year time line from declaration of the PRC in 1949 to 2049 when China is expected to be a fully modernized rich country with a well-developed ecological civilization
UNCED	United Nations Conference on Environment and Development held in Rio de Janeiro June 1992, often called the First Rio Earth Summit
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNEP	United Nations Environment Programme
UN 2030SDGs	United Nations 2030 Sustainable Development Goals
UN Decade of Ecological Restoration	Designated 2021–2030 period to prevent, halt, and reverse the degradation of ecosystems on every continent and ocean
VOCs	Volatile organic compounds such as industrial solvents, household products such as paint, fuels, dry cleaning agents, etc., that are important air or water pollutants
War on Pollution	China's concerted effort to reduce air, water, and soil pollution initiated in 2014
WBCSD	World Business Council for Sustainable Development and an associated organization, the China Business Council for Sustainable Development
WCED	United Nations World Commission on Environment and Development 1983–1987; major sustainable development report, Our Common Future; often called the Brundtland Commission; Chinese member was Mr. Ma Shizhun
WEF	World Economic Forum
WRI	World Resources Institute
WTO	World Trade Organization
WWF and WWF China	World Wildlife Fund is a not-for-profit international conservation organization active throughout the world; WWF China is the first international conservation organization invited to work in China, starting with 1980 work on the giant panda, its worldwide symbol. Now with more than 40 projects, both WWF and WWF China are active with CCICED.
Xiaokang Society	"Moderately well-off society," the goal achieved by China in 2021 by elimination of extreme poverty and other with progress on aspects of economic, political, cultural, and social development achievements. Ecological progress was added in 2012.
YREB	The Yangtze River Economic Belt consists of nine provinces plus Shanghai and Chongqing cities that together contribute more than 40% of the country's GDP. It is strategically important for future growth in domestic and international trade and investment. Since 2016 new megaproject development within YREB has been discouraged in order to promote ecological restoration and environmental sustainability.

Chapter 1. A New Kind of Sharing

Introduction

In the late 1970s, when the world community began to build a modern, comprehensive approach to emerging environment and development (E&D) issues, China was still in the early stage of its "reform and opening up." A decade later, when many Western economy nations had already formed specialized environmental organizations to address rising pollution and other risks, China, like most other developing nations, was struggling with how to address these new problems. There was some level of resolve to do so, but there was concern that environmental success would interfere with rising economic growth rates. By the early 1990s, there was both national and international pressure for China to strengthen its environmental protection efforts. The China Council for International Cooperation on Environment and Development (CCICED) came into being in 1992 as one important means to accelerate the process of change since it could identify policy needs based on international experience and China's situation (see CCICED's current mission and tasks in Box 1.)

Box 1. Mission and tasks as defined currently in CCICED's Charter[1]

Mission

Inspired and driven by a vision of building towards a more beautiful China and a green and bountiful world, CCICED is committed to promoting ecological civilization and sustainable development by serving as a platform for exchanges on environment and development policies between China and the international communities, for promoting collaborative efforts to achieve ecological civilization, and for advocating innovative and better governance system of the global environment.

Tasks

1. CCICED will provide policy analysis and recommendations, technical support, best practice experience and early warning in support of the national five-year plans and China's goal of building a moderately well-off (Xiaokang) society. CCICED will support the implementation of the Chinese government's socio-economic and sustainable development strategies, the accelerated development of a resource-conserving and environmentally friendly society, and an evidence-based approach to comprehensive, coordinated, and balanced policies covering the environment, the economy, and society.
2. CCICED will share research findings with the international community and will focus on the interaction between China and the global environment and development.
3. CCICED also will facilitate the Chinese Government's consideration of Council recommendations, promoting their eventual adoption into policy, legislation, regulations, and operational directives.
4. The CCICED will monitor and report on China's progress in implementing its policy recommendations.

For the past 30 years, since 1992, the China Council for International Cooperation on Environment and Development (CCICED) has provided policy advice regarding Chinese and international matters on a wide range of problems and strategies related to E&D. This time period covers a significant period when global environmental concerns such as pollution, climate change, and ecological damage have expanded in their complexity and impacts.[2] China has participated in addressing such concerns while at the same time addressing its own set of E&D concerns nationally and locally.[3] The dramatic changes in China's economic, social and environmental situation are unprecedented in their scope and intensity—often with combinations of domestic, regional, and global implications. The full impacts, positive and negative, arising from what is now a generation-long transformation are still fresh and not fully understood. China and the world are now on a precipice where ever-greater sustainable development action is needed to prevent our planet from tumbling into very inhospitable environmental conditions. This current decade can become the turning point away from the precipice, and China is well placed to be a leader in this process.

Our report describes a unique long-term partnership to identify policy innovations and strategies for E&D based on both Chinese and international needs and experience. CCICED was initiated by, and inputs directly to, China's State Council at the highest levels. CCICED draws upon the work and expertise of leading Chinese and international individuals and organizations from a wide array of relevant fields. Our Council operates at the boundary between science and high-priority policy needs. With a relatively flexible organizational setup, CCICED can fast-track advice based on its findings but also at times be reflective and long-term in its perspectives. Its work is knowledge-based and cross-disciplinary, drawing upon many existing sources within and outside of China. This expertise comes from government agencies, research institutions, universities, academies, civil society organizations, the United Nations (UN) and other international agencies, development banks and leading Chinese and international enterprises. CCICED's output is always based on inputs from a combination of Chinese and international sources.

CCICED reflects a new kind of international/national sharing where very important concerns can be examined with a level of independence, openness, and equal exchange that builds frankness, mutual understanding, and exploration of alternative solutions regarding key E&D issues. CCICED has helped with advice for new pathways and ways to accelerate progress on major economic, fiscal, legal, and social reforms, as well as matters related to organizational needs, strengthened R&D, and mechanisms for piloting, scaling up, and identifying adaptive planning and management needs. There is confidence and trust on the part of both Chinese and international leaders involved that CCICED produces an output of high value worthy of consideration as China formulates new domestic policies for green development and ecological civilization—and as the country enhances its efforts to strengthen sustainable development globally. In 2022, CCICED will initiate its seventh 5-year phase (CCICED Phase VII).

The basic purpose of this CCICED at 30 report is to explain and celebrate what we believe has been accomplished through CCICED's international cooperation approach and how it was done. The CCICED approach includes: (1) pursuing complex topics over extended time periods; (2) undertaking integrative approaches covering a range of specific topics and linking these to bigger pictures of E&D progress; and (3) defining innovative policy synergies on a scale covering what are now often described as global "environmental emergencies" (pollution, climate change, and biodiversity/ecological protection and restoration.) In fact, our work extends beyond these matters as we must look at underpinnings/drivers such as national and international laws and regulations, market and economic approaches, finance, investment and trade, institution strengthening, public participation, and many of the aspects now identified under the umbrella of the UN 2030 Sustainable Development Goals (SGDs).

Some key CCICED achievements[4] have been "building awareness of environmental problems and their impacts; identifying methodologies for solutions and needed policy tools; recommending the directions and roadmaps for medium-term policy implementation; relationship-building that opens perspectives and builds capacity to understand best practices and how they can be applied in China, regionally or globally; and successful pilot efforts to implement policy recommendations at local levels." The range of topics covered is broad:

- Ecological civilization, sustainable development, integrated development
- Green transition
- Green governance
- Rule of law
- Economics, green finance, trade, and investment
- Social development, including civil society participation in environment and development matters, health, and education
- Ecosystems, ecological services, and biodiversity conservation

[1]Charter for CCICED Phase VI. http://www.cciced.net/cciceden/ABOUTUS/Charter/
[2]UNEP. 2021. Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies. https://www.unep.org/resources/making-peace-nature
[3]Xie Zhenhua. 2018. China's Road of Green Development. Understanding China Series, Foreign Languages Press. Beijing. 302 pp.
[4]This paragraph on achievements and topics is drawn from CCICED Concept Note of Phase VII. CCICED Secretariat September 2021. 8 pp.

•Energy, environment, and climate change

Individual and enterprise E&D concerns and responsibilities, including sustainable consumption

Planning for sustainable development, conservation, and environmental protection, including the 2030 SDGs in China and internationally

•Pollution prevention, control, and mitigation

•Regional and global engagement

•Green agriculture, industrialization, urbanization, and transportation

•Science, technology, and innovation.

CCICED at 30 Report

This 30th Anniversary publication provides insights about how CCICED, hosted by China's State Council but also with many other international and Chinese partners, is recognized as a senior source of independent, trusted policy-related advice to China's State Council at a leadership level. Through CCICED's members, research contributors, and supporting organizations, the desire of international bodies and other countries to better engage with China on E&D problems of priority concern can be at least partially met through CCICED's efforts.

For the several thousand individuals who have participated in one or more CCICED activities, new windows have been opened, friendships and linkages developed, and new ways worked out for understanding and solving the formidable challenges of E&D issues. Some of CCICED's members and experts, funding bodies, and other partners have been involved with CCICED over its entire 3-decade existence. As priorities shift, new partnerships have emerged, and new insights have helped in its renewal. This report cannot hope to cover the full range of initiatives carried out by CCICED, and it is not intended to serve as an assessment or program review document. All CCICED recommendations, research studies, and major Annual General Meeting (AGM) outputs can be accessed on the Internet in both Chinese and English.

Transformative change towards green and sustainable development has become an overarching objective globally and in China. From CCICED's start, there has been recognition that initiatives should be seen through the lens of both Chinese and international approaches so that CCICED outputs are formulated as policy advice "with Chinese characteristics." Over the three decades of our work, we have witnessed many positive changes in E&D relationships, as reviewed in this report. But major challenges remain and demand comprehensive action across government and in the entire society.

Since about 2015 and certainly until 2035, a concerted effort has been underway to build an ecological civilization within China as the fundamental path for future prosperity and security. This two-decade period will lead to new green technology, development shifts, and behavioural changes in production and consumption planning and management that are intended to shape China's position in the world and complete its transition to becoming a "modernized" country. Central to this effort is building a society harmonious with the natural world by the middle of this century.

The issues covered by CCICED range from very specific topics—such as reduction in mercury use, specific environmental laws, soil pollution, ecological redlining, etc.—to very broad themes, such as biodiversity conservation, energy and climate change, sustainable land, freshwater and ocean use, human and planetary health, global green governance issues, environment and trade, green urbanization, green technology innovation, green finance, and public participation in environmental improvement efforts.

The above topics and many others have been examined in detail through CCICED's Working Groups (WGs), Task Forces (TFs), Special Policy Studies (SPSs), and Roundtables involving experts from China and abroad. Policy recommendations from their studies are reviewed by CCICED members during CCICED's AGM prior to their presentation to China's State Council. Two conditions are (1) that all work be carried out and discussed in a collaborative fashion between international and Chinese experts and CCICED members, and (2) that the finished products be made accessible to all who are interested.[5] Studies and recommendations are available on the Internet in both Chinese and English.

[5]See http://www.cciced.net ; https://cciced.eco ; and for archives between 1992 and April 2019 https://www.sfu.ca/china-council/overview.html

CCICED's Chair is a member of the Politburo Standing Committee, at the level of a Vice Premier. A small CCICED Executive (the Bureau), headed by China's Minister for Ecology and Environment and by a person of equivalent rank drawn from the international community, provides oversight. The organization's Charter has been in place from CCICED's beginning, and Charter amendments are developed and agreed upon by both the Government of China and the major donors of CCICED, generally at the start of new phases. Formal adoption by members of any changes in the Charter takes place at the CCICED AGM.

Continuity, change, and progress documentation

When CCICED was launched, there was no precedent for the model described above to be found in any country. It remains a unique organization today. CCICED has tapped into the experience and talent of leading figures and organizations within China and internationally to serve as a think tank able to directly provide policy advice to the most senior levels of the Chinese government. At the same time, CCICED builds international understanding on China's approaches, concerns, and needs related to E&D. There has been unwavering overall financial and other support over 3 decades to enable a broad reach of topics and advice. CCICED has provided input annually to China's State Council during six five-year phases. Even during the difficult period of COVID-19, CCICED has been able to continue its research and policy work through a combination of in-country and virtual meetings.

For CCICED, the coming 5–10 years may become the most significant period of its existence. Pressing issues such as climate change, biodiversity conservation, ecological restoration, and pollution are now mainstreamed at all levels, from local to global. This new decade, 2021 to 2030, offers the opportunity to accelerate the pace of transformative change towards sustainable green development. China is better equipped now to deal with E&D issues than it was a decade ago when we produced CCICED at 20.[6] For the first two decades of CCICED advice, the main focus was on China's domestic needs. Consideration of China's global roles on E&D was somewhat limited, especially when the subject of potential E&D leadership was raised. That has changed and likely will change further during this current decade.

CCICED's very extensive digital trail of WG, TF, and SPS research reports, roundtables, and other special session documentation, plus AGM recommendations to the State Council, and other important documents have been well tapped for this 30th anniversary document.[7,8] We also have reviewed speeches, research presentations, independent articles, and other documentation. In addition, we have referenced some of the extensive published literature reflecting on China's E&D progress and challenges, and the roles and approaches China takes on international stages. Together, this information has provided a solid knowledge base to ensure the accuracy of CCICED at 30.

Understanding and contributing to policy development

CCICED advice has been used to bring about transformative change, sometimes quickly, but sometimes in a stepwise approach lasting the full three decades. Drivers of policy transformation, notably those with both domestic and international elements, can create new opportunities but also highlight the complexity of challenges. Hence, policies seen to be useful at one point often later have been re-opened by CCICED for review and improvement, sometimes with drastic changes suggested.

CCICED is one player among many tapped into contributing inputs to any particular policy change in China. Therefore, our approach is to track whether new or revised policies are consistent with our suggestions. Where appropriate, we continue to advocate for positions that we believe are of high importance, even if they have not yet been adopted. One very significant point is the quite dramatic shift in the emphasis of CCICED's work from an earlier approach focused mainly on China's domestic E&D policy needs to today's (and certainly tomorrow's) interests for mutual sharing of solutions and China's growing interest in participating in global and regional E&D governance. Of course, China's

[6]CCICED. November 2021. CCICED at 20, Activities, Impacts, and Future Opportunities. https://cciced.eco/wp-content/uploads/2020/06/C-CICED-AT-20-. A Report-By-Art-Hanson.pdf .
[7]An earlier document (CCICED—Success Story) was produced by the CCICED Secretariat at the end of Phase III.
[8]A valuable new 2017-2021 Capstone Report for CCICED Phase VI has been prepared by CCICED's current Chief Advisors. Since 2002 an annual Issues Paper has been prepared by the Chief Advisors with insights into current situations and key areas for policy improvement (see titles in Annex 2). A Policy Progress Report has been released by CCICED each year since 2008. These reports document China's policy shifts, and provides understanding on how CCICED's recommendations have helped. All of this information has been valuable for the preparation of CCICED at 30.

domestic environmental concerns are still paramount. We hope that this China at 30 Report will be helpful for planning the approach to CCICED's new Phase VII (2022–2026).

Transformative change, green development, and "ecological civilization"

China plans for another full generation of transformative changes between now and 2060 with continued emphasis on green and sustainable development as the country embraces its own style of ecological civilization and green development.[9] New Chinese efforts are intended to bridge "Two Centuries," the first being the time frame from 1921 to 2021 devoted to forming a new nation and its initial transformation into a "moderately prosperous" society where extreme poverty has been eliminated. The second century refers to the period of the "New China" era starting from 1949. The expressed goal is to build a comprehensively prosperous, modern nation with leading characteristics in technology, etc., by 2049. Future changes are intended to address ecological restoration, create a prosperous future where people and nature can live harmoniously, and reach the point where pollution and other environmental issues are fully resolved. Basic modernization requiring transformative changes towards building an ecological civilization is to be in place by 2035. These Chinese aspirations will have to be met over a time frame where many other parts of the world are still far from achieving such lofty goals. Thus, an important question that has been prominent in CCICED's current sixth phase of work is how China's experiences, for example, from the ongoing "War on Pollution," can be made of value to other nations, especially those in the developing world.

China has signalled its intention to become carbon neutral by 2060, addressing the global climate change crisis. And by hosting the Global Convention on Biological Diversity COP 15 (2021–2022 meeting of the Conference of the Parties), China is demonstrating its concern for ecological security. This is in line with the global Convention on Biological Diversity (CBD) 2050 objective of achieving a harmonious relationship between humanity and nature. As evidenced by COVID-19, many more challenges are likely to be experienced in the decades ahead, not only for China but also for the broader community of nations, rich and poor. We can assume that the post-COVID style of globalization will be very different from earlier periods, especially from the globalization style as practised from the mid-1990s onwards under the World Trade Organization (WTO) and regional trade agreements. Green growth and investment, green development, and other expressions of high-quality, inclusive development are needed for an environmentally secure global future. What happens in China over the coming half-decade and well beyond is critical for success in meeting global needs such as those covered by the UN 2030 SDGs.

Audience

China at 30 should be of interest not only to individuals already familiar with CCICED but also to others who want to understand how China has been able to construct its E&D initiatives in an adaptive planning and management way. Aspects of the CCICED type of partnership approach may be of special value to other nations, such as those engaged with China on the Belt and Road Initiative (BRI), and for those dealing with environment and trade concerns such as those associated with the circular economy, green development, commodity trade, and green technologies. We hope our report can stimulate interest in many circles. While CCICED at 30 is a contribution to China's environmental history, its main value is about describing the construction, operation, and outcomes of a trust-based robust national mechanism for international cooperation on E&D. It is a remarkable story about the complexity of change in thinking, policies, and actions as China prepares itself to become an environmentally friendly global citizen.

[9]See Arthur Hanson. 2019. Ecological Civilization in the People's Republic of China. ADB East Asia Working Paper Number 21. https://www.adb.org/publications/ecological-civilization-values-action-future-needs ; and China Daily. 3 December 2020. Blueprint Sets Tone for Green Development. https://www.chinadaily.com.cn/a/202012/03/WS5fc81cd5a31024ad0ba996c2.html (a newspaper article based on CCICED's Special Policy Study on Green Transition and Sustainable Social Governance)

Chapter 2. CCICED and its Uniqueness for Both China and the World

Origin and early years

CCICED's incubation began with an influential group of senior Chinese governmental officials plus some international development specialists. Mr. Qu Geping, who had attended the 1972 Stockholm Environment Conference and who played a major role in establishing environmental protection within China afterwards, was instrumental in bringing forward the concept.[10] His insights were important and prescient. At the first CCICED AGM in 1992, Qu Geping noted that in spite of significant environmental investments and some legislation for environmental protection, China was facing considerable difficulties, including (1) deterioration of natural ecological conditions; (2) arduous tasks in air and water pollution control; (3) difficulty in replacing coal as the main energy source; (4) unreasonable price structure leading to waste of resources; and (5) backwardness of science and technology.

He spelled out the challenge of achieving both economic development and environmental protection by the turn of the new century. Also, he addressed the need for "ecological evolution" towards a better relationship between people and nature. These points were important in terms of the selection of CCICED's initial themes. In addition, Qu Geping noted, "China's progress in environmental protection will also contribute to the cause of environmental protection in the world as a whole."

The actual proposal for establishing CCICED was suggested at the International Conference on the Integration of Economic Development and Environment in China (Beijing, October 1990). Mr. Martin Lees played a significant role in selling the idea to donors, especially the Canadian International Development Agency (CIDA), Norway, and some other donor countries. Initial seed funds came from a few international foundations and the United Nations Development Programme (UNDP). That it should be a high-level body, operating with a high level of relevant scientific expertise but also with political and policy figures, plus CEOs of enterprises and other organizations, set the composition of members. Such a mix of CCICED members has continued throughout the entire three decades since.

The first Chair, Mr. Song Jian, State Councillor and Director of the State S&T Commission, and the International Executive Vice-Chair, Mr. Marcel Massé, President of CIDA, were well aware of the potential value of CCICED. Song Jian called it a "pioneering initiative [and] a lofty and humanitarian objective." He noted, "the Council can push for a coordinated economic and environmental protection policy for China during its period of economic takeoff, thus making a positive contribution to the global issue." He also described CCICED as a "think tank" with initial in-depth studies covering five or six thematic working groups, each with a five-year mandate.[11] These initial terms for working groups were extended into the second five-year phase and additional task forces were established.

CCICED operates under a Charter negotiated at the start of the first phase and periodically updated with inputs from key partners.[12] Ultimate approval of Charter revisions lies with China's State Council and CCICED members' formal agreement.

High-level CCICED leadership

The first AGM took place in Beijing just 2 months before the June 1992 Rio Earth Summit. Vice Premier Wu Xueqian spoke at the first CCICED AGM Opening Ceremony, and Premier Li Peng held a lengthy meeting with members. This first AGM set a pattern that has lasted throughout the entire three decades of CCICED with some adjustments. For more than 20 years, CCICED members met annually with the Premier of China each year. From 1997 until the present time, the Chair of CCICED has been China's Executive Vice Premier. CCICED recommendations have been submitted to the State Council of China each year and reviewed at high levels.

Table 1 demonstrates the continuity of high-level leadership on both the Chinese and international sides of CCICED. Six Vice Premier-level individuals have served as CCICED Chairpersons (and two of these, Mr. Wen Jiabao and Mr. Li Keqiang, went on to become Premier). Eight ministerial-level (or

[10]See Ma Tianjie. 2021. 1972: The Start of China's Environmental Journey. China Dialogue, September 23, 2021. His article draws upon an interview of Mr. Qu Geping by Dr. Li Lailai, regarding the 1972 Stockholm meeting. https://chinadialogue.net/en/nature/stockholm-1972-chinas-environmental-journey/
[11]The titles of the CCICED Working Groups as of 1993 were: Biodiversity Conservation; Energy Strategies and Technologies; Environmental Monitoring and Data Analysis in China; Pollution Control; Resource Accounting and Pricing Policy; China's Scientific Research, Technology Development and Training. Trade and Environment was added in 1995.
[12]http://www.cciced.net/cciceden/ABOUTUS/Charter/

equivalent) individuals have served as CCICED Chinese Executive Vice Chairs, and seven Canadian CIDA Presidents and three Canadian Ministers have served as International Vice Chairs. Council Members have met with at least four Premiers on CCICED matters. Premier Wen Jiabao met at least 15 times during the period he served as Vice Premier and as Premier.

Table 1. CCICED leadership: Chairs, executive vice chairs, and secretary-generals

CCICED Phases (years)	Chairperson	Chinese Exec. Vice-Chair(s)	Int'l Exec. Vice-Chair	CCICED Secretary-General
Phase I (92-96)	Song Jian, State Councillor for S&T (Vice Premier level position) 92-97	Qu Geping, SEPA Admin Gu Ming, Deputy Director of the NPC Law Committee, 92-96	CIDA Presidents: Marcel Massé, 92-93; Huguette Labelle, 94-96	Xie Zhenhua, Deputy Admin. SEPA
Phase II (97-01)	Wen Jiabao, State Council Vice Premier, 98-02	Qu Geping, Chairman of the NPC EP Committee, 97-01 Xie Zhenhua, SEPA Admin. 98-01	CIDA Presidents: Huguette Labelle, 97-99, Leonard Good, 00-01	Zhang Kunmin, former Deputy Admin. SEPA
Phase III (02-06)	Zeng Peiyan, State Council Vice Premier, 03-07	Xie Zhenhua, 02-05 Zhou Shengxian, SEPA Admin. 06	CIDA Presidents: Leonard Good, 02, Paul Thibault, 03-04, Robert Greenhill, 05-07	Zhang Kunmin, 02-03, Zhu Guangyao, 03-06, Deputy Admin. SEPA
Phase IV (07-11)	Li Keqiang, State Council Vice Premier, 08-11	Zhou Shengxian, MEP Minister, 07-11	CIDA President: Margaret Biggs, 07-11	Zhu Guang-yao,07-09 Li Ganjie, 10-11 Vice Min. MEE
Phase V (12-16)	Li Keqiang, 11-12 Zhang Gaoli, 13-16 State Council Vice Premier	Zhou Shengxian, 12-15 Chen Jining, MEP Minister 15-16	Min. of Env. Canada, Peter Kent, 12-14 Min. of ECCC Catherine McKenna, 15-16	Li Ganje, 12-16, Vice Min. MEP
Phase VI (17-21) and Phase VII (22 – 26)	Zhang Gaoli, 17-May 18 Han Zheng, 18-present, State Council Vice Premier	Li Ganjie, MEP/MEE Minister, 17-April 20 Huang Runqiu, April 20 to present	Ministers of ECCC, Catherine McKenna, 17-19, Jonathan Wilkinson, 20-21 Steven Guilbeault, 22-present	Zhao Yingmin, 16 to present, Vice Min. MEP/MEE

Organization and management

CCICED's Charter lays out basic organization and responsibilities (see Box 1 reference.) There are two Executive Vice Chairs, the Minister of Ecology and Environment (MEE) and currently the Minister of Climate Change and Environment from Canada. There are several other Chinese and International Vice Chairs. Together these individuals form a Bureau that provides high-level operational oversight for the planning and implementation of CCICED's activities.

CCICED's Secretariat operates from its headquarters office in Beijing.[13] The CCICED Secretary-General is a Vice Minister administrator within the Ministry of Ecology and Environment (MEE, formerly MEP, SEPA, and NEPA), and Deputy Secretary-General(s) and Assistant Secretary-Generals are appointed as necessary.

An international support unit (SISO) linked to the CCICED Secretariat was established in Canada[14]. This office provided services to CCICED international members, partners, and research projects.

Since 2002, a Chinese Chief Advisor and an International Chief Advisor have provided inputs to the Secretary-General and Secretariat, Council Members, and others, including CCICED partners and research teams. The Chief Advisors, who also are CCICED members, become involved in most aspects of CCICED efforts, attend CCICED Bureau meetings, and produce key documents such as Issues Papers and draft policy recommendations. They also review the substance of work plans and research reports and often make presentations on behalf of CCICED. They are supported in their work by a small team of E&D experts from both Chinese and international sides. Individuals serving as Chinese Chief Advisors include Mr. Sun Honglie (2002–2004), Mr. Shen Guofang (2005–2016), and Mr. Liu Shijin (2017 to present); International Chief Advisors have included Mr. Arthur Hanson (2002-2019) and Mr. Scott Vaughan (2019 to present).

A very important point is that, while CCICED is linked to the Ministry of Ecology and Environment for the administration of its activities, it operates under the direction of the State Council at the level of the Executive Vice Premier. The CCICED recommendations submitted each year to the State Council are circulated widely to the relevant entities of the State Council and can reach the highest levels of government.

Funding partners

Funding for CCICED is provided by a range of partners, with China now contributing the largest amount of any donor. While amounts vary somewhat year by year, annual funding levels currently total about USD 5,000,000 or more. In addition, there is considerable in-kind support. Canada has been the lead donor throughout the entire period of CCICED's existence, and some other donors, such as Norway and Sweden, have been present throughout. Countries such as Germany, France, Australia, Japan, Italy, and Switzerland, and regional bodies such as the European Union have been donors, often on a long-term basis with periodic renewal. Some international and Chinese donors are corporate, and others are non-governmental international organizations; United Nations organizations such as the United Nations Environment Programme (UNEP), UN Industrial Development Organization (UNIDO), and UNDP; and other international bodies, such as the Asian Development Bank (ADB). Partners frequently provide services and other major in-kind contributions of high value to CCICED activities. A list of donors for each CCICED Phase is noted in Annex 1. Further information also is provided on cciced.net. Staff from various CCICED donor partners, both in China and their headquarter locations, provide substantial personnel support to CCICED's activities. In fact, in many cases, the activities would have been challenging to complete without their insights and efforts.

CCICED members and advisors

[13]The CCICED Secretariat operates from the MEE Foreign Environmental Cooperation Center (FECO) building. http://en.fecomee.org.cn/Focal_Areas/202103/t20210323_825650.html

[14]SISO was initially set at Simon Fraser University (SFU) in Vancouver, British Columbia. Since April 2019, SISO has been located at the International Institute for Sustainable Development (IISD). Mr. Earl Drake, a former Canadian Ambassador to China, was the initial Director (1992–2010). Following him in this position was Mr. Chris Dagg and then Ms. Lucie McNeill. Very familiar to most international and many Chinese members and various research team members is Ms. Yichun Dai, the SISO administrator from 1992 until early 2019. SISO now operates from the International Institute for Sustainable Development (IISD).

A full listing of all Chinese and International CCICED members from 1992 to the present time is available on cciced.net. All serve in their personal capacity. They are appointed for 5-year terms, with re-appointment possible. CCICED Membership is about 60, split evenly between Chinese and international members. A sampling of well-recognized past and present international members is provided in Box 2. Some additional international experts are asked to serve as Special Advisors. They are tapped for their specialized knowledge and experience; some are invited to join research teams and, by invitation, attend AGMs and other CCICED activities. Research Team Leaders generally attend AGMs and sometimes other events in addition to sessions with their own research team.

Box 2. A sampling of prominent CCICED international members (past and present)

Inger Andersen, Executive Director UNEP, Under-Secretary-General UN

Peter Bakker, President and CEO of the World Business Council for Sustainable Development (WBCSD)

Roger Beale, former Secretary, Department of Environment and Heritage, Australia

Børge Brende, President, World Economic Forum, former Norwegian Minister (Environment, Foreign Affairs)

Catherine Day, former Secretary-General European Commission

Kristalina Georgieva, Managing Director and Chairwoman of the International Monetary Fund (IMF), former EU Commissioner and CEO of the World Bank Group

Vidar Helgesen, Executive Director, Nobel Foundation, and former Norwegian Minister (Climate and Environment)

Naoko Ishii, Executive Vice President of Tokyo University, Director for Center for Global Commons, and former Chair and CEO of the Global Environmental Facility (GEF)

Francesco La Camera, Director-General of the International Renewable Energy Agency (IRENA)

Martin Lees, Chair of the OECD-IIASA Strategic Partnership on Systems Approaches, former UN Assistant Secretary-General for Science and Technology, and Secretary-General for the Club of Rome

Marco Lambertini, Director General of WWF International

Lars-Erik Liljelund, former Executive Director of Mistra, and former Director General Swedish Environmental Protection Agency

Marcel Massé, former President of CIDA, and former Canadian Minister (Intergovernmental Affairs, Treasury Board, Infrastructure)

Michael McElroy, Gilbert Butler Professor of Environmental Studies and Chair, Harvard-China Project on Energy, Economy and Environment

Dirk Messner, Director, German Development Institute

Kathleen McLaughlin, Chief Sustainability Officer at Walmart, President of the Walmart Foundation

Andrew Steer, President and CEO of Bezos Earth Fund, former President of the World Resources Institute

Achim Steiner, Administrator UNDP and Chair UN Sustainable Development Group, formerly Executive Director UNEP

Lord Nicholas Stern, Chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics (LSE)

Sir Crispin Tickell, former British Ambassador to the UN and Permanent Representative on the UN Security Council

Hau Sing Tse, former Vice President, Canadian International Development Agency (CIDA), former Executive Director, African Development Bank

Laurence Tubiana, CEO of the European Climate Foundation, Frances's Climate Change Ambassador and an architect of the 2015 Paris Agreement, former President of the Institute of Sustainable Development and International Relations (IDDRI)

Zhang Xinsheng, former President, International Union for the Conservation of Nature (IUCN) and Executive Chairman, Eco-Forum Global (EFG)

Kandeh Yumkella, former Director General UNIDO, and CEO of Sustainable Energy for All

Research teams

CCICED began its research program in 1992–1993 and provided some preliminary recommendations to the State Council in April 1992. At the AGM held each year, usually in Beijing, a concise set of recommendations is prepared based on the available CCICED research outputs, from deliberations of CCICED members, and sometimes from other inputs. Typically, several hundred people take part in person during a CCICED AGM. The concise recommendations document is submitted each year to the State Council and discussed with a Vice Premier or Premier-level state official of the People's Republic of China (PRC). The recommendations and full research reports are distributed within government and placed online. On some occasions, specific recommendations are submitted between AGMs in order to be timely or meet other needs.

CCICED aims to distribute its work as broadly as possible. AGMs now can attract as many as 2,000 participants (in-person and virtual) over the three-day meeting periods. Some access sessions, such as Open Forums, are available online. Currently, through cooperation with IISD, summaries of the AGM events are produced quickly through IISD Reporting Services. A full record of the research reports, recommendations, and other documents is released each year—as a Policy Research Report on Environment and Development book or other means. The same information is also permanently archived on cciced.net. All key information is produced in both Chinese and English. Over the years, a substantial number of other books and peer-reviewed papers have been produced by individuals and research teams drawing on their CCICED work.

The research teams are at the core of CCICED work. Each team includes both Chinese and international co-chairs, about five members each from the Chinese and international sides, other relevant researchers, and Chinese and international coordinators. In all, the average size of teams, including experts beyond the core, tends to be about 50 or more, including those participating in reviews and dialogue. The appointment terms for each team vary according to need and vary considerably depending on the length of the research activity. At present, activities generally run from one to three years. There is flexibility to ensure arrangements are compatible with objectives and needs. Each team prepares a Summary Report for presentation at the CCICED AGM of about 30 pages, in addition to any necessary background reports that may be tabled during the course of research. Oversight is provided by the Chief Advisors on content.

The most important elements are timeliness, credible and relevant factual content based on specified research objectives, and appropriate emphasis on high-priority, high-quality policy recommendations. Chief Advisors are responsible for preparing an integrated draft recommendations report from the

materials submitted by research teams. The draft recommendations document is modified through CCICED member debates at the AGM and then accepted for submission to the State Council. In addition, the original, generally more detailed recommendations by research teams are also circulated to interested audiences within government and to others. They are accessible in their original form online. Many funding partners also take a direct role in the CCICED's research, sometimes providing full funding responsibility for a particular project. It is a standing rule that no single organization can propose only members from their own organization or country to join a major research initiative. CCICED's intention is to bring diverse perspectives by inviting people from a range of backgrounds onto research teams.

Themes during each 5-year CCICED phase 1992–2021

The selection of research topics, preparation of terms of reference, supervision of quality, and preparation of recommendations occupy much of the work for the CCICED Secretariat and the Chief Advisors. In any single year, there can be up to 8–10 research teams active.

Environmental governance, finance, environmental and resource economics, S&T innovation, and the role of the marketplace have been key concerns since the early days of CCICED. These concerns are now expressed in terms of their roles regarding ecosystem health, sustainable development, ecological civilization, green development, and societal motivation and participation—for example, on topics such as sustainable consumption, trade, and investment. Over time, such efforts have expanded into collaborative arrangements helping to meet global and regional needs. Some have spun off into bilateral or other collaborative initiatives. Even so, some remain linked to CCICED, for example, green BRI, various energy conservation initiatives, ADB/PRC initiatives for green development in the Yangtze River basin, and business efforts such as those with the Chinese Business Council for Sustainable Development (CBCSD).

Table 2 provides an overview of work carried out by CCICED in each of its six phases. By the start of Phase III (2002–2006), specific themes were selected for each year's AGM in order to bring coherence and identify synergies among related topics. This has proved helpful, although under each year's theme, there can be 4, 5, or many more separate studies. Other activities supporting each year's theme include roundtables, special events, the CCICED Issues Paper, and Open Forums co-organized by CCICED and its partners.

Table 2. CCICED themes for the six CCICED Phases and AGM themes
Phases III to VI

CCICED Phase I (1992–1996). Emphasis on Individual Long-term Task Forces
Biodiversity Conservation, Energy Strategies and Technologies, Environmental Monitoring and Data Analysis in China, Pollution Control, Resource Accounting and Pricing Policy, China's Scientific Research, Technology Development and Training; Trade and Environment (started in 1995.)
CCICED Phase II (1997–2001). Emphasis on continuing Task Forces started in Phase I, plus considerable focus on rural areas and ecosystem conservation
Cleaner Industrial Production, Enterprises' Development and Environment; Pollution Control; Energy Strategy and Technologies, Environment and Transportation; Environmental Economics; Environmental Protection and Economic Planning; Biodiversity; Forests and Grasslands; Sustainable Agriculture; Trade and Environment.
CCICED Phase III (2002–2006). Sectoral approach with the introduction of Annual Themes at AGMs
2002 Environment and Sustainability: International Issues and China
2003 Sustainable Industrialization and a Well-Off (Xiaokang) Society
2004 Sustainable Agriculture and Rural Development
2005 Sustainable Urbanization
2006 China's Environment and Development Progress and Prospect
CCICED Phase IV (2007–2011). Integrated approaches and transformative change
2007 Innovation for Environment and Development Strategy
2008 Harmonious Development through Innovation
2009 Energy and Environment
2010 Ecosystem Management and Green Development
2011 Investment, Trade and Environment
CCICED Phase V (2012–2016). Governance including institutional innovation for green development
2012 Regionally Balanced and Green Development
2013 Environment and Society
2014 Management and Institutional Innovation in Green Development
2015 Green Goals, Governance Capacity and Innovation
2016 China's Ecological Civilization and the World
CCICED Phase VI (2017–2021). High-quality development, international cooperation needs related to UN 2030 SDGs and BRI, and accelerated progress on three global emergencies plus COVID-19 green recovery
Four Task Forces (Global Governance and Ecological Civilization; Green Urbanization and Environment Improvement; Innovation, Sustainable Production and Consumption; Green Energy, Investment and Trade), each with Special Policy Studies and other initiatives
2017 Ecological Civilization in Action: Common Green Future for a New Era
2018 Innovation for a New Green Era
2019 Towards a New Era of Green Prosperity
2020 From Recovery to Green Prosperity
2021 Green Recovery with Resilience and High-Quality Development
(CCICED Phase VII (2022–2026) has been approved to continue with detailed plans under preparation.)vv

Some persistent/recurrent themes during CCICED's 30-year period

Important topics often change in focus and in their relationship with each other, sometimes with time gaps. Others can be found in one form or another almost every year. An obvious case is pollution control, where activities can have dramatic shifts—for example, air pollution. CCICED started with a rather general examination of problems in the first two CCICED Phases and with an emphasis on command-and-control approaches such as those found in Organisation for Economic Co-operation and Development (OECD) countries during the 1970s. By Phase III, efforts focused on control of

specific regional pollutants, especially SO2. Later, PM2.5 and ground-level ozone issues became dominant sources of smog in cities such as Beijing, and sources also shifted. Now, more attention is given to synergies between air pollution and climate change mitigation, forming a mainstay of CCICED efforts. Comprehensive approaches to such issues have received a high level of attention, especially as the regional nature of problems was realized and acted upon in line with CCICED and other advice. Solutions have moved in the direction of emissions trading and other innovations. Despite considerable improvements, the air pollution situation throughout China remains difficult. Another decade or more is needed before victory in the War on Pollution can be fully claimed. But it is encouraging that considerable progress is evident in the return of blue skies and improvements to water quality even in some of the worst-hit areas.

For other topics, such as the pursuit of a low-carbon economy in China's cities and rural areas, the time frames for fully effective policy will take many decades more. An important strength of CCICED is that it has the knowledge base, understanding, and relationships to provide long-term, meaningful advice. It is essential to highlight the short-term as well as the longer-term needs and benefits. This has led CCICED to prepare extended (in time) "roadmaps" with policy options and alternatives. An example is the broad field of energy and the environment. Phase I and II research studies identified the potential of renewable sources such as wind and solar well before this was being fully understood by others. Studies from 2008 to 2010 laid the groundwork for fundamental transformations for energy and environment and a low-carbon economy. Since then, there have been many CCICED studies on other aspects, including the phase-out of coal, the synergies between pollution control and climate change, and market-based mechanisms for reducing fossil fuel use. CCICED also pays particular attention to two-way processes between China and the world, seeking both domestic and international benefits. These approaches are likely to be of even more value in the future, as E&D issues continue to grow in complexity regarding both cause and effect.

Some other examples of persistent, long-term themes include the following topics: circular economy, green tech innovation and development; market-based and economic incentive systems for green development, including eco-compensation; green finance and investment; green spatial planning including ecological redlining, biodiversity conservation, national parks system, marine protected areas, and integrated water basin management; green trade, sustainable agriculture and food systems, sustainable production and consumption, sustainable urbanization, ecological restoration, rural vitalization, metrics of E&D, green laws and regulations fostering green development; governance and institutional strengthening; "China and the World" environmental issues; and comprehensive greening of international development cooperation.

Other important topics—such as business participation, including corporate social responsibilities (CSR), health and environment, risk management, cultural and social influences, and public participation—have been treated on a more sporadic basis by CCICED, but they are recognized as subjects not to be forgotten, sometimes covered broadly within a variety of initiatives in any particular year. Public participation and social aspects of sustainability continue to be of great significance, although progress takes time and careful transitions to be successful.

Chapter 3. Transformative Change: An Essential but Lengthy Process

The PRC's development from 1949 to the present day has been marked by many more transformative changes than most other nations have experienced over that same time period. Much of China's change initially focused on meeting basic needs linked to a new nation with a predominantly rural and poor population. Importantly, the 1978 "Opening Up" policy quickly became dominated by rapid economic growth as the central focus. In 1978, China's permanent urban population was less than 20%; soon, it will be 70%. While urbanization has promoted major transformative shifts in population, it is also very important to recognize that very significant E&D needs exist in the countryside and will take decades to address. Current rural vitalization policies emphasize that "by 2050, rural areas should have robust agriculture, beautiful landscapes and prosperous farmers." [15]

Structural to transformative change

China's guiding economic approach from the 1980s onwards into the early 2000s was "structural change" in keeping with economic theories promoted internationally and within countries at that time.[16] Early development emphasized food production and other extractive aspects of natural resource uses consistent with primary sector development.

From the first decade of the new century onwards in China, this emphasis gradually shifted to include major efforts for secondary sector development with the rise of industrial production and manufacturing coupled with international trade successes. This was a mixed transformational and structural stage that required greater attention to energy and other infrastructure, both generally linked closely to urban development. By 2004, China became the world's largest single consumer of concrete and steel, among other materials. China's entry into the WTO created unbelievably high economic growth rates, and the ensuing relative prosperity brought about a major emphasis on tertiary service sectors.

Despite international financial disruptions in 2008, structural change continued to play a major role with still high economic growth rates, while government modernized systems for all three main sectors. Greenhouse gas (GHG) emissions in China went from very low to the world's largest in terms of both total production and consumption, although the picture shifts when the figures are translated into per capita and historically cumulative emissions.

Environmental quality achievements failed to keep up with economic growth impacts. The race for financial prosperity came without adequate attention and capacity to address pollution control, sustainable land and water use, and other serious E&D concerns. While modern environmental controls lagged in priority during China's governance in earlier years, by 1990, a basic system for environmental protection was in place[17] through vigorous efforts of pioneers such as Qu Geping, who had become China's first environmental administrator.

By 1992, when the global community at the Rio Earth Summit initiated policy pathways towards sustainable development, China's government made the transformative decision of linking E&D by setting up CCICED and various other ways it treated the environment. The debate in formulating the Council's work plans and the advice provided to the Government of China has never been about environment alone. Instead, the focus has always been on the complex relationships between the two. CCICED's efforts have focused on transformative change to some extent throughout all six phases of its efforts, although not always headlined with that phrase. Yet much of the first two decades of CCICED work had to be directed towards dealing with the consequences of past structural change.

Some of the architects of the ground-breaking 1994 China Agenda 21 were members of CCICED at

[15]Xinhuanet. 22 February 2021. Backgrounder: China's rural vitalization strategy. http://www.xinhuanet.com/english/2021-02/22/c_139759111.htm
[16]For examples of differences between structural change and transformative change see S.N. Islam and K. Inversen. 2018. From "Structural Change" to "Transformative Change": Rationale and Implications. UN-DESA Working Paper No. 155 ST/ESA/2018/DWP/155. 32 pp.
[17]See Information Office of the State Council, China. 1996. Environmental Protection in China. http://www.china-un.ch/eng/bjzl/t176940.htm

that time, notably Ms. Deng Nan, a daughter of Deng Xiaoping. At the 1994 CCICED AGM, she presented the framework of this White Paper on China's Population, Environment and Development in the 21st Century.[18] She reminded those present that CCICED had discussed the formulation of the document during the September 2003 AGM and that these comments had been helpful in the document's drafting: "We hope that the future work of the CCICED will be closely linked with the implementation of China's Agenda 21. We will extensively absorb the knowledge, wisdom and experience of both the Chinese and foreigners so as to do a better work in the future."[19] A decision had already been made by President Jiang Zemin and the State Council that Agenda 21 would be incorporated within the 9th FYP (1996–2011). The presentation by Deng Nan to CCICED certainly had a lasting influence on CCICED members. At the time, China's Agenda 21 was considered one of the most advanced efforts anywhere towards a national sustainable development plan.

During China's Sixth National Conference on Environmental Protection in 2006, Premier Wen Jiabao emphasized "three transformations." The first concerns the change from economy-centred development to equal attention for both environmental protection and economic development. The second is the change from delayed environmental protection after economic development to simultaneous environmental protection and economic development. The third is the change from mainly administrative measures to an integrated approach of legal, economic, technical, and necessary administrative measures. At the 2006 CCICED AGM, Minister Zhou Shengxian noted that this is a strategic policy shift based on the "lessons and experience" of developed countries and can lead to an era "where environmental protection can optimize economic growth."

CCICED's 2007 AGM recommendations to the State Council noted with approval the signals for a strategic transformation of Chinese government policy relevant to environment, including elevating environment protection to the level of an "ecological civilization," where the objective is building a resource-conserving and environment-friendly society. The guiding idea has shifted from "rapid and sound development" to "sound and rapid development." CCICED's recommendations concluded that other countries such as Germany and Japan, in their period of transformative change for environmental improvement, found four key factors influence success: (1) public participation and involvement of the whole society in decisions; (2) in most cases, it is problems of environment and health that have galvanized action; (3) the need for a progression of changes, some immediate and others longer-term, towards fundamental technological and institutional changes over periods generally of 5 to 10 years; and (4) taking into account international aspects of major policy shifts, including impacts of the transformation on other nations.

We indicated in the 2007 CCICED Recommendations that "China is now in the most significant period for strategic transformation when it will be possible to accelerate the turn-around in the relationship between E&D. To take full advantage of this key period, the Chinese Government must solve three outstanding problems. First, the strategic transformation is taking a top-down approach and lacks the full involvement and support from all stakeholders and levels of government. Second, detailed and effective policies, capacities and action plans are still missing to carry out the strategies and principles set up by the central government. And third, it is essential to continue searching for better value from existing levels of investment, and at the same time, increasing the flow of funds in support of environmental protection."[20]

Environment and high-quality development

Despite ever-increasing expenditures on environmental matters, major economic and social changes overwhelmed many, even most, environmental policy efforts by China for the first two of the last three decades. Even today, the key document laying out China's future is still labelled The Five-Year Plan for National Economic and Social Development, without reference to the word Environment. What has been transformative is how the environment now shapes much of the content within the FYPs and government performance. In particular, during the 12th and 13th FYPs, transformative action about E&D was underlined by the urgency associated with environmental problems, their political dimensions, and the accountability of administrators to meet environmental goals. The emphasis in planning has now shifted to "high-quality development," which includes environment quality as an important component.[21]

But what is transformative change in this context? It is certainly not simple transitions and minor tinkering. Incrementalism can be useful in some settings, such as the cautious approach taken by China through its pilot testing of some complex new environmental initiatives. An example is the time taken to introduce carbon trading, starting with five large cities and two provinces participating and with limited objectives.[22] It took almost 8 years from the initial piloting in 2013–2014 until a full national system was underway. Debates regarding a carbon tax system vs. carbon trading preceded the whole business by several years. In all, it took at least 11 years for the nationwide implementation of the national carbon trading system, completed in July 2021.

Throughout the world, important mechanisms for transformative change involving E&D have involved underlying or indirect drivers, such as the following: (1) incentives and capacity-building efforts; (2) cross-sectoral cooperation; (3) pre-emptive action; (4) decision making in the context of resilience and uncertainty; and (5) environmental law and implementation.[23] These terms frequently appear in CCICED's work. There has been an overarching concern for green investment, environmental economics and taxation, polluter pays, as well as other financial mechanisms, such as eco-compensation, plus trade measures, etc. CCICED has placed considerable focus on pricing mechanisms, including for ecological services, and on innovations such as carbon trading. These and other tools require overarching frameworks with clear objectives. Contributing to such frameworks has included some of the most interesting and satisfying efforts on the part of CCICED. Five examples of closely followed CCICED initiatives are described in Chapter 5.

China's "New Era" economy and sustainable development

From 2017 onward, there has been extensive effort put forward by both the Communist Party of China (CPC) and the national government to define the changes required to move China's economy into a "New Era" dominated by innovation, dual economy (international trade and enhanced domestic consumption), and adherence to a "socialist market economy."[24] This is to be a direction stimulated by high-tech, improved education, and greater investment in science. But it must be made compatible with the construction of an ecological civilization, rural rejuvenation, and the development of healthy and productive cities. Most recently, there has been additional emphasis placed on the concept of "common prosperity" to address gaps in wealth distribution within Chinese society. These are all subjects that will shape CCICED's next stage of work on transformative E&D, especially with regard to China's domestic steps between now and 2035.

[18]https://english.mee.gov.cn/Events/Special_Topics/AGM_1/1994agm/meetingdoc94/201605/t20160524_345213.shtml ; https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192142/CICERO_Working_Paper_1998-04.pdf?sequence=1&isAllowed=y ; https://sustainabledevelopment.un.org/content/documents/5538cheng.pdf
[19]http://www.cciced.net/cciceden/Events/AGM/1994nh/News/201205/t20120515_80305.html
[20]http://www.cciced.net/cciceden/POLICY/APR/201608/t20160803_74631.html

[21]See for example, Fan Gang and Zhang Xiaojing. 2019. Toward High-Quality Development in the People's Republic of China. ADB East Asia Working Paper Series. No. 18. https://www.adb.org/sites/default/files/publication/543621/eawp-018-toward-high-quality-development-prc.pdf
[22]Liu Zhe and Zhang Yong-Xiang. 2019. Assessing the maturity of China's seven carbon trading pilots. Advances in Climate Change Research. 10: 150-157.
[23]Notes from IPBES Global Assessment Report. May 2019. https://www.downtoearth.org.in/news/environment/the-world-needs-transformative-changes-else--64382
[24]See, for example, Quan Heng. 2018. Navigating China's Economic Development in the New Era. China Quarterly of International Strategic Studies. 4 (2): 177-192. https://www.worldscientific.com/doi/pdf/10.1142/S2377740018500161

Chapter 4. CCICED Inputs to China's E&D Actions

CCICED and China's FYPs

Decisions regarding CCICED research work have been influenced by both demand- and supply-side considerations. This has never been an easy task for several reasons, including the four that follow. First, it has been vital to stay in tune with major shifts on the part of China's leaders and the changing nature of China's development needs and external drivers. Close synchronization of CCICED work with China's FYP objectives—as well as with other medium- and long-term Chinese planning efforts in particular sectors, such as China's Medium- and Long-Term Program for Science and Technology Development (2006–2020)— is necessary to remain relevant. Second, it is necessary to spot emerging problems, risks, and opportunities—at global or regional levels as well as nationally and sectorally—in order to signal trends that may require policy shifts. Third, the presence of recurring and evolving topics continues to be important to CCICED's work and advice, even after 30 years of engagement. Finally, global perspectives, events, and various international pressures change and influence dominant paradigms for both problems and their solutions.

All of the factors described above need to be blended into workable research programs and useful policy recommendations. CCICED tries to use dynamic and adaptive approaches to ensure CCICED's work is in line with China's governmental priorities and plans but also sets the work into broader international contexts and ensures that CCICED is looking ahead. The way this has been carried out has varied over time, according to China's own capacity and perceived needs.

The big picture of China's evolving FYP process on E&D policy is provided in Box 3. It is a remarkable story that could be told in much greater detail than is possible in our CCICED at 30 report.[25] Our key intent here is to describe CCICED inputs and their uptake. The 7th FYP ended before CCICED began its activities, but already, during the 1980s, awareness-raising efforts had led to a limited number of environmental policies, for example, the first Environmental Protection Act enacted in 1979 and revised in 1989.[26] Further, environmental exploration over the 8th and 9th FYPs was perhaps at its most shocking, with the realization that the immense 1998 floods in the Yangtze River basin could be traced to deforestation and other aspects of poor land use. This led to a logging ban and enhanced efforts regarding forest and grassland restoration. The almost completely new-to-China topic of trade and environment/sustainable development was initiated by CCICED in 1995 and continued for the better part of a decade. This work received considerable policy attention within government and internationally as the PRC engaged with, and eventually joined, the WTO. CCICED identified the great potential of China's wind and solar power in the late 1990s while coal burning was still on a rapid trajectory upwards.

Box 3. "Big Picture" for China's E&D focus related to FYPs

7th, 8th and 9th FYPs explored the new field of E&D.

10th FYP laid important groundwork for pollution control and other aspects such as ecological services.

11th FYP emphasized the creation of a "Resource-efficient, Environmentally Friendly Society."

12th FYP initiated a focus on "Green Development," and China has taken this as its main action approach to E&D ever since.

13th FYP highlighted "Ecological Civilization" as an important framework focus and as one of three main national priorities for this FYP.

14th FYP (2022–2026) will set in place the Green Agenda for the third decade of the 21st century and well beyond, with major shifts such as preparing for peak carbon to occur before 2030, 2060 carbon neutrality, further investment in green technologies, pollution control, and ecological restoration. To an unprecedented degree, it will blend Chinese and international E&D priorities, including those for meeting China's action on the UN 2030 SDGs.

Stepwise efforts during the 9th to 11th FYPs made considerable progress on establishing what might now be considered a conventional early approach to environmental institutions with limited power inside and outside government to stop pollution and environmental degradation. The poor level of coordination between national and local governments on E&D was a stumbling block. In the race to build infrastructure, to meet rising demands for raw materials and energy, and to produce manufactured goods for domestic and export purposes, it is not surprising that environmental protection could not keep up with the rapid pace of economic growth impacts. While the concept of seeking a resource-efficient, environmentally friendly society in the 10th and 11th FYPs was valid, the actual capacity to deliver was still weak and not very well accepted across all parts of the government. CCICED was able to suggest many ways that environmental improvements could be successfully undertaken, as we will describe in Chapter 5.

In fact, the first decade of the new century was a time for discovery and experimentation, with many pilot efforts and a realization of new (to China) environmental technologies, environmental planning, and management tools. The ambitious UN Millennium Development Goals (UN MDGs) placed major attention on poverty reduction. China's initiatives both before and after this global effort outpaced all other large developing nations. Major efforts were already well underway on re-greening damaged agricultural, forest, and pasture lands as one major element of poverty reduction. Applications of innovative environmental technologies started to show promise during the first decade, but the rapid rise of the heavy chemical industry, demand for steel, cement, and other building and infrastructure materials, plus a skyrocketing manufacturing capacity continued to outpace environmental protection efforts. Environmental quality became a topic of great concern to the government, with public demands and many examples of poor local decision making on urban planning.

It was during the 12th and 13th FYPs that transformative change truly began to be realized with good results. The concept of ecological civilization was well introduced during the 12th FYP and in various innovative ways later.[27] This integrative way to link problem solving, people, projects, and programs has taken hold in both central and local government circles, with the strong encouragement of President Xi Jinping. Green development is the action of choice for the implementation of ecological civilization values. These trends are documented in more detail in Box 4.

Starting in 2008, CCICED began to track progress annually and, in some detail, examine the E&D shifts in Chinese governmental policy and, to the extent possible, trace these to relevant CCICED recommendations. This very helpful effort, now undertaken by a small team linked to the Chief Advisors and supported via the China Office of the Environmental Defense Fund (EDF), provides the basis for many of the observations in our report.[28]

[25]See for example: OECD. 2018. China's Progress Towards Green Growth. An International Perspective. https://www.oecd.org/env/country-reviews/PR-China-Green-Growth-Progress-Report-2018.pdf ; Sternfeld, Eva (ed). 2017. Routledge Handbook of Environmental Policy in China. https://www.routledge.com/Routledge-Handbook-of-Environmental-Policy-in-China/Sternfeld/p/book/9780367277093

[26]Zhilin Mu, Shuchun Bu and Bing Xue. 2014. Environmental Legislation in China: Achievements, Challenges and Trends. Sustainability 6: 8967-8979. https://www.researchgate.net/publication/273319400_Environmental_Legislation_in_China_Achievements_Challenges_and_Trends

[27]For further references on the rollout of ecological civilization see: Xie Zhenhua. 2018. China's Road of Green Development. Understanding China Series, Foreign Languages Press. Beijing. 302 pp; and Arthur Hanson. December 2019. Ecological Civilization in the People's Republic of China: Values, Action, and Future Needs. ADB East Asia Working Paper Series. No. 21.

[28]See http://www.cciced.net/cciceden/POLICY/rr/ir/ Progress in Environment and Development Policies in China and Impact of CCICED's Policy Recommendations (provided each year since 2008)

Box 4. Major domestic trends on E&D within China's FYPs from 1986 to 2021 and some linkages to CCICED work[29]

- 7th FYP (1986–1990). First "All-round Plan" for social and economic development. Very limited consideration of environmental matters. Coordinate economic development with reform. High production output focus, with combined 38% growth in agricultural and industrial output expected over 5 years. Annual growth rate of 7%. "Socialist ideological civilization" with "construction of material civilization" (pre-CCICED period.)
- 8th FYP (1991–1995). New phase of accelerated economic growth. Outputs of cement and coal highest in the world. Economy growth 11% per year. Major emphasis on large energy (e.g., Three Gorges Dam) and transportation infrastructure. 1,100 county-level cities opened to the outside world. New value-added tax (VAT) tax system. Emphasis on macroeconomic framework. Environment and economy relationships strongly emphasized in CCICED's initial work plans.
- 9th FYP (1996–2000). Second phase of modernization drive to be completed. Population growth to be capped. 4X per capita GNP compared to 1980. And further doubling projected by 2010. Groundwork laid for WTO entry, including extensive CCICED studies on trade and environment. Yangtze 1998 flooding followed up with national logging ban and major grassland and tree planting programs for ecological restoration. Extensive CCICED work by CCICED on sustainable agriculture, natural resource economics, biodiversity conservation needs, and western China regional development.
- 10th FYP (2001–2005). High growth rates emphasized with secondary industries seeking 51% of GDP. "Socialist Market Economy." Continued high growth in economic growth rates. Emphasis on expansion of industrial sector by 51%. Very high material consumption. First overall focus on environment. Forest cover to be 18.2%. Urban green rate to be 35%. Total amount of rural and urban pollutant discharges to be reduced by 10% compared to 2000. Population to be capped at no more than 1.33 billion by 2005. CCICED emphasis on reducing SOx from coal burning in power plants, industrial operations, and homes. Intensive CCICED effort on sustainable agriculture, sustainable industrialization, and macroeconomic approaches for environmental protection.
- 11th FYP (2006–2010). Service sector emphasis in the economy. Urbanization rate increased to 47% by 2010. First really major effort to include a comprehensive approach to E&D. Circular economy. Forest cover to be 20% in 2010. Enhanced efficiency of irrigation water use. Total discharge of pollutants set at 10% reduction. Water consumption per unit of industrial added value to be reduced by 30% over 5 years. 20% reduction in carbon intensity per unit GDP (set in 2009). First national climate change strategy. Strengthened eco-compensation effort. Efforts to cap coal consumption. China becomes world's largest wind power domestic market. Economic stimulus package in 2008 after global financial meltdown includes some funding increases for environment. Ecological Civilization concept introduced by President Hu Jintao in 2007. CCICED introduced recommendations on a low-carbon economy, carbon intensity reduction, renewable energy sources, ecosystem restoration and protection, ecological services, circular economy, integrated river basin development (Yangtze River), green environmental technology innovation, and transportation.
- 12th FYP (2011–2015). Economic emphasis on equitable distribution of wealth, especially between rural and urban, increasing domestic consumption, and an important shift towards inland and rural sustainable development. Urbanization rate of 51.5%. Target of 8% annual GDP growth. Greater emphasis on social and safety nets. Greater emphasis on expanded environmental protection (War on Pollution; spatial planning, protection of ecological services, waste management systems, green buildings, etc.) Improved environmental protection law. Emphasis on green technology expansion. "Green is Gold" and Ecological Civilization promoted as a way of moving beyond conventional GDP thinking. CCICED's major emphasis is on three main components of the War on Pollution (air, water and soil), green economy, and green development. Regional green development, greater emphasis on innovation tools including ecological redlining, eco-compensation, and a focus on major aspects of governance such as better laws, standards, risk management, public participation, and CSR. Examination of ocean sustainability issues and sustainable urbanization.
- 13th FYP (2016–2021). Severe economic impacts of COVID-19 during early to mid-2020. China's "greenest" FYP. Focus on innovation and green tech industries, including digital technologies, major shift to electric vehicles, battery technologies, more efficient renewable energy generation, etc. Green financial system. Focus on ecological needs, including green cities and ecological conservation red lining. Yangtze River Economic Belt shifted towards green development and ecological protection. Green BRI initiatives started. Environment and natural resource institutional improvements. Ecological Civilization is emphasized for all sectors and, in 2018, was written into China's Constitution. Emphasis of CCICED on various elements related to green development and ecological civilization priorities, with many, such as sustainable production and consumption, linked to global environmental priorities. They are well documented in the CCICED Phase VI Capstone report. Important contributions were provided on carbon peaking and neutrality, national carbon market, energy efficiency, national standards, low carbon manufacturing, ecology and biodiversity conservation.

[29]Some elements adapted from Wikipedia.org Five-year Plans of China. Other material from CCICED work plans and other documents. CCICED's first studies and recommendations came in 1992.

Utilization of advice from CCICED Phase I (1992–1996)

CCICED's first 5 years provided a solid base of findings that formed the foundation for many specific policy outcomes well into later years of CCICED work. A list of 16 major Phase I CCICED recommendations[30] is shown in Box 5. In bold text, we have added selected later policy actions linked to each recommendation. CCICED does not claim full credit for all these actions. Rather, we celebrate that important policy decisions happened for each recommendation and in directions we believe to be very positive.

Box 5. Selected CCICED Phase I recommendations and some later Chinese policy actions

- Make the environment central to economic and social policy decisions at their start. 13th FYP (2016–2020).
- Allocate adequate funding to implement environmental laws, standards, and regulations. War on Pollution (2014 onward) and especially for air pollution control.
- Introduce environmental impact assessments (EIAs) more widely in project assessments. PRC Environmental Impact Law introduction and revisions (2002–2016).

[30]The list of 16 major recommendations is from CCICED at 20. p 25

- Set priorities as identified in China's Agenda 21. Symbolized many needs for new approaches and influenced major shifts such as adoption of the polluter-pays principle (PPP), plus indirect grounding for broad-based ecological civilization and China and the 2030 Sustainable Development Goals (1994 onwards).
- China must leapfrog over mistakes made by other countries through technology choices and management approaches, drawing upon technologies and best practices elsewhere. China Midterm S&T Program, including emphasis on environmental technologies (1995–2020).
- Adoption of cleaner production and technologies. Cleaner Production Promotion Law (1992) and China National Cleaner Production Center (CNCPC) transforming efforts to a pollution prevention strategy (1994 onwards).
- Seek balance between "command-and-control" regulation and "market-based" instruments. China's Environmental Protection Law revision (2015) required direct use of fiscal assistance, taxation, prices, and green procurement to meet pollutant reduction goals and encourage the development of environmental industries; 2021 national carbon trading system.
- Introduce levies, licences, meaningful pollution charges, and other environmental fees. PRC Environmental Protection Tax Law (2018).
- Reform prices for important natural resources, and incorporate environmental factors when establishing prices for coal, water, timber, etc. Major reform of energy source pricing (2013).
- Remove inappropriate subsidies. Ongoing efforts only partially successful since ~2001 involving state-owned enterprises, ocean fisheries, agriculture, green technology products, fossil fuels, paper industry, etc. Reasonable success after 2013.
- Keep improved use of coal and other energy at the heart of E&D. Transformative action became significant once the low-carbon economy and climate change became important in China in 2009. First, carbon intensity reduction targets for China were announced by Hu Jintao during the UN General Assembly session in September 2009.
- Seek out alternative energy technologies. Wind and solar revolution (2008–2009 to present).
- Prevent trade in endangered species. China's ban on elephant ivory trade (buy or sell) (December 2017); ban on terrestrial wildlife trade and consumption in response to COVID-19 (February 2020).
- Extend the network of protected areas and enforce legislation to safeguard these areas. 1994 Regulations for Nature Reserves provided a system-wide framework; and, separately in 1994, the first national biodiversity action plan; by 2009, 15% of China protected as nature reserves.
- Enlist local communities in restoration of degraded habitats to ecological productivity. Grain for Green Program designed to retire farmland susceptible to soil erosion and to prevent flooding. (1999–present); Zhejiang "ecological province" Green Rural Revival Program and River Chief System (Anji County 2003-2005 to present); eco-compensation support for smallholders for land restoration and payment for ecological services (1995–2005 and to present).
- Improve environmental monitoring and develop a sound environmental quality database. China National Environmental Monitoring Centre (CNEMC) established in 1980, but comprehensive monitoring network mainly developed from 2010 onwards.

The point to be emphasized here is the length of time for full uptake of CCICED recommendations. Occasionally, a policy outcome can be realized in a matter of months, but this is the exception. More generally, there can be years for stepwise change and even a decade or more for major transformative policy shifts. Premier Wen Jiabao, in his meetings with CCICED members on various occasions, noted the high value of having an organization and individuals familiar with Chinese situations and decision making, given the need for longer-term thinking and action.

Two outlook initiatives: Assessing emerging challenges, risks, and opportunities

There has never been a shortage of new challenges and risks to be assessed. Similarly, opportunities and suggestions for new topics are not in short supply. One of the responsibilities of the CCICED Chief Advisors is to make sense of the many possibilities about which high-priority topics should be suggested for new study topics. Input is provided from many sources, including ministers and other officials, CCICED members, donors and other partner organizations, researchers, and other groups within and outside of China. Advice on future activities also has come from strategic salons[31] organized by the Secretariat or others, CCICED roundtables, and sometimes directly from suggestions by the State Council. It is a dynamic process that can be accompanied by advisors' retreats, field visits within or outside China, and, of course, AGM discussions, etc.

(1) 2006—Reflections on progress and key challenges to 2020

Special CCICED initiatives have been carried out to assess general progress and needs for China over specific time frames. A particularly interesting initiative was a 2005–2006 Special Task Force that was both reflective concerning the first 15 years of CCICED work and forward-looking to address key E&D challenges to 2020. The co-chairs for this initiative were the first Chinese CCICED Chair, Mr. Song Jian, and Madame Huguette Labelle, the International Executive Vice-Chair from 1994 to 1999. The report was issued as a Chinese book. Seven challenges were identified (see Box 6), all characterized as "complex system issues where no single intervention is likely to be fully effective as a solution. They are interactive with each other, and all have major economic implications."[32] The intent was to provide early warning to the Government of China and also to help shape CCICED's future research directions.

Box 6. Seven E&D challenges facing China to 2020
(Source: from CCICED Special Task Force on Review and Prospects, 2006)

Challenge 1.	China will be faced with serious energy security, severe air pollution, and increasingly heavier pressure on reduction of emission of greenhouse gases.
Challenge 2.	Increasingly severe water crisis.
Challenge 3.	A continuous and rapid increase of municipal waste, industrial waste, and hazardous waste.
Challenge 4.	Degraded ecosystems and loss of biodiversity.
Challenge 5.	Emerging environmental issues such as indoor pollution, ground-level ozone, mercury pollution, environmental health problems, soil pollution, and environmental problems associated with information technology, biotechnology, and nanotechnology.

[31]Strategic Salons began in 2012 under the guidance of Mr. Li Ganjie. They are "an open platform to inspire thinking and exchange viewpoints on E&D" with each focused on a theme, and with a mix of attendees drawn from within government and outside experts. They target potential areas for future work. http://www.cciced.net/cciceden/NEWSCENTER/CCICEDActivities/201212/t20121217_81042.html
[32]CCICED at 20. p. 39.

Challenge 6. Continuously worsening global environment.

Challenge 7. China's increasing external environmental impacts from a rapid growth economy.

These challenges indeed proved to be very valid and, over the 15 years that followed, they cost China many billions of dollars/RMB to address them. CCICED carried out 60 or more studies and other initiatives regarding these challenges from 2007 to the present and has undertaken various efforts to understand linkages among them.

(2) 2015—A "Very Transformative Year" for China's E&D and CCICED's high-level examination of China's 13th FYP E&D needs

If one year of CCICED's 30 could be chosen as the most significant time to witness a turnaround in China's E&D relationship, it likely would be 2015. That point in time was highly significant for starting to move from "tipping point to turning point" on the politically significant issue of air pollution. The revised Environmental Protection Act came into effect. After being enshrined in the CPC Constitution in 2012, ecological civilization was highlighted in two "Opinions" jointly produced by the CPC and China's State Council (April and September 2015.) They provided detailed guidance on eight systems for policy transformative action, covering the still novel approach of green development as the means to achieve ecological civilization.

CCICED believed that it was timely to assemble a special international advisory meeting to provide observations about the longer-term road ahead and identify specific recommendations during a meeting directly with CCICED's Chair, Vice Premier Zhang Gaoli, as input to national planning for the 13th FYP. The small, international high-level group included a mix of CCICED members and various leading figures.[33] All participated in their individual capacity. A senior Chinese team prepared the background materials, including a long list of topics and questions. The chair of the meeting was the recently appointed MEP Minister and Chinese Executive Vice-Chair of CCICED's Bureau, Mr. Chen Jining. The consultative meeting was structured around discussion rather than presentations and produced a very interesting set of materials focused on observations concerning the existing situation (Box 7) and recommendations for the 13th FYP (Box 8) presented in the meeting with Vice Premier Zhang Gaoli and passed on to the State Council.

This was the first time this particular approach had been used by CCICED, and it was very successful. The effort was reinforced during the 2015 CCICED AGM through the theme of Enabling Governance Capacity for Green Transformation. One of the most significant recommendations was to innovate a green financing system during the 13th FYP in order to drive and finance China's green transformation. The uptake of this recommendation was swift and quite successful. Within months, the whole financial sector began complying, with direct encouragement from President Xi Jinping.

[33]They included: Jochen Flasbarth, Kristalina Georgieva, Stephen Groff, Arthur Hanson, Lisa Jackson, Marco Lambertini, Li Yong, Hank Paulson, Janez Potocnik, Richard Samans, Achim Steiner, Björn Stigson, Klaus Toepfer and Matthew Trerotola.

Box 7. Observations about the existing Chinese E&D situation in 2015

(Source: from the June 2015 CCICED International Advisory Meeting on Environment and Development for China's 13th Five-Year Plan)

China's transformation of development patterns is still a long and difficult process with many issues and challenges.

First, insufficient, unbalanced, and low-level development is still the fundamental problem facing China. There is no fundamental change in the irrational economic structure and low resource utilization rate; enormous challenges still remain to coordinate the relationship between economic development and environmental protection.

Second, ecological and environmental carrying capacity has reached or exceeded its limits. Air and water quality have been continuously burdened with excessive discharges, becoming a bottleneck constraint for China's economic development.

Third, other social challenges, such as population, poverty, and health risks, are intertwining with environmental problems and together pose serious challenges to social governance.

Fourth, lock-in effects from conventional urbanization processes have become more obvious, and increased urbanization can bring in more resource and environmental pressures.

Fifth, new environmental challenges are emerging from China's increased obligations for CO_2 emission reduction and more participation is expected in global sustainable development issues, as well as the expansion of supply chains in the region.

Sixth, new characteristics have emerged: environmental problems are becoming complex with the combination and intertwining of traditional pollutants and new pollutants. Environmental risks are becoming more imminent due to the historical accumulation of unsolved problems, which makes the overall improvement of environmental quality a complex, challenging, and long-term mission.

Seventh, the current environmental governance system and capability have yet to be able to cope with the above-mentioned challenges.

In the context of overall E&D challenges, as well as the national development strategy, environmental quality improvement has become the weakest link in the construction of the "well-off" society. Transformation of the economic development mode becomes the key and fundamental solution to mend this weak link and achieve grander targets.

The 13th FYP period is a critical window of opportunity for China to promote green transformation. By grasping this window of opportunity, China will lay out a solid foundation for sustainable development and the realization of the "China Dream" in the next 10–30 years; otherwise, China may lose its initiative of transformation and reform and pay much more in ecological and environmental costs for its development. To grasp this window of opportunity, the key is to emphasize the transformation of development mode and improvement of environmental quality.

Box 8. Abridged recommendations from CCICED's June 2015 International Advisory Meeting on Environment and Development for China's 13th Five-Year Plan

Participants noted that the opportunities associated with green development eventually will outweigh the challenges faced today. The 13th FYP is therefore a pivotal point in the transformative change towards ecological civilization. It is essential to set "stretch targets" (objectives that force organizations to significantly alter their processes to involve new sets of paradigms) with innovation and the longer term in mind. Green development must be seen as a source of new jobs and the new economy. Governance capacity must be built within business and in the whole of society, not only within government.

Recommendations [note: only a sampling of each extended recommendation is provided here]:

Take a coordinated and comprehensive approach. Make environment a core pillar of development and a stimulus to China's economy. Set clear national objectives for E&D rather than depending on individual departments. Establish improved cross-regional cooperation in pollution. Overall, set clear milestones for the 13th FYP and demonstrate how these can be of value for initiating longer-term action.

Strengthen and rationalize institutional roles. Match fiscal strength to the scale of activities and avoid overinvestment. Clarify institutional arrangements for separating protection and exploitation aspects of natural resources and environmental issues. Improve independent supervision of E&D.

Accelerate the pace and efficiency of implementation. Move more quickly from "pilot project to general practice" and from "practice to habit." Shift from "learning to leading."

Link economy and environment. Build into the 13th FYP a new normal model of economics that is respectful of environmental needs does not trade off between the two. Shift taxes from labour onto environmental polluters.

Enhance natural capital. Consider nature as "green infrastructure." Incorporate ecological redlining into land and water use planning and management. Build programs for business, government, and the public to understand dependence on natural capital. Focus on ecological restoration and natural resource renewal, including biodiversity. Strengthen eco-environmental accounting in national accounts.

Diversify regulatory approach. Develop regulations that cannot be easily avoided, ignored, or overruled. Create an enabling legal framework to encourage citizens and enterprises towards sustainable practices. Expand and strengthen green procurement. Supporting the best rather than fighting the worst for transformative change. Develop market-based approaches that include consideration of market-based failure and both suppliers and consumers. Build cap-and-trade pollution control in an adaptive fashion. Strengthen green taxation.

Expand efforts in business, financing, and investment. Strengthen the role of business as a partner of government in implementing green development. Expand the use of PPP models. Encourage new green products. Establish a green investment forum as a "safe place" for developing "enlightened self-interest" on the part of both enterprises and community. Engage with leading companies to change whole sectors. Foster the good, do not just get rid of the bad. Focus investment more clearly around sustainable green growth opportunities.

Improve sectoral action. Focus on three key areas: mobility, buildings, and food. Make modern agriculture a key contributor. Focus the greatest attention on newly emerging industries rather than supporting sunset industries. Use green certification processes for quality green products and to improve manufacturing. Emphasize practical applications such as water investment, energy efficiency, distributed power, green buildings, natural gas infrastructure, and parks.

"Going green while going global" and "Planetary Partnerships." Ensure green strategies for BRICS Bank, AIIB, and BRI. Begin to shrink the ecological footprint of China. Build S-S cooperation for desertification, etc. Seek carbon capture and storage partnerships. Give public health and environment a higher profile in China's international cooperation. Consider implications for China of the G7 pledge to complete "decarbonization" of their economies by the end of the 21st century. Prioritize fostering green industrialization when desired by African countries.

Even though the 2021 completion of China's 13th FYP has taken place during "the pandemic of the century," very significant progress has been achieved towards the country's E&D goals. Perhaps for the first time, there has been a sense of genuine progress overall on green development, including meeting most FYP targets. By mid-2020, when the sky appeared very blue in many Chinese cities, partially from War on Pollution action but also a measure of closed factories and reduced automobile use related to COVID-19, it was possible to see a tantalizing glimpse into a low air pollution future. Alas, to some extent this pollution respite was short-lived once the economy restarted. But real gains are being made as current annual air pollution falls. Climate change continues to demonstrate its growing presence in many ways, including 2021 floods and rising sea levels threatening coastal infrastructure. Biodiversity within China continues to be threatened, along with many other land and water sustainability concerns. Even so, at the start of this new decade, there is a strong sense of hope that a genuine turning point is at hand.

A companion piece to our CCICED at 30 Report has been prepared by the CCICED Secretariat to review the topics and recommendations from CCICED Phase VI. This Capstone Report[34] is rich in detail concerning more than 10 major research initiatives undertaken during the 2017–2021 period and their influence on Chinese policies. In addition, a "Fact Sheet" covering current policy frameworks and policies, as well as relevant CCICED recommendations, was produced as part of the Capstone Report. A very interesting part of this Fact Sheet is the section addressing crosscutting issues (see Box 9). Building capacity within CCICED to address such issues has taken time but is essential to both present and future perspectives on our work, and particularly to ensure they are in line with the government's call for innovation.

Box 9. Four major crosscutting outcomes seen during CCICED Phase VI

(Source: excerpt from CCICED 2021. CCICED Phase VI Outcomes and Impacts. Fact Sheet 2017-2021)

Four Crosscutting Outcomes:
China now boasts a massive green finance market.
China's 14th FYP calls to develop a green technology system.
Major growth seen in clean energy and consumption.
China's BRI Int'l Green Development Coalition and BRI Green Development Institute.

Green Financing

- CCICED has played a leading role in the introduction, encouragement, and demonstration of green finance in China.
- In 2014, CCICED set up a Green Finance Task Force.
- CCICED's annual policy recommendations have consistently called for progress on green finance based on policy research. Examples include establishing a National Green Development Fund; promoting green credit, green bonds, and green insurance; and establishing cross-departmental green finance coordination mechanisms.
- CCICED's green financing recommendations were adopted by the central government and also incorporated into the 2015 G20 Summit agenda.

[34]CCICED Secretariat. September 2021. CCICED Phase VI (2017-2021) Capstone Report. Outcomes and Impacts. 30 pp. https://cciced.eco/research/council-document/cciced-phase-vi-capstone-report-and-fact-sheet-outcomes-and-impacts/

- In 2018, CCICED's Policy Recommendations highlighted opportunities for green project financing through a "Greening the BRI" fund.
- In 2020, CCICED recommendations included adopting world-class standards and safeguards for BRI projects, increasing green bilateral and regional green Overseas Development Assistance, and other steps aimed at shifting investments away from carbon-intensive sectors in geographic areas of importance to biodiversity and local and Indigenous communities.
- In 2012, the China Banking and Insurance Regulatory Commission (CBIRC) introduced green credit guidelines for banks.
- China now boasts a massive green finance market, with RMB 12 trillion in green credit available and about RMB 800 billion in green bonds issued.

Green Technology

- In 2014, CCICED recommended green technologies as a means to achieve a number of positive environmental outcomes, including clean coal technologies.
- In 2015, CCICED's Policy Recommendations included the establishment of a National Green Development Fund, which was subsequently established in July 2020.
- In March 2021, China announced that its 14th FYP includes development of a green technology system to drive innovation.
- In 2018, China's Ministry of Industry and Information Technology (MIIT) promoted their Special Action on Power Demand-Side Management in the industrial field (2016–2020).
- At the December 2020 UN Climate Ambition Summit, China agreed to increase the proportion of non-fossil fuels in power sector consumption to around 25%.
- Estimates indicate that between 2012 and 2019, clean energy consumption increased by 8.9 percentage points to account for 23.4% of the total energy sector.

Green Urbanization and Consumption

- The 2018 CCICED Policy Recommendations proposes to shift traditional thinking, fully integrate green standards into green urban planning, and bring forward innovative solutions in combination with local realities.
- In December 2018, the General Office of the State Council issued the Plan for Pilot Development of Solid Waste-Free Cities. At the end of April 2019, MEE published a list of pilot solid waste-free programs. In May 2019, MEE issued the Guidelines for Compilation of Implementation Plan of Solid Waste-free Cities Pilot Programs and the Indicators for Solid Waste-Free Cities (tentative).
- NDRC promulgated the Key Tasks of New Urbanization 2019, which sets forth working requirements in 2019. It also puts forward that new urbanization should take into full consideration the actual bearing capacity of resources and the environment, stress coordinated development, make full use of intelligent IT means, conduct lean management and coordinate with the control of air pollution and other environmental problems.
- The 2019 CCICED Policy Recommendations stated that green consumption is one of the key measures for ecological civilization and should be included as a key task for the national-level 14th FYP.
- The 2020 CCICED Policy Recommendations proposed that green consumption sectors should be prioritized. To accomplish this, it will be necessary to increase the supply of green products and green services, including clothing, green food, green housing, transportation, and tourism.
- On March 2020, the National Development and Reform Commission of the State Council (NDRC) and MOJ released Opinions on Accelerating the Establishment of a System of Regulations and Policies for Green Production and Consumption, which stipulates multiple tasks such as promoting green design, enhancing clean industrial production, developing recycling for the industrial economy, strengthening control of industrial pollution, advancing the development of clean energies, facilitating the green development of agricultural and service industries, boosting consumption of green products, and advocating for green lifestyles.
- In 2021, the Standing Committee of National People's Congress adopted the Anti-Food Waste Law.

Green BRI

- Since 2015, CCICED's annual policy recommendations have identified opportunities and tools to mitigate the ecological risks of the BRI.
- CCICED's 2018 and 2020 Policy Recommendations encourage greening of the BRI.
- In 2017, China issued its Guidance on Promoting Green Belt and Road, which includes "a series of eco-environment risk prevention policies."
- In 2019, China and other BRI partners launched the BRI International Green Development Coalition.
- In 2020, the BRI Green Development Institute was launched.

CCICED's ongoing "outlook" approaches

Considerable effort each year goes into providing a reasonably clear picture of the current state of play on E&D both in China and internationally. This informs CCICED members, researchers, and officials, etc., providing a picture of "hot topics," emerging concerns, and sometimes, advice on what has been overlooked or deserves greater attention. Ultimately the work can inform not only the State Council through our recommendations but also provide relevant new knowledge to others in a more detailed way. This is done through a variety of means.

(1) Selection of research topics and length/depth of studies

After the first two CCICED phases, it was apparent that the initial 5-year WG model was a luxury that could no longer be supported across the board since so many environmental problems were emerging with a need for quicker responses. However, the long-term commitment to major themes was very important in the first two CCICED phases since the subject of E&D was still quite new and, for many problems, a still relatively unexplored field.

Later, especially during Phases III to V, research teams were generally restricted to one to two years of TF work. Some activities had even shorter periods of 6 months to a year. These shorter SPSs rapidly became the norm. This system worked well to provide more tightly focused and timely advice. However, the approach sometimes lacked the necessary depth of work that was desirable.

During Phase VI, hybrid models were put in place, trying to get the best balance between the longer- and shorter-term approaches described above. There are very good examples of each type of approach as briefly described below and in much further depth in the next chapter.

Initial long-term (5+ years) WG model. Of the initial five WGs started in 1992, four continued right to the end of Phase II with adjustments to their topics in annual plans. This was the case with the WG on Pollution Control, which established a range of important starting points related to air and water emissions control, solid waste, and some pioneering research regarding GHG emissions in cities and sectors throughout China. The WG on Sustainable Energy for China flagged the great potential for renewable wind and solar energy in China at a time when this topic was still poorly understood in China. This WG also provided CCICED's first major study on a strategy for transforming the use of coal in China through advanced clean technologies. The WG on Environmental Economics helped to build

a solid understanding of resource accounting, pricing, subsidies, and other topics related to both environmental management and various natural resource economics subjects. The information was highly relevant to market-based regulation of environment and user-pay models, as well as economics related to biodiversity conservation. The WG on Biodiversity focused much of its effort on the need for ecologically based management of China's rapidly expanding network of nature reserves and related topics such as problems of invasive species, illegal activities, and the need for nature-oriented livelihoods for people living near or within nature reserves. The WG on Trade and Environment was a very timely addition in 2005. During this first period of CCICED, it was sometimes necessary for research teams to seek at least a portion of their financial support. This led to some very helpful additions to our donor community for later phases of work.

TFs and SPSs. These models depend upon setting out very clear terms of reference, minimizing changes once the work is underway and ensuring compatibility among study team members. The following examples demonstrate the high value of working to a tight deadline for focused subjects of high interest to policy-makers.

A very successful early task force established in 2000 examined the performance of forest and grassland conservation and restoration programs, especially those in Western China. The TF had a 2-year period for its work, but even after the first year was able to provide important observations on serious problems with the programs. The final recommendations led to important reforms covering vast areas of China's rural areas.[35] Cooperation with World Wildlife Fund (WWF) China in 2005–2006 examined the need for improvements in river basin management for the Yangtze River. This TF was an important effort because it introduced the concept of "living river" as applied in the Netherlands and elsewhere and highlighted a number of important considerations acted upon by the Government of China.

An important 2011 SPS on Mercury Management in China provided insights into the country's policy actions needed prior to negotiations that led to the 2013 Minamata Convention. As the last of the three major components of the War on Pollution, soil pollution required attention to legal, scientific, practical remediation, and pollution prevention aspects. Policy action was needed for dealing with legacy site-based issues, imminent concerns requiring immediate responses, and protection to avoid future pollution, including groundwater issues. Priorities included the safety of agricultural lands and management of risks associated with contaminated areas of many types. The CCICED SPS covered these points and was both timely and pragmatic.

Hybrid TF and SPS approaches during CCICED Phase VI. As E&D problems become more multi-faceted, with numerous crosscutting topics, new ways to address CCICED research were promoted in Phase VI. This effort involved the establishment of four coordinating TFs: Global Governance and Ecological Civilization; Green Urbanization and Environmental Improvement; Innovation, Sustainable Production and Consumption; and Green Energy, Investment and Trade.[36] Within each TF, there are two or more SPSs on specific topics associated with the overall TF theme. A key concern with this approach is to extract maximum value related to the specific clusters of work. This hybrid model seems to work quite well, covering both short- and longer-term needs in research. What remains is a need to better link together the output of all four TFs in order to identify synergies and co-benefits across the whole range of CCICED's research. Such linkages are important in producing outstanding recommendations.

An example where the new hybrid of TFs and SPSs has worked well is Phase VI CCICED research on Global Governance and Ecological Civilization. Three key research areas were established for 2017 to 2021, each related to serious global negotiations: Global Climate Governance and China's Role; Post-2020 Biodiversity Conservation, taking into account China's hosting of the CBD COP 15 in Kunming; and Sustainable Ocean Use. This last topic is described briefly below.

[35]A recent survey of literature on various Chinese land use reforms and progress is Cui, W., et al. 2021. Terrestrial ecological restoration in China: identifying advances and gaps. Environ Sci Eur 33, 123. https://doi.org/10.1186/s12302-021-00563-2

[36]For further information on the SPSs within each Phase VI TF see http://www.cciced.net/cciceden/POLICY/RPR/op/

The declining condition of ocean habitats and fisheries, ocean pollution such as plastics, ocean and climate change relationships, and environmental impacts of the expanding "Blue Economy" are prominent examples of why ocean ecological and environmental concerns require integrated planning and management. CCICED first tried such an approach with a 2009–2010 TF on Sustainable Ocean Use. However, it became clear that much more work was still needed. Operating under the Global Governance Phase VI TF, a new SPS for Ocean Governance and Ecological Civilization carried out its mandate from 2017 to 2021. An SPS core team was established with five sub-teams, each covering a different aspect of ocean use (see Box 10) and working for varying lengths of time. In effect, this was a re-invention of our much earlier WG concept, but with one significant difference: Now there are clusters of SPSs, with each cluster operating under the guidance of one of the four task forces.

Box 10. Components of CCICED SPS on Ocean Governance and Ecological Civilization

CCICED 2017-2021 Ocean SPS

Overview Final Report

Global Ocean Governance and Ecological Civilization

(Presented at 2021 CCICED AGM)

Ocean SPS Sub-Reports

(Reports submitted to individual AGMs)

Integrated Ecosystem-based Ocean Governance

Living Marine Resources and Biodiversity

Marine Pollution, Especially From Land-Based Sources

Green Shipping and Maritime Operations

Renewable Energy Systems

Ocean Mineral Resources Extraction

Undoubtedly, there will be further thinking during CCICED Phase VII about how to extract more value by continuing to optimize research design. It is important to do so, given the strong interest in taking integrated approaches to policies and the urgency created by mainstreaming of E&D at both the national and international levels.

(2) Modelling and scenario development

Many of CCICED's initiatives involve various models, including those for economic projections and complex land-use allocations over time, drawing together information on important matters concerning choices for biodiversity conservation and for climate change or other topics related to longer-term changes. The most interesting and ambitious undertakings have been to examine scenarios for future potential situations in China or globally. Our first suggestion along these lines was made in 2002 to the State Council as follows:

CCICED recommends the development of scenarios that would explore the implications of developing a sustainable national economy. Such scenarios should draw upon quantitative and qualitative information on cross-sectoral impacts of sustainable development strategies, introduction of new technologies, and other factors. And the scenarios should take into account the impacts of various international financial, security, environment and development conditions.[37]

Most of our work on scenario initiatives was undertaken in the middle part of CCICED's existence, notably during Phases IV and V. Studies were undertaken with some of the world's leading experts in this field drawn from research organizations in Europe and elsewhere. While the scenario work proved to be stimulating, the most ambitious efforts simply did not seem to resonate with policy decision-makers to the extent expected. It is a puzzle why that should be the case.

One of the most interesting CCICED longer-term scenario efforts was the 2016 China Green Transition Outlook 2020–2050 TF. There were two reports from this group: a jointly prepared document related to China's domestic E&D potential situation by 2050 and a report for CCICED prepared by our Dutch partner, PBL[38]. The latter document covers global matters related to an array of possible outcomes based on China's E&D efforts.

In October 2019, CCICED held a workshop on how scenario tools might provide added value to several recent SPSs (Green Finance, Global Green Value Chain, Major Green Technology Innovation and Implementation Mechanisms). Chinese and international experts on climate change and from the PBL Netherlands Environmental Assessment Agency on socio-economic scenario methods provided inputs on recent practices. CCICED continues to believe that scenario development can play an important role in our studies and recommendations.

(3) China's "Ecological Footprint"

The Living Planet Report[39] prepared by the WWF in cooperation with the Global Footprint Network has garnered considerable attention throughout the world, and versions have been prepared for various countries. Starting from 2008, CCICED worked with WWF China and other partners to produce a series specifically addressing China's ecological footprint as a tool to measure demand for and consumption of natural resources. The measure is intended to compare human consumption of resources in relation to the planet's regenerative capacity (biocapacity). It is possible to compare different countries and to examine different consumption levels in varies parts of the country and in cities compared to rural areas. The report also was issued in 2010, 2012, 2014, and 2015.[40] This work is cited internationally and documents China's growing ecological deficit and ecological debt. In the 2015 report, a number of suggestions were provided in relation to the construction of China's ecological civilization. The work continues via the Ecological Footprint Network and will be of ongoing value, including information on China's carbon footprint. Currently, China's aggregate carbon footprint is the largest in the world as a consequence of its large population, its urban consumption habits, and its role as a major exporter of finished products.

(4) CCICED Issues Paper

Since 2002, this document has been prepared for each AGM as a means of keeping CCICED members and others associated with the organization informed of current E&D issues within China and internationally. It is a means of providing an overview that fills in the gaps among the research reports for any particular year's theme. Generally, 8 to 10 specific issues are identified and interpreted. This document is independently prepared by the Chief Advisors, with considerable review and input from the Chief Advisors Group and others. Often the paper takes a longer view of problems and is considered to be a thoughtful review of concerns that need to be aired. At the same time, the intent is to find new pathways and positive ways to solve problems.[41]

The 2014 Issues Paper From Tipping Point to Turning Point is one of the best examples. It was produced soon after China's government had forcefully tackled the major environmental and political problem of the 2013 "tipping point" for air quality caused by PM2.5 air pollution. How to reach a "turning point" towards improved conditions and avoid further tipping points is the question for this problem and others. The final point of this 2014 Issues Paper was that, especially for pollution, the information base at the time was not broad enough in scope. Further, the existing indicator set was inadequate for the task. We called for modelling and scenario development that was not available in China at the time for understanding and acting on ecological civilization needs in a timely fashion.

[37]See CCICED Annual Policy Recommendations 2002. http://www.cciced.net/cciceden/POLICY/APR/201608/t20160803_74626.html
[38]Bakkes, J. et al. (2017). The Worldwide Context of China's Green Transition to 2050. PBL Netherlands Environmental Assessment Agency, The Hague.
[39]www.cciced.net/cciceden/NEWSCENTER/CCICEDActivities/201910/t20191031_100968.html
[40]https://www.zujiwangluo.org/living-planet-report-2015-draft/ ; https://d2ouvy59p0dg6k.cloudfront.net/downloads/chna_footprint_report_final.pdf

[41]See Annex 2 for a full list of the CCICED Issues Papers. All the Issue Papers are available . A book compiling CCICED Issues Papers from 2012-2016 has been released by the CCICED Secretariat.

Chapter 5. CCICED's Work in Detail

Substantive policy recommendations emerge at the CCICED AGM after considerable dialogue about themes and priorities within each main theme, as well as mutual probing of issues by Chinese and international members. In these discussions, there is an attempt to understand the most significant factors, what might be visionary in scope, and time frames for change. Included is the need to account for the effects of extremely high economic growth rates, limited capacity in environmental governance, and other institutional strengths and weaknesses, especially at local levels. Mayors and other provincial and local officials, specialists in various fields, etc. are often tapped for their views on specific topics. In recent years, this input has been expanded through Open Forums held during CCICED AGMs (see Chapter 6.)

Understanding and agreeing with each other

Language use within China often deviates from international descriptions of environmental solutions, often leaving international CCICED members and research participants with a need to understand subtleties, for example, what is meant by "ecological construction," "five in one," "ecological barriers and shields," etc. On the other hand, in earlier times especially, concepts such as "demand driven" proved to be puzzling for some Chinese CCICED colleagues. Such situations have lessened, but not completely. Therefore, the crafting of mutually understandable recommendations in two very different languages can be a lengthy, difficult process. Structuring suitable approaches to work plans—even defining what constitutes theory and practices—can be difficult.

Seeking green policies with "Chinese characteristics"

Whatever the origin of policy approaches, they must be crafted with careful consideration of how they can be made to work well in national and local settings within China. For example, how to deal with environmental impacts of development such as Township and Village Enterprise (TVE) smelters in the early phases of CCICED; greening a "socialist market economy"; very rapid urbanization where there are disparities due particularly to the hukou system; extreme dependence on coal as the largest single energy source for electricity; the profile of a green Chinese economy; measures of institutional strengths and weaknesses in the Chinese system; approaches to biodiversity and nature protection in a nation of 1.4 billion people; and green transportation. Box 11 provides insight into how such imperatives play out in CCICED discussions and approaches. Both international and Chinese participants have learned a lot in the process. Chinese senior leaders sometimes have commented that the development of mutual understanding of the nature and significance of Chinese characteristics is an important element of success on the part of CCICED.

Box 11. Some green policies with "Chinese characteristics"

specially in early CCICED phases, concern about off-the-shelf solutions being ill-suited for the Chinese economy, business, and governmental practices led to many efforts trying to understand what should be altered. This was especially true regarding some economic tools that were deemed to be difficult to implement in a "socialist market economy."

- Concern for advice about using imported species for ecological restoration (grasslands, forested lands).
- Ensuring respect for ancient Chinese approaches related to water management, land use, and cultural practices.
- Urban design and planning, including traditional buildings vs. high energy demand for skyscrapers with sealed windows, etc.
- Small vs. large-scale initiatives for industrial transformations, rural and urban development, transportation, and technology choices.
- Wariness towards new concepts being advocated by the international community, for example, initial mixed responses to a low-carbon economy, some international green certification programs, acceptance of non-mercury alternatives in manufacturing and use of mercury thermometers in hospitals, traditional Chinese medicine (TCM) components involving wildlife and plant conservation concerns, social behaviour for conservation and for sustainable production and consumption, circular economy.
- Design of work-around needs and solutions for addressing issues of S&T limits, especially for innovations regarding such matters as rural sanitation, novel approaches to climate change, and some aspects of biotechnology.
- Important means such as pilot initiatives for creating adaptations that will help make Western innovations function well in Chinese settings.
- Applying Chinese "advantages" for building hybrid national and international markets. The advantages are a combination of reaching out to a large domestic market, low production costs, rapid innovation, and rapid international marketing—for example, solar and wind commercialization.
- Understanding Chinese characteristics related to governance issues such as administrative silos; overlapping jurisdictional situations; unworkable arrangements between central and local governmental bodies; top-down, limited participation situations; weak legal and enforcement situations; and inadequate information sharing.

Social Development, Gender, and Poverty Elimination

Building understanding, policy, and follow-up action for social development issues and linking these to environment and economy concerns is seen as among the most difficult tasks for sustainable development. This is true for rich countries, emerging economies, and poor nations. It is why social development is so prominent in today's UN 2030 SDGs and in the earlier UN MDGs.

In its work and recommendations regarding social aspects, CCICED has focused particularly on public participation in development decisions, for example, in relation to EIAs of projects, access to information, people-centred development strategies, gender aspects of E&D, CSR and environmental, social and governance criteria, environmental health, eco-compensation, environmental risk assessment, sustainable consumption, and quality-of-life issues. Annex 3 provides a list of the topics covered by research teams arranged under 11 topic areas. The list indicates some of the subjects noted above, for example, a successful 2008 report on Environment and Health Management System and Policy Framework. Another example is a 2015 SPS on Eco-environmental Risk Management. A number of important studies have been carried out on eco-compensation, a topic that has been essential for addressing poverty reduction in rural areas.

The theme for the 2013 CCICED AGM was "Environment and Society." It included two TFs: (1) China Environmental Protection and Social Development and (2) Sustainable Consumption and Green Development. In addition, there were several SPSs, including Media and Public Participation Policies on Promoting China's Green Development and Corporate Social Responsibility in Green Development in China. The CCICED Issues Paper for this AGM provides an expansive overview of both the social development problems and the considerable progress achieved to date, plus 10 major policy issues.[42]

CCICED started its work just a few years before the 1995 UN's World Conference on Women held in Beijing. Yet during the 25th Anniversary Commemorative Summit of the 1995 Conference, UN Secretary-General Guterres noted that despite gains in some areas such as the education of girls worldwide, "the ambitious vision of the Beijing Declaration remains unfulfilled." The China Progress Report for the 2020 Summit indicated that some "blind spots" remain in gender mainstreaming within China. Three recommendations by the PRC government regarding the environment were proposed to address these blind spots:[43] (1) "incorporate a gender perspective in environmental legislation and policy development"; (2) "further safeguard the rights of women and other beneficiaries to participate in environmental decision-making"; and (3) "further strengthen the collection, analysis and use of gender statistics in

[42]https://cciced.eco/wp-content/uploads/2020/06/2013-Issues-Paper-Environment-and-Society.pdf
[43]PRC. Comprehensive National-Level Review Report on the Implementation of the Beijing Declaration and Platform for Action. https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/CSW/64/National-reviews/China%20English.pdf

the environmental field."

Efforts to incorporate gender parity as a key element of CCICED's overall design and research initiatives began in the middle stages of its activities after considerable dialogue. How gender and some other social features should play out in CCICED organizational matters is spelled out with some clarity: CCICED "upholds the values of diversity, inclusiveness, and sharing. It aspires to a balance in gender, region, nationality and areas of expertise, and will increasingly involve youth, the private sector and civil society in its research and activities."[44] A valuable contribution is a detailed 2019 CCICED Gender Tool Kit[45] prepared after internal workshops and other discussions, including with donor partners. The kit provides comprehensive guidance to CCICED staff and researchers, with special attention given to all stages of work, from proposal formulation to the preparation of policy recommendations. It also notes that "the Executive Committee of the CCICED is committed to working towards increasing gender parity among those selected to join the Council, its advisors and its constituent bodies such as the Secretariat and the Executive Committee." A progress tracker is proposed for this purpose. [46]

During 2020 and 2021, a concerted effort to expand gender considerations was undertaken, with good participation by eight SPSs. An independent report on the results[47] was prepared in September 2021 based on each SPS's gender-related content. This report noted three important overarching findings: (1) gender equality should be seen as a "multiplier of sustainability"; (2) gender equality awareness and action must be mainstreamed into environmental policies, strategies, and programs; (3) women have important roles to play as stakeholders and as agents of change (women as leaders of social networks, as gatekeepers and communicators, as conscientious consumers, or as entrepreneurs).

The independent report suggested seven ways to strengthen the integration of gender within future CCICED research: (1) commission a dedicated gender analysis for each SPS topic; (2) provide gender training specific to each SPS topic; (3) encourage each SPS to integrate gender considerations as a standard of practice; (4) mandate the inclusion of a section on gender equality and its intersection with the topic of each SPS; (5) appoint a gender focal point for each SPS team; (6) mandate the inclusion of a gender-focused case study or example within each SPS; and (7) mandate the inclusion of a minimum of one gender-focused recommendation in each SPS. This advice will be helpful for planning new Phase VII initiatives.

Phase III of CCICED ran parallel to the key period of planning and follow-up to the 2002 Johannesburg Earth Summit, where poverty and environment linkages were highlighted. CCICED Phases IV and V were very important times for initiatives related to the UN MDGs and also for addressing needs covered in the powerful Rio+20 Conference final document: The Future We Want. In 2012, the Rio+20 Earth Summit set the stage for the later preparation of the UN 2030 SDGs, and various other E&D advances we are seeing play out worldwide in China now. It is noteworthy that, for the Rio+20 Earth Summit, Premier Wen Jiabao requested that CCICED organize a high-level Roundtable, which the Premier chaired, covering a range of topics, including some of the important social development and environment linkages.

While China has attained great success with poverty elimination, that is still not the case worldwide. China's extensive international development efforts, including greening of the BRI, can be of help in many locations around the world. Furthermore, with China's growing domestic prosperity comes the issue of income distribution and concentration of wealth within China. In recent times, attention in China is being given to "Common Prosperity" as a means of improving domestic wealth distribution.[48] In essence, this means finding new ways to ensure that everyone benefits financially and in terms of access to development achievements. It is a call for moderate lifestyles, as well as fair distribution of benefits related to new technologies and a better balance of opportunities available to those living in rural areas in comparison to urban areas. There are both immediate (i.e., 14th FYP) and longer-term (2030–2035 and beyond) implications for China's sustainable development and ecological civilization initiatives.

[44]https://cciced.eco
[45]https://cciced.eco/wp-content/uploads/2020/09/cciced-2019-en-toolkit-for-gender-equlity-and-womens-empowerment.pdf
[46]"Tool #10 - Gender Participation Tracker" in the CCICED Gender Tool Kit
[47]CCICED Secretariat. (2021, September). Report on Gender Mainstreaming in SPS Research for the Period 2020-2021. https://cciced.eco/wp-content/uploads/2021/09/cciced-en-2021-report-on-gender-mainstreaming-in-sps-research-for-the-period-2020–2021.pdf
[48]See translation of President Xi Jinping 17 August 2021. To Firmly Drive Common Prosperity. https://www.neican.org/to-firmly-drive-common-prosperity/

Snapshots of five CCICED themes for policy research

There are multiple ways to cluster CCICED's research topics, and it is important to note that considerable interaction takes place among particular themes. For example, air pollution control involves transportation, urban design, industry, agriculture, and other topics. Annex 3 provides a list of 11 categories used by the SFU SISO team in their archiving of research initiatives (mostly between 1996 and 2018). The list is not complete, but the bracketed numbers provide a sense of how many initiatives were covered under each. The topic areas they suggested were: Economics, Investment, Finance and Trade (15); Ecosystems and Biodiversity Conservation (13); Energy, Environment and Climate (8); Governance and Rule of Law (9); Individual and Enterprise Concerns and Responsibilities (4); Planning for Sustainable Development, Conservation and Environmental Protection (17); Pollution Prevention, Control and Mitigation (9); Regional and Global Engagement (10); Urbanization, Industrialization and Transportation (8); Science, Technology and Innovation (5).

The top three themes noted above are planning for sustainable development and environmental protection; economics, finance, and trade; ecosystems and biodiversity conservation. The fewest activities are sustainable consumption related to individuals and enterprise concerns such as social responsibilities, as well as innovation related to S&T. Some themes—for example, the BRI and on Ocean Sustainability—are separated into their own categories during the recent years of CCICED Phase VI. It is important to recognize that while innovation (and also enterprise concerns and responsibilities) seem underrepresented, they also are researched in reports classified under other categories.

We have identified five major transformative change themes (Box 12), with somewhat different titles than those in Annex 3. Each reflects an overarching theme closely followed during all three decades of CCICED initiatives. They are by no means the only important examples we could have highlighted. All five draw from activities that stretch from Phase I to Phase VI of CCICED, albeit with periodic shifts in titles, objectives, content, and individual research team compositions.

For each theme in Box 12, our understanding and advice have evolved over long periods of time. They have served as some of the most important pillars of our work. These cases demonstrate how CCICED has been able to leverage knowledge gained over decades of work in order to shift attitudes and policies not only within China but also to build understanding and changes beyond national boundaries. We have selected one, Harmonious Relationship of People and Nature, for detailed examination (see Annex 4) using information drawn from the recommendations document submitted to the State Council after each CCICED AGM. This topic was selected because it is aligned very much with China's determination that its society should become an ecological civilization. For the remaining four examples, we provide truncated timelines and transformative CCICED recommendations regarding each. This is done for the sake of brevity. Full information is accessible online in the archived Recommendations to State Council materials available from each year's CCICED AGM.

Box 12. Five examples of transformative change in CCICED E&D frameworks studied by CCICED

Harmonious Relationship of People and Nature

Comprehensive Pollution Control and Prevention

Energy, Climate Change and Low Carbon Economy

Green Finance, Investment, and Trade

Environment and Development Governance

(1) Harmonious relationship of people with nature: CCICED recommendations timeline

The basis of CCICED recommendations on "People and Nature" relates to a number of significant interests, including biodiversity conservation and species loss; ecological restoration and habitat protection—including addressing impacts of deforestation, grassland and wetland destruction, and desertification; and heavy demands from many types of agriculture and marine ecosystems in danger and declining fisheries (freshwater and marine). In addition, there has been a strong interest and need to preserve and enhance ecological services via rural and urban ecosystem planning and management, water basin management, and marine and coastal management. Also, recommendations to address ecological and environmental concerns of Chinese impacts globally and regionally through trade and investment abroad including supply chain issues; ecological and environmental issues of Chinese business activities abroad; and, broadly, China's growing ecological footprint globally. China's bordering lands and freshwater bodies involve 14 other countries, and there are significant land and water, species migration, public health and other matters affecting harmony between people and nature. In addition, China shares maritime boundaries with several other countries, such as Japan and various South China Sea countries. Chinese ancient belief systems that "man and nature" must live in harmony are a fundamental part of today's concern for building an ecological civilization approach.

The need to realize these very broad aspirations via green development is urgent but also has both immediate and long-term efforts. This point is repeatedly made by China's leaders, most recently by Xi Jinping during a field visit to the 700 km2 Saihanba Forest Farm in Hubei Province on August 23, 2021. This location is considered a "Green Lung of Beijing," since it is a recovery from desertification through a provincial effort to "develop integrated management of the mountain, forest, lake and sand landscape…" The President noted that "The whole party and the people of the whole country must carry forward this [Sahihanba] spirit and develop a green economy and ecological civilization."[49] His visit came a little more than two months before China's hosting of the first round of two global CBD COP 15 meetings in Kunming. Transformative change has already taken place in China regarding the protection of nature, and much more will be done before the mid-century CBD global goal of a new, more harmonious relationship between people and nature. This topic is one of the most well-covered subjects by CCICED—with nature recommendations to the State Council in 22 out of 30 years, as noted below.

Phase	1 (92-96)	2 (97-01)	3 (02-06)	4 (07-11)	5 (12-16)	6 (17-21)
Years	2	5	3	2	5	5

During CCICED Phase I, the initial baseline recommendation came in 1993 with extensive follow-up, as noted below and in much more detail in Annex 4.

Baseline (1993 CCICED Recommendations)

China is rich in biodiversity. Its continued destruction could do enormous damage to the economy by weakening its natural base and depriving China of its potentialities for future food, medicine and other materials. It is necessary to: strengthen the system of terrestrial and aquatic protected areas; restore degraded habitats to ecological productivity; in order to achieve this, enlist the indispensable help of local communities; and cooperate with neighbouring countries to work out regional agreements on the prevention of trade in endangered species.

1996 CCICED Recommendations

[49]South China Morning Post (SCMP). 24 August 2021. China's Carbon Neutral Goal: Xi Jinping Visits Historic Tree Farm to Highlight Green Targets. https://www.scmp.com/news/china/politics/article/3146210/chinas-carbon-neutral-goal-xi-jinping-visits-historic-tree-farm

…new efforts [are needed] to explain and demonstrate the vital importance of biodiversity within the Chinese economy and the Chinese way of life; improvement in monitoring and managing natural resources; establishment of new mechanisms for protecting natural resources, including fiscal means; better protection of forestry; above all more association of rural populations with conservation and restoration, so that they have a stake in it. Social and economic, as well as biological factors need to be taken more into account.

Later Phases of CCICED Recommendations

In later CCICED Phases, nature and ecological recommendations become increasingly complex, with shifts away from the initial considerations focused on biodiversity, nature reserves, and illegal wildlife trade. Much greater attention was given to topics related to sustainable agriculture, the urgent need for forest and grassland protection, ecosystem protection and restoration, and emphasis on ecological services. From 2006 onwards, topics began to include the examination of large units, such as river basin management, especially the Yangtze River, "mountain to sea," and other comprehensive topics. Throughout, emphasis has been on the need to adequately compensate poorer upstream communities for their role in protecting often much richer cities and downstream rural areas that benefited from better ecological conditions. The topic of eco-compensation has become highly sophisticated and continues to be refined with inputs via CCICED and others to the present time. By 2010, climate change impacts had entered the picture, with complex themes such as carbon sequestration.

Over the past decade, emphasis has been placed on ecological health in broad terms and its linkages with human health, most recently with the concern for COVID-19 and also matters such as environmental risks. A neglected topic during the first 18 years of CCICED concerned unsustainable practices in the use of the oceans and coastal areas. Major efforts and recommendations were made in 2010¬–2012 and again during the entire period of Phase VI. This work has been very productive and produced a stream of recommendations to the State Council. The policy needs regarding Nature have included considerable economic work related to natural resource matters; new law on subjects related to the development of functional zoning—and especially ecological redlining; studies on important green finance topics, including valuation and taxation of resources and eco-ecological attributes; and the distribution of benefits related to biodiversity and ecological conservation. With the rise of eco-tourism and other benefits such as urban green space, as well as sustainable consumption, including green food production opportunities, it is clear that nature-based studies will continue to hold a strong place in future CCICED efforts.

During the last two CCICED Phases, ecological civilization has become a theme of considerable significance guiding research topics. The shift towards ecological subjects provides a more comprehensive base for identifying synergies and co-benefits and is in keeping with international trends towards recognizing linkages involving complex systems. This is reflected in the growing capacity within CCICED and in Chinese policy circles towards dealing with multiple drivers of major problems.

This brief overview hardly gives a full picture of the work carried out by CCICED on the topic of the "Harmonious Relationship of People with Nature." A more fulsome compilation of key recommendations on People and Nature from 1992 to 2021 is presented in Annex 4. Even this extraction from individual years of recommendations is incomplete. The full recommendations for each year are available online. Also, the main reports on specific topics generally have detailed policy recommendations targeted to specific units of government and other audiences.

(2) Comprehensive pollution control and prevention: CCICED recommendations timeline

CCICED Phases I–II, 1992–2001

Baseline 1994: Control of pollution requires detailed knowledge, which can only be gained through rigorous monitoring. It must form part of integrated environmental policy planning, which in turn must form part of economic planning as a whole. It is necessary to put sufficient resources into monitoring; to establish a sound database on environmental quality with projections for the future; to focus on clean technologies and clean production methods; to ensure better coordination between local, provincial, and national authorities with a staff training program; to make more and better use of such policy instruments as licences, levies, fees, incentives, and disincentives; to set priorities for action in meeting the specific goals in the area identified in China's Agenda 21 report; to draw upon the experi-

ence and up-to-date technologies of industrial countries, while recognizing cost factors, with the aim of reducing further damage to the environment.

1996 Formulation of an Urban Water Conservation and Environmental Pollution Plan, covering all water issues including supply, saving, recycling, and waste disposal; establishment of rural, inter-city, and inter-provincial Commissions covering such environmental problems as acid rain in defined geographical areas; new means for preventing and disposing of industrial and toxic wastes…

2000 The old practice of "taking treatment measures only after pollution has already occurred" and "end-of-pipe treatment" should be avoided. In other words, the traditional industrial stage characterized by heavy environmental pollution should be leapfrogged.

CCICED Phases III–IV, 2002–2011

2004 Develop a national strategy to control non-point pollution (NPP)…formulated in the context of IRBM and actions to limit the overuse of irrigation, global concern for greenhouse gases, agricultural policies, and better control of point sources such as village and town sewage and wastes from intensive animal production.

2006 Enhance environmental management in the countryside…improve access to clean drinking water…promote development of methane digesters, as well as solar and renewable energy sources…study potential carbon sequestration of altered agricultural practices…extend the concept of Circular Economy to agriculture, reduce greenhouse gas emissions and long-range air pollution.

2007 Adopt the "Five Shifts" approach and examine how it could be implemented in not only the 11th but also the 12th and 13th FYPs: (1) move to a focus on reducing total emissions and specific improvements in environmental quality; (2) move from an over-reliance on reducing pollution from selected industries to reducing pollution from all industries; (3) move from total control of single pollutants to the coordinated control of many pollutants; (4) move from increasing the number of pollution reduction projects to increasing their quality; and (5) move from reliance on administrative mechanisms to greater use of market-based instruments.

2007 Establish China's Environmentally Sound and Strategic Management of Chemicals System…strengthen capacity building to carry out effective testing, evaluation, monitoring… A long-term action plan for risk assessment should be developed. Chemicals with high risks to health and environment...should follow clean production and green chemistry concepts. The strategy should be WTO compliant…[Adopt] a special law or administrative regulations on chemical environment administration…should establish a basic institutional system on chemical environmental administration…[including] a publication system for toxic chemical pollutants so that the Chinese public is informed and can participate in the government decision-making on chemicals management.

CCICED Phases V–VI, 2012–2021

2012 Integrate regional environmental capacity, optimize economic structure and layout, and establish a new regional joint control mechanism. Deepen industrial pollution control, advance SOx emission reduction, establish industrial NOx control system focusing on power and cement sectors, deepen industrial smog pollution control, and enhance VOCs pollution control from typical sectors and sources. Multiple pollution control is essential if good air quality is to be secured… Develop, maintain, and update scientifically sound pollution inventories.

2013 Focus greater effort on the resolution of prominent environmental issues such as air, water, and soil pollution, in order to meet basic public demands for a healthy environment.

2014 Develop a broader regional air pollution control mechanism robust enough to stop severe air pollution and to restore air quality...Adopt a science-based regional approach for atmospheric management....Launch comprehensive pollutant control of industrial sources, domestic and rural non-point sources, and mobile and non-road equipment sources.

2014 Improve economic incentive policies for motor vehicle pollution control...Motor vehicle fuel surcharges should be introduced at a proper time in order to lower the intensity of vehicle use…A new air pollution control fund could be funded from the fuel surcharge…Use fiscal and taxation measures to promote the phasing out of yellow label and old vehicles.

2017 Create a 15-Year Strategy for War on Pollution Action Plans...there should be a longer-term and integrated effort focused on cost-effectiveness, synergies, and ways to build public confidence about eventual results from the War on Pollution.

2018 Strengthen green development performance in the Yangtze River Economic Belt (YREB)...continue efforts to reduce the volume of solid waste pollution causing serious water pollution in upstream and downstream areas through to the oceans; (ii) develop economic incentives for collecting and disposing of solid wastes; (iii) promote the recycling of waste materials and reduce the incineration rate; (iv) improve livestock and poultry farming pollution control measures; (v) improve the performance of wastewater treatment plants and treatment of sludge; (vi) pay more attention to social concerns through public awareness campaigns on solid waste treatment and recycling activities.

2018 Formulate a national action plan for marine debris pollution prevention and control. Speed up the research and application of innovative approaches for substitution of plastic products and for waste treatment.

2019 Strengthen regulations and risk prevention for chemicals, nanomaterials, and other substances by providing ongoing risk assessment and risk management for legacy as well as new chemicals, including assessing the acute and chronic effects of new nanochemicals.

2020 Promote Circular Economy Solutions and Implement Extended Producer Responsibility (EPR)…with implementation of the early 2020 MEE–NDRC joint announcement on plastics, as well as setting guidelines to reduce plastics and packaging waste in e-commerce, logistics, and related systems; implementing waste separation and sorting to improve the plastic waste recycling system; and reducing and eliminating single-use plastics. Strengthen CSR related to green consumption, waste reduction, and improve waste recovery will also be crucial…

2021 Establish and improve joint scientific and technological research mechanisms to improve science-based marine and oceans management, including tackling marine pollution from point and non-point sources. Strengthen pollution prevention and control with integrated land and sea management. Bolster the monitoring and traceability of mercury pollutants, tackle marine plastic and micro-plastic pollution at the source, reduce plastic waste, and enhance the capacity of waste management and disposal.

2021 Adopt an assessment system covering the entire life cycle of products in the steel industry, including developing standards, assessment measures, and certification schemes for eco-design in the steel industry to encourage synergies in carbon emission reduction and pollution control. Advance green taxation reform in the automobile industry and implement tax policies to encourage the use of hydrofluorocarbons (HFC)-free technologies. Apply eco-design concepts and methodologies, as well as stronger disclosure and public participation mechanisms, to ensure the minimal environmental footprints of waste incineration facilities, creating livable habitats for people.

(3) Energy, climate change, and low-carbon economy: CCICED recommendations timeline

CCICED Phases I–II, 1992–2001

Baseline 1993: Energy is critical. At present, dependence on coal is a prime cause of pollution and contributes to global as well as local climate change. It is necessary to promote energy conservation and efficiency in domestic and industrial use, clean coal technologies, and alternative renewable sources of energy…China should make efforts to reduce atmospheric carbon emissions, which are related to international efforts.

1996 Reduction of dependence on coal as a long-term strategy; development of new technologies for its use, particularly beneficiation, gasification, desulphurization, and liquefaction; increase in the role of natural gas, importing supplies as necessary; development of alternative energy sources, including agro-energy, biomass, wind and solar, with demonstration projects where appropriate; continuing emphasis on energy saving and efficiency through removal of artificial obstacles and adoption of best new methods; creation of a legislative framework for prices, taking account of environmental and social costs; further development of the national plan for coping with such global problems as climate change.

2000 For western China, wind energy resources (accounting for half the national total) should help to

meet energy demand not only in the west but elsewhere in China. Ambitious Renewable Portfolio Standard (RPS) policies should be put forward at the national level to ensure that power supply departments include a percentage of green electricity (i.e., generated from renewable resources) in their supplies, either self-generated or purchased.

2007 Combine the endeavours of energy conservation and pollutant emission reduction in China with that of CO2 emission reduction…[to] begin moving towards a pathway in China consistent with global efforts to achieve a low-carbon economy in the future.

CCICED Phases III–IV 2002-2011

2008 China should consider specifying low-carbon economy-related targets in the 12th FYP for economic and social development and incorporate the low-carbon economy in current strategies and actions.

2009 Based on both the international and national contexts, China should develop a national Low Carbon Economic Development Plan as soon as possible, including strategic objectives, specific tasks, and measures. Low-carbon pilot demonstrations should be initiated within key industrial sectors and within selected urban and rural locations. Low-carbon economy lifestyles and opportunities should be promoted widely to China's citizens.

2011 Map out a development plan for low-carbon industrialization in China with carbon intensity targets set for main heavy industrial sectors…Improve the regulatory and voluntary standard system for low-carbon production and products…Build a low-carbon industrial system that champions and supports the green transformation of economic development mode.

CCICED Phases V–VI, 2012–2021

2014 Make great efforts to improve the energy efficiency of major coal-consuming sectors, such as power plants and industry. China should continue to increase the proportion of coal washing and promote only clean coal technologies.

2017 Clean coal and synthetic natural gas for power generation should be transient technologies, bridging from old to new during China's green transition. Large-scale deployment of "clean coal" needs an exit plan and an exit budget to protect China from being locked into a path of prolonged fossil fuel use.

2017 Through co-benefits, China's pollution reduction plans can contribute to a steady transition for meeting the Paris targets of staying within a global 1.5 to 2°C temperature increase. Action on black carbon sources will also reduce PM2.5 pollution and ozone pollution. Action on methane emissions will become very important. Monitoring of co-benefit results is essential…Prime cases are the Yangtze River Economic Belt and the Hebei-Beijing-Tianjin region.

2018 Tighten coal control policies and the promotion of renewable energy and energy efficiency. Specifically, China should end coal quotas and long-term contracts, control industrial coal use and help coal-dependent provinces to transition to other sources of prosperity…In terms of efficiency, China is well positioned to lead in the implementation of the Kigali Amendment to the Montreal Protocol by introducing world-leading standards for domestic and exported air-conditioning and demonstrating centralized cooling at scale.

2018 Upgrade China's contribution to global climate governance through enhanced action on climate change mitigation within China.

2019 Develop a clear vision of China's low-carbon development: Through an updated Nationally Determined Contribution, set new targets to attain GHG emissions peaking for key sectors and certain regions during the 14th FYP and set an emissions cap during this period. Develop decarbonization pathways to 2050. Accelerate reductions in the total use of coal and expand renewable energy use. Climate mitigation targets should comprise carbon dioxide and other GHGs, including HFCs, methane and other short-lived climate pollutants…Activate the carbon market…

2019 Climate adaptation plans should be integrated into national and local government planning. Seek synergies between climate adaptation and freshwater management, biodiversity conservation, marine governance, human health protection, and green infrastructure.

2019 Strengthen research, development, and promotion of major low-carbon technologies, such as energy storage technologies, carbon capture and storage (including both nature and technology based), photovoltaic efficiency-improvement technologies, long-term battery storage, and other areas of low-carbon/zero-carbon innovation.

2019 Promote technological innovation in urban infrastructure and energy systems, including expanding urban green and nature-based infrastructure and green zones; high-standard green buildings; clean, low-carbon energy systems; stringent energy-efficiency standards for consumer goods like appliances; cooling and lighting systems; and establishing a circular economy system covering waste reduction, sewage treatment and waste disposal.

2019 Incorporate climate change into the Central Environmental Inspection Program...Integrate climate change tasks into the existing supervision system for eco-environmental protection.

2020 Pursue ambitious climate targets with energy transition at their core to build a low-carbon society: This will involve building a clean, low-carbon, safe and efficient energy system while setting more ambitious and binding targets for GHG emission reductions—e.g., setting an absolute cap on carbon emissions for 2025 and 2030. Emission caps should also include non-carbon dioxide emissions, notably methane and HFCs.

2021 Coordinate and implement the carbon peaking and carbon-neutrality targets…Institutionalize China's high-level central working group on carbon peaking and carbon neutrality to advance…development of carbon-neutral interim targets, timetables, and action roadmaps. Encourage those provinces and cities that have rich endowments in renewable energy, as well as the sectors that produce power, steel, cement, and other high-carbon industries to reach peak CO2 emissions ahead of schedule. By 2050, build a carbon-neutral economic and social system, striving to reach near-zero CO2 emissions…Update the Nationally Determined Contributions plan prior to the Glasgow UNFCCC COP 26, with a view to closing the gap between collective global ambitions and the Paris Agreement targets. Establish an absolute carbon emission cap control system… Reserve a policy window for introducing a carbon tax for key sectors not covered under the emissions trading system… Implement climate-friendly air pollution prevention and control strategies…Strengthen the legal basis for the climate transition… Accelerate the decarbonization of the manufacturing sector…paying special attention to achieving high rates of renewable energy penetration with minimal biodiversity impacts…Set out clear targets, timetables and detailed green investment roadmaps to achieve carbon peaking before 2030 and carbon neutrality before 2060…Fully implement climate risk disclosure and climate risk reporting. Encourage innovation in climate investment and in financing products and instruments, initiate local pilot projects, and develop an applicable, efficient, and advanced classification standard system for climate investment and financing. Actively phase out fossil fuel subsidies…Collaborate with the Belt and Road South–South Cooperation Initiative on Climate Change and the Green Silk Road Envoy Program.

2021 Address equity and justice issues that may arise from the green transition prudently, especially employment and economic development in coal-reliant areas. Advance gender equity in this context. Develop coal phase-out mechanisms. Consider solutions such as resettlement compensation and employment transition. Establish dedicated funds for a just transition and the orderly phase-out of coal for the upgrading of high energy-consuming industries and for the inclusive transformation of underdeveloped areas.

2021 Ensure that carbon peaking and carbon neutrality form the strategic foundation of green urbanization and spatial planning…

(4) Green finance, investment, and trade: CCICED recommendations timeline

CCICED Phases I–II, 1992–2001

Baseline 1993 (Green Finance and Investment): Correct valuation and pricing of resources is the key to a sustainable economy. It is necessary to develop and adopt resource pricing policies which reflect environmental and social costs; remove inappropriate subsidies; improve the present National Economic Accounting System by incorporating environmental costs into it; and develop and use economic and fiscal instruments for environmental management and pollution control… Allocate adequate funds to support the implementation of environmental laws, standards, and regulations.

Baseline 1996 (Trade): Integration of environmental factors into foreign trade policy, especially in

relations with Asia-Pacific Economic Cooperation and the World Trade Organization; strengthening of the eco-labelling program with a view not only to domestic consumption but the promotion of exports of environmentally friendly products; promotion of green foods through the application of standards to reduce current agricultural dependence on chemical inputs…

2000 Relevant environmental tax reform should be implemented. Environmental taxation should be adopted as a market instrument so as to reflect environmental costs and promote the commercialization of sustainable technologies. The pollution fee collection system and other environment-related taxes could be unified into a coordinated and efficient environmental taxation management system.

2000 (Investment) Integrated investment policies for sustainable development should be established. Incentives (such as tax reduction or exemption) should be created to encourage investment into sustainable utilization of resources, high value-adding industries, and cleaner industries. Likewise, disincentives should also be created to prevent pollution-intensive industries and industries that have been banned by investors' home countries or prohibited by international environmental agreements from transferring into western China.

CCICED Phases III–IV, 2002–2011

2002 (Trade) PRC should require a strategic environmental assessment and perhaps a sustainability impact assessment be performed on the impacts of China's accession to the WTO…[and] should establish mechanisms to monitor and report on significant changes in the laws and regulations of other countries that might affect China's international trade.

2004 (Trade) Formulate a Green Trade Action Plan with policies that promote the import of resource and energy-intensive materials and products and the export of labour-intensive products, services, and technology-intensive products. The Foreign Trade Law should be amended to reflect the concept of sustainable development and to ensure the implementation of Green Trade.

2006 (Finance) [Undertake] comprehensive fiscal reform in favour of "resource saving, environmentally friendly, harmonious and sustainable development"…[including] establishment of inter-ministerial evaluation mechanisms in environmental fiscal reform... reduction and lifting of subsidies that have significant adverse impacts on resources and the environment…an eco-compensation mechanism…a gradual shift from production to consumption taxes to avoid wasteful consumption, and government procurement procedures to encourage green consumption.

2007 (Trade) Address in a more timely and effective way the environmental challenges brought by economic globalization…. While China enjoys a "trade surplus" in economic terms, it is also building a domestic "ecological deficit" generated by the export-oriented economy… China is also facing severe local impacts from illegal trade of hazardous waste…Gradually change the current growth mode of trade to adjust the relationship between trade, resources, and environment… Levy an environmental pollution tax on export-oriented enterprises with high energy consumption and high pollution, and assign costs for environmental damage to the responsible enterprises… Develop appropriate regulations for and carry out comprehensive EIAs on key market supply chains for raw products entering China… Work with other nations to ensure the honouring of international agreements and international monitoring in order to curb illegal trade in toxic wastes. Take additional steps to eliminate illegal timber trading and other such problems, including activities banned under the Convention on International Trade in Endangered Species of Flora and Fauna (CITES).

2008 (Finance) An Environment and Health Fund could be established to help compensate victims of historical environmental problems, or when the responsible party has no civil compensation capability and when it is hard to identify who should be responsible.

2011(Finance) Implement green fiscal reform, including environmental taxes such as a carbon tax and financial policies designed to improve market-based approaches and establish emissions trading platforms.

2011 (Investment and Trade) Develop a green trade and investment system, establish green supply chains, and champion a goal-oriented green transformative strategy for China's trade and investment…China should introduce trade policies that encourage the development of the green economy. A challenge for China is to consolidate its cooperation with international partners and push forward international collaboration on sustainable development, including…global transfer and application of green technologies.

CCICED Phases V–VI, 2012–2021

2013 In order to fully realize co-benefits arising from economy, environment, and energy measures, it is important to coordinate efforts for the reduction of conventional pollutants, energy conservation, and low-carbon development. Market-based long-term mechanisms, including pricing, taxation, and emissions trading, are important instruments for this coordinated effort. It is further recommended that efforts be stepped up in exploring and creating new funding mechanisms and resources for environmental protection and environmental investments.

2013 (Trade) Strengthen the credibility and independence of the Chinese green product certification system and enhance China's environmental labelling system…Strengthen sustainable public procurement and give preferential purchase treatment to products from green supply chains…Revise government procurement systems to include new energy and low-emission vehicles and make green supply chains an important indicator for procurement standards.

2014 (Finance) Accelerate and improve the eco-compensation system. Strongly adhere to the principles of "polluter pays", "those who damage must compensate," and "those who protect receive benefits." Enforce mandatory green insurance for certain sectors, such as the exploitation of petroleum and natural gas, petro-chemical industries, iron and steel, and plastic sectors.

2014 (Investment) [Adjust] policies to promote a re-balance between investment and consumption. Promote reform of the fiscal and the taxation system, administration system, hukou system, and social security system to rationalize the expenditure structure of local governments, reduce overinvestment, and improve social security and public service. Improve income allocation structure and reduce the income gap.

2015 (Investment) Ensure that the growth of central fiscal investment in the environment is not lower than the growth rate of fiscal revenue.

2015 (Investment) Establish a National Green Development Fund...[mainly to] support large and medium, mid- to long-term green projects and other pilot projects that have major demonstration effects…[for] clean energy, environmental technology and environmental industries...[use] the leverage of green funds to mobilize more social capital for low carbon and environmental protection projects.

2015 (Investment) Promote green credit, green bonds, and green insurance…Revise the Commercial Bank Law to clarify the environmental responsibilities of banks. Support and encourage financial institutions and enterprises to issue green bonds…Implement a mandatory environmental liability insurance system for high-risk sectors.

2015 Establish a green financing coordination mechanism at the national level, i.e., establish a green financing guidance and implementation entity run jointly by the People's Bank of China, the China Banking Regulatory Commission, the China Securities Regulatory Commission, the China Insurance Regulatory Commission, and environmental protection and finance departments.

2016 (Trade and Investment) Proactively Lead and Integrate China into Global Green Value Chains…promote an integrated policy package that addresses investment, trade, standards, certification, and capacity building… China should align its green standards with international standards. Advocate for the establishment of global green value chains and help BRI countries to improve their participation capacity.

2016 (Finance and Investment) Establish a ministerial-level China International Development Cooperation Agency to integrate international development aid and South–South Cooperation. This agency would be responsible for mainstreaming the Ecological Civilization concept into all decisions and plans [for international development] …Develop a comprehensive "Green Action Guide for China's Foreign Aid."

2016 (Finance) Encourage green economy growth by levelling the playing field for clean technology and other green innovations. The slow pace of green taxation reform should be addressed along with subsidy reform that is consistent with the needs for green development. Remove inappropriate subsidies for fossil energy sources. Use measures such as green credit, differentiated water/electricity prices, mandatory environmental liability insurance, and special award funds to support enterprises with sound environmental performance.

2019 (Finance and Investment) Develop a precautionary mechanism for green finance…Establish environmental safeguards and EIAs to mitigate environmental risks of proposed projects. Operationalize the Green Investment Principles. Require the disclosure of environmental and climate-related risks. Encourage public feedback before final project decisions are made…Formulate and implement green finance development strategy; establish a set of comprehensive risk assessment methods and comprehensive management systems to mitigate environmental, climate, social and other risks in all financing and co-financing initiatives.

2020 Improve the assessment methods and payment mechanisms for natural capital and ecosystem services to advance high-quality development of the Yangtze River and Yellow River basins.

2020 (Investment) Explore ways for the China International Development Cooperation Agency to mainstream green practices in all project finance; adopt "do no harm" principles; and increase the proportion of green and environmental assistance in foreign aid for green development in BRI countries.

2020 (Trade and Investment) Adopt measures to promote systematic greening of global soft commodity value chains to avoid deforestation and ecological degradation.

2020 (Investment) Bolster green elements in the "New Infrastructure Stimulus" program…economic recovery [from the COVID-19 Pandemic] presents an opportunity to further expand clean energy and avoid high-carbon lock-in. [The stimulus program should be designed] to strengthen green development by including renewable energy, low-carbon, and resilient infrastructure, building efficiency and upgrading, green urban centres, green technologies, and other relevant areas… [Economic recovery] should be guided by the principle of "no significant harm" to the environment, ecology, and climate. Economic recovery planning should also apply EIAs to green recovery programs and projects.

2021 (Green Finance and Investments) Increase investments and financing in green urban infrastructure projects…Provide capacity-building funds and set qualifications for a green, smart, and participatory urban transition… Provide long-term, clear, stringent, and stable market expectations and an effective price transmission mechanism to support the national emissions trading system. Take account of differences in carbon peaking timetables within and between sectors and regions, and enable market-based approaches to provide price, investment, and other incentives for early action. Clarify the asset attributes of carbon emission rights, promote the establishment of carbon accounts for market players, and improve the disclosure of carbon emissions… Set out clear targets, timetables, and detailed green investment roadmaps to achieve carbon peaking before 2030 and carbon neutrality before 2060. Conduct cost-benefit analyses of proposed carbon-intensive infrastructure, including the analysis of economic and financial risks such as stranded assets. Scale up biodiversity-relevant conservation financing and investments. Highlight ecological protection, conservation, restoration, and regeneration as key focuses of green finance. Further identify the steps needed to ensure public and private finance flows are consistent with biodiversity objectives, supported by conservation finance pilots…Apply financial technology in biodiversity conservation, including establishing "fintech and biodiversity" pilot demonstration areas… Actively identify and subsequently reform environmentally harmful incentives, regulations, spatial planning, subsidies, and other measures… Drawing on international experiences, set up blue economy financing principles, standards, and guidelines in line with China's conditions.

2021 (Trade and Investment) Identify opportunities for preferential tariffs for sustainable soft commodities and examine means to tackle trade in single-use plastics through the World Trade Organization… Enrich the forms of, and pool of participants in, green investment and financing, and broaden and mainstream the sources of green investment funds for BRI. Scale up financing in sectors such as renewable energy, sustainable storage and power grids, and conservation financing. Establish mechanisms to ensure that future BRI financing and investment will exclude coal projects. Promote cooperation in green energy, green infrastructure, and green finance… In line with project-based green investment and financing management needs, advance a BRI green investment and financing evaluation system based on standards, safeguards, and best Chinese and international practices… Strengthen the communication, cooperation, and information-sharing among overseas investment and financing authorities, ecological environmental authorities, and financial regulatory authorities, and improve the classification management system of BRI investment and financing projects…Work with key ministries to incorporate "green and sustainable" as core risk evaluation criteria into the performance evaluations of financial institutions and project developers.

(5) Environment and development governance: CCICED recommendations timeline

CCICED Phases I–II, 1992–2001

Baseline 1993: China should learn from the mistakes as well as the achievements of the industrial countries and build on China's assets to create a sustainable economy. Environmental considerations should be brought into the centre of economic and social policy making from the beginning.

CCICED Phases III–IV, 2002–2011

2004 Include Integrated River Basin Management (IRBM) into the next national five-year plan (2006–2010) and develop a river basin Master Plan for the large river basins…[with] a Master Plan for ecosystem-based IRBM in Yangtze Basin and set up the [multi-stakeholder] Yangtze Development and Conservation Forum.

2006 Reform of the government's environmental management capacity… Elevate SEPA to full cabinet rank in the government… Elevate SEPA to full cabinet rank in the government… Improve multi-level governance by realigning local environmental management to create a direct line of authority to provincial environmental protection bureaus (EPBs).

2006 China should prepare to take a more active role and international responsibilities in global environmental governance and sustainable development…including active participation in establishing international environment institutions; providing scientific evidence of potential impacts; promoting global sustainable development; making continued efforts in implementing international environmental agreements…

2007 China should strive for strategic transformation of its E&D path for the coming 15–20 years, leading to significant improvement of its ecological environment as well as its economic development…elevating environment protection to the level of a "conservation or ecological culture," where the objective is building a resource conservation and environment-friendly society.

2008 Create a better mix of government regulation and market-based mechanisms, and between factors favouring innovation and those favouring stability.

2010 Implement green regional development strategies by taking into account resources and environmental capacity, biodiversity conservation needs, and establish within-China regional cooperation mechanisms for ecological protection.

2011 Reform government functions, strengthen its management of public goods and social service functions for green development…Build a better performance evaluation system and mechanisms that strengthen the accountability of government officials for the green transformation of development mode… Government should provide a favourable regulatory framework to facilitate enterprises' green transformation and encourage enterprises' active participation in international cooperation.

CCICED Phases V–VI, 2012–2021

2012 Enhance institutional and policy innovation as well as enforcement in order to promote practical implementation of ecological civilization… Define and develop mid- and long-term plans for an ecological civilization at the macro level… Promote integrated institutional innovation towards the direction of green and ecological transformation...Integrate regional environmental capacity, optimize economic structure and layout, and establish a new regional joint control mechanism…expand the six MEP's Regional Environmental Supervision Centers into Regional Environmental Quality Management Centers.

2013 Establish a high-level leading and coordination mechanism for the construction of Ecological Civilization. Speed up institutional reform for eco-environmental protection management; establish an environmental governance system for unified supervision of all pollutants, all emission sources, all environmental components, and all ecosystems. Establish a regional joint action mechanism that coordinates terrestrial and marine regimes for ecosystem conservation and restoration, and for pollution prevention and control…Improve governance policies for green development and speed up the transformation of environmental governance…Improve environmental governance structure by establishing robust green government-public-enterprise partnerships.

2014 Implement environmental audits for government and party leading officials.

2015 Establish an Environmental Protection Commission of the State Council, with specific environmental protection responsibilities, objectives and explicit responsibilities assigned to various departments, especially departments for overall economic and social development; direct and coordinate ecological protection and pollution control among various departments, inter-provincial regions and river basins; take into consideration the environmental impacts of major national decisions; and conduct monitoring and evaluation of the environmental performance of various departments under the purview of the State Council and local governments.

2017 Strengthen Global and Regional Green Governance…China needs to start early to develop its own Mid-Century Climate Strategy and link it with others. Also, China's national Carbon Trading initiative could be a model for replication at an Asian regional level…China should create a national strategy that will more clearly provide for green development of its Blue Economy. This strategy will need to focus attention not only on the use of China's own ocean space, but also on China's use of the high seas and waters subject to dual rights. Concurrently, China can play an important role in the ongoing implementation of global ocean governance… a Belt and Road Green Governance Mechanism, including information disclosure, public participation, and access to arbitration, should be established.

2018 Develop an ecological civilization approach for China in national and global ocean governance…Establish a national "marine ecological report card" on the health of China's coastal and marine ecosystems…Develop a national plan of action to restore lost marine ecosystem functions and services. The plan should include actions governed by the Ministries of Agriculture and Rural Affairs, Ecology and Environment, and Natural Resources, as well as coastal provincial and local agencies.

2019 Support innovative global marine governance…More attention must be directed to sustainable marine development during the 14th FYP period.

2020 Enhance comprehensive marine governance to promote the resilience of marine ecosystems and support the sustainable growth of the blue economy.

2021 China needs to pay attention to policy coherence across economic sectors, the interplay between regulatory binding targets and market-based pricing mechanisms, and the dynamic role of demand-side consumption… Establish a mechanism that allows for collaboration in the efforts of the government, industry associations and non-governmental organizations, catering businesses, and consumers to tackle food waste…Institutionalize China's high-level central working group on carbon peaking and carbon neutrality to advance inter-agency and inter- sectoral coordination…Support local governments to formulate an urban sustainable development vision and strategy based on a multi-stakeholder participation process… Improve rural and county green development, including reform of the rural land acquisition system and land transfer system… Give full play to counties as the bridge to link urban and rural areas in terms of industries and resource allocation to synchronize rural revitalization and urban green transformation.

2021 Formulate a comprehensive, national FYP and roadmap to green China's supply chains…Enrich global marine public goods, and deeply engage in global marine environmental governance.

2021 Integrate green consumption into in-depth, supply-side structural reform to green the "dual circulation" and high-quality development patterns. Incorporate green production and consumption into the national legislative process…Develop a mechanism to allow stronger inter-agency governance and coordination between upstream and downstream entities to advance green consumption…Develop and implement a comprehensive green labelling scheme as the basis of green public procurement practices.

Lessons learned about transformative change

CCICED, from its start, has espoused policies that would lead (sooner or later) to transformative changes in the treatment of E&D issues within government, enterprises, and within the broader society of China and, sometimes regionally and globally. The need for this approach became very evident at various points, sometimes due to "shocks" related to disasters such as those associated with the 1998 Yangtze River flood; chemical spills and explosions like those in the 2005 Jilin chemical plant explosion that created benzene spills into the Songhua/Amur River and the 2015 Tianjin chemical storage explosion; the 2011 oil leakage into Bohai Sea; and various epidemics, including the current COVID-19 pandemic. All of these and many other environmental "surprises" spurred after-the-fact policy action. Often, the groundwork laid by CCICED through its sectoral examinations and its ongoing environmental and ecological problem focus proved to be helpful.

The case for establishing new transformative approaches and policies has most often emerged gradually from a blend of concerns based on changing national and international opinions—particularly when it became apparent there were superior opportunities or important needs not currently being addressed adequately. This is certainly the situation for the complex issues surrounding the low-carbon economy and its relationship to the transformation of the energy sector towards greater efficiency, new energy sources, and the need to decouple economic growth in many sectors away from environmentally harmful energy sources and mechanisms. This certainly has become a very strong driver for transformative change in China, with a great deal accomplished in the past 10 to 15 years. It is not surprising that this topic and its link to climate change and pollution reduction, among other concerns, has risen to such a priority in CCICED's work at present. The terminology of a low-carbon economy is often expressed in terms such as "synergies," "win-win," "new efficiencies," and "improved outcomes."

From the beginning to the recently completed sixth CCICED Phase, nature (including biodiversity conservation and natural resource management) and ecological restoration have played a very significant role in CCICED's work. Over this 30-year period, we have seen dramatic shifts in how ecological protection can be set in place, ranging from logging and fishing bans, transformative shifts in approach towards workable systems for nature reserves, ecological barriers, and integrated river basin and coastal zone management. Ecological restoration efforts pre-date CCICED, but this topic continues to be an important element in our recommendations.

The work has been backstopped and given continuity by the importance accorded to ecology in governance shifts, including laws and regulations, improved administrative arrangements at national to local levels (e.g., 2018 transformation of the MEP Department to become MEE, the 2016 emphasis on ecological sustainability for the YREB), and various fiscal measures. The significance of eco-compensation is highlighted by the frequent reference of this term in CCICED recommendations. CCICED has made recommendations regarding ecological civilization since 2007 and has supported the shifts in national policies resulting from this values-driven approach. One lesson learned is that ecological civilization can provide an umbrella for bringing together various actors within a sector on their green transformation. An example is CCICED's work with the financial sector in the period 2015–2017 and onwards. The CCICED recommendations involving banks, regulatory commissions, and others in the sector were the basis for a transformative guideline to which they agreed as part of their efforts towards ecological civilization.

Transformative change insights can be of real value when examining issues "at the edge" or on the borders between systems. One of the most difficult situations is the interphase between urbanization and rural vitalization efforts (e.g., Chongqing, many other provincial capital cities, and their suburban areas). Another is the interphase zones between land, rivers and wetlands, and the sea (e.g., flood plains, Yangtze Delta), as well as desertification zones. Suburban and peri-urban areas require their own types of planning and management, including sustainable transportation and other infrastructure as the city expands into rural areas, environmental protection strategies, etc. CCICED has conducted some studies, but it is one of the more difficult themes regarding insights into how transformative change can be channelled into optimal environmental development and how to apply value-driven concepts such as ecological civilization.

Drawing on CCICED's experience and insights on tackling transformative change as a central focus and need, we suggest considering the following points:

(1) For many of the subjects CCICED has covered, there is no single endpoint. More likely, transformative change will be an ongoing effort with changing goals and approaches over years and decades. Therefore, an adaptive planning and management approach is needed. The FYPs, mid-term (10 to 15 years) plus longer-term efforts, such as the mid-century goals and ecological civilization aspirations, are very helpful. China's vigorous efforts to ensure follow-up from plans to action and to put in place upgraded indicator systems, coordinated planning, and reward systems for achieving E&D goals are helpful. The early successes of the War on Pollution are an example.

(2) Transformative change is costly for some Chinese E&D problems, but if full costs of inaction are incorporated and if full costs of health, environmental, or other externalities are included, it may still be cheaper to pursue transformative change pathways. That prevention can be cheaper than the ultimate cost of treatment is another way of making this point. It is perhaps also illustrated by the dislike of some Chinese experts concerning the "environmental Kuznets curve" and the current desire for high-quality development rather than "pollute first and clean-up later."

(3) The time for achieving initial benefits of some transformative change efforts, especially of national "scaling-up" after initial pilot efforts, behavioural change, new technological adoption, or even problem definition, has generally been too long, even measured in decades. There can be multiple factors involved. Common ones put forward include the complexity of decision making, lack of supportive laws and administrative arrangements, inadequate funding and capacity building, vested interests often at local levels or within sectors, and reliance on top-down and non-participatory approaches. The use of leading groups and other special mechanisms to overcome these types of hurdles can be valuable. Illustrations include the YREB, the BTH Region, and other regional frameworks, and the new high-level leaders' group created in early 2021 under the direction of Vice Premier Han Zheng to ensure the timely meeting of 2030 and 2060 carbon targets to address climate change concerns.

(4) A common expression of concern is that green technology often is slow in moving from laboratory to commercialization to meet urgent needs. This is an important concern since in almost all E&D fields there will be greater use of advanced technologies, including "Big Data." It is also a somewhat surprising concern, considering both China's successes with wind and solar energy within and outside of China and the short time within which it adopted electric-powered vehicles of many types and sizes compared to many other countries.

(5) China's great reliance on trade and investment, especially after its entry into the WTO and in signing various bilateral and other trade agreements, sped up the economic side but likely slowed at least some of the E&D transformational needs. This point may be disputed since much of the funding for green development depends on trade and investment flows. The relatively slow adoption of green certification and internationally accepted standards, relatively limited acceptance of green market supply chains, and the need for greater attention to sustainable consumption matters are important considerations, especially at a time when China is encouraging reliance on increased domestic consumption for its future economic growth. The need for further greening of small and medium-sized enterprises (SMEs), coupled with continuing green improvements in state-owned enterprises (SOEs) and in operations such as commodities produced by Chinese-owned operations abroad, especially those related to commodities used in China, points to major opportunities for accelerating the pace of transformative change in approach, especially in green development initiatives within BRI countries.

(6) It is widely recognized that the major impacts of COVID-19 on all countries also hold the key to some transformative changes, whether related to new forms of globalization, national economic and social recovery, or the need for improved ecological management to prevent future pandemics from happening. The idea of "building back better" appears to be taking hold, and the means to do so are at least partially at hand. Accelerated efforts to meet the UN 2030 SDGs are urgently needed. This will require greater attention to integrated development strategies, no matter how difficult that can be at times.

The foundation for China's future transformative change continues to be wrapped up in bundling together socially and politically acceptable combinations of institutional capabilities, financing, and legal frameworks to enable innovative change mechanisms to flourish. Improved community and individual participation, plus feedback loops on what is actually working and whether benefits can be clearly defined and delivered, are needed. CCICED's past experience and insights will be valuable for the future in providing advice concerning the areas highlighted above.

Chapter 6. Partnerships, Outreach, and Other Activities

While the primary audience for CCICED is the State Council at high levels, by no means is it intended to be the only recipient of its advice. Furthermore, now that the E&D subject matter is well entrenched in many circles throughout China, it is important to be listening to perspectives that can help shape CCICED's own work. Especially over the past 5 to 10 years, CCICED has placed emphasis on strategic outreach efforts. This has taken a variety of forms.

CCICED has strengthened its relationships with funding partners, bringing them more directly into research and outreach efforts. For example, a large number of CCICED AGM Open Forums have been organized with the assistance of funding partners. With live streaming, these sessions can be followed by audiences both inside and outside of China. Most are directly related to contemporary CCICED research themes and therefore offer new perspectives to our researchers, as well informing audiences.

In recent years, CCICED also has given more attention to expanding its range of contacts and partnerships. This point is noted on cciced.eco:

CCICED upholds the values of diversity, inclusiveness and sharing. It aspires to a balance in gender, region, and nationality and areas of expertise, and will increasingly involve youth, the private sector, and civil society in its research and activities.

These are not new ideas for CCICED, but it has taken a long time for them to fully take hold. During the coming 7th Phase of CCICED, it is anticipated that good progress will be made.

With China and the rest of the world now emphasizing the need for E&D to be mainstreamed across the full range of societal decisions, the need for many more input sources is clear. Understanding and building on linkages and synergies, as noted in other parts of CCICED at 30, is critical. This point is underlined by environmental linkages and associated opportunities for a green recovery from COVID-19.

The funding and creativity of enterprises must be fully tapped. In keeping with the 2012 UN global call for The World We Want and the aspirations of the UN 2030 SDGs, CCICED must work hard to be relevant to the whole of society and use these efforts to be even more relevant to its main sponsor: China's State Council.

CCICED-European Union roundtable partnerships

CCICED and the European Union (EU) have enjoyed a long and productive relationship with the participation of European Commission (EC) senior staff as CCICED members, presence on CCICED research initiatives, and discussions on topics of mutual interest such as green development, trade and supply chains, environmental protection, and climate change. In May 2016, a roundtable was held in Brussels on the sharing economy as a contributor to green development. The meeting was co-chaired by the EC DG of Environment and China's Environment Minister, Mr. Chen Jining. Participants included the CEO of Uber and Head of Global Operations from Airbnb. This meeting was followed up with an Open Forum on the same subject at the 2016 CCICED AGM, which introduced some very successful cases from China's entrepreneurial sharing economy.

Another CCICED-EU roundtable in Brussels took place in June 2018, examining Synergies for Improving Performance on Global Environment and Development Agreements. Three questions were posed: (1) How to enable synergies to achieve global goals and targets in a more timely and comprehensive fashion? (2) How could China play a greater and sometimes leading role in bringing about improved global E&D governance? And (3) What are some priorities for action to improve synergies in the coming years, first to 2020 and then over longer time frames? The meeting focused on three SPSs covered by CCICED's TF on Global Governance and Ecological Civilization: Global Climate Governance and China's Role; Post-2020 Global Biodiversity Conservation; and Global Ocean Governance and Ecological Civilization. The meeting was chaired by Mr. Xie Zhenhua and Ms. Catherine McKenna and included the participation of Frans Timmermans, the EC's First Vice President, plus more than two dozen high-level experts associated with CCICED activities and others.

Business sector partnerships

Individuals with well-earned senior business credentials have served as members in each of CCICED's six phases. They have always been in the minority on both Chinese and international sides. The same is true for participants in research teams. There has been an under-representation of SMEs, the young entrepreneurs who have shaped much of the innovation in China's and international business, and those involved in break-through investments for the circular economy, the sharing economy, and booming fields such as eco-tourism. One of the strongest proponents for addressing these shortcomings has been Mr. John Forgách, a private entrepreneur, banker, and dedicated environmentalist from Brazil. He was a member of CCICED during Phases IV and V and served along with Mr. Pan Jihua as a Co-Chair of the 2011 CCICED TF on Trade, Investment and Environment.[50] At the time, this TF was unique in that it included extensive interviews and field visits with business leaders, non-governmental organizations (NGOs), and officials in three developing countries with extensive Chinese investments.

CCICED has built solid working relationships with some global business sustainable development organizations, notably the World Business Council for Sustainable Development (WBCSD) and its Chinese affiliate, the CBCSD, formed in 2003. These relationships were facilitated by Mr. Björn Stigson, who played a very active role in CCICED as a member during Phases II–IV (1997–2011). This period was the time of China's transition to a major industrial and manufacturing country when the scale of operations of businesses such as refineries and steel grew immensely. CCICED activities regarding eco-efficiency, low-carbon industrialization, growth of the heavy chemical industry, environmental assessments, and the location of industrial operations were very important topics. The relationship with WBCSD has continued with Mr. Peter Bakker from 2012 to the present, and new topics emerged, including CSR and reporting, environmental risk management, green technology innovations, and, more recently, the leadership roles for industry in green development. CCICED has participated actively in studies in all of these fields and continues to work closely with both CBCSD and WBCSD. It is particularly useful to draw upon the networks of such organizations to explore specific themes. An example is a major CCICED meeting in April 2021 with cooperation from WBCSD on examining biodiversity and climate change.[52] This session involved WBCSD members, China's MEE Minister, and various members of CCICED and its SPSs.

In recent years, CCICED has cooperated with the WEF. The working relationships have been created through various channels, including with present and former CCICED members, with the CCICED Secretariat, and with linkages extending to various research teams. WEF has held major Summer Meetings in China for several years. CCICED has co-organized E&D sessions in some. Since 2017, the relationship has been formalized with a Memorandum of Understanding. The collaboration will explore how circular and sharing-economy models can create a more resource-efficient society in China and will also focus on other areas, including oceans, the potential of new technologies for the environment, and climate change. In senior-level discussions and recommendations during 2007–2009, CCICED promoted a law for circular economy and its full implementation. Dame Ellen MacArthur, a strong supporter of circular economy, indicated: "In 2009, China was the first country to adopt circular-economy legislation…Today's announced collaboration between the Chinese government and the World Economic Forum, which is committed to accelerating the transition to a circular economy, sends a very strong signal of the importance of this topic and its take-up globally."[52] One of WEF's recent contributions to CCICED has been a 2020 White Paper for CCICED's SPS on Major Green Technologies.[53]

International and Chinese research organizations and connections

So many organizations have been involved on CCICED research teams that it is difficult to include a list or highlight even just a few without worrying about which ones might be accidentally left out! They are the engine of CCICED's mainstay activities. Not only do they contribute immense amounts of their own staff time working collegially to design and carry out initiatives, but they also help in the selection of research team members and arrange field trips and teams within and outside of China. They also search for additional funds and liaise with others, such as sponsoring bodies, others interested in the research activity, and with the CCICED Secretariat, including SISO Secretariat, Chief Advisors, and CCICED members.

Another group of individuals who often bear heavy responsibilities but receive limited credit for their efforts are the China-based liaison officers and representatives from organizations, embassies and home offices of donors, other international organizations, corporations, etc. Often, such individuals have assisted CCICED in managing complex issues, such as ensuring funding flows are smooth, arranging meetings, taking an active role in research activities, finding relevant experts, etc. Some have lived for years or even decades in China or have worked on the China file in home offices for long periods. They have been welcome partners and sometimes are indispensable to CCICED's work.

The full value of the contributions from all of these sources, Chinese and international, cannot be computed only in monetary terms, or even in terms of their "in-kind contribution." Both institutionally and individually, it can only be measured through the level of enthusiasm brought to the task and, at its best, the lasting professional and personal understandings and relationships that frequently are formed.

A characteristic required for most CCICED work is the need not only for science-based knowledge but also the transfer of that knowledge into forms useful to policymakers. Furthermore, crosscutting issues abound (as noted in Box 9). Therefore, in almost all CCICED studies and in the preparation of recommendations, there is a need for synthesis involving many types of findings and results. This is perhaps the most difficult of our undertakings. We have turned to recognized specialists and institutions with advanced skills in this area. It is a skill expected of CCICED's Chief Advisors and those who work with them, also of many of our CCICED members and many of the research team leaders.

It also is necessary to be well versed in the "political science" of current E&D issues and to have a good sense of trends well into the future. This applies not only to matters within China but also to regional and globalized situations. CCICED's strength is that it has so many channels through which such information can be acquired. Also, over these past decades, the world has come to China. A CCICED AGM brings together not dozens but hundreds of well-informed people focused on a set of issues of common concern. And at international gatherings within and outside of China, there are good exchanges, occasionally with special CCICED events.

CCICED's networks are constantly expanding and changing and are therefore requiring management attention. Sometimes it is difficult to let go of topics in order to tackle new subjects or to try for new perspectives over old ones. CCICED's Phases, which are matched to the cycle of China's FYPs, is helpful in this regard.

CCICED AGM Open Forums

During CCICED Phases V and VI, an important reform has been the introduction of Open Forums, generally occupying up to a day of meetings linked to the specific AGM theme. Several such sessions, co-organized by individual CCICED research teams and partners, provide for presentations and extensive discussion involving individual CCICED members, relevant experts, and others. Each Open Forum is kept to a reasonable size at the venue location, but with an online opportunity to follow the discussions. This effort has been very successful. The conclusions and suggestions are reported to the AGM and can find their way into the formal recommendations as appropriate. The sessions also are of value for planning future CCICED work programs and for providing insights into crosscutting themes such as those noted earlier in Box 9.

At the 2018 CCICED AGM, with the support of the Energy Foundation China, Children's Investment Fund Foundation (CIFF), and the Institutes of Science and Development of the Chinese Academy of Sciences (CASISD), an Open Forum on Addressing Climate Change by Innovating Development Pathways was held. It addressed both low-carbon pathways and the role of institutional innovation in climate change governance. What is instructive is the broad range of speakers and discussants, all with major links to CCICED either as Council Members or involved in research on this theme. They included:

Two Vice Chairs of the CCICED—Xie Zhenhua, China's Special Representative for Climate Change Affairs, and Achim Steiner, UNDP Administrator of the United Nations Development Programme [who]-co-hosted and addressed the open forum. The event witnessed participation and discussion by many leading experts in the field, including Wang Yi, member of the Standing Committee of the National

[50]Main Topics Report by the CCICED Task Force on Investment, Trade, and Environment. CCICED AGM. November 2011. https://www.iisd.org/system/-files/publications/cciced_main_topics_report.pdf
[51]https://www.wbcsd.org/Overview/News-Insights/General/News/China-s-CCICED-Conference-puts-Climate-and-Biodiversity-central
[52]https://www.weforum.org/press/2017/02/new-partnership-aims-to-boost-china-s-environmental-policies-and-circular-economy/
[53]WEF and CCICED. September 2020. Major Green Technologies and Implementation Mechanisms in Chinese Cities. https://www.weforum.org/whitepapers/major-green-technologies-and-implementation-mechanisms-in-chinese-cities.

People's Congress and Vice President of the CASISD; He Jiankun, Director of the Academic Committee of the Institute of Climate Change and Sustainable Development at Tsinghua University and former Executive Vice President of Tsinghua University; He Kebin, Academician of the Chinese Academy of Engineering and Dean of the School of Environment at Tsinghua University; Zou Ji, President of Energy Foundation China; Kate Hampton, CEO of the CIFF; Jonathan Pershing, Program Director of Environment at the William and Flora Hewlett Foundation and former Special Envoy for Climate Change at the U.S. Department of State; and Laurence Tubiana, CEO of the European Climate Foundation.[54]

Being able to call upon such a range of expertise is a strength of CCICED activities. The results of this initiative were then incorporated into the work of CCICED's SPS on Climate Change.

CCICED business roundtables

Each year since 2008, CCICED has held one or more business roundtables, generally on a topic closely related to the AGM and/or specific research activities. They are considered community events and are therefore held in different cities. The keynote and panel presenters bring together people from business backgrounds, local administrators such as governors and mayors, CCICED leaders, and researchers to focus on topics of high relevance to the local or regional audience. Some are held as partnership events, such as the 2020 ocean event with the WEF and a 2016 green finance event with the China Executive Leadership Academy in Pudong.

The range of CCICED roundtable meetings held during CCICED Phase VI include the following:

- 2021 Synergies between Pollution Control and Carbon Emission Reduction. Coordinated governance of pollution control, carbon emissions reduction, and ecological improvement; possible pathways and challenges in early peaking; good practices in the Yangtze River Delta region in promoting ecological and environmental protection together with economic development. (Suzhou and virtual)
- 2020 Economic Opportunities for Blue Investment. Key areas of ocean economy development for the 14th FYP; investment opportunities for the blue economy; best practices of corporate ocean responsibility (Beijing and virtual)
- 2020 Innovative Cities and Greater Bay Area Green Development. (Shenzhen)
- 2018 Innovation and Green Development (Changsha)
- 2016 Promoting Green Finance and Supporting Local Development (Shanghai)

One of the most interesting CCICED roundtable events was the first, held in April 2007 in Beijing. It was not designed for business but for the specific purpose of introducing the low-carbon economy as an important topic for China. The distinguished speakers included Mr. John Prescott, Deputy Prime Minister of the United Kingdom, R. K. Pachauri, IPCC Chair, Ms. Linda Adams, Secretary of California's EPA, and numerous high-ranking, mainly European politicians and others, plus key experts from China. The meeting was the brainchild of Mr. Børge Brende, CCICED member, who was also, at the time, a Norwegian politician, and Mr. Zhu Guangyao, the CCICED Secretary-General. Some of the important foreign guests were self-invited, as they felt the meeting would be vital for advancing interest in the topic. It was a tumultuous event, as there was no agreement, especially on the Chinese side, about how important this topic was likely to be in the future and how it might affect China's economy. Within a few years, the low-carbon economy became one of the most significant topics in China, attracting widespread public attention. This one-day roundtable "energized" CCICED's interest in taking on a leadership role in this field.

[54]https://www.efchina.org/News-en/EF-China-News-en/news-efchina-20181102-en

Chapter 7. Looking Ahead: 2022–2035 and Beyond

"A once-in-a-generation transition is underway."

One of the most eloquent statements from CCICED in recent times is the introduction to the September 2021 AGM recommendations.[55] It highlights the existential struggle of multiple environmental crises and the next steps needed on the part of China and globally. The recommendations document is entitled: Great Transition Toward a Green Development Epoch: Low Carbon, Inclusive, and Harmonious With Nature.

"The world faces multiple crises, including COVID-19 and from its economic consequences, climate change, the destruction of nature, and pollution…The ongoing economic recovery must place a strategic priority on integrating low-carbon solutions, nature stewardship, and pollution protection.

"Global action against COVID-19 has shown us again that global ecosystems are interconnected. No country or region can face these crises alone. Therefore, global solidarity and international cooperation in reducing wildlife trade and the destruction of natural habitats are urgently needed to reduce the risks of future pandemics caused by zoonotic diseases. Commitments are deepening across countries and all levels of society to reach carbon neutrality, protect nature, minimize waste and pollution, fund integrated approaches like One Health, and support greater equity.

"The Convention on Biological Diversity's 15th Conference of the Parties, in Kunming, and the 26th Nations Climate Change Conference of the Parties (UNFCCC COP 26), in Glasgow, present historic opportunities to advance an inclusive, carbon-neutral, and nature-positive agenda. Efforts to strengthen environmental governance and enhance synergies among multilateral environmental agreements are especially significant to support integrated policies…

"CCICED members greatly appreciate President Xi's commitment to building an ecologically sustainable world and to the harmonious co-existence of humanity and nature. This commitment includes targets and measures mainstreaming high-quality, green development as detailed in the 14th Five-Year Plan and 2035 Long Range Objectives…CCICED members believe that President Xi's announcement of the nation's plan for carbon peaking and carbon neutrality sets a clear direction for China's post-pandemic recovery and green prosperity.

"The world is looking to China for experience and inspiration. To implement its commitments in an efficient, stable, and predictable manner, China needs to pay attention to policy coherence across economic sectors, the interplay between regulatory binding targets and market-based pricing mechanisms, and the dynamic role of demand-side consumption…CCICED members believe that President Xi's announcement of the nation's plan for carbon peaking and carbon neutrality sets a clear direction for China's post-pandemic recovery and green prosperity.

"CCICED members recommend that China grasp and capitalize upon the dynamic opportunities offered by technological innovation and the green industrial revolution; pay special attention to targets, timelines, and pathways for structural transformation; formulate actions at both the macro and micro levels; and set out clear, robust, integrated, and systemic green policies that advance and implement a comprehensive socio-economic green transition."

The 2021 CCICED recommendations propose four broad areas for this immediately needed but "once in a generation" transition, as noted in Box 13.

[55]https://cciced.eco/wp-content/uploads/2021/11/P020211109499612150007.pdf

Box 13. CCICED's 2021 four headline recommendations to the State Council

- Value the integrity of global ecosystems. Mainstream actions for addressing climate change, protecting biodiversity and ecosystems, and controlling pollution, and enhance policy coordination across regions. Examine steps to establish green responsibility mechanisms through ecological and natural capital accounting in ways that strengthen the micro-level foundation for green, low-carbon development and that ensure a comprehensive, stable, and inclusive transition.
- Develop a new model for green urbanization, taking it as a strategic starting point for commitments on carbon peaking and carbon neutrality. With urban renewal, county development, and green rural revitalization as the three pillars, innovate spatial planning with low-carbon roadmaps.
- Jointly promote sustainable production and consumption, with an emphasis on the utility of digital technology innovation for sustainability. Integrate low-carbon and ecosystem protection standards into green supply chains, including upstream product design to expand materials and product reuse and recycling, to bolster circular economy practices. Establish a green "dual circulation" model to provide new impetus for high-quality development.
- Align domestic green targets and measures with multilateral and international cooperation: Develop closer green development partnerships, promote an equitable and inclusive green transition, and share development achievements, including through the adoption of green investment and green financing, green supply chains and sustainable trade, and jointly building the green BRI.

There are three distinct time frames ahead where CCICED could have useful inputs, both within China and internationally. First is the 14th FYP, which is now underway and to which CCICED already contributed recommendations in 2019–2021. Second is the follow-up need now for more specific suggestions on how this current FYP can set in place the staging for the coming two FYPs out to 2030–2035, by which time China hopefully will have achieved key goals related to ecological civilization and the basic modernization of China's development. Integrated development strategies will be particularly important between now and 2035. Also, there is a great need to assist with international commitments, such as the peaking of GHG emissions by 2030, meeting goals for biodiversity conservation under a revised CBD national action plan, and the very important commitment to achieve the UN SDGs. Finally, there is the longer term, from 2035–40 to 2050–60. This third time frame is where scenario development and modelling may help to set goals for achieving a fully modernized society that will adhere to ecological civilization principles and action, including a "carbon-neutral" state.

Promoting green development and ecological civilization in China's 14th FYP (2021 to 2025)

The opportunity to set China on a longer-term course of green development is now underway via the 14th FYP. The overall theme is for high-quality development, and the overriding principle is "dual circulation" of stimulating domestic consumption while continuing to expand overseas trade. The pursuit of a low-carbon economy is expected to play a prominent role. There is less emphasis on GDP targets. Indeed, there are no set targets for GDP. Efforts will continue to put in place new GEP measures such as Green Economy Progress[56] and Gross Ecosystem Product.[57] Over the course of the 14th FYP, these new measures will become of increasing value to policy-makers. CCICED researchers have made numerous contributions to these new topics in past years. In the introduction to the 2019 CCICED recommendations to the State Council, the point was made that "transition from high-speed to high-quality development reconciles the conflict among competing objectives such as unbalanced or insufficient economic development and the needs of people for a better life. This transition can also promote environmental protection, ecological stewardship and sustainable development…Ambitious domestic environmental actions need to be aligned with multilateral commitments that include the United Nations Framework Convention on Climate Change's Paris Agreement, the Sustainable Development Goals (SDGs) and the post-2020 global biodiversity framework."[58]

Three important characteristics of green development were highlighted in the CCICED 2019 recommendations: "holistic, amplifies innovation, and modernizes consumption." In other words, integrated approaches are needed and, for many initiatives, a long-term approach. Therefore "the 14th FYP should anticipate and support Beautiful China 2035, climate change targets and a 2050 Vision for Biodiversity." "Green development should revise key development concepts, reform and modernize governance mechanisms, and advance ecological capital accounting. Green development indicators should be integrated and evaluate both policy and cadre performance. Green finance, eco-taxation, green pricing, green procurement and green consumption should work in a coordinated manner to internalize ecological costs."

Eight detailed recommendations (each is presented in original form in Annex 5) highlighted a number of key concerns starting with the need to "promote green consumption." Just for this one topic, there were many important suggestions: expand green consumption in key sectors; expand access to green products and services supply; revise the Government Procurement Law to emphasize green sources; promote green supply chains and the circular economy through China's "Extended Producer Responsibility" (EPR) rules[59]; reduce plastics; establish a science-based, coherent green labelling and certification system; promote the Green Lifestyles Campaign."

The other seven recommendations dealt with Green Urbanization, Green Development in the Yangtze River Economic Belt, Acceleration of Climate Action, Post-2020 Biodiversity Conservation, Marine Sustainable Development, Green Belt and Road Initiative, and Cross-cutting Issues: Technological and Institutional Innovation. This range of topics demonstrates how diversified the dialogue can be and how many government units must be involved in the uptake of the recommendations. There is no question that implementing green development will require full mainstreaming of E&D during the 14th FYP.

From 2020 to the present, CCICED's inputs regarding the 14th FYP continued through the work of its research teams with many "virtual" meetings involving the international team members. This was remarkably successful, given the travel constraints imposed by COVID-19. In September 2020, CCICED's annual recommendations were forwarded to the State Council.[60] Not surprisingly, the 2020 recommendations' title is From Recovery to Green Prosperity. The introduction suggests: "The international community will closely follow China's economic, social, ecological, and environmental strategies laid down by the 14th FYP, which, in the era of globalization, is not only key to China's sustained and stable growth but also related to global green prosperity and well-being." Also, the value not only domestically but also internationally of President Xi Jinping's "Green is Gold" approach, and the government's continued strengthening of green development efforts. What is now required is further attention to advancing "the comprehensive framework for green development" and "to set up strategic concepts, concrete policy targets, priority areas, and delivery institutions and mechanisms." In other words, emphasize attention on the practical basis needed for ecological civilization.

It was noted that "China should continue contributing to multilateral environmental and developmental processes, fulfill its obligations as a responsible major developing country, and join global green partnerships in fostering a shared future for all life on Earth."

[56]Chengchen Qian. 30 August 2020. Making Progress towards an inclusive green economy in China. https://www.greengrowthknowledge.org/blog/making-progress-towards-inclusive-green-economy-china
[57]There are numerous examples of Gross Ecosystem Product studies emerging for Chinese cities, such as Shenzhen, river basins such as Yangtze and Yellow, and some provinces such as Qinghai.

[58]See Annex 5, "Enhancing New Consensus on Green Development: The pathway to China's high-quality development during the 14th Five-Year Plan period." The full set of CCICED 2019 recommendations to the State Council is also available online at http://www.cciced.net/cciceden/POLICY/APR/201908/P020190830118167260634.pdf
[59]The EPR was introduced in 2016-2017 and will be gradually put it into place with various sectors over the coming years. It is intended to shakeup how China's manufacturers address their environmental responsibility. The goal is to have 50% of waste products recycled and reused, and the proportion of recycled material in key products will reach 20% by 2025. This is a key way to build a strengthened Circular Economy. http://www.responsibilitas.com/blog/china-epr-regulation/
[60]https://cciced.eco/wp-content/uploads/2020/08/cciced-2020-en-policy-recommendations-2020.pdf

Another key concept is “the promotion of effective measures for both COVID-19 and environmental issues, given the close relationship of public health, pollution, and waste management. The ideal will also require the promotion of multi- stakeholder governance, poverty alleviation, gender mainstreaming and achievement of social equity and justice.” These points echo the concern heard around the world for “building back better.” Specifically, concerning post-pandemic economic recovery, it is suggested that there is an opportunity to promote green development and pivot toward socio-economic resilience. Concepts and measures might include efforts to bolster green elements in “New Infrastructure Stimulus”, support green jobs, [take] integrated measures for community vulnerability reduction, promote green production and green consumption, and support multilateral initiatives and enhance international cooperation…such as “One Health” and the “UN Decade of Ecological Restoration.” Beyond that, it should be possible to take measures that would “help build out the green finance system.”

“Green development requires integrated approaches to advance policy coherence. Short-, medium-, and long-term goals should be better aligned. Additionally, focus should be placed on creating synergies among the legislative, judicial, and administrative organs in the practice of Ecological Civilization, and establishing and improving a modernized environmental governance system. Other mechanisms include exploring more science-based, rational, and practical assessment methods and payment mechanisms for natural capital accounting while formulating policies and plans with a broader vision. It will also be important to integrate environmental considerations into broader economic and social planning and policies, along with establishing and developing green market mechanisms such as the carbon trading market. There also need to be improvements in green standards, green fiscal and taxation systems, and a green finance system. Policy incentives should be aligned with the goals of green development and strengthened by compliance promotion and regulatory enforcement.”

Many of these observations have been made by CCICED in recent years and, in some cases, even a decade or more ago. What marks their significance now is the much-enhanced national and local capacity to act steadily towards their implementation. Accountability regarding performance is more significant, and the tools, funds, and will to act quickly are at hand. It is reasonable therefore to seize the opportunity of post-pandemic recovery to promote major green technologies that are readily scalable, strengthen the development of green infrastructure, and enhance socio-economic resilience.

In the 2019, 2020, and 2021 recommendations, there is a level of sophistication and grasp of the greening and sustainable development relationships between national and global action, and also between sectors, that was simply not as well developed half a decade ago at the start of the 13th FYP. This does not mean that future efforts will be easy. It is encouraging that many of the suggestions from CCICED have made their way into the 14th FYP.

Key mid-term actions for 2021–2035

China’s commitments today can accelerate progress on E&D later. This has been said repeatedly by leading researchers, such as Lord Nicholas Stern, concerning peak GHG emissions in China, by organizations such as WWF and IUCN regarding biodiversity conservation, and by the UN for ecosystem restoration. This current decade is a precious time for bending the curve on all of these and other major E&D needs, both inside and beyond China. Globally, the UN 2030 SDGs are critically important. Here, China can help by meeting its own SDGs but also by working with its development partners in other countries through means such as the BRI and South–South cooperation mechanisms, plus through its many enterprises and other organizations working abroad.

A shortlist of potential priorities for domestic China E&D over this FYP period is proposed by the authors of CCICED at 30 in Box 14. These priorities are based on our opinion about current situations; however, as we have seen with the emergence of COVID-19, there can be very sudden additions to priorities. Events related to climate change have the potential to be some of the most potent drivers of change. Greater emphasis must be given to both sustainable production and consumption.

Box 14. Ten significant priorities on China’s domestic E&D issues 2021–2035

1. Fulfill needs laid out in the goals for 2035 Ecological Civilization, China’s domestic and international efforts for the UN 2030 Sustainable Development Goals, and continued efforts to create and apply better green S&T innovations.
2. Substantially complete the removal of all major air, water and soil pollutants at their source and through shifts to cleaner production processes, green mining, brownfield remediation, low pollution agriculture, including the minimizing of non-point pollution, better solid waste management, reduced plastic wastes, etc.
3. Implement green development that creates opportunities for sustainable livelihoods, boosts natural capital and human capital, and well-being, and increases the capacity to maintain ecosystems and sustainable/green livelihoods. Optimize river basin use and marine areas based on improved ecological integrity.
4. Undertake ecological restoration and biodiversity conservation with synergies to address climate change mitigation and adaptation and to increase ecological services.
5. Set in place the world’s most advanced and effective programs for a low-carbon economy and mechanisms for turning carbon neutrality and nature-based solutions into new economic opportunities.
6. Successfully carry out energy use transformation to drastically reduce coal and other fossil fuel use while at the same continuing efforts to reduce carbon intensity even beyond those currently announced.
7. Hasten innovation for ultra-high efficiency in water use for both urban and rural areas and drastically reduce groundwater depletion and quality decline.
8. Eliminate unsustainable/perverse subsidies; remove trade and investment arrangements not in line with green supply chains, circular economy, and other environmentally sound practices.
9. Ensure green, safe, and livable cities, as well as green and sustainable rural vitalization. Build green bridges between the two lifestyles and protect nature, food security, and ecological services in modernized rural, suburban and city settings.
10. Overhaul public and private sector financing mechanisms and sourcing to fully meet needs for green investment, along with improved means to reduce various inequities between rural and urban inhabitants, and to redefine wealth and prosperity in broader terms than economic growth and development.

International and domestic cooperation strategy (2022–2035) for CCICED

Especially during 2019/2020/2021, there have been many calls for intensified efforts to accelerate action regarding eco-environmental and other global emergencies such as COVID-19. Some of this attention has targeted the need for green recovery strategies from the pandemic nationally and regionally as well as globally in relation to the economic, environmental, and social consequences of the pandemic. These efforts, as they relate to China, include several important matters: (1) the ongoing and rising commitment of the Chinese government to fully meet its ecological civilization objectives; (2) the desire to peak GHG emissions before 2030; (3) the need to ensure ecological conservation red lines lead to strict and effective protection of ecosystems and biodiversity; and (4) meeting various other 14th FYP environmental goals related to urbanization, rural vitalization, cleaner industry, and green tech development.

Priority themes for an ecological civilization (2022–2035)

Some of these topics (Box 15) might be examined during CCICED Phase VII. In general, they are topics that are already high in Chinese and/or international priority. While most have already been examined quite extensively by CCICED studies, in our roundtables, etc., they are examples of evolving issues requiring long-term attention.

Box 15. Potential themes addressing 2022–2035 needs

Ecological Security and Sustainable Resource Use

Climate Change Mitigation and Adaptation

Non-Point Source Pollution

Ecological Supporting, Regulating and Cultural Services Enhancement

Ecological Provisioning Food and Fiber Security

Ecological Water and Soil Security

Ocean Sustainable Use

Nature Appreciation and Protection (Parks, Ecological Redlining, Traditional and Modern Conservation Practices)

Green Development Reform

Green Urban Development and Rural Vitalization

Green Transportation

Green Industrial Revolution (Industry 4.0, etc.)

Green Recovery and Restoration

Prosperity and Resilience

People's Well-Being

Public Participation in E&D Decision Making and Initiatives

Domestic Sustainable Production and Consumption Supply and Demand

"One Health"

Livelihoods for and in an Ecological Civilization

Green Development Science and Technology Innovation

Green Development S&T Innovation

Advanced Circular Economy

High Tech (IT and Big Data, Biotech, etc.)

China and the World

Green Investment, Trade and Green Supply Chains

Chinese Green International Development Partnerships,

Green BRI

Green Globalization (addressing Planetary Boundaries, Doughnut Economics, Ecological Civilization and Sustainable Development as mainstream subjects)

Addressing understudied topics

CCICED, for various reasons, has not sufficiently explored some major topics that are widely discussed globally or regionally in Asia or other parts of the world. They include full incorporation of poverty concerns and ongoing debates on eco-social impacts of large-scale water projects and other infrastructure development; nuclear power development; hazardous waste management; ongoing aspects of illegal trade involving wildlife, etc.; gender issues in all aspects of CCICED work; various ocean issues, including fulsome examination of distant water fishing fleets; Arctic and Antarctic environmental protection and resource uses; and environmental and occupational health. This list is certainly not a complete one. Should some of these topics be covered in more depth in the future? In the broad context of ecological civilization, that is an important consideration since this concept includes both culture and politics in addition to the usual triangle of sustainable development elements.

Looking ahead to 2040–2060

At this point, there is not too much to say in detail. Work on scenarios and modelling will be useful during CCICED Phase VII to shed more light on the directions and potential values of long-term green, high-quality development. The most concrete examples of long-term E&D include those related to major themes, such as China's "carbon neutral" commitment by 2060, the desire for a harmonious relationship between people and nature by mid-century or soon after, and, certainly, the long-term vitalization of rural areas and very challenging shifts in urbanization approaches. The aging of China's citizens is a current subject of great concern in the 14th FYP, and that concern will likely become even more acute soon after. What we can anticipate is continued progress towards a "Beautiful China," with help from green technologies and the desire of China's people for a high quality of life. It must be done with less pressure on planetary boundaries and with a smaller ecological footprint on the part of China and all other well-off countries. Surely all these topics and others will vie for CCICED's attention in the years ahead. It is encouraging that the new Leading Group on Peak Carbon and Carbon Neutrality, established in Spring 2021, is chaired by Vice Premier Han Zheng, CCICED's Chair.[61] This government mechanism highlights the need for a coordinated approach among departments.

CCICED's future as a "think tank"

From its very first AGM in 1992, some CCICED members and others have described it as a think tank. Over the years, there have been mixed views about the value of such a moniker. On the one hand, it is valuable to be considered as a source of wise advice and generator of new ideas or be imbued with other attributes of a think tank. On the other hand, it can also conjure images of being an "ivory tower"—a place that produces ideas but is not always clear on how they fit into real-world settings. A leading assessor of think tanks defines them as "public-policy research analysis and engagement organizations that generate policy-oriented research, analysis and advice on domestic and international issues, thereby enabling policymakers and the public to make informed decisions about public policy."[62] By this definition, certainly, CCICED should qualify as a think tank. Over the years, CCICED has built working relationships with people from at least 13 of the 25 top think tanks in the environmental category of the Think Tank Index Report, and maintains long-standing relationships with several of these institutions.

CCICED's chief client, China's State Council, must continuously find solutions and mixes of policies for very real problems and must understand the trade-offs and synergies involved. The State Council can draw upon many sources of advice, including its own planning and research organizations such as the Development Research Center (DRC), universities, departmental research facilities in many sectors, and, of course, China's major research academies.

In the early years of the new century's second decade, the issue of being classified as a think tank became a serious matter. China's government determined that only a limited number of research organizations would be considered high-level think tanks. The designation would be important in determining such matters as government financial support and how often major events such as CCICED's member meetings could be held. Being a hybrid type of organization and CCICED's uniqueness could be considered either an advantage or a disadvantage in the national struggle for full recognition as a think tank. For CCICED it might also be considered a test of whether the concept of this senior advisory body and its research initiatives were still deemed to be of high value.

In June 2015. a small team led by CCICED's Secretary-General explored the characteristics of several leading U.S. think tanks at meetings in Washington D.C. These included a major session with the World Resources Institute, the

[61] https://www.carbonbrief.org/explainer-china-creates-new-leaders-group-to-help-deliver-its-climate-goals Peak Carbon

[62] An annual ranking of leading Think Tanks in various categories is carried out by a survey team at the Lauder Institute, University of Pennsylvania. See James McGann. 2019. Global Go To Think Tank Index Report. https://repository.upenn.edu/cgi/viewcontent.cgi?article=1018&context=think_tanks

Environmental Defense Fund, plus several others engaged on the "supply side." CCICED also explored perceptions from the "demand side," i.e., U.S. government officials and others seeking advice from U.S. think tanks. The 40-person meeting was a successful undertaking since it provided solid advice on positive ways of taking on the best characteristics of think tank leadership. Participants underlined how important it is to continue advancing transformative policy change as the driving force for CCICED.

Prior to holding this meeting, a brief was prepared about CCICED and shared with the American institutions.[63] The document emphasized some of the strategic lessons learned by CCICED during its first two decades, such as the following points: (1) keep emphasizing key themes while at the same time building the case for new directions; (2) assert that it is not necessary to seek credit for all the policy shifts on topics where CCICED had a strong involvement—much better to be satisfied if the desired shifts are actually taking place and continuing to find ways they can be further improved; (3) the twin needs of good communication and trust-building are essential and must be instilled in all work; (4) avoid being a negotiating forum to second guess or try to influence outcomes that should properly occur via direct negotiations of parties; (5) with the import of ideas, technologies, etc., from outside of China it is necessary to give adequate consideration to Chinese characteristics and situations; (6) recognize that once decisions are taken on policies, action may take place with breath-taking speed, and that will influence follow-up needs. These points were well received as indicators of a degree of maturity in how to conduct business as a successful think tank. The meeting was linked to the 7th U.S–China strategic dialogue.

How CCICED might evolve as an institution in the future will depend on circumstances that are in the hands of senior decision-makers in China. But it is clear that, at present, CCICED is accepted as a think tank of value to both China and the international community. Perhaps the best signals of that are the continued external and Chinese financial support, the access given by Chinese leaders and their ongoing uptake of CCICED recommendations, and the quality of people and institutions attracted to work with CCICED.

Other thoughts on the future of CCICED

Should CCICED continue with the major focus being on China's future domestic environmental needs, or should it place more emphasis on China and world issues? Should it become an advanced think tank along the lines of some other international E&D organizations?

In the world's evolving views about what constitutes living within planetary boundaries, reducing ecological footprints, building "carbon neutrality," maintaining biodiversity, setting new goals for ecological services and ecosystem restoration, how can CCICED help by promoting advances in sustainable development and ecological civilization?

Should CCICED-types of organizations become a new basis for promoting integrated eco-environmental planning and management in various other parts of the world?

How can CCICED improve on its existing relationships with private sector organizations within and outside of China, and what role should it play in promoting market-based solutions and trading arrangements? Also, is there any role for CCICED beyond what it does already in addressing new policies for meeting massive needs for green finance, whether in China or regionally and globally?

How should CCICED itself be funded in the future? Should it continue with five-year renewal periods or be developed and maintained as a permanent body? Certainly, E&D progress to 2030–2035 is of crucial importance on topics such as avoiding further erosion of biodiversity, bending the curve of potential climate change outcomes, reducing/eliminating poverty, and meeting the full range of the UN 2030 SDGs.

At this point, we pose these questions as items to be considered rather than attempting to provide specific suggestions about answers. However, we consider the warning that complacency stalks all organizations of a certain age. So far, CCICED has "kept up with the times," in part because of China's dynamic and adaptive approaches. But that is not enough. CCICED has to be ahead of the times in its thinking and advice. As pointed out by some senior Chinese colleagues in government, "Please do not tell us what we already know!" Thus, innovation concerning both institutional and management approaches must continue to be front and centre.

CCICED as a model directly applicable to other countries

From CCICED's beginning, there were high expectations regarding need, uniqueness, and the anticipated high value of international cooperation. CCICED was (and to some extent still is) an experiment since each phase has brought forward new ideas regarding content and adjustments on how work is carried out. There were some initial donor hopes that this type of institution might be valuable for other large countries, notably India and Russia. Indeed, there were some early efforts to do so, although not really very successful.

The most direct efforts towards CCICED cooperation with the potential of seeing a CCICED-style organization in another large country was initiated by the late R. K. Pachauri, a former member of CCICED and Director General of the Energy and Resources Institute (TATA), India. Based in part on his knowledge of CCICED, he set up an India Council for Sustainable Development (ICSD). This body included eminent advisors from India and international sources with the intent of providing recommendations to relevant government agencies. A major meeting sharing Indian and Chinese experiences was convened by CCICED in September 2006. Research cooperation followed with two objectives: (1) understand the E&D paradigms of the two countries and (2) draw commonalities, differences, and lessons to be learned. The hope was that the experience might be shared with other countries. A joint 2011 book was commissioned by CCICED and ICSD from this work.[64]

The reality is that CCICED's success story may not be easy to exactly replicate in other countries. This Council got started in a highly motivated setting where some precursor activities had already set the stage for improved environmental protection nationally and internationally. Its birth took place just before the 1992 Rio Earth Summit. China's national government recognized the urgent need to address the environmental consequences of extremely rapid economic growth. The government was relatively well organized for managing development basics but lacked the knowledge, organization, and frameworks for environmental protection that many OECD countries had gained from the 1970s onwards.

The painstaking efforts during CCICED's first decade to build strong working relationships at the level of CCICED members and within WGs turned out to be essential grounding. These efforts were coupled with the welcoming attitude of China's senior leaders, political and scientific, plus the supportive and long-term attitudes of international funders and participating organizations (generally 5-year pledges of cooperation), which all helped to provide stability in work plans and positive outcomes. In return, the ongoing government and partners' interest in the results and the evidence of positive outcomes in terms of policy development have helped to sustain interest levels in the transition at the end of each CCICED Phase.

China has presented some of the most challenging E&D situations found anywhere in the world. The opportunities to see transformative change in action have been stimulating for most people engaged in CCICED's earlier activities. This realization is still present today and is an important motivational factor. What was initially discussed as the need for "leapfrogging" efforts now has turned into productive partnerships for tackling today's global and national environmental emergencies. In the future, it will be learning from China's advances in many E&D aspects, including the value of overarching visions, such as those of ecological civilization.

Whatever might have "gone off the rails" that could have brought an end to the organization during any one of CCICED's six phases has been avoided. One matter sometimes raised is that the need for international input and advice eventually would not be necessary. Given the huge advances in Chinese experience and expertise, on the surface, this might already appear to be a valid point. However, there has been a major shift in approach, particularly in the last decade. Now E&D problem solving is much more of a mutual learning process to address complex issues.

Senior Chinese leaders at various times have offered the opinion that CCICED should be a very long-term endeavour, given that today's international environmental commitments often extend past mid-century. Debates regarding whether CCICED should be mainly working on domestic China priorities or also include a major focus on Chinese and global environmental matters have taken place, but mainly in the past. Now it is generally recognized that substantial commitment to international matters is very important for CCICED's future.

The unusual nature of CCICED could have been a threat to its financial support base, especially when China graduated into a higher-income status, with questions about whether CCICED should be supported with development assistance funds from some donors. From its domestic sources, China likely could find the relatively small level needed to keep CCICED well-funded. Such matters have been considered by some donors. Overall, funding has remained at a steady level. The feeling is that the best arrangement is to have support flow from multiple sources, including a range of international sources. This helps in various ways to maintain the independence and quality of

[63]CCICED: Profile of a Unique Think Tank. 24 pp. CCICED Secretariat. 2015.

[64]2006 Report on CCICED Meeting on Environment and Development in China and India and Global Implications; and CAEP, TERI, CCICED and ICSD. 2011. Environment and Development. China and India. 479 pp.

CCICED's work and also gives it the capacity to tap into the most outstanding people and diverse perspectives.

China is the largest funding contributor, especially when in-kind contributions are considered. Canada and several other countries, such as Norway, have provided anchor funding that is important to send a signal to others concerning the value proposition that makes the investment viable. As noted in Annex 1, at any one time, there can be a dozen or more funding partners, each with their own interests in mind and rules that will work for them and for China's administrative system.

The justification for spending from development funds such as CIDA, SIDA, GIZ, and others was simply that high-quality development depends on good environmental quality. While poverty eradication is essential—as are investments in health, education, and sustainable livelihoods—it is the health of ecosystems and the quality of rural and urban development, including clean air and water, etc., that also can make a huge difference in the quality of people's existence and happiness. And for the future, with the looming presence of climate change, biodiversity decline, and other such threats, building resilience, restoring productive ecosystems, and safeguarding against toxic substances are front and centre in sustainable development goals. Whether CCICED's international funds are channelled through a Ministry of Environment and Climate Change, currently the case for Canada and some other sources; through arrangements with China for support of specific initiatives, such as the Asian Development Bank (ADB) contribution that has supported work related to the Yangtze River; or from partners drawn from business and international organizations such as The Children's Investment Fund Foundation, it is spent in accordance with the objectives of CCICED's annual work plans.

An important point is that substantial in-kind funding by international partners takes place via their contributions to CCICED's SPS work, support of roundtables, workshops, open forums, etc. Some examples are a 2008 Swedish-sponsored meeting of the Chinese 50 Forum of leading economists that was very helpful for the initial planning of CCICED's low-carbon economy efforts; WEF meetings on green technology and other topics; WRI's recent work related to green supply chains; ADB and TNC work on integrated planning and river basin law related to YREB; the Netherlands PBL on scenario development, water basin management, etc.; WWF China on Ecological Footprint; and Germany's long-standing partnership with CCICED, which draws upon the participation of government departments such as the German Federal Agency for Nature Conservation (BfN) and the non-profit organization GIZ. These types of in-kind (and financial) support and experience magnifies the quality, contacts, and reach of CCICED efforts immensely.

Greening the BRI

China's BRI is often described as one of the most ambitious infrastructure projects ever conceived. Initiated in 2013, it is a "transcontinental long-term policy and investment program" aiming to "promote the connectivity of Asian and European and African continents and their adjacent seas…and realize diversified, independent, balanced and sustainable development."[65] While more than 100 countries and international organizations are involved, it is recognized as a flagship initiative of China. At the BRI Forum for International Cooperation in May 2017, President Xi Jinping proposed that "we should pursue the new vision of green development" and the UN 2030 SDGs. This was followed by an official Guidance Document on Promoting Green Belt and Road.[66] The document proposed sharing China's experience and practice in ecological civilization and green development, enhancing capability for eco-environment protection, preventing eco-environment risk, and facilitating the joint achievement of the 2030 SDGs by countries and regions along the route.

In mid-2018, CCICED initiated an SPS on the need for a Green BRI, drawing on existing work from MEP and other sources.[67] This SPS held consultative meetings in Pakistan and Sri Lanka, as well as in China. The meetings in the two partner countries were very useful since they provided insights regarding the developing country partner side of BRI. Some of the key suggestions from these meetings were the need for aligning BRI with the 2030 UN SDG Agenda; enacting principles that would ensure new projects are green from the start; enforcing environmental regulations in host countries should be incorporated into the loan conditionality by China; understanding the role a digital BRI can play; implementing projects that are demand driven and sustainable; and engaging in solid environment-related projects.

Based on the SPS preliminary work and AGM discussions, an extensive set of recommendations for a green BRI were included in the 2018 CCICED report to the State Council. Further recommendations can be found in the SPS 2019 report as summarized below:

[65]beltroad-initiative.com
[66]http://english.mee.gov.cn/Resources/Policies/policies/Frameworkp1/201706/t20170628_416864.shtml
[67]CCICED Special Policy Study on Green Belt and Road and 2030 Agenda for Sustainable Development. May 2019. http://www.cciced.net/cciceden/POLICY/rr/prr/2019/201908/P020190830114510806593.pdf

(1) actively participating in global environmental and climate governance to build the Belt and Road into a road to ecological civilization and green community of shared destiny; (2) developing the strategic alignment mechanism for Green Belt and Road and promoting the coordination and implementation of strategies with policies, plans, standards and technologies; (3) establishing a Belt and Road risk prevention mechanism to guide green investment with green finance and ecological and EIA; (4) building Green Belt and Road project management mechanisms to encourage green development practice by businesses; and (5) promoting people-to-people bond to strengthen personnel exchange and capacity building.

A follow-up CCICED SPS on BRI was initiated in 2019 to explore some of these themes and others in order to create more detailed suggestions for a green BRI roadmap. In its September 2020 report,[68] this follow-up SPS on BRI placed considerable emphasis on biodiversity, given that many partner BRI countries are located in biodiversity-rich regions. The following excerpt from the SPS recommendations is illustrative.

China should align the BRI with other biodiversity related international conventions that China is a signatory to such as the Convention for the Protection of New Varieties of Plants, the Convention Concerning the Protection of World Cultural and Natural Heritage, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and Convention on Wetlands of International Importance Especially as Waterfowl Habitat, and foster synergies with climate related conventions such as UNFCCC…

...Take ecological redlining as a key instrument to link the BRI and SDG 15. As the practice of ecological redlining has yielded promising results in China, it is recognized by the international community, with expectations, that the ecological redlining system is most closely aligned with a mitigation hierarchy that is commonly used in biodiversity conservation at the global level.

…Adopt a mitigation hierarchy for those projects identified as having significant biodiversity risks as a result of strategic environmental assessment (SEA). The majority of international financial institutions require biodiversity assessments tied to mitigation measures to attain the overall goal of "no net loss" or even a "net gain" in biodiversity…drawing on its own experience with the ecological redlining, biodiversity offsets, ecological restoration, and ecological compensation schemes, China is recommended to develop a standardized biodiversity conservation hierarchy that should include four components of "avoidance", "mitigation", "restoration", and "compensation"…The cooperative measures to be taken depend upon the degree of risk identified in the assessments. Such an approach should include ecological 'red lines' across the BRI…

CCICED has worked closely with the BRI International Green Development Coalition (BRIGC)[69] by sharing sources of expertise over the past several years. Further, some key CCICED recommendations are already finding their way into policies—for example, on July 15, 2021, the Ministry of Commerce and MEE jointly issued the Guidelines for Green Development in Foreign Investment and Cooperation. These guidelines are very important for BRI. Under the theme of green and low-carbon development, a meeting was recently held by BRIGC concerning marine ecological and environmental protection and sustainable shipping. This topic is a direct follow-up to CCICED 2021 AGM advice provided by CCICED's Sustainable Ocean Use SPS.

South–South Cooperation

In 2016, CCICED established a TF on South–South Cooperation for Ecological Civilization. The intent was to have the TF report quickly since the theme for the 2016 AGM was China's Ecological Civilization and the World. This was an important initiative since it was the first time the topic had been carefully reviewed by CCICED. Mr. Kandeh Yumkella, a CCICED member and former Director-General of UNIDO, served as the International Co-Chair. The TF produced a number of very useful recommendations, as summarized in Box 16.

China's special relationships with developing countries are valuable globally, regionally, and bilaterally. They have trended towards environmental matters in recent times—for example, in China's South–South Climate Cooperation Fund announced in 2016 and another such fund related to the UN SDGs. The Asian Infrastructure Investment Bank (AIIB), the BRICS New Development Bank, and China's Development Bank are very important sources of outgoing investment funds for development. In 2018, the China International Development Cooperation Agency (CIDCA) was announced and, since then, has become an important coordinating body within the State Council on foreign aid matters. It can be presumed that China will continue transforming its approach to be in line with green development and ecological civilization in all its activities, including international development commitments.

[68]https://cciced.eco/wp-content/uploads/2020/09/SPS-4-1-Green-BRI-and-2020-Agenda-for-Sustainable-Development.pdf
[69]https://green-bri.org/belt-and-road-initiative-green-coalition-brigc/

Box 16. Recommendations of CCICED TF on S-S Cooperation for Ecological Civilization

Establish criteria to guide China's selection of priorities in South–South Cooperation for Ecological Civilization: (1) be consistent with the 2030 SDGs; (2) be adaptable to countries at different stages of development and with varying needs; (3) provide systematic solutions that balance livelihood and ecology; (4) operate with innovative technology and development models; and (5) promote environmentally friendly and low-carbon infrastructure. The use of these criteria consistently will send strong signals to partner countries about ecological civilization.

Achieving global sustainable development goals requires both developed and developing countries to make joint efforts with due consideration of common but differentiated responsibilities and actively promote South–South cooperation while continuing South–North cooperation…implement major initiatives in the context of green development such as the BRI, proactively promote South–South Cooperation for Ecological Civilization with Asia, Africa and small island countries, respond to green development demand from other developing countries, jointly promote and assist implementation of the UN 2030 SDGs, and enhance China's contribution to global environmental governance.

Establish a coordination mechanism for South–South Cooperation for Ecological Civilization.

(1) Establish a ministerial-level China International Development Cooperation Agency to integrate international development aid and South–South cooperation. This agency would be responsible for mainstreaming the ecological civilization concept into all decisions and plans, including objective identification and policy making at the macro level and institutional arrangements, process management, monitoring, and evaluation at the micro-level.

(2) Develop a comprehensive Green Action Guide for China's Foreign Aid. This guide should provide information on types of projects that are particularly supportive of green development, assess the potential environmental impacts of China's foreign aid projects and provide support and guidance to mitigate environmental impacts. In addition, the guide should recognize the positive effects of foreign aid on meeting UN 2030 SDGs and addressing climate change.

Create the enabling conditions for South–South Cooperation for Ecological Civilization.

(1) Develop medium-term and longer-term strategies for Ecological Civilization components of South-South Cooperation. These strategies should give due consideration to the demands of global E&D, as well as demands from developing countries, including priority fields and programs that can take full advantage of Chinese technical, scientific and managerial expertise. Attention should be given to climate change, biodiversity, desertification, landscape restoration and afforestation and various ocean fields, and especially to topics of interest to developing countries adjacent to China.

(2) Develop a broad multistakeholder participation system for South–South cooperation. Motivate local governments, NGOs, and enterprises, and explore multilateral cooperation with other donor countries, development banks, international NGOs, and multinational companies.

(3) Strengthen institutional and human capacity building. Improve environmental awareness of people working for South–South cooperation. Enhance fundamental research efforts to provide a better theoretical and data basis for policy development and decision making. Select and train personnel in international perspectives, environmental awareness, and the expertise to take on South–South cooperation work.

(4) Enhance outreach. Systematically elaborate the relationship between ecological civilization and sustainable development goals to promote the internationalization of the ecological civilization concept. Strengthen information and data collection, pre- and post-project analysis and disclosure for South–South cooperation, and establish an official information release system and a "Government–Civil Society" dialogue platform.

Increase Financial Support.

Combine various financial sources to achieve an integrated funding [approach], including government aid, development agencies, commercial banks, and the private sector. Fully use the leverage of government funds to encourage more input from commercial banks. Fully utilize the financing capacity of multilateral financial platforms such as AIIB, NDB, GEF, and the Green Climate Fund.

Improve Process Management.

(1) Understand the demands of partner countries and stakeholders to improve project implementation in South–South cooperation. Proactively understand the needs and demands of partner countries and expand project partner relationships to include more environmental protection projects in the project pool of South–South cooperation.

(2) Consolidate existing foreign aid approaches and further strengthen technical assistance and knowledge sharing. Broadly extend China's successful experience in green agriculture, industry, and other sectors, and promote the application of new technologies in South-–South Cooperation for Ecological Civilization

(3) Pay close attention to the whole process assessment for large projects in the infrastructure, energy, mining, and agricultural sectors. In assessments, consider the ecological environment to be of the same level of importance as economic and social impacts, and establish an interactive mechanism for projects at all stages: proposal, assessments and monitoring, and evaluation.

The UN and CCICED relationships

The UN's role in promoting E&D in ways relevant to China stretches from the 1972 UN Conference on the Environment to the 1992 Rio Earth Summit, which influenced many of the subjects examined by CCICED from its start to this day. The UN General Assembly has been the stage for some major environmental announcements by China's Presidents, notably President Hu Jintao's September 2009 commitment to reduce carbon intensity and President Xi Jinping's "carbon neutral by 2060" statement in September 2020. In 2012, Premier Wen Jiabao chose the UN Rio+20 Earth Summit as the venue to chair a CCICED roundtable dialogue session with environment ministers from selected countries. In recent years, CCICED has been active in publicizing the UN World Environment Day (June 5), and in 2019, when China was selected to be the global point for this celebration from Hangzhou, the CCICED AGM was held in conjunction with World Environment Day. Former UN Secretary-General Ban Ki-moon attended in person.

China is a party to most of the world's global multilateral conventions relevant to E&D. CCICED takes care to differentiate between providing insights on the many aspects related to policies and the actual negotiations of agreements. The two most complex agreements (Biodiversity and Climate Change) are quite central to much of our work, as we have emphasized throughout this CCICED at 30 Report. As well, for topics such as trade and environment, development of new approaches to resource accounting and other indices, environmental health, and social aspects of sustainable development, etc., have led to participation in a large number of UN agencies, including those involving social and economic branches, and on regional UN organizations such as ESCAP.

Although all CCICED members serve in their personal capacity, it is hard to ignore the reality that having many members, research team participants, and others with linkages to UN bodies is extremely helpful. For CCICED, this starts with the people at the top of UN agencies. In Box 17 is a list of present and former CCICED members distinguished by their role as leaders of UN bodies or initiatives. At the other working levels, of course, there are many more. These affiliations are mutually supportive since the UN agencies can amplify their presence in China and on matters where China plays an important role regionally and globally, such as on many marine and ocean issues, green urbanization and infrastructure, and the circular economy.

Box 17. CCICED members with past or present UN head-of-organization positions

From the start, there have been helpful relationships between various UN specialized organizations and CCICED. Several past or present leaders of UN bodies have been CCICED Members.

These Members include: Mr. James Speth and Mr. Achim Steiner, UNDP Administrators; Mr. Klaus Topfer, Mr. Achim Steiner, Mr. Erik Solheim, and Ms. Inger Andersen, UNEP Executive Directors; Mr. Kandeh Yumkella and Mr. Li Yong, UNIDO Director-Generals. Leaders from other important UN-related bodies include: Mr. Barber Conable, former World Bank President, Ms. Kristalina Georgieva, IMF Managing Director and former CEO of the World Bank; Mr. Leonard Good, and Ms. Naoko Ishii, former CEOs of the Global Environmental Facility (GEF); Mr. Martin Lees and Ms. Julia Marton-Lefèvre, Rectors UN University for Peace; Mr. Francesco La Camera, Director-General International Renewable Energy Agency (IRENA); Sir Crispin Tickell, UK Permanent Representative on the UN Security Council; Mr. R K Pachauri, Chair of the Intergovernmental Panel on Climate Change (IPCC); Mr. Emil Salim, Chair of Preparatory Committee of the 2002 UN World Summit on Sustainable Development; Ms. Erna Witoelar, UN Special Ambassador for the MDGs, Asia and the Pacific; Ms. Laurence Tubiana, member of the UN Scientific Advisory Board, and co-architect of the UN COP 21 Paris Climate Agreement.

A major opportunity for CCICED in future partnerships with UN bodies lies in the implementation of ecological civilization. UNEP endorsed the concept at its February 2013 UN Governing Council meeting.[70] In 2016, UNEP produced a widely circulated report, Green is Gold, which described China's efforts for ecological civilization.[71] The report was financed in large part through CCICED. The theme of the 2021-22 CBD Conference of the Parties (COP 15) in Kunming is Ecological Civilization: Building a Shared Future for all Life on Earth. It is important to build an understanding of how ecological civilization can provide value-added to existing concepts of sustainable development and, in particular, to achieving the UN 2030 SDGs.

Ecological civilization is demonstrating its value inside China by providing new means for integrated planning and management to take place, as well as in its association with innovation and new perspectives. It is also a way of strengthening frameworks for green development. At a time when the UN and countries everywhere are searching for a new path to transformative change to build harmonious relationships between people and nature, there is a chance for China to make a big difference, just as it did with poverty reduction over the last two decades. Topics such as "green recovery" and other themes, including the "three global emergencies" promoted by UNEP and other UN organizations such as UNDP, could be included.

[70]"The international community applauded the Chinese measures and progress in promoting ecological civilization. In February 2013, UNEP's 27th council meeting adopted a decision in promoting China's ecological civilization." See Zhu Guangyao. Ecological Civilization. pp. 26-29 in March 2016 issue of Our Planet (UNEP Magazine on 'Inclusive Green Economy: Building Bridges to a Sustainable Future.')

[71]UNEP. 2016. Green is Gold. The Strategy and Actions of China's Ecological Civilization. https://reliefweb.int/sites/reliefweb.int/files/resources/greenisgold_en_20160519.pdf

Chapter 8. Observations and memories from CCICED members and others

Ideally, the supply side of CCICED shapes and carries out research initiatives and creates policy recommendations, while the demand side focuses on how to implement the advice received and on defining future needs and priorities. In addition, there are other interests at play, especially on the part of donors, sectors, and special interest groups within and outside of China. Many opinions, therefore, might be expected about CCICED's values and overall worth. As indicated in the preceding chapters, while there is an ongoing expectation of continuing improvement in quality of insights, usefulness of recommendations, and ability to anticipate future situations, there is considerable satisfaction in what has been accomplished.

There are also matters related to administrative quality, coordination needs, and how to address inevitable issues of varying perspectives related to research disciplines, limited time available for the work, etc. During the COVID-19 pandemic, there has been the concern of limited face-to-face meetings and disruptive schedules for virtual e-meetings. Remarkably, the COVID-19 problems have not overwhelmed CCICED's capacity to turn out good recommendations and high-quality scientific reports.

To carry out a detailed opinion survey and analysis involving the full range of people who have been involved with CCICED over a 30-year period is a major task. Indeed, it would be an effort beyond what is expected of this report. Instead, we have undertaken a more modest approach of drawing on opinions expressed in existing published materials, primarily from sources familiar with CCICED. As well, we include opinions from a very limited number of interviews with people actively engaged in CCICED roles. A short questionnaire (see Box 18) was used on an individual basis. As well, other observations were gleaned from published statements and speeches. For example, Huguette Labelle, former CCICED International Executive Vice Chairperson who as Co-chair of the 2006 Special Task Force on Review and Prospects, noted: "The CCICED Task Force on Forests and Grasslands provided an early assessment of performance that was an outstanding example of analysis. The work of this task force was listened to and acted on by the Government of China."

It would be valuable to undertake a more extensive and rigorous opinion survey on various aspects of CCICED activities. Perhaps at some point during the coming Phase VII such an activity could be added, with the intent of using such information for improvements that might be valuable for the critical period of 2030–2035.

Box 18. Questions and perceptions regarding CCICED and its activities

Early and ongoing viability of CCICED

- What makes CCICED unique in terms of its mandate, operations, long-term success or in other ways?
- What were the crucial early steps and inputs that helped CCICED gain strength and longer-term viability?
- Why has CCICED been able to attract high-quality members and researchers over such a long time frame?

Issues

- Were there key issues and approaches beyond those given high priority for CCICED Phase I or other Phases that you feel might have been given more attention?
- What became the most pressing E&D concerns for China in each of the three decades of CCICED's existence, and how successfully were they dealt with in CCICED recommendations? How well was CCICED able to draw upon its own previous efforts as time progressed?
- What do you think are the top concerns for future activities, especially during the next 5 years (Phase VII) and perhaps to 2030?

Time Frame for Policy Shifts

- Roughly what time frame was needed generally for CCICED recommendations to become actionable policies and outcomes? Please provide actual examples if possible.
- What might have been done differently to improve the effectiveness of CCICED's policy advice and uptake of the advice, timeliness of problem identification, operational strategy, and work implementation/completion?
- How might CCICED be improved to deal with converging issues, including those related to the current "three environmental emergencies" (climate change, biodiversity, and ecology and pollution) in addition to other big issues such as green COVID-19 recovery, green BRI, and other partnerships, and ongoing concerns related to UN 2030 SDGs?

Value to China and the World

- How does one properly assess the value of policy advice when its full impact may not be seen sometimes for a decade or more?
- Why does CCICED remain of high interest to senior leaders when they may get advice from many more sources compared to CCICED's first several phases?
- Is the value of CCICED to China and to the international community likely to increase or decline during the coming 5 to 10 years? How can its future value be maximized?
- Should CCICED continue indefinitely, well into the future, as suggested in one of our meetings with Premier Wen? He said this due to the complexity of E&D problems and their implications for all of us—China and the World.
- What might be the best roles, institutional arrangements, and funding sources for CCICED in the future (Phase VII and beyond)?
- Why is China the only country to successfully implement a mechanism such as CCICED for ongoing policy inputs? Might other countries benefit?
- How can CCICED's interest in green development and ecological civilization be phrased in terms helpful to the international community and in global green governance?

Your Personal Memories

- What are your most memorable experiences and successes regarding CCICED?
- Any additional points you may wish to contribute?

Senior Chinese leaders

Based on comments by senior leaders during CCICED events, some senior leaders' views are provided below.

Han Zheng, Executive Vice Premier of China and Chair of CCICED in 2019 CCICED AGM Speech:[72]

"The Chinese government fully affirms the tremendous efforts made by the CCICED to promote China's sustainable development…and it will support the CCICED to continue to play an important role. I hope that members of the CCICED and experts will put forward more forward-looking and operational policies in China's ecological environment protection and green low-carbon cycle development."

At the CCICED AGM Meeting in September 2021, Han Zheng noted that:

[72]https://www.zj.gov.cn/art/2019/6/10/art_1568565_34539783.html

"I hope the council members and experts continue to offer opinions and recommendations and make new, even greater contributions to promote the comprehensive green transition in China's economic and social development, as well as the construction of a clean and beautiful world,"

Premier Wen Jiabao[73] said during his meeting with CCICED members in 2010:

"The reason the China Council has lasted is because of the sincerity and good cooperation from both sides. For so many years, international experts and friends have sacrificed their free time to study China's problems and put forth recommendations. This has been of great help to China. From a broader perspective, I get the sense this is also your own commitment to Mother Earth, the only home we have."

In 2011 Premier Wen further suggested that:

"On the question of how long this Council will exist, I can tell you that we will continue until the international community is satisfied with China's efforts towards environmental protection. This is not an easy task: it will require the efforts of many generations, perhaps dozens."

As Vice Premier and CCICED Chair, Mr. Li Keqiang at the 2009 AGM indicated that:

"For 18 years, CCICED has witnessed the development of environmental protection in China… many study findings and policy recommendations have been taken up by the Government of China."

At the AGM in November 2003, Vice Premier and CCICED Chair Mr. Zeng Peiyan provided considerable guidance on what he expected in our work.[74] It was at an important time for the "Building of a Well-Off Society" and for "Adopting a Sustainable Industrialization Mode." He proposed three key points: (1) policies integrated to promote coordinated development of humans and nature, (2) promotion of international cooperation to protect the global environment, and (3) ensure that the role of CCICED should be fully utilized. Vice Premier Zeng Peiyan noted that:

"CCICED has done a great deal of effective work during the past 10 years or so, and played an important role in supporting China's sustainable development." However, he also called for internal improvements including "the quality of the Council Meeting" with better efforts and capacity of the Secretariat; the Council's policy advisory role should be strengthened, with attention to succinctness and practicability of recommendations; and more attention given to key issues on integration of E&D such as environmental protection financing mechanisms, international trade and environment, and urbanization and environment. Zeng Peiyan also indicated that "The China Council has attracted an outstanding body of Chinese and international experts…and have outstanding research ability… [with reports that are of] important and practical significance to us."

This type of blunt exchange has often taken place in meetings with senior leaders and others. It is a sign of trust that they take place. And they are helpful to CCICED members and experts who also seek continuous improvement and clarity about what is important on the demand side. At the 2004 AGM, the Vice Premier, Zeng Peiyan, noted that "all experts are welcome to voice your views freely and frankly." He suggested a need to provide China with recommendations on newly emerging issues.

Ministers and other administrators

Minister Zhou Shengxian,[75] at the 20th-anniversary celebration of CCICED in 2011, noted that there have been "two surging 20 years" for global E&D—first, the period of 1972 to 1992, and the second from then until 2012, the time of Rio+20. China's First National Conference on Environmental Protection in August 1973 took place only a year after the Stockholm Conference on the Human Environment. The National Conference produced the "30 Words" prelude that became the start for many E&D actions in China onward into later decades.

The second "surging 20 years" produced CCICED and other initiatives where "China once again joined with the world environment and development tide." Minister Zhou indicated that:

[73]http://www.cciced.net/cciceden/POLICY/rr/ir/201608/P020160803415551798447.pdf
[74]http://www.cciced.net/cciceden/Events/AGM/2003nh/yjjb/201205/t20120515_90268.html; http://www.cciced.net/ccicedPhoneEN/Events/AGMeeting/2004_3988/meetingplace_3989/201609/t20160922_89634.html
[75]Zhou Shengxian. Sharing the Achievements, Embracing the Future. Summary Speech at CCICED 20th Anniversary Forum. 2011. http://www.cciced.net/cciceden/Events/qthd/20zn/News/201205/P020160810375856773238.pdf

CCICED has developed a unique brand attracting high attention at home and abroad…Maintaining vigor and vitality, the direct dialogue mechanism of CCICED is long in history, high in level and big in influence and attracts high attention at home and abroad, while receiving good feedback…CCICED has turned into a platform where China has turned into a platform where China and the international community interact and learn from each other…a bridge for international cooperation.

In his speech to the 20th-anniversary session, Minister Zhou pointed out several examples of significant CCICED influence on governmental decisions: the need for an eco-compensation mechanism and a national strategy for ecological conservation and development; encouragement of clean production; developing national industrial, financial, taxation and monetary policies to facilitate Circular Economy; and the suggestion arising from the Task Force on Trade and Environment "for China's automobile industry to adopt Euro II–IV emission standards or their equivalent."

Over the years at CCICED AGMs, there have been many reflections about CCICED's value to both China and the world. Comments include constructive criticism, exhortative statements to "work even harder in the future," suggestions on how to make policy recommendations more practical, and identification of new topics for study, etc. More often, on the part of CCICED members, there is a sense of accomplishment expressed, of innovative pathways and roadmaps identified, and of the capacity to genuinely come to a mutual agreement on difficult issues. In every case, there is interplay among research team members, Council Members, and many others, including donors. For example, at the CCICED Bureau meeting held just prior to the 2018 AGM, the two CCICED Executive Vice Chairpersons (at that time) made the following observations:[76]

MEE Minister Li Ganjie noted that:

"The Council has made positive progress this year…Its policy recommendations in the areas ranging from global climate change to marine environment protection, and from biodiversity protection to gender equality, have spearheaded global environmental governance, owing largely to the Bureau's contributions. He hoped that the Council can play a better role as a Policy Express and contribute more to the development of the ecological civilization in China and in the world as a whole."

Minister of Environment and Climate Change, Canada, Catherine McKenna held that:

"…the work of the Chinese and international Council members has been diversified, inclusive, and sharing-based, and that the Council should enable its policy research to be more strategic and prospective based on China's development experience, extend its international influence, and better serve the global sustainable development."

Mr. Achim Steiner has been a long-time member and supporter of CCICED. He has served with the UN as UNEP Executive Director and currently as the UNDP Administrator—both organizations that have had long-standing CCICED cooperation. Concerning CCICED findings and policy assessment, Mr. Steiner said at the 2007 AGM: "I believe that China is now in the forefront of helping the world to interpret the environment in the context of development—more as a driver for development."

At the 2013 CCICED AGM, he commented:[77]

"Since my service as a Vice Chairperson of CCICED, I have witnessed its pro¬cess of growing into a platform for experts from the world to sit down and carry out re¬searches on emerging environmental issues as well as countermeasures. China has invested continuous efforts in coping with environmental issues and I am proud to be part of it…This meeting is held at a critical time when China is at the crossroad of green transition and ecological civilization construction. Through my meeting with Premier Li Keqiang, I learnt China's strong political will to make a difference in environmental management."

Mr. Steiner also indicated that:

"UNEP and the CCICED signed a Memorandum of Understanding to enhance and consoli¬date cooperation in the field of environment and development…Overarching cooperation areas of this MoU include the sharing of CCICED's experiences on green development, performance evaluation of CCICED policy research, capacity building programs and technical support from UNEP among other areas of collaboration."

Stephen Heintz, President and CEO of the Rockefeller Brothers Fund and CCICED member, at the 2021 CCICED AGM indicated:[78]

"Chinese leadership is committed to building an ecological civilization and it is clear China has reliable allies in the diverse international leaders and organizations represented at this annual general meeting. I think CCICED can be seen as a model of global trust-building, cooperation and effective partnership…This model will help China reach its ambitious goals of peaking carbon dioxide emissions and going carbon neutral. They are helping the world community to a future of net zero emissions."

At the same meeting, Kristin Halvorsen, former Minister of Finance and of Education in Norway, Director of the CICERO Center for International Climate Research, and currently a CCICED vice-chairwoman, said she found China a completely different country compared with 1985 when she first visited:

"I'm also very impressed by all [China's] achievements during the last decades, especially your fight against poverty. To go into a broad range of challenges, climate change, threats against biodiversity and the need for just transition to the sustainable economy. I'm impressed by the expertise that CCICED can mobilize to contribute to solve these tasks…I also appreciate how the experts try to focus on solutions."

Thoughts from a CCICED Chief Advisor, Academician Shen Guofang

CCICED has been fortunate to have individuals of broad experience and great wisdom available to serve in the role of Chinese CCICED Chief Advisor. Initially referred to as Lead Experts, and then Chief Advisor, the three individuals involved have made essential contributions to the quality and relevance of CCICED's scientific and policy initiatives, in addition to providing consultative services on many other aspects of the Council's efforts. The first person to be appointed was Academician Sun Honglie, Former Vice President of the Chinese Academy Sciences, and one of China's most prominent ecological and geographic figures. The second, Academician Shen Guofang, Chinese Chief Advisor between 2005 and 2016, is a forest scientist and university president, who was Vice-President of the Chinese Academy of Engineering. The third, Mr. Liu Shijin, has been Chief Advisor since 2017. He is a leading economist with extensive experience in transformative economic change and Vice-Chairman of the China Development Research Foundation and former Deputy Director of the Development Research Centre of the State Council. We asked Mr. Shen Guofang to provide some insights (see Box 19a.) arising from his long-term service with CCICED (at the start of this chapter, see Madame Huguette Labelle's comments on one of Professor Shen's earlier CCICED task force leadership contributions on Forests and Grasslands).

Box 19. Perspectives on CCICED from Chinese Chief Advisor (2004–2017) Mr. Shen Guofang

What makes CCICED unique? To begin with, it is a big platform, because China, the main target of the platform, is a large and fast-growing country. CCICED deals with nearly all issues relating to environment and development in the world and engages with many countries and international organizations. For this reason, CCICED can embody international views and experiences in a wide range of fields. In addition, it is very effective and offers targeted and productive policy recommendations for two subjective and objective reasons. Subjectively, the Chinese government earnestly expects to hear recommendations conducive to China's environment and development. It also welcomes diverse opinions with an open mind, and is

[76]http://english.mee.gov.cn/News_service/Photo/201811/t20181112_673409.shtml
[77]UNEP In China Newsletter, Issue No. 26 November-December 2013
[78]https://www.chinadaily.com.cn/a/202109/11/WS613be9d0a310efa1bd66ec1d.html

capable of converting reasonable opinions into science-based action. Objectively, by bringing top-notch Chinese and foreign experts together to explore common issues, the CCICED has become a pioneer of ideas and technology. Lastly, this platform enshrines the spirit of friendly cooperation. All parties involved in the work of the CCICED aspire to improve the ecological environment and facilitate social progress. Steering clear of potential differences in political views, they work together to advance the overall interests of the world's environment and development, and thereby set a remarkable example for international cooperation.

Over the past thirty years, the CCICED has made exceptional contributions to China's undertaking of environment and development. If you asked me to evaluate its contributions, I would compare the achievements secured by China in the field since the implementation of the reform and opening-up policy with the platform's joint research results and policy recommendations over the years. The CCICED was established in 1992, at a time when the Chinese government had just kicked off reform and opening-up and was trying to rebuild the country from scratch. At that time, the general understanding of environment and development was shallow, or they couldn't see the wood for the trees, regardless of whether they were government workers or the general public.

Over the past three decades, China has secured remarkable progress in this field and has even become a world leader in ecological protection and restoration, development of renewable energy, and protection of water and the atmospheric environment. The CCICED plays a crucial role in this process. Its contribution is not limited to the establishment and improvement of environmental protection agencies, or the issuance and implementation of environmental protection policies. Even more importantly, it has helped form and deepen the idea of environment and development through its influence in academia and public opinion. The endeavours of the CCICED and those of Chinese experts are sometimes mutually reinforcing and interdependent on each other. In this way the CCICED has subtly influenced the formation of several major policies in China. In fact, the CCICED's influence can be felt all the way from China's adoption and promotion of an international vision of sustainability, to coming up with its own concept of "building a resource-conserving, environment-friendly society" and the Scientific Outlook on Development, and to advocating for a more comprehensive ecological civilization. China's advanced ideas have, in turn, exerted positive influences on international ideas of environment and development.

Through three decades of hard work, the CCICED has developed into a world-renowned platform for environment and development, while China has grown into an experienced and capable major power in this regard. The CCICED will press ahead with its undertaking and continue to carry out international cooperation research and provide policy recommendations. However, it must continue to expand its expertise and engage more in forward-looking research. The CCICED could join hands with developed countries to explore some common, emerging issues relating to environment and development. It could also cooperate with those emerging economies and developing countries, especially countries in the Belt and Road Initiative, to explore their environment and development challenges and provide recommendations. China, and CCICED, could play the role of an international think tank, importing as well as exporting knowledge. It won't be easy to pull it off, but efforts should be made to achieve this goal step by step. I believe the CCICED will make a big difference in the future.

Academician Shen Guofang
Former Vice President of the Chinese Academy of Engineering

Observations on CCICED from several long-serving colleagues

Several individuals have responded to our requests for their observations about CCICED. Each person has more than a decade's experience with CCICED activities, often in several roles. We anticipate more such contributions. What is of particular interest is the impact of CCICED on the development of new skills and approaches on their own part. And, as Mr. Xue Lan points out, now it is possible to recruit young scholars into the work of CCICED and, more generally, into policy innovations linked to local needs. Each of the observers believes that CCICED still has untapped potential and is well placed to continue serving important needs for China. In addition, emphasis is placed on innovation as a key attribute that must not be lost.

Box 20 (a – f). Perspectives of individual CCICED Colleagues

Box 20a. "Green Transformative Change" Mr. Ren Yong

My career on environmental protection has been inextricably bound with CCICED and with accumulated and profound feelings. They link to my own professional growth, and to what I hope are substantive contributions. My first CCICED participation was in the research group on Resource Accounting and Pricing in CCICED Phases I and II. The outcome was experience gained on ecological compensation, market mechanisms, circular economy and other economy and environment relationships. Next came a role as Director, and Assistant Director General working with the CCICED Chinese Chief Advisor and his Expert Support Team. This involved a range of responsibilities including suggesting annual themes and research topics, supervision of draft annual policy recommendations, and oversight of research quality from 2007 until 2017. The fourth started in 2018, when I was responsible for SPSs on green transformation and sustainable social governance.

CCICED has left indelible impressions and lifelong benefits that I am grateful for. Unforgettable is the wisdom, dedication and sincerity of CCICED members and those engaged in research; and the modesty, openness and leadership of its leaders. Also, the trust placed on us by key members of the Secretariat, including individuals such as Mr. Guo Jing, who over a long period of involvement with CCICED, has encouraged innovative thinking and suggestions on matters such as green transformation, greening of BRI and other matters. Also, the role of key officials outside of MEP who can help in the translation of our efforts to the broader audiences on policy formulation within government. An example, to whom I am indebted for his advice, is Mr. Han Wenxiu, Executive Deputy Director of the Office of the Central Committee for Financial and Effective Affairs who is a CCICED member and head of our Sustainable Production and Consumption Research Group.

Mr. Ren Yong, Director General of MEE Environmental Development Centre,
CCICED Assistant Director General,
Director of Expert Support Team for Chief Advisors, and
Research Team Leader

Box 20b. "Growing Up Together" Mr. Wang Yi

As a young scientist in 1992 I was a member of the CCICED Working Group on Scientific Research and Technology Development and Training, later divided into two groups, on sustainable agriculture and on cleaner production. I was involved in other groups, especially with the Lead Expert's team that eventually became the support for the Chief Advisors. In CCICED Phase V, I participated in two research teams. Therefore, I can say that CCICED and I grew up together, especially in blending the efforts of both international and Chinese specialists on environment and developed. I made many linkages that were helpful with my Academy of Sciences work on sustainable development. Finally, through participation with CCICED, it has opened opportunities to see different perspectives on issues rather than only the ideas of a limited number of government agencies such as MEE. This is especially valuable for my service as a member of the NPCC.

Both CCICED and I have learned a lot over these three decades, and, as a consequence, are likely more valuable to society now. For example, the combination of Chinese and international elements of problems places CCICED on the cutting edge of environment and development. This contributes a lot to the growth of Chinese scientists, and I daresay also benefits international experts and organizations. To sit through a CCICED AGM and also to participate in the 'backstage' aspects definitely is valuable. It is quite different than being involved in international negotiations on the more rigid platforms of the UN or other bodies. Yet CCICED is also a direct channel to national leaders. CCICED influences widely. It is thanks to its open mechanism and forward-looking topics that CCICED continues to attract many excellent Chinese and international experts.

In the future CCICED could play a larger role in the new approaches to environment and development, perhaps even in some issues related to COVID-19 or other emerging global socio-ecological problems. Also, CCICED could place more emphasis on studying problems elsewhere such as in Europe and North America, and developing countries such as those in Southeast Asia. We need to understand where the great opportunities for environment and development progress can be found, and the best roles for CCICED in addressing them. Hopefully our "growing up together" can continue well into the future!

Wang Yi Member of Permanent Committee of the 13th National People's Congress; Former Vice President of Institutes of Science and Development, Chinese Academy of Sciences

Box 20c. "Sustainable Ocean Use" Academician Su Jilan

First and foremost, I am an ocean scientist. I have had the good fortune to hold interesting research positions within China, and also to contribute to global ocean studies and administration. I became involved in CCICED when I co-chaired along with Mr. Peter Harrison, former Deputy Minister of Fisheries and Oceans Canada, a Task Force on Sustainable Use of China's Ocean and Coast (2009-2010). Prior to that time CCICED had not undertaken any studies specific to oceans.

Following this work, I became a CCICED member, and from 2017 to 2021 have co-chaired with Mr. Jan-Gunnar Winther of Norway a 6-part CCICED examination of Global Ocean Governance and Ecological Civilization: Building a Sustainable Ocean Economy for China. This SPS has now completed its work. However, it has been suggested that there is much more work remains to be done on oceans and coast, not only regarding policies linking rivers and the sea, but also such as the relationship of the oceans to climate change policies, low carbon economy and circular economy. One might say that the key to success in CCICED lies in spotting appropriate research topics. It took a long time for this to happen for oceans, but now interest levels are high, and there have been very positive uptakes arising from our recommendations. Notably, severe restrictions on further destruction of coastal wetlands, domestic fishing fleet reductions and closures, efforts underway to reduce plastic wastes entering the sea from rivers, and ecological redlining in China's coastal and offshore areas.

There are some valuable lessons from which others might learn. CCICED's unique mechanism for its policy recommendations to be directly submitted to central government authorities at senior levels is valuable. Many other institutions have a difficult time to do so. By keeping an open mind about the breadth of work undertaken and the necessary scope of recommendations suited to the root causes of problems is another advantage of CCICED. It can assess problems from a number of perspectives and with views come from a range of stakeholders. This is very helpful when considering complex situations such as land-based sources of marine pollution, and incentive systems for marine components of ecological civilization.

So far, CCICED has not placed sufficient emphasis on how to bring its marine research policy findings into the public domain. We know the general public is interested in the ocean's role and how to protect the sea's environmental quality. Also, how the public can participate in improving ocean sustainability. It is essential to create these connections via examples that use understandable language and imagery that convey important messages about how the sea and its ecological health affects all people in China and elsewhere. There is a certain level of urgency in doing so, given that the ocean is already seen to be in a state of environmental crisis globally, with many restorative and preventive actions needed. Working with BRI partners interested in ocean matters can be a significant next step in addition to addressing China's domestic ocean sustainability.

Mr. Su Jilan, Honorary President of the Second Institute of Oceanography, SOA, CAS Academician

Box 20d. "Four Important Characteristics of CCICED" Madame Sarah Liao

How privileged I feel to have been a CCICED member from 2008 to 2018, a time when the flood gates of access to information and communication, technological innovation, funding availability, and energy options opened in China. The 30 years of CCICED's existence parallels the evolution of sustainable development thinking in the world. Globalization has removed many barriers and created opportunities for those with a vision for a better future. China has seen its share of growing pains but has left little doubt about its commitment to sustainable development. Placing the environment parallel to development in the Council's title was no accident. And I salute that! Four characteristics have been especially important for the Council's unprecedented success.

1. Building trust among members, CCICED researchers, and policy-makers

   Carrying out research for a CCICED policy topic, as I did with colleagues from Hong Kong University, involved PRC government officials such as MEP, NDRC, universities, Chinese research units, overseas think tanks, and CCICED members. It was a very satisfying and encouraging experience to be trusted with access to so much information and varied analytical capacity. A number of those involved were younger-generation researchers. All shared the desire to see China's environment be protected and its people enjoying a better quality of life. Ultimately, we want to see China's sustainable development become a long-term asset in the best interests of both the country and the entire world. That thinking helps to build consensus in the teamwork and recommendations. I remember the CCICED AGM main Council meeting as packed with presentations, but there were always seasoned scholars who knew the appropriate time to ask critical questions.

2. Empowerment of CCICED

   A look at the CCICED leadership explains why it is so effective. It is chaired by the Executive Vice Chairman of the State Council. We can rest assured that the Chairman would not recommend the proposals and recommendations submitted by CCICED unless he is satisfied that the conclusions are supported by robust research consisting of scientifically tested and verified data. After all, so far, the chance of a CCICED chairman later becoming the country's Premier has been high! The appointment of very high-level heavyweights to head CCICED speaks clearly about its perceived worth.

3. Institution strengthening and capacity building

   It is not an exaggeration to say that many leaders in every trade, institution, or government department still have a tendency to treat environmental needs as an afterthought or an add-on. But CCICED explicitly gives the environment equal priority in its recommendations. For the PRC Government to implement what they believe in requires structural and institutional shifts, as well as more well-trained people to do the actual work. The benefits are obvious for the PRC and globally. CCICED is exemplary in its ability to propose red tape removal while still building momentum for sustainability.

4. Telling it like it is: Nothing is better than genuine facts

   CCICED has laid down very clear directives regarding its requirements and standards. It does not mince words but makes it loud and clear that it wants all recommendations to be fact based and supported by true data and testing. Discussions can then move toward identifying solutions to improve the conditions of the environment and/or the economy.

Looking Ahead

There will always be difficult common problems to deal with at any time. The challenge is to catch and ameliorate them before they become untenable. I would be keen to see a review of the outcome of the projects and advice conducted under the purview of CCICED—and the final destiny and impacts of their recommendations. I would love to see the next stage of CCICED include suggestions for successful models for Chinese partnerships, such as with countries along the BRI. All the best for the next 30 years!

Madame Sarah Liao
Former Member of CCICED and SPS Team Leader
Former Secretary for the Environment, Transport and Works, Hong Kong
Environmental Advisor for Beijing Olympics and Shanghai World Fair
Senior Advisor to Chancellor of Hong Kong University

Box 20e. “Governance and Innovation” Mr. Xue Lan

I have been involved in several CCICED projects, including one related to Environmental Governance in China, with experts from Germany and the USA (2004-2005). Soon after, I served on the Task Force on Innovation and Environment-friendly Society (2006-2007). In 2016-2017 an SPS on environmental governance examined China’s Green Transformation Governance needs. Over this time frame it is fair to say that China’s environmental governance system improved a lot, and I believe that the work of CCICED helped.

When viewed from another perspective, environmental governance is not a simple issue related to the environment. Actually, it faces production mode transformation—and the transformation from production into life styles shared by the entire society. An example on how CCICED linkages can help is the following case. Ms. Lisa Jackson former, US EPA Administrator, became Apple Vice President of Environment, Policy and Social Initiatives Both she and I were involved as members of the 2016-2017 Transformative Change SPS. While working out a specific aspect of China’s environmental governance, we consulted MEP Minister Chen Jining. He mentioned the cultivation of young environmental protection talents. He suggested the need to go beyond influencing people only for these posts, but also reach out to people for all types of posts so that they would be aware of environmental protection for sustainable development in the future.

Subsequently, we took forward the idea for a “Summer Institute for China’s Green Innovators.” We cooperated with Apple to initiate this program and up to this point (5 years) have cultivated several hundred young people. They are exposed to green transformation and sustainable development basics at Tsinghua. Following this, they go to some grass-root entities in China to conduct field investigations. Then they seek out projects and submit their proposed solutions. These are assessed and we have found a lot of good projects. Some have been applied locally, and some are about to provide relevant policy recommendations to the country, or even to the international community. We have a project relating to marine garbage, which has attracted the attention of the Office of the Central Committee for Financial and Economic Affairs. In addition, some other projects have successfully obtained patents. I mention this program repeatedly in CCICED to remind it to care about cultivating young people—a new generation for China’s green transformative development in the future. We sow the seeds and they will grow into towering trees.

I also want to provide my views on why I believe CCICED can be a long-term success. First, it offers the best integration of openness and reform, a combination of a platform with an international mechanism but also concerned about high-priority domestic environment and sustainable development concerns. Second, CCICED is an example of industry-university-research cooperation. Third, it is a new-type think tank, a dynamic institution capable of shifting attention to be in line with changing policy needs, sometimes quite radically, and a devotion to solid and in-depth efforts. Its results can be directly submitted to top-level leaders but also must be shared broadly and openly for all interested parties.

The value of CCICED to China and the international community in the coming 5 to 10 years will rise. International environmental changes in the past several years have posed great challenges to China. But, for example, concerning the relationship between climate change and sustainable development, China and western countries share common value in many aspects. Compared to any time in the past, the importance of the CCICED’s platform should be strengthened. Take advantage of this channel and let it play a greater role. At the same time, I wonder if there is the possibility to change into a more flexible orientation during next steps. Combine stable, longer-term projects with flexible ones in order to provide a more complete research mechanism. Also, we need to consider shifting towards scientific analyses that may be more quantitative to confirm environmental standards. We should also take our work to specific end points such as the effect of environmental pollution to human health. This requires empirical effort.

Mr. Xue Lan
Tsinghua University, Dean of Schwarzman College,
Co-Chair of the Leadership Council of the UN Sustainable Development Solution Network,
and Professor at School of Public Policy and Management at Tsinghua University

Box 20 f. “A Unique and Impactful Organization” Madame Li Lin

My experience with CCICED extends back more than 15 years. I share the views of many others—Chinese and international—that it is a unique and impactful organization for advancing sustainable development in China and, I believe, in the future, for the world. Below, I provide some reasons why and a suggestion for the future.

Why does China’s government continue to seek advice from CCICED after 30 years? There are many answers. These three stand out for me.

(1)The unique characteristics of its top-down management system, with access to centralized policy-makers, work effectively in China and allow for transformative change.

(2)China’s strong desire to learn from a range of experiences throughout the world. CCICED was structured to draw upon wisdom from within China and from many outside sources. That has enabled CCICED to formulate recommendations appropriate for Chinese circumstances and needs and draw upon successful experiences elsewhere. It opens the door to “leap-frogging.”’

(3)China has good implementation skills and an ability to turn challenges into opportunities. By linking environment with development, CCICED has been well positioned to provide insights helpful to setting necessary policy frameworks that enable high-quality implementation. This has been true not only for pollution prevention and control but also for carbon peaking and carbon neutrality.

Why has CCICED been so successful in attracting outstanding international experts and organizations to participate in its research and policy work and to be Council Members? One reason early on was the interest in working with a major country that was mostly an unknown entity on environmental matters. Later, as the issues became more complex, the full range of problems was revealed, and the government became determined to solve them, CCICED participation became a source of pride for both Chinese and international participants. They added achievements to their professional growth and recognized that their contributions were being applied in meaningful ways—for both the environment and development. Nothing makes a professional environmentalist prouder than his/her opinions and recommendations being valued and put into action in a rising country on the world stage—China.

Why does the mechanism of CCICED continue to work well? Over time, issues have matured and changed. CCICED has kept up with the changes through various consultative means and by keeping track of policy needs. CCICED scans frontiers of concern and hot topics concerning national and global environmental trends.

(1)CCICED can provide research-grounded policy recommendations relatively quickly—for example, for the low-carbon economy first proposed in 2003 in England. Throughout 2006–2009, CCICED actively debated the issue. By 2010 China put forward the scheme of “five provinces and eight cities” to start low-carbon pilot provinces, regions, and cities.

(2)Chinese and international thoughts can be sublimated by internal discussions at the level of research teams. This can lead to advanced ideas appropriate for Chinese situations and implementation being further refined during CCICED member meetings, with final recommendations then being forwarded to the State Council.

(3)Particularly in recent years, CCICED has done a good job of publicizing its policy recommendations—for example, through roundtables and open sessions at the AGMs and through an innovative, fully bilingual website. Recommendations and reports are circulated not only to the State Council but also to a range of decision-makers inside and outside of China, including local governments, businesses, and civil society organizations.

What about the future development of CCICED? For a long time, CCICED has been importing international research beneficial in various ways to Chinese environmental and development policies. So now it is time for CCICED to change into a two-way platform. It should consider how best to tell the Chinese story of sustainable development and help to export successful domestic experience, especially to interested developing countries.

Madame Li Lin
Director of Global Policy and Advocacy, WWF International

Box 21. Excerpts of Remarks by international Council Members during the 2021 Annual General Meeting

Erik Solheim, former CCICED Vice Chairperson; World Resources Institute Advisor

… Two huge shifts have happened in the world over the past 30 years.

First, of course, China has won maybe the biggest battle in human history, to bring every single Chinese out of abrupt poverty, and into a decent economic life. It also transformed China and the CCICED from being mainly a recipient of international finance, international technology, and best practices, into an exporter of investment technology and best practices. This is also why Belt and Road is now so important, because it's the vehicle for making all the green ideas, finance and technology in China available to the world.

The second big shift is the shifting of the thinking. In the 20th century, the development model was, pollute first and clean up later. And it was all about win-lose. Economists said, "we need to prioritize development." Environmentalist said, "No, Mother earth is more important. You need to prioritize green solutions." Most people think economists won that debate, because development for most people was seen as the most adamant desire of the time. But that was the 20th century. The 21st century is all about win-wins. All the policies, green tourism, green agriculture, shifts from coal into renewables. All the policies are good, both for environment and for development. It is about win-wins, even triple wins, good for economy, good for people's life and health, and good for mother earth, in the same policy.

…And finally, CCICED is all about togetherness, bringing together the private sector, governments, and civil society. More importantly, bringing together all the major regions of the world, China and the United States, Europe, Africa, Latin America, etc. Together we can achieve everything. If we allow someone to split us, we will be poorer, there will be less trade, less technology, and the environment will suffer. So, let's embrace that togetherness. Together we can create a green, global civilization. Together we can create a shared prosperity, and the shared humanity with every single individual.

Stephen Heintz, president and CEO of the Rockefeller Brothers Fund

… this brings me to the remarkable work of CCICED, which is nearing its 30th year. Through task forces, research projects, on ecological civilization, to production, and green energy, leaders and organizations from across the world have joined hands with scientists, policymakers, and planners in China to tackle some of the countries, and the world's, greatest environmental challenges.

In addition to delivering concrete policy recommendations, CCICED provides a safe space for stakeholders across government, private and non-governmental sectors, to candidly assess the challenges of achieving an ecological society in China, and to form resilient partnerships that have produced practical and significant outcomes. The collaborative research between universities, the information sharing between non-governmental and governmental organizations, and the technical and policy exchanges on climate and environmental affairs are exemplary of the work that is necessary for our entire global community, and the future viability of our planet. It is through these interactions and engagements, that all sides of the table gain a deeper understanding and appreciation of each other's challenges, choices, and actions.

Over the years, and through all of the activities of CCICED, trust has been built and trust may, in fact, be one of the most important outcomes of this council. With the announcement of China's dual goals of peaking emissions before 2030, and reaching carbon neutrality by 2060, China has reached a major milestone on its journey while also demonstrating old global leadership from Guan dong to Guan dong, across all of China, thousands of hours of learning together and working together have crafted roadmaps, and drafted policies that form the foundations for the achievement of China's ambitious goals. The Chinese leadership is committed to building an ecological civilization, and it is clear China has reliable allies in the diverse international leaders and organizations represented at this AGM.

I think CCICED can be seen as a model of global trust-building, cooperation, and effective partnership in which U.S.-China cooperation is very much present. This model will help China reach its ambitious goals of carbon peaking and neutrality. It will help lead the global community toward a net-zero future.

We close this chapter with the recognition that much more remains to be said on the part of both those working on the supply side of analysis and those charged with the responsibility of turning good ideas into new policy, planning and management efforts.

Chapter 9. Conclusion: Advancing Ecological Civilization and Sustainable Development

The long struggle for a successful societal green transformation will not be over soon. After 30 years of effort during which CCICED has been a steady contributor to shaping China's E&D relationship, we see at least another 15 years of hard work ahead. On February 22, 2021, in advance of the 14th FYP, the State Council issued a circular (see Box 16) laying out key elements for "green, low carbon and circular development" for building a new economy over the period to 2035. This represents the underpinnings of an ecological civilization. There are no points covered in the circular where CCICED has not provided relevant recommendations at some point in past decades. For some, we have sent signals well in advance of what the State Council has been calling for. At other times, CCICED has been able to provide additional suggestions relevant to what is already a progressive policy shift by the Government of China.

Box 22. "State Council calls for green, low carbon and circular development." (22 February 2021)

http://english.www.gov.cn/policies/latestreleases/202102/22/content_WS6033af98c6d0719374af946b.html

(Note: This box is the full text from the State Council release)

The State Council issued a circular on Feb 22, urging efforts to build an economic system featuring green, low-carbon and circular development, and to promote an overall green transformation of the economy and society.

By 2025, the industry, energy and transportation system will see a noticeable improvement, with the manufacturing, circulation and consumption system featuring green, low-carbon and circular development taking initial shape.

And as of 2035, the endogenous power for green development will be intensified, the scale of green industry will advance to a new level and the ecological environment will be fundamentally improved. The goal to build a Beautiful China will be basically achieved, the circular said.

In terms of building a green manufacturing system, the circular set targets in many sectors, including industry, agriculture, services, environmental protection, industrial parks, and cluster and supply chains.

For example, green reforms should be obtained in industries, including steel, petrochemical, chemical, nonferrous metal, building materials, textile, papermaking, leather, and others, the circular said. And all-out efforts should be made to develop the remanufacturing industry and clean production.

Also, work should be done to develop ecological circular agriculture, strengthen farmland protection and promote saving water in agriculture.

The circular called for efforts to develop green logistics, encourage reusing renewable resources, build a green trading system, promote consumption of green products and advocate a low-carbon lifestyle.

For example, green and low-carbon vehicles using new energy or clean energy should be promoted. Logistics enterprises are encouraged to establish digital operating platforms, and develop smart warehousing and transporting.

Accelerated efforts should be made to build a waste recycling system for renewable resources, such as waste paper, plastics, tires, metals and glass.

A green and low-carbon lifestyle will be advocated around the country by practicing thrift and reducing food waste. Domestic waste classification will be further implemented. The transportation system will be

more intelligent to guide more people into green travel.

The green, low-carbon transformation also should be stepped up in China's energy system. Work should be done to raise the utilization ratio of renewable resources and develop wind power and photovoltaic power. Also, rural power grids should be upgraded, and construction and interconnection of natural gas infrastructure should be sped up.

According to the circular, the urban and rural living environment will be improved. In urban areas, green residential communities and buildings will be built, while in rural areas work in clean heating and dilapidated housing rehabilitation will continue.

The circular also called on efforts to develop green, low-carbon technologies and accelerate the application of sci-tech outcomes.

Fiscal funds and national budget investment should be used to support environmental infrastructure, environmental protection industries, efficient utilization of energy, and resources recycling. Also, green financing, including loans, direct financing and insurance, should be developed.

The circular also said China will intensify international cooperation in sectors like energy saving and green energy. It will require more international exchanges in policy technology, green projects and talent training.

China will actively participate in and lead global climate governance, improve its capability of promoting green, low-carbon and circular development, and contribute to building a community of a shared future for mankind.

An important conclusion that China's government has reached is the need for strengthened international cooperation as a means to build a "community of shared future." We know that it is not only for people but also to ensure that all life forms can function in healthy ecosystems and within planetary boundaries. This struggle is the larger one that will take us at least to mid-century—with the fulfillment of ecological civilization and sustainable development ideals as an approach. What once seemed like a very distant set of goals around topics like climate change and biodiversity conservation of land, freshwater, and sea now has become an interlocked crisis at our global, national, and local doorsteps. CCICED should be generational in its scope and be prepared to work closely with those who will have to take up the challenges of turning today's crises into tomorrow's opportunities. It is impossible to achieve the necessary level of transformative change without careful attention to lifestyle, sharing, and collective action throughout the world. China can be an enabling force in these essential shifts.

While preparing this CCICED at 30 Report, we have marvelled at the determination of the pioneers on both the Chinese and international sides. Some are named in our document— many others not, simply for our trying to keep it relatively short. Without the groundwork done from the 1970s to the 1990s, it is doubtful that CCICED would have been able to flourish as quickly as it did during the first two Phases. We also wish that it was possible to add more content about the working meetings, field visits within China and outside, and, of course, the discussions with senior leaders. These discussions have been a magnet, attracting international figures, and a major feature for some donors. We believe there is still a two-way learning effort underway. It was one of the original objectives of CCICED that international participants might come to better understand Chinese approaches and needs. The days of just modifying what was already on the world's E&D bookshelf are long gone. At its best, the CCICED collaborative teamwork of today is very satisfying since innovative solutions emerge.

The amount of time dedicated by some CCICED members and those involved with research and in the organization of special events is well appreciated. Also appreciated is the considerable effort that it takes to travel either to China or, in the case of Chinese CCICED participants, to participate in study trips abroad. Sometimes this travel amounts to more than 10,000 km and three continents. Surely this travel need may diminish somewhat in the COVID-19 and post-COVID-19 world of live video exchanges.

Even though COVID disrupted agendas worldwide at the start of this new decade, strengthened efforts for solving longer-term environmental emergencies are emerging. It is essential that integrated planning and management of sustainable development action is accelerated throughout the world. China has reached a stage where its leadership is needed both inside the country and internationally. It is very encouraging that CCICED is now planning the details for Phase VII (2022–2026). This period is significant for delivering on ambitious goals related to pollution reduction, climate change, biodiversity conservation, and the socio-ecological UN 2030 SDGs. Accelerated policy action now will embolden and inspire societies to make smart choices for the future. Further transformative change is necessary.

There has been considerable discussion globally and in many institutions on the need to strengthen resilience and to build back better in the wake of COVID-19 damage. These terms are helpful to the extent that they genuinely address a move towards sustainability and towards an ecological civilization future. The problem is that for many people, "building back better" translates into re-creating what already was in place—tweaking rather than transforming. Perhaps it may be better to shift to alternative language, such as Building Forward Better or Building Forward Together. These latter terms more directly reflect action for reducing inequities and take full advantage of green development and embracing other future-oriented innovations.

The hybrid model of a limited number of TFs, with each having several special policy studies, has worked well during CCICED Phase VI. So far in the planning for Phase VII, four TFs have been proposed (see Box 17.) This list provides continuity with existing key subjects, but it also is intended to bolster work plans. In all cases, greater emphasis will be placed on the quality of development and, wherever possible, mechanisms for accelerated action. There will be further efforts to identify value-added synergies among key elements, such as between climate change and biodiversity and among the many ways to transition to a low-carbon economy and lifestyle. By placing greater emphasis on sustainable production and consumption, CCICED hopes to identify innovative means for full societal participation in green development and local-level choices of green lifestyle, improved green supply chain decision making, and, of course, the development of the circular economy in cities, towns of all sizes, and in China's vast countryside areas.

Box 23. Four Proposed TFs for CCICED Phase VII (2022–2026)

(Source: CCICED Concept Note of Phase VII. CCICED Secretariat September 2021. 8 pp. This list may be subject to change.)

Innovative Global Environmental Governance
Global environmental and development challenges, such as climate change, biodiversity, marine governance, BRI, etc.

National Green Governance System
Institutional and governance challenges during the green transition and supporting China's War on Pollution.

Sustainable Production and Consumption
Adjustment of industrial, transportation, and energy structure and facilitating green and low-carbon production and lifestyle.

Low-Carbon and Inclusive Transition
Addresses inequality, risk prevention, and synergies during the green transition.

We are pleased that CCICED's work has been so well documented and retained in accessible form over the years. The ability to easily access all key reports, recommendations, etc., is certainly valuable. Undoubtedly this will be useful for students, scholars, and others in the future to trace the dynamics of change over this past 30-year period, probably one of the most significant times for environmental changes over the long span of Chinese civilization. We hope it will be their children's children who may thank us for what we in CCICED have tried to do for their health and prosperity—and for the health of the planet.

Annex 1. CCICED International Funding Partners/Donors

This information is available online http://www.cciced.net/cciceden/ABOUTUS/Donors/

CCICED Phase I
Canada (Lead Donor), Canadian International Development Agency (CIDA)
Germany, (GIZ)
Japan, OECC
Kingdom of the Netherlands
Norwegian Embassy to China
Rockefeller Brothers Fund
United Kingdom, Department of International Cooperation (DFID)
CCICED Phase II
Australia, Australian Aid
Canada (Lead Donor), Canadian International Development Agency (CIDA)
Ford Foundation
Germany, (GIZ)
Japan, OECC
Kingdom of the Netherlands
Norwegian Embassy to China
Rockefeller Brothers Fund
Shell
United Kingdom, Department of International Cooperation (DFID)
World Bank Group
World Wide Fund for Nature (WWF)
CCICED Phase III
Asian Development Bank (ADB)
Canada (Lead Donor), Canadian International Development Agency (CIDA)
Environmental Defense Fund (EDF)
Embassy of Denmark
Embassy of Norway
Germany, (GIZ)
Italy, Ministry of the Environment
Japan, OECC
Kingdom of the Netherlands
Rockefeller Brothers Fund
Shell
Sweden
Switzerland
United Kingdom, Department of International Cooperation (DFID)
World Wide Fund for Nature (WWF)
CCICED Phase IV
Australia, Australian Aid (AFD)
Asian Development Bank (ADB)
Canada (Lead Donor), Canadian International Development Agency (CIDA)
Embassy of Denmark
Embassy of Norway
Energy Foundation
Environmental Defense Fund
European Union
Germany, (GIZ)
Italy, Ministry of the Environment
Japan, OECC
Kingdom of the Netherlands
Rockefeller Brothers Fund
Shell
Sweden
University of Hong Kong
UNDP
UNEP
UNIDO
United Kingdom, Department of International Cooperation (DFID)
World Wide Fund for Nature (WWF)
CCICED Phase V
Australia, Australian Aid (AFD)
Canada (Lead Donor), Environment and Climate Change Canada
Embassy of Norway
Environmental Defense Fund
European Union
Germany, (GIZ)
International Institute for Environment and Development (IISD)
Italy, Ministry of the Environment
Kingdom of the Netherlands
Rockefeller Brothers Fund
Shell
Sweden
Switzerland

UNDP
UNEP
UNIDO
United Kingdom, Department of International Cooperation (DFID)
World Resource Institute (WRI)
World Wide Fund for Nature (WWF)
CCICED Phase VI
Asian Development Bank (ADB)
Canada (Lead Donor), Canadian International Development Agency (CIDA)
Client Earth
Embassy of Norway
Environmental Defense Fund
European Union
Germany, (GIZ)
International Institute for Environment and Development (IISD)
Italy, Ministry of the Environment
Kingdom of the Netherlands
Rockefeller Brothers Fund
Shell
Sweden
Switzerland
The Nature Conservancy
UNDP
UNEP
UNIDO
United Kingdom, Department of International Cooperation (DFID)
World Bank
World Economic Forum
World Wide Fund for Nature (WWF)

Annex 2. List of CCICED Issues Papers (2002–2021)

2002 Environment and Sustainability: International Issues and China
2002 Environment, Development and Governance: How to Face Environmental Challenges in the New Century
2003 Sustainable Industrialization in China and a Well-Off Society
2004 Sustainable Agricultural and Rural Development In the New Era of Development: Preparing for the Future
2005 China Sustainable Urbanization
2006 (Issues Paper combined with CCICED Review and Perspective General Report)
2007 Innovation for an Environmentally-Friendly Society
2008 Environment and Development for a Harmonious Society
2009 China's Green Prosperity Future – Environment, Energy and Economy
2010 Ecosystems and China's Green Development
2011 Green Transformation of China's Economic Development Mode
2012 Regionally Balanced and Green Development
2013 Environment and Society
2014 From Tipping Point to Turning Point
2015 Green Goals, Governance Capacity and Innovation – 'Mind and Bridge the Gaps'
2016 China's Ecological Civilization and the World
2017 Ecological Civilization Shaping China's New Era
2018 Shocks, Innovation and Ecological Civilization A 'New Green Era' for China and for the World
2019 The Shift to High-Quality Green Development
2020 Recovering Forward
2021 Implementation, Equity and International Cooperation

Annex 3. Eleven CCICED Topic Areas and Policy Research Studies Under Each (1992–2021)

(Source: http://www.sfu.ca/china-council/council-documents/TopicAreas1.html)

ECONOMICS, INVESTMENT, FINANCE AND TRADE

Topic area includes pricing policies; market-based environmental instrument; resource and environmental economics; green economy and green growth; green finance and taxation; insurance and risk management; trade and investment; natural resource and environmental accounting; and, market supply chains and green procurement.

1996 - Resource Accounting and Pricing Policy
1996 - Trade and Environment
2001 - Environmental Economics
2002 - China's WTO Accession and Sustainable Development
2003 - Financial Mechanisms for Environmental Protection in China
2005 - Environmental and Natural Resources Pricing and Taxation
2006 - Economic Growth and Environment
2006 - Eco-compensation Mechanism and Policies in China
2008 - Economic Instruments for Energy Efficiency and the Environment
2009 - China's Green Prosperity Future – Environment, Energy and Economy
2011 - China's Green Economy
2015 - Green Finance Reform and Green Transformation
2018 - Green Urbanization Strategy and Pathways Towards Regional Integrated Development
2018 - Goals and Pathways for Environmental Improvement in 2035
2018-2021 - Green Belt and Road and 2030 Agenda for Sustainable Development

ECOSYSTEMS AND BIODIVERSITY CONSERVATION

Topic area includes conservation of species, ecosystems and ecosystem services; ecological restoration, ecological construction; eco-compensation; parks and nature reserve management; ecological redlining; invasive species; wildlife smuggling, habitat destruction, and other illegal practices; sustainable fisheries, forest, and grassland management; sustainable agriculture; China's ecological footprint.

1996 - Biodiversity
2001 - Biodiversity
2002 - Forest and Grassland
2002 - Strategies for Controlling Invasive Alien Species in China
2004 - Using Protected Areas to Extend Economic Benefits to Rural China: Task Force on Protected Areas
2010 - Ecosystems and China's Green Development
2010 - Policy Framework Research on Improving Service Functions of Aquatic Ecosystems
2010 - China Ecological Footprint Report 2010 and other years (2008 to 2015)
2010 - Ecosystem Service and Management Strategy in China
2015 - Special Policy Study on Institutional Innovation of Eco-Environmental Redlining
2018 - Global Ocean Governance and Ecological Civilization
2018 - Ecological Compensation and Green Development Institutional Reform in the Yangtze River Economic Belt
2018- 2021 - Post 2020 Global Biodiversity Conservation

ENERGY, ENVIRONMENT AND CLIMATE

Topic area includes energy supply, generation and distribution systems; coal consumption; low carbon economy; alternative and renewable energy sources; greenhouse gas emissions; climate change mitigation and adaptation.

1996 - Energy Strategies and Technologies – Sustainable Energy for China
2001 - Energy for Sustainable Development in China
2003 - Transforming Coal for Sustainability – A Strategy for China
2008 - Energy Efficiency and Urban Development
2009 - Sustainable Use of Coal and Pollution Control Policy in China
2009 - Rural Development and Its Energy, Environment and Climate Change Adaptation
2015 - Special Policy Study on Coordinated Actions for Addressing Climate Change
2018-2021 - Global Climate Governance and China's Role

GOVERNANCE AND RULE OF LAW

Topic area includes environmental laws, regulations and enforcement; EIA process; public participation; government and civil society capacity for environmental governance; institutional and management innovation.

2006 - Environmental Governance in China
2013 - Special Policy Study on Media and Public Participation Policies on Promoting China's Green Development
2014 - Special Policy Study on Chinese Environmental Audit System for the Government
2014 - Special Policy Study on Performance Evaluation of the Action Plan of Air Pollution Prevention and Control Regional Coordination Mechanism
2014 - Task Force on Institutional Innovation for Environmental Protection in the Context of Ecological Civilization
2015 - Task Force on the Rule of Law and Ecological Civilization
2015 - Task Force on National Governance Capacity for Green Transformation
2018-2020 - Green Transition and Sustainable Social Governance
2018-2021 - Global Climate Governance and China's Role

INDIVIDUAL AND ENTERPRISE CONCERNS AND RESPONSIBILITIES

Topic area includes sustainable consumption; health impacts of pollution; access to environment and development information and data; engagement in environmental hearings; monitoring and enforcement.

2008 - Environment and Health Management System and Policy Framework

2013 - Special Policy Study on Media and Public Participation Policies on Promoting China's Green Development

2013 - Task Force on Sustainable Consumption and Green Development

013 - Task Force on China's Environmental Protection And Social Development

PLANNING FOR SUSTAINABLE DEVELOPMENT, CONSERVATION AND ENVIRONMENTAL PROTECTION

Topic area includes regional planning; airshed and watershed management; integration of environmental concerns in China's Five-Year Plans; data requirements for planning; ecological civilization; green development and environmental management.

1996 - Monitoring and Information Collection

2000 - Integrated Resource Management And Sustainable Agriculture Development In The Red Soil Area Of South China

2001 - Agricultural Structural Adjustment and Sustainable Development in China's Southeastern Coastal Area

2004 - Promoting Integrated River Basin Management and Restoring China's Living Rivers

2007 - Policy Mechanism Towards Successful Achievement of the 11th Five-Year Plan Environment Targets

2011 - Practices and Innovation of Green Supply Chain

2012 - Regional Air Quality Integrated Control System Research

2012 - Strategy and Policies on Environment and Development in Western China

2013 - Special Policy Study on Corporate Social Responsibility in Green Development in China

2014 - Task Force on Evaluation and Prospects for a Green Transition Process in China

2015 - Special Policy Study on Eco-environmental Risk Management

2018 - Post 2020 Global Biodiversity Conservation

2018 - Green Urbanization Strategy and Pathways Towards Regional Integrated Development

2018 - Ecological Compensation and Green Development Institutional Reform in the Yangtze River Economic Belt

2018 - Goals and Pathways for Environmental Improvement in 2035

2018 - Green Transition and Sustainable Social Governance

2018 - Green Belt and Road and 2030 Agenda for Sustainable Development

POLLUTION PREVENTION, CONTROL AND MITIGATION

Topic area includes all pollution-related topics (air, water, oceans, soil); agriculture and non-point pollution; clean production, circular economy; War on Pollution; drinking water, sewage, solid waste management; indoor pollution.

1996 - Monitoring and Information Collection

2000 - Integrated Resource Management And Sustainable Agriculture Development In The Red Soil Area Of South China

2001 - Agricultural Structural Adjustment and Sustainable Development in China's Southeastern Coastal Area

2004 - Promoting Integrated River Basin Management and Restoring China's Living Rivers

2007 - Policy Mechanism Towards Successful Achievement of the 11th Five-Year Plan Environment Targets

2015 - Special Policy Study on Coordinated Actions for Addressing Climate Change

2015 - Special Policy Study on Soil Pollution Management

2017-2021 - Global Ocean Governance and Ecological Civilization

2018 - Goals and Pathways for Environmental Improvement in 2035

REGIONAL AND GLOBAL ENGAGEMENT

Topic area includes regional and global treaties, agreements and conventions; impacts of China's external trade and investment on environment; environmental issues related to South–South cooperation including the 'Belt and Road Initiative'; China and the World environment and development relationships; international cooperation on environment and development.

2002 - China's WTO Accession and Sustainable Development

2010 - China Ecological Footprint Report 2010

2011 - Policy Study on Mercury Management in China

2011 - Main Topics Report: Investment, Trade, and Environment

2012 - Regional Air Quality Integrated Control System Research

2018 - Global Climate Governance and China's Role

2018 - Global Ocean Governance and Ecological Civilization

2018 - Ecological Compensation and Green Development Institutional Reform in the Yangtze River Economic Belt

2018 - Green Transition and Sustainable Social Governance

2018-2021 - Green Belt and Road and 2030 Agenda for Sustainable Development

2019-2020 – Global Green Supply Chain

2021 – Sustainable Food Supply Chain

URBANIZATION, INDUSTRIALIZATION AND TRANSPORTATION

Topic area includes energy efficiency for urban development; low-carbon industrialization, green industrial production; good city models; green travel development.

2003 - Development of China's Environmental Industry

2005 - Sustainable Transportation

2005 - General Report on Sustainable Urbanization Strategy for China

2009 - Energy Efficiency and Urban Development (Building Sector and Transport Sector)
2011 - China's Low Carbon Industrialization Strategy
2013 - Special Policy Study on Promoting Urban Green Travel
2014 - Special Policy Study on Good City Models under the Concept of Ecological Civilization
2018-2020 - Green Urbanization Strategy and Pathways Towards Regional Integrated Development

SCIENCE, TECHNOLOGY, AND INNOVATION

Topic area includes new technologies for pollution control and mitigation; green chemistry; clean technology; green building construction; climate change and other sustainability technological innovations.

1993 - China's Scientific Research, Technological Development and Training
1995 - Scientific Research, Technological Development and Training – Cleaner Production and Use of Coal
1996 - Scientific Research, Technological Development and Training
2008 - Innovation and Environment-friendly Society
2012 - Regional Air Quality Integrated Control System Research

ANNEX 4. Excerpts of CCICED Recommendations to the State Council of China on Harmonious Relationship of People and Nature (1992–2021)

Many themes of present-day CCICED's policy studies were established in much earlier phases of CCICED's work. The continuity of effort is perceived as an important strength in CCICED's approach and is very clearly expressed in the growing sophistication and detail of recommendations over time. Chapter 5 includes five key themes taken from excerpts drawn from the entire 3 decades of CCICED's recommendations to the State Council. The information from the final recommendations produced at the CCICED Annual General Meeting as agreed upon by its members.

The starting point of the Annual General Meeting (AGM) recommendations process is the executive report formulated by each research team reporting to the AGM in a particular year. From the recommendations in these executive reports, a draft recommendations document is then produced by the Chief Advisors team and circulated in advance of the AGM. This draft document can identify crossovers and synergies by drawing upon multiple task forces and special policy study findings. During the AGM, further ideas emerge during member discussions. The final recommendations document is then produced, ratified by members, and submitted to the State Council. In addition, the original reports from each study team remain accessible and are incorporated into an overall CCICED policy report for later circulation.

As noted in Chapter 5, five themes we have chosen to examine in detail in the CCICED at 30 report are Harmonious Relationship of People and Nature; Comprehensive Pollution Control and Prevention; Energy, Climate Change and Low Carbon Economy; Trade, Investment and Green Finance; Environment and Development Governance.

"Harmonious Relationship of People and Nature" has been outlined in detail in this Annex and summarized in Chapter 5. The other four themes are covered in a somewhat different format directly in Chapter 5. The full text of annual recommendations (1992–2021) to the State Council of China are accessible on the CCICED website in both Chinese and English

Harmonious Relationship of People and Nature

The basis of CCICED recommendations relates to a number of significant interests, including biodiversity conservation and ecosystem management, water basin management, sustainable agriculture, forest and grassland use, marine and coastal management, and Chinese ancient belief systems that "man and nature" must live in harmony.

The excerpts described below are drawn directly from the text of the recommendations submitted to the State Council. However, they are only a fraction of the content in the full recommendation documents, which are available at cciced.net.

Baseline (1993 CCICED Recommendations)

…China is rich in biodiversity. Its continued destruction could do enormous damage to the economy by weakening its natural base and depriving China of its potentialities for future food, medicine and other materials. It is necessary to: strengthen the system of terrestrial and aquatic protected areas; restore degraded habitats to ecological productivity; in order to achieve this, enlist the indispensable help of local communities; and cooperate with neighbouring countries to work out regional agreements on the prevention of trade in endangered species.

1996 CCICED Recommendations

…new efforts [are needed] to explain and demonstrate the vital importance of biodiversity within the Chinese economy and the Chinese way of life; improvement in monitoring and managing natural resources; establishment of new mechanisms for protecting natural resources, including fiscal means; better protection of forestry; above all more association of rural populations with conservation and restoration, so that they have a stake in it. Social and economic, as well as biological factors need to be taken more into account.

1997 CCICED Recommendations

…[eco-compensation]: introduction of a fairer system of compensation whereby funds are transferred from down-stream agencies and sectors deriving large benefits from good water supplies, eco-tourism, flood control and conservation to under-financed agencies and local communities upstream whose development is limited by the need to preserve natural vegetation.

1998 CCICED Recommendations

… [biodiversity and grasslands]… Particular attention should be paid to the sustainable use of grassland resources and the development of husbandry in south China…it is likely to develop into a meat and wool production base…It will also be important for creating greater wealth in traditionally poor areas…Reduction of overgrazing on critical grassland areas is essential.

…Afforestation projects should be designed with the view to water and soil retention rather than timber production (in other words broadleaf or mixed forests should be preferred to monocultures and conifers). Further increases in forest cover throughout China are desirable …Mountain ecosystems in north west China are under threat, and this has significance for Asia's major river systems...Lakes and wetlands should be preserved…Loss of mangrove swamps and other coastal marine ecosystems has serious implications…

1999 CCICED Recommendations

… The agricultural and rural development plans of the Loess Plateau area should be re-examined, with a view to integrating sustainable agriculture with ecological construction and industrial development, controlling water and soil loss, creating job opportunities, and overcoming ecological degradation and poverty… Land property rights should be clarified to encourage farmers to increase investment on land, and to improve the rational use and conservation of natural resources… Planning of energy and mineral resources development in the Loess Plateau should be closely integrated with ecological construction. Part of the revenue from development activities should be used as ecological compensation fees for environmental improvement…Highlight the authority of the management body of the Yellow River Basin…

2000 CCICED Recommendations

…Biodiversity should be cherished…Diversity of crop species and the micro-organisms which support them are of fundamental importance. Conservation in gene banks, arboretums and botanical gardens as well as farm conservation methods adopted by farming families need strengthening…There is an opportunity for classifying land into conservation, restoration and sustainable and intensified use areas. Genetic gardens might be created in certain areas where both native and introduced food and medicinal plants could be grown and evaluated…There are particular dangers arising from invasive species which might do harm to native ecosystems. There is also a potential danger arising from incautious use of genetically modified organisms. There is widespread ignorance of the importance of biodiversity…it is important to use local knowledge and engage the interest and support of local communities.

…Sustainable agriculture is another priority…There are four broad issues…[1] use of pesticides and the need for a national strategy for integrated pest management…farmers use more pesticides than they need…reduction in pesticide use can be lowered without damaging rice, cotton or other crop yields…government departments seem to play conflicting roles in the regulation, production and sale of pesticides…[2] existing national food security policy needs reconsideration. The effect of current regulations is to limit the internal grain trade to no good purpose, and to cause grain to be produced on land not suitable for the purpose…[3] existing national food security policy needs reconsideration. The effect of current regulations is to limit the internal grain trade to no good purpose, and to cause grain to be produced on land not suitable for the purpose…[4] The Council recommends caution in the use of genetically modified materials until greater understanding of them is achieved. It is proposing to set up a Task Force to enquire further into how the rich resources of China can be converted into economic wealth through the application of biotechnology.

2001 CCICED Recommendations

…[Biodiversity and ecosystems]…improve coordination whereby the various sectors involved in biodiversity management and conservation are brought together, with particular regard to the maintenance, functioning, and in some cases restoration of whole ecosystems…review current regulations for protected areas and their enforcement…undertake a national assessment of the status and functioning of ecosystems in China…establish a national biosecurity programme to cover issues arising from the invasion of alien species, and those relating to uses of biotechnology. In this respect early ratification of the Cartagena Protocol on Biosafety is highly desirable…work out integrated policies for biodiversity and ecosystem functioning in the Western Development Strategy.

…[Sustainable Agriculture]… [Agricultural problems will become more important after China joins the World Trade Organization. The safety and security of food supplies depend ultimately on the manner in which the supply chain is managed from soil and water to the consumer…[It is necessary to]…assess critically the effects of increasing use of biotechnology…reconcile the sometimes conflicting roles of government departments over regulation, production and sale of fertilizers and pesticides…raise agricultural efficiency...raise awareness among farmers of environmental costs of poor agricultural management…promote production of food in certain areas, free of pesticides, chemical fertilizers and genetically modified organisms, for which a market is rapidly developing…pay attention to the agricultural biodiversity conservation, particularly the species sources of wild crops.

…[Forests and Grasslands]…there is a lack of coordinated policies regarding land conversion, forest protection and replanting, property rights of individuals and communities, logging (and compensation for the current logging ban), and policies to rehabilitate damaged soils…Government should aim to conduct a full cost benefit analysis of land conversion and natural forest protection programs, taking into account ecological and socio-economic benefits and costs at every level…put in place long term arrangements for monitoring and evaluation, and supply the necessary funds…integrate watershed management with particular regard to property rights and use of appropriate technologies (including natural regeneration and the use of appropriate tree species to maximize ecological and economic benefits)…reconsider and in some cases relax the current logging ban according to particular circumstances.

2002 CCICED Recommendations

…[Forests and Grasslands]… Improve the SLCP (Sloping Land Conversion Program)… to make land conversion both ecologically and economically sustainable. Needed is an approach aimed at achieving ecological restoration while providing realistic, economic market-based incentives to households…and the NFPP (Natural Forest Protection Program)… [including]…make a gradual and carefully planned transition over time from a blanket logging ban to a more diversified, flexible approach that enables sustainable forest management on state-owned forests…land use planning for diversified land use that includes ensuring adequate protection of old growth forests, tree planting, as well as natural rehabilitation of sites…Adjust overall forest policy in five priority areas…[such as]… restructuring public private forest management and decentralizing authority…monitoring and evaluation of performance…rationalizing of taxes…strengthening of property legislation… strengthening of property legislation pertaining to collective forests.

…China's rapid economic development, including explosive levels of growth in trade, transportation and tourism, is increasing the introduction of species—both intentionally and unintentionally. Serious attention should be paid to Alien Invasive Species (AIS) threats and damage to biodiversity and natural ecosystems, and, in turn, to economic loss.

2004 CCICED Recommendations

…Some of the most transformative approaches for China's environment and development are not being promoted nearly enough in rural areas. Appropriate water-saving technologies are often not available and the incentives to adopt them are not in place. More effort is needed to promote the application of the many integrated farming systems, such as the use of economically-viable recycling and sustainable production methods. Another is the use of integrated land and water planning and management in order to safeguard the extensive range of natural resources and high value rural ecosystems.

… Implement a broader vision linking ecological and food security…The damage to ecosystems is growing, especially through overuse of fertilizers and pesticides. This results in Non-Point Source Pollution from crop production that contaminates lakes, rivers, groundwater and the coastal seas. The

security of rural ecological services is threatened, to the detriment of both rural and urban areas. In the near term measures such as compulsory labeling and the use of smaller containers for pesticides and fertilizers could save farmers money and reduce pollution…Consideration should also be given to the use of economic instruments to reduce excessive use of pesticides and fertilizers…A re-commitment, with improvements to enhance efficiency and quality of results, to programs such as Grain for Green and other ecological construction efforts on more authority granted to water management agencies; implementation of water rights for both ground and surface water; volumetric pricing and regulation of water; and progressive implementation of other reforms for water conservation in line with a sustainable water basin strategy that covers both water quality and quantity.

…Modernize the management of China's protected areas…By designating some 18% of the nation as protected areas, China has placed itself among the most progressive nations. But the protected areas are not fully meeting their goals, either for protecting species, or in providing ecological benefits. Management is poor, with staff forced to find financial resources, sometimes at the expense of the biodiversity they are supposed to protect. Modern concepts of conservation biology, such as linking individual reserves by migration corridors, and recognizing the potential conservation benefits of surrounding agricultural lands, are not being applied. Managers are given many duties and mandated activities, but often are not provided the fiscal resources that are needed to meet their obligations. Actions should be taken to correct this by providing sufficient core support and focusing the attention of protected area managers on conservation…Protected areas should be categorized according to the internationally-recognized IUCN system. This can provide stricter protection for the most important areas. The new approach will require greater cooperation among various units of government in the establishment of boundaries and zoning. A system of protected areas should contribute in measurable ways to the provision of ecological services, for example from wetlands and natural forests.

2006 CCICED Recommendations

An eco-compensation mechanism…should be created to adjust the relations between stakeholders with regard to the distribution of environmental interests and economic benefits.

2010 CCICED Recommendations (from executive summary)

…Change Views and Management Approaches Regarding Ecosystem Services and Management, and Update the National Strategy on Ecological Protection and Rehabilitation. Required is a shift in views and approaches in the use of natural capital, with more attention to a holistic and integrated ecosystem management approach linking changes in ecosystems from "mountains to seas," cross-sectoral and trans-regional ecological management and coordination, and broader societal participation.

…Strengthen Environmental Management and Allow Key Terrestrial Ecosystems to Recover. Needed are ecosystem protection and recovery plans with guarantees of longer-term revenues, ecosystem and biodiversity legislation, an eco-compensation system, improved ecological resilience to reduce impacts of natural disasters, and more attention to ecologically fragile regions and the nature reserves.

…Place Marine Ecosystem Management High on the Policy Agenda and Promote Sustainable Ocean and Coasts Development. Urgently needed is a green development strategy for China's seas, with special attention to the inshore zones, where there are severe impacts from: urban development, land-based sources of pollution (agricultural and industrial), and land reclamation; and attention to restoring fisheries. Ecological decline of the Bohai Sea requires immediate attention. A national strategy on marine and coastal development, a national ocean law, and strengthened coordination mechanisms for reducing land and freshwater impacts on the ocean should be set in place.

…Promote Scientific Innovation, Improve Technological Support, and Strengthen Capacity Building on Ecosystem Management. Needed is a measurable, verifiable and reportable monitoring system concerning the health of China's ecosystems throughout the country.

…The core mission of environment and development should be to integrate environmental protection with the transformation of economic growth strategies already underway. This should include ecosystem and biodiversity protection, rural environmental concerns, soil pollution prevention and climate change mitigation and adaptation targets for ecosystem management, among other actions.

2011 CCICED Recommendations

…Incorporate the concept of Ecological Civilization into overall social and cultural development, and reward sound social values and environmental ethics...abide by the rules of ecology…Land allocation should be given to those projects with the highest added value and ecological service capacity and with land resource value taken into account.

…Promote the green transformation of resource-depleting cities…Much of the emphasis should be on conservation planning and practices—for land, water and other natural resources and ecosystem services. With new and necessary subsidies from the central government, local governments should devote more of their limited resources to the protection and restoration of the ecological environment…

…Promote green restructuring in the agricultural sector Agricultural land and water use planning should be improved overall, with zones for green agriculture and its leading agro-products should be clearly delineated. The nature of such products should be based on robust, well-trusted certification processes. Monitoring work needs to be carried out for soil pollution…There is an urgent need to strengthen non-point pollution prevention and treatment and to promote comprehensive environmental improvement programs, including waste treatment in rural areas…The government should cancel its subsidies for chemical fertilizer production…At the same time, large-scale production of organic fertilizers should be supported, and increased subsidies for substitution of chemical fertilizers by organic ones where feasible. Current subsidy patterns require examination to determine how they may be improved or removed in order to create sustainable animal husbandry, including aquaculture…more effort is needed to turn a greater portion of the [biomass]waste into new products such as second generation biofuels…forest management and other land and water uses be developed as ecological enterprises for services such as carbon sinks…[Several resource laws] will require administrative regulations and rules to help maintain and sometimes increase the productivity of land, water and sea, as well as the carbon sink function of agro-forest ecosystems…more strictly control cultivation in ecologically fragile regions and habitat important for biodiversity protection, and…forbid destruction of natural forest, grassland and farmland, and critical aquatic and marine habitats…

2012 CCICED Recommendations

…CCICED members have stressed the importance of addressing poverty alleviation while preserving fragile ecosystems, as a significant proportion of poor people live in these areas…Overall, the double pressure of environmental pollution and ecological degradation may threaten the foundation of green development in China…Establishment of an integrated and comprehensive environmental authority for ecological and environmental protection with integrated functions and high efficiency could be considered…

… put ecosystem and environmental protection as the main body of ecological civilization construction with provision of sound eco-services and products, and improve protection of biodiversity through greater attention to conservation and management of natural habitats on land, in fresh waters, and in marine areas and sensitive coastal habitats.…To enforce mandatory protection, define ecological red lines for important function zones, nature reserves, sensitive land and marine areas, and other ecologically fragile areas.…development of eastern China heavily relies on the energy and resources supply from the western part of the country. The payment for ecological services from the east at present is far from sufficient to cover the ecological deterioration suffered by the west. For central and western regions, establish and improve a fiscal transfer system to guide and support green transformation, and implement a payment system for ecosystem service payments from eastern areas to central and western regions…

…Implement ecological compensation measures. A compensation fund should be determined according to the ecological function zoning in the eastern, central and western China. Eco-compensation standards need to be established based upon specific ecosystem service requirements. Fair compensation should be paid to rural residents that commit to long-term ecosystem protection. Meanwhile, extend the "polluter pay" principle to the resources and mineral development fields on a much more extensive and well-enforced basis…

…Speed up the formulation of a robust national marine development and environmental protection plan. This plan should be based on existing land and marine function zoning plans...cover all the coastal zones…The plan should integrate the overall planning of offshore areas with plans for coastal provinces, and establish marine economy and environmental protection areas in the Yellow Sea and

the Bohai Sea, the East China Sea and the South China Sea…pay special attention to marine ecosystems that preserve high ecological value, but are highly vulnerable to human activities…Establish national marine emergency response planning system for major environmental incidents… China should require oil and gas operators to invest in regional and national funds for marine environmental research with the aim of strengthening science and technology research on marine environmental management.

2013 CCICED Recommendations

…there is positive change of understanding on environment and society relationship on the part of China's government, illustrated by a deep understanding statement from Chinese leaders—that "a sound ecological environment is the fairest public good, and most beneficial welfare"…

…develop guidelines for strengthening Ecological Civilization construction in the immediate future, and formulate Ecological Civilization mid-term(2015-2030) and long-term (to 2050) vision, objectives and plans… Define a comprehensive and credible ecological redlining approach…extend the scope and degree of ecological compensation to balance and coordinate equitable distribution of resource and environmental benefits…Establish a regional joint action mechanism that coordinates terrestrial and marine regimes for ecosystem conservation and restoration…

2014 CCICED Recommendations

…the time frame required for a Green Transition Strategy in China… spans the 13th FYP to 2030…[including] protection of ecological services and biodiversity and to reduce the risks associated with climate change…

...Improve the environmental public interest litigation system and the ecological environment damage compensation and accountability systems…

…Establish a spatial regulation system at the provincial level based on ecological security…When land markets are set up in China, ensure that environmentally sensitive or high-priority green space lands remain in public control…Adhere to people-centered urbanization that also fully respects ecosystems, ecological services and green space...

…Set into law the National Ecological Protection Red Line (EPRL) System...Clarify the contents and composition of the EPRL system…Establish a national target of China's appropriate land area to be within an EPRL…An ecological protection red lining law should be passed within 3 to 5 years. Improve spatial land use planning and marine use planning system with clear identification of EPRLs...Add a new category of ecological lands in the existing land use planning system…Identify ocean EPRLs. Identify ocean EPRLs through ocean ecological function zoning classification and other ocean spatial planning to ensure the health and security of ocean ecosystems and coastal wetlands…Establish a new national coordinating mechanism for ecological conservation and for monitoring and enforcement...Further clarify and integrate various types of protection areas in terms of functions and management system, establish a nature protection area system consisting of nature reserves, national parks, scenic parks, agricultural species resources protection areas and ecological function protection areas…Establish an EPRL management system by departments, types and categories...

...Improve eco-compensation and incentive mechanism based on EPRLs...Establish a long-term eco-compensation mechanism and directly pay the impacted landowners or operators. Allocate key ecological improvement projects mainly to the ecological protection redline areas. Improve ecological protection fiscal transfer to match with the area and effectiveness of EPRLs protection.

2015 CCICED Recommendations

...Draft a National Parks Law...Clarify the nature and types of National Parks in China, establish an integrated administration system, and improve the current situation which is typified by varied administration systems, unclear functions and overlapping management bodies for nature reserves, scenic areas, geological parks and forest parks…

...Pay close attention to the ecological risks of the Belt and Road Initiative and achieve a green BRI with consultation and cooperation among involved countries...

2017 CCICED Recommendations

…to secure a nationally and globally safe approach, development must remain within ecological planetary boundaries such as those for biodiversity, geochemical cycles, and climate change…it is timely for China to take a stronger role in global ocean sustainability and to help make oceans free of plastics and other pollutants; and to accelerate efforts under the Global Convention on Biological Diversity (CBD), including topics such as invasive species; and to stem global desertification…

…[there is a] need to create more long-term livelihoods based on ecological construction (and restoration), especially for people in more remote parts of the countryside…Cultural and gender specific experience can open new opportunities…build Ecological Civilization co-management systems to improve ecological and other services in nature reserves, parks, ecological redline areas, and in other public lands that sometimes are considered to be of low value… Forming a national Ecological Conservation Corps might be considered for improving contaminated soils, greening deserts, and creating ecosystem–based carbon sinks…provide more opportunities for public participation in…improving ecological services in the countryside and cities, for wildlife conservation, etc…Tourism, protection of ecological services, and preservation of traditional culture should give opportunities to women and men in villages and towns.

...Build a comprehensive eco-reform process for green development and ecological civilization...integrated efforts for addressing land and water use on a regional scale are necessary…Definition of responsibility for preservation and restoration of ecosystems can still be improved…the integrated planning approach now being taken in the Yangtze River Economic Belt is a useful example…The connection between urban and rural development requires a greater level of eco-reform…

…In China and worldwide…ecological services [should] become the prime value even for agricultural and other material-producing lands and waters…better biodiversity conservation actions are needed so that there is respect for the role people in the countryside play in maintaining land and water in good condition, supplying ecological services and the food and natural resources that cities require. Eco-compensation by cities to support upstream stewards of land and water should be part of urban green plans… As soon as possible, but no later than 2035 to 2040, the primary objective of all land and water use should be enhancement and protection of the ecological services they provide...

…The perilous ecological situation of the world's oceans is receiving global attention. China should create a national strategy that will more clearly provide for green development of its Blue Economy. This strategy will need to focus attention not only to the use of China's own ocean space, but also on China's use of the high seas…Concurrently, China can play an important role in the ongoing implementation of global ocean governance. China can influence other countries to build a better foundation for global ocean health and blue economy by using its well-placed position and drawing on its own experience and solutions.

...Early ecosystem-scale planning in collaboration with partner countries where infrastructure development will take place is essential for BRI to be green and sustainable. The same reasoning should be applied to China's overall efforts in South–South Cooperation initiative…

2018 CCICED Recommendations

The 15th Conference of the Parties (COP15) of the CBD will be hosted by China…Play a strong leadership role in developing effective post-2020 global biodiversity goals under the Convention on Biological Diversity...Make all efforts and demonstrate leadership in the development of an ambitious, robust, and internationally agreed post-2020 global biodiversity framework, with measurable targets… Showcase China's biodiversity conservation experience to other nations and to the international community… COP15 will cast a spotlight on the overseas impacts of China's investment and trade. China should be ready by taking immediate steps to strengthen greening of the BRI and to reduce environmental, climate and biodiversity impacts arising from China's massive imports of commodities such as timber, palm oil, soybeans, and seafood… There is a need for proactive outreach linked to a proposed Heads of State Summit at the UNGA in 2020…

...Develop an ecological civilization approach for China in national and global ocean governance ...China faces an emerging crisis in its coastal and marine ecosystems…and has great influence on marine ecosystems in many parts of the world…China should enact a new aquaculture law that

emphasizes best practices, and places clear limits and strict enforcement policies on waste discharge…Implement a high-tech monitoring system for marine science assessments to combat corrupt and illegal activities and that will highlight responsible fisheries, habitat and environmental protection…Develop a national plan of action to restore lost marine ecosystem functions and services…Establish a national "marine ecological report card" on the health of China's coastal and marine ecosystems…Improve real-time monitoring of primary rivers and outlets discharging into the sea. Improve the connection of water quality standards between surface fresh water and seawater. Integrate governance mechanism between the Lake and River Chief System and the Bay Chiefs…

…Formulate a national action plan for marine debris pollution prevention and control. Speed up the research and application of innovative approaches for substitution of plastic products and for waste treatment…Strengthen Chinese research on emerging marine environmental issues of global concern. Priority topics include ocean acidification, ocean plastics and microplastics, oxygen deficiency in hotspot areas, and other emerging marine environment issues of global concern…

…Carry out the greening of the Belt and Road Initiative (BRI)…there should be alignment of BRI initiatives with the Paris Climate Change Agreement, global biodiversity targets, and the UN 2030 SDGs. China should apply internationally agreed environmental and social safeguards, transparency rules and public participation at an early stage of planning, to reduce environmental and social risks…Establish a "BRI Ecology and Environment Big Data Platform" which is publicly accessible…Set mandatory requirements for responsible investment overseas (replacing the current voluntary guidelines for responsible overseas investment). Implement gender mainstreaming as part of best practices in BRI projects…

Strengthen green development performance in the Yangtze River Economic Belt (YREB)...Strategically focus remediation and restoration efforts on problems with large impact on the overall river basin health. The following actions are needed: (i) continue efforts to reduce the volume of solid waste pollution causing serious water pollution in upstream and downstream areas through to the oceans; (ii) develop economic incentives for collecting and disposing solid wastes; (iii) promote the recycling of waste materials and reduce the incineration rate; (iv) improve livestock and poultry farming pollution control measures; (v) improve the performance of wastewater treatment plants and treatment of sludge; (vi) pay more attention to social concerns through public awareness campaigns on solid waste treatment and recycling activities…

…Find and address synergies among issues...'Nature and Climate Solutions' can achieve both climate and biodiversity goals. Quality reforestation, investments in mangroves and coastal wetlands, and investments to protect watersheds can all be designed to enhance carbon sequestration and optimize biodiversity outcomes, while providing additional ecosystem benefits such as flood protection and soil retention. Reducing overfishing, improving aquaculture management, and restoring coastal and marine habitats will increase seafood economic production value, restore ecosystem functions, and biodiversity. Efforts to reduce climate, biodiversity and ocean impacts of the BRI will strengthen China's position as 2020 CBD COP15 host. By addressing ecological impacts of trade and investment (e.g., on overseas rainforest conversions for beef, palm oil or soybean production), China can and will inspire other countries to take similar initiatives. Synergies that result in new, green livelihoods should be encouraged.

2019 CCICED Recommendations

…Accelerate the formulation of a holistic YREB protection strategy...translate the strategic visions for 2035 and 2050…into a goal setting and evaluation system tailored to the ecological features of the YREB. Lay out the key missions to protect and recover the Yangtze ecosystem in the medium-to-long term…Implement an ecological compensation mechanism featuring "one vertical + multi-horizontal" dimensions. Rely primarily on local budgets for an eco-compensation fund, complemented by incentives provided by the central budget…Strengthen the hard constraints on YREB ecological protection through the rule of law: The specific requirements for the protection of the Yangtze River and its unique positioning should be codified by a law that establishes basin-wide eco-environmental protection targets and protected areas, and coordinates action between the central and local governments and across different jurisdictions and agencies…Establish a YREB-wide natural capital balance sheet and related indictors for natural capital accounting to identify the ecological benefits of nature. Share the accounting results across the Yangtze River basin and enhance professional capacity in natural capital accounting…[Establish] a cross-jurisdiction digital Yangtze River platform that involves multiple sectors and players: Enhance environmental governance and early warning systems through expanded digital platforms…

...nature-based solutions…Seek synergies between climate adaptation and freshwater management, biodiversity conservation, marine governance…Enhance effective linkage between climate and biodiversity action to better promote forestry protection and reforestation, and to promote the protection of wetlands, peatlands, grasslands, tidal basins and other ecosystems.

2020 CCICED Recommendations

… China should…join global green partnerships in fostering a shared future for all life on Earth…It is a priority to implement the strategy of major function-oriented zoning, and promote green urbanization… greening of soft commodity supply chains… along with promoting the interconnectivity between land and sea and taking holistic nature-based approaches to addressing ecological challenges… Other mechanisms include exploring more science- based, rational, and practical assessment methods and payment mechanisms for natural capital accounting while formulating policies and plans with a broader vision… Seize the opportunity presented by the post-pandemic economic recovery to promote green development and pivot toward socioeconomic resilience… Bolster green elements in "New Infrastructure Stimulus"…In order to promote a green and resilient stimulus package, the drive to stimulate the economic recovery should be guided by the principle of "no significant harm" to the environment, ecology, and climate…Support green jobs: These include labour-intensive public works in afforestation and reforestation, wetland and coastal restoration, soil and water decontamination…-sustainable agriculture…Integrated measures for community vulnerability reduction: tackling the illegal wildlife trade, deterrence of intensive animal farming, biodiversity/ecosystem loss, and other factors that may increase the threat of zoonotic diseases… support existing multilateral initiatives such as the World Health Organization/World Food Programme One Health initiative and the UN Decade of Ecological Restoration…Align the functional city model with a "nature-loving" city model: This alignment will integrate biodiversity and ecosystem services into planning and protect biodiversity and natural habitats in urban areas…materialize the economic value of ecosystem services…increasing the supply of ecosystem services to expand innovative channels for growth…incorporate biodiversity conservation into tourism-related standards and certification schemes…Enhance ecological integrity and connectivity to tackle environmental challenges…"One Health"—which connects and coordinates public health, economic activities, and ecosystems changes (including climate, the sea, and rivers) with the management of other areas—must be strengthened. In tackling the environmental changes, the terrestrial and marine ecosystems must be connected, and climate action should be aligned with biodiversity conservation…Host a successful UN CBD COP 15…work proactively…to raise COP 15 ambition levels by setting clear, quantified targets for land and marine ecosystem restoration and conservation…promoting transformative and ecosystem-based approaches…strengthening the conservation of different types of ecosystems with a focus on restoration and regeneration of natural vegetation and ecological processes in priority-degraded areas. Also necessary will be the promotion of nature-based climate adaptation and the prioritizing of adaptation within integrated water and river basin management systems, building codes, infrastructure, and sustainable agricultural systems, within the context of sustainable use to mainstream nature conservation…conservation and management of socio- ecological production landscapes as well as tackling alien invasive species as a national priority within the Post-2020 Global Biodiversity Framework…expanding forests, wetlands, and grasslands as the basis of nature-based climate resilience and prohibiting and actively prosecuting activities…such as the illegal wildlife trade, illegal pesticide production and use, illegal fishing, and illegal land conversion. Stopping the habit of eating wild animals and regulating wildlife parts in traditional medicine—as well as promote greater private sector action in biodiversity conservation… promote the resilience of marine ecosystems and support the sustainable growth of the blue economy…strict controlling of sea reclamation, strengthening the restoration of coastal wetlands and re-establishing key habitats… delineate marine ecological red lines and marine protected areas—they have critical long-term benefits for biodiversity and fisheries…strengthening scientific knowledge, monitoring, and legal enforcement to advance the protection and restoration of ocean ecosystems…fully leveraging the inter-ministerial coordination mechanism and national-level science advisory body for the ocean…development of integrated marine management policies based on ecosystems…green fishing vessels, green fishing ports, and green marine aquaculture…establishing a traceability system for seafood and promotion of green shipping… Improve assessment and payment mechanisms for

natural capital and ecosystem services to advance high-quality development of the Yangtze River and Yellow River basins…establish a well-regulated and standardized natural capital accounting system and develop an ecosystem monitoring network. A pricing mechanism for ecological products that consists of market pricing, government pricing, and regulated market pricing innovating the ecological compensation mechanism… Incorporate biodiversity conservation into China's Framework for Green Finance…Carry out pilot cooperation projects and promote green development concepts and practices in BRI countries…maximize the role of the BRI International Green Development Coalition…Ecological redlines and nature-based solutions should be promoted among the participating BRI countries…-Improve green assessment and classification of BRI projects: positive and negative lists to provide green development solutions for projects and green credit guidelines…more green and high-standard demonstration projects…enterprises to effectively bear the responsibility of ecological and environmental risks… Adopt measures to promote the systematic greening of global soft commodity value chains to avoid deforestation and ecological degradation…explore ways for the China International Development Cooperation Agency to mainstream green practices in all project finance; adopt "do no harm" principles; and increase the proportion of green and environmental assistance in foreign aid for green development in BRI countries.

2021 CCICED Recommendations

Mainstream biodiversity conservation within key economic sectors; integrate nature and nature-based solutions into financial planning for public and private sectors. Develop science- based, quantifiable, ambitious, and pragmatic biodiversity objectives and associated indicators to track progress, covering the pressures on biodiversity, the state of biodiversity, and the impacts and outcomes of response measures…Strengthen the system of national parks and protected areas by identifying low-cost and high- efficiency priority conservation areas…ensure high levels of ecological integrity within each national park, as well as marine and wilderness protected areas. Pay special attention to maintaining green connectivity in cross-provincial and cross-border biodiversity hotspots. Assess the overall carbon-sequestration potential of the Ecological Conservation Redline areas, and identify areas with a high carbon-sequestration function…Take actions to promote the full implementation of the Post-2020 Global Biodiversity Framework, and share innovative implementation mechanisms such as the ecological redlines, eco-compensation, and other actions. Support these actions with reliable and operable indicators capable of assessing progress in ways that take full account of natural capital and ecosystem services, treating nature and its systems as valuable assets. Actively contribute to meeting the goals of the UN Decade of Ecological Restoration…Scale up biodiversity-relevant conservation financing and investments. Highlight ecological protection, conservation, restoration, and regeneration as key focuses of green finance. Further identify the steps needed to ensure public and private finance flows are consistent with biodiversity objectives, supported by conservation finance pilots, risk disclosure, reporting, stress- testing, and wider public accountability for private sector investments. Apply financial technology in biodiversity conservation, including establishing "fintech and biodiversity" pilot demonstration areas. Ensure…benefits derived through conservation accrue to local communities. Evaluate emerging international conservation finance goals such as green debt arrangements…reform environmentally harmful incentives, regulations, spatial planning, subsidies, and other measures…replace environmentally harmful agricultural subsidies with low-carbon, regenerative agricultural practices. Introduce convenient and quantifiable subsidy identification standards…Increase investment in agricultural science innovation and technological application. Provide stronger support for female farmers…knowledge and skills training…Jointly promote livestock, wildlife, and plant health; ecosystem integrity; disease prevention; and early warning systems within the One Health framework that gives full play to "whole-of- society" approaches…Strengthen the protection of key marine species and the conservation and restoration of their habitats to improve the quality and stability of marine ecosystems. Conduct baseline studies of marine ecosystem values. Assess the impact of coastal development and other activities on marine natural capital. Monitor and assess the effectiveness of the conservation and adaptation of vulnerable and carbon-rich coastal ecosystems such as mangroves, seagrass beds, salt marshes, coral reefs, dunes, and islands. Enhance the protection and restoration of coastal ecosystems, and build stronger climate resilience, including through coastal nature-based solutions…Establish and improve joint scientific and technological research mechanisms to improve science-based marine and oceans management, including tackling marine pollution from point and non-point sources. Strengthen pollution prevention and control with integrated land and sea management. Bolster the monitoring and traceability of mercury pollutants, tackle marine plastic and micro-plastic pollution at the source, reduce plastic waste, and enhance the capacity of waste management and disposal…Set out targets and plans for the sustainable management of the seafood supply chain. Implement advanced traceability and monitoring systems, regulatory targets, and broader public awareness campaigns regarding sustainable fishery benefits. Formulate and deploy science-based indicators, standards, and management mechanisms to track the progress of sustainable fisheries. Develop long-term and profitable business models. Identify the green financial instruments and market opportunities for the sustainable sourcing of fisheries. Integrate community and social resources to explore the joint management model of fishery resources protection…Enrich global marine public goods, and deeply engage in global marine environmental governance. Drawing on international experiences, set up blue economy financing principles, standards, and guidelines in line with China's conditions; pioneer the development of the Bohai Bay and Guangdong-Hong Kong-Macau Greater Bay Area as "Beautiful Bay" demonstration areas.

Annex 5. CCICED 2019 Detailed 14th Five-Year Plan (FYP) Recommendations to the China State Council

(Source: "Enhancing New Consensus on Green Development: The pathway to China's high-quality development during the 14th Five-Year Plan period.") http://www.cciced.net/cciceden/POLICY/APR/201908/P020190830118167260634.pdf

The following sections elaborate on detailed recommendations.

I. Promote Green Consumption

Green consumption is critical to ecological civilization and should be incorporated as a strategic objective in the 14th FYP.

- Expand green consumption in key sectors. Include agriculture, transport, e-commerce, housing and buildings, and electronic and other consumer goods.
- Expand green products and services supply. Ease market access for green products and services; encourage increased investments in green industries; strengthen the construction of green infrastructure and promote green consumption.
- Revise the Government Procurement Law. Government procurement should prioritize green mobility and green buildings, encourage waste minimization, zero-deforestation food supply chains and nature-based products and services.
- Promote green supply chains and the circular economy through Extended Producer Responsibility rules.
- Reduce plastics. Interim steps include eliminating single-use plastics, reducing upstream plastic use in packaging and implementing waste sorting to recycle plastic waste.
- Apply market incentives. Establish a science-based, coherent green labelling and certification system. A green consumption statistical indicator system and national green consumption information platform should be developed. Complement market-based approaches with mandatory green product requirements supported by differential taxes and market credit incentives. Phase out subsidies that disadvantage or impede the circulation of green goods.
- Promote the Green Lifestyles Campaign. Encourage demand for green products. Engage celebrities as frontrunners and motivators for change, as they have a positive influence on consumers' behaviour and turn green consumption into new trends. Emphasize the public health and environmental benefits of green consumption lifestyle choices.

II. Advance Green Urbanization

With the advent of the green development model, the digital economy and high-speed train connectivity, the traditional dichotomies between urban-versus-rural development, or industry-versus-agricultural development, are undergoing profound changes.

- Reformulate the Urbanization Strategy. The 14th FYP should formulate an urbanization strategy based on ecological civilization. The strategy should move away from the quantity-based model to a quality-based model where green urbanization becomes a key driver of China's high-quality economic development. The strategy should mainly comprise a green transformation with a focus on city clusters and metropolitan areas and green urbanization with a focus on counties.
- New understanding of the relationship between urban and rural areas. The new development concept defines the countryside as a new type of economic region rather than a subordinate from the anachronistic industrial perspective. It is necessary to go beyond the traditional concepts of "agriculture, rural areas and farmers" and expand the green supply of rural areas by harnessing technologies such as the Internet and the unique natural environment and culture of the countryside.

III. Promote Green Development in the Yangtze River Economic Belt

The 14th FYP should establish a protection strategy for the Yangtze River Economic Belt (YREB) and set an example for green river basin development.

- Accelerate the formulation of a holistic YREB protection strategy. Establish a science-based goal setting and evaluation system, translate the strategic visions for 2035 and 2050 as specified in the 19th National Congress into a goal setting and evaluation system tailored to the ecological features of the YREB. Lay out the key missions to protect and recover the Yangtze ecosystem in the medium-to-long term.
- Ecological compensation. Implement an ecological compensation mechanism featuring "one vertical + multi-horizontal" dimensions. Rely primarily on local budgets for an eco- compensation fund, complemented by incentives provided by the central budget.
- Strengthen the hard constraints on YREB ecological protection through the rule of law. The specific requirements for the protection of the Yangtze River and its unique positioning should be codified by a law that establishes basin-wide eco-environmental protection targets and protected areas and coordinate action between the central and local governments and across different jurisdictions and agencies.
- YREB natural capital accounting system. Establish a YREB-wide natural capital balance sheet and related indicators for natural capital accounting to identify the ecological benefits of nature. Share the accounting results across the Yangtze River basin and enhance professional capacity in natural capital accounting.
- A cross-jurisdiction digital Yangtze River platform that involves multiple sectors and players. Enhance environmental governance and early warning systems through expanded digital platforms. Establish an "Eco-industry Intelligent Platform" and a cross-regional cooperation platform on green finance. Establish a green supply chain system in YREB.

IV. Accelerate Climate Action

Develop a clear vision of China's low-carbon development. Through an updated Nationally Determined Contribution (NDC), set new targets to attain greenhouse gas (GHG) emissions peaking for key sectors and certain regions during the 14th FYP and set an emissions cap during this period. Develop decarbonization pathways to 2050. Accelerate reductions in the total use of coal and expand renewable energy use. Climate mitigation targets should comprise carbon dioxide and other GHGs, including hydrofluorocarbons (HFCs), methane, and other short-lived climate pollutants.

- Synergetic advancement of economic development, energy revolution, environmental protection, and climate action. By giving full play to the National Leading Group on Climate Change, Energy Conservation and Emission Reduction, use the war on pollution to accelerate the optimization of industrial structures, the energy mix, the transportation system, and land-use planning to complement climate action. Coordinate targets on economic development, energy reform, eco-environmental protection, and climate adaptation. Execute plans, technological advancements, and sustainable investment and financing and other policy measures to promote sustainable development.
- Total carbon emission control indicators. The total energy consumption control should be replaced by total carbon emission control (including also non-carbon dioxide GHG emissions). It will not only reduce the percentage of coal use but also boost the growth of clean energy resources, especially zero-carbon energy supplies. Apply "double control" (control of total carbon emission and its intensity).
- Incorporate climate change into the Central Environmental Inspection Program. Enhance local climate change institutions and their capacity. Integrate climate change tasks into the existing supervision system for eco-environmental protection.
- Step up coal control to win the blue-sky battle with determination. Elaborate a national long-term zero-emission strategy toward the eventual phase-out of coal. Accelerate the phase-out of all non-industrial coal use by around 2020 in the Beijing- Tianjin-Hebei and Fenhe-Weihe River Plain regions. Priority for non-fossil fuel energy grid connection and modern energy dispatch systems should be enforced.

- Activate the carbon market. Improve total emission control objectives and accelerate legislation to enhance a binding national emissions trading system. Implement a system of quota auctions and broaden the scope of carbon pricing to other sectors. A sound carbon market with a strong enforcement mechanism is needed.

- Climate adaptation and nature-based solutions. Climate adaptation plans should be integrated into national and local government planning. Seek synergies between climate adaptation and freshwater management, biodiversity conservation, marine governance, human health protection, and green infrastructure. Identify key regions, sectors, and communities vulnerable to climate-related events, and implement pilot programs in building climate resilience, drawing on recommendations from the Global Commission on Adaptation. Strengthen research and capacity building on nature-based solutions. Enhance effective linkage between climate and biodiversity action to better promote forestry protection and reforestation, and to promote the protection of wetlands, peatlands, grasslands, tidal basins, and other ecosystems.

V. Biodiversity Conservation

The 15th Conference of the Parties of the UN Convention on Biodiversity (COP 15) is an important opportunity to implement a new global biodiversity framework and ambitious post- 2020 agenda.

- Host a successful COP 15. Learning from the successful experience of the Paris climate negotiation, use green diplomacy to build high-level political momentum, enlist businesses, the academic community, non-governmental organizations, and the public to contribute to the post-2020 biodiversity framework and its implementation. The Action Agenda for Nature and People should raise public awareness and catalyze cooperative initiatives. Align biodiversity and climate change action through the scaling-up of nature-based solutions. Share with other countries China's successful experiences in building ecological civilization and eco-environmental protection, especially those on ecological redlines system.

- Accelerate biodiversity conservation in China. Reference the 2019 IPBES and other scientific reports to enhance species and habitat protection. It should tackle the underlying drivers of biodiversity loss, notably changes in land use, climate change, environmental pollution (including marine pollution) and the invasion of alien species. A robust monitoring and review mechanism should track progress. Comprehensively assess the state of land, freshwater and marine biodiversity, and other ecosystems regularly, using advanced remote sensing and analysis, combined with physical surveys. Publicly disclose assessment results. Strengthen a national management system for protected natural areas mainly comprised of national parks. Demarcate ecological protection redlines. Adopt and enforce comprehensive laws, regulations, market incentives, and policies to ensure implementation. Cross-ministry efforts are needed to eliminate ecologically harmful subsidies. Enhance research on breeding and the cultivation and sustainable use of wildlife resources, upgrade technologies to reduce consumption of natural and biological resources and improve the ecological compensation system to benefit local communities. Actively prosecute all illegal wildlife sales and traffic.

- Effectively align biodiversity protection with Belt and Road Initiative (BRI).

  Strengthening the development of Green BRI to promote biodiversity protection. Platforms should be developed to share best practices for environmental, conservation, and sustainability impact assessments. Nature-based solution initiatives should be a priority, supported by natural capital assessments and related indicators. Prioritize biodiversity in China's overseas aid; establish safeguards, standards, and innovative project finance; promote technical cooperation; and develop eco-tourism and other green markets. Support sustainable trade by initiating cooperative action to enhance green supply chains with a focus on establishing the green supply chain of soy, palm oil, fish, beef, timber, and other commodities.

VI. Marine Sustainable Development

China should enhance marine ecological protection, actively participate in global ocean governance, and enhance governance capabilities for marine ecological protection.

- Advance integrated marine governance: The network of protected areas should be activated, including the marine ecological redlines and national park system. Step up long-term baseline research and monitoring, in particular, of important habitats, such as coral reefs, mangroves, tidal flats, and seagrass beds, and key species, including cetaceans, sea turtles, spotted seals, water birds, and fish stocks. Keystone or umbrella species such as the Chinese white dolphins are especially important to monitor. Establish a database to form the basis of marine zoning. Simultaneously consider the multiple objectives of protecting natural resources, biodiversity, and ecosystem services. The "non-market" value of ecosystem services in developing China's marine economy should be appreciated. During the 14th FYP period, all plans involving onshore and offshore development must factor in the vulnerability of the offshore ecosystem. A strategic environmental impact assessment of the whole area should be conducted to assess the cumulative impact before proceeding with major development projects.

- Support innovative global marine governance: More attention must be directed to sustainable marine development during the 14th FYP period. Achievable goals for development and protection must be set, and measures must be in place. In the development and protection of the deep sea and the exploitation of its resources, China should actively contribute to developing and reviewing international norms for sustainable development resources. China should work with BRI countries on the development of a sustainable marine economy.

VII. Green BRI

The BRI presents a new and important platform to advance multilateral cooperation.

- Align the BRI with the multilateral agenda. Develop guidance, policies, and tools to align BRI investments with the Sustainable Development Goals (SDGs), the Paris Agreement, and the post-2020 biodiversity targets. BRI investments should prioritize green, climate-resilient infrastructure, support and accelerate decarbonization, and protect areas of ecological importance.

- Advance the alignment of sustainable development strategies of BRI countries.

- Disseminate the concept and best practices of eco-civilization through the International Coalition for Green Development on the Belt and Road. Advance the development of green BRI by aligning the sustainable development strategies of the BRI countries. Create platforms to support the construction of green infrastructure and green ports in BRI countries.

- Develop a precautionary mechanism for green finance: Establish environmental safeguards and an environmental impact assessment mechanism to mitigate environmental risks of proposed projects. Operationalize the Green Investment Principles. Require the disclosure of environmental and climate-related risks. Encourage public feedback before final project decisions are made. Globally, implement high-ambition, binding and measurable BRI green investment and financing principles. Introduce environmental and climate regulations for overseas investments. Domestically, encourage market demand for green financing; encourage financial institutions to establish green investment and financing mechanisms. Formulate and implement a green finance development strategy, establish a set of comprehensive risk assessment methods and comprehensive management systems to mitigate environmental, climate, social and other risks in all financing and co-financing initiatives.

- Promote green production, trade, and consumption. Promote green labels and green government procurement. Develop green supply chain pilot projects.

- Strengthen people-to-people ties. Assign Ministry of Ecology and Environment (MEE) staff to become Environmental Counsellors in China's embassies overseas. Implement the program of the Green Silk Road Envoys to build capacity for eco-environmental protection and climate mitigation among young environmental officials and scholars. Enhance exchanges and cooperation among environmental non-governmental organizations. Offer training to strengthen women's leadership in environmental matters.

VIII. Cross-Cutting Issues: Technological and Institutional Innovation

- Strengthen research, development, and promotion of major low-carbon technologies. Such as energy storage technologies, carbon capture and storage (including both nature and technology based), photovoltaic efficiency-improvement technologies, long-term battery storage, and other areas of low-carbon/zero-carbon innovation.
- Promote technological innovation in urban infrastructure and energy systems. Including expanding urban green and nature-based infrastructure and green zones; high-standard green buildings; clean, low-carbon energy systems; stringent energy-efficiency standards for consumer goods like appliances; cooling and lighting systems; and establishing a circular economy system covering waste reduction, sewage treatment and waste disposal.
- Establish Beautiful China demonstration zones. Such as ecological provinces, cities, and counties that are selected as Pilot Demonstration Zones for Building Beautiful China. Best practices will be replicated in other areas.
- Strengthen regulations and risk prevention for chemicals, nanomaterials, and other substances. By providing ongoing risk assessment and risk management for legacy as well as new chemicals, including assessing the acute and chronic effects of new nanochemicals.
- Enhance information disclosure and public participation to make full use of the positive contribution by individuals and non-governmental organizations. The rules on environmental information disclosure and public participation should be fully implemented and widened.