CCICED Policy Research Report on Environment and Development

CHINA COUNCIL FOR INTERNATIONAL COOPERATION ON
ENVIRONMENT AND DEVELOPMENT
POLICY RESEARCH REPORT ON ENVIRONMENT AND DEVELOPMENT

ECOLOGICAL CIVILIZATION : CHINA AND THE WORLD

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Note on This Volume

2016 was the first year of China's 13th Five-Year Plan. The National People's Congress approved the *Plan for Economic and Social Development of the People's Republic of China*, which puts forward the concept of innovative, coordinated, green, open and shared development. It commits the country to the fundamental national policy of resource conservation and environmental protection, to sustainable development, and to an advanced development path leading to economic growth, improved living standards and at the same time, a healthy natural environment. It also commits China to accelerated resource conservation and to the construction of an environmentally-friendly society which fosters harmony between humanity and nature. Ultimately, it is believed this will support both a beautiful China and global environmental security.

On the international scene in 2016, nations of the world reached a consensus on the *Paris Agreement,* which will come into effect in 2020. This marks, marking an important milestone in the history of global environmental governance. The agreement provides a blueprint for addressing climate change and achieving green and low carbon development worldwide. Also in 2016, a green finance initiative was championed by China at the G20 summit in Hangzhou, heralding a new era of sustainable development, and the *Kigali Amendment* paved the way for reducing GHG compounds.

It is in this context that the China Council for International Cooperation on Environment and Development (CCICED) held its 2016 Annual General Meeting (AGM), exploring the theme of "Ecological Civilization: China and the World". Four policy research teams presented their reports, namely: *China Green Transition Outlook 2020—2050, Rule of Law and Ecological Civilization, South-South Cooperation for Ecological Civilization,* and *China's Role in Greening Global Value Chains*. In addition, council members and experts exchanged views during four parallel forums on the following themes: "New Growth Impetus for Green Transformation and Prospects for Sustainable Development", "Global Governance on Environment and Climate Change", "Sharing Economy and Green Development", and "South-South Cooperation and Greening of the Belt and Road Initiative". Policy recommendations were finalized, reflecting the views of council members and experts.

Mr. Zhang Gaoli, Vice Premier of the State Council and Chairperson of the CCICED, addressed the opening plenary session with remarks entitled "Adhering to Green is Gold and Elevating the Development of Ecological Civilization to a New Level". Vice Premier Zhang pointed out that ecological civilization, an important part of socialism with Chinese characteristics, has a direct bearing on people's well-being, on China's future, and on global climate change. China is accelerating its transition to ecological civilization, making herculean efforts to clean up the environment and therefore to enhance both the country's natural beauty and the globe's ecological security.

The CCICED believes that the promotion of ecological civilization and therefore of green transition require the implementation of three initiative. First, China must integrate and mainstream ecological civilization into policy making, not only to guide domestic innovation and transformation, but also to inform international cooperation. Second, China must make concrete progress in addressing climate change at regional and global levels, by leveraging the opportunities offered by the SDG 2030 agenda. Third, the nation must make headway in the area of green innovation and cooperation by making use of the G20 and other international cooperation platforms. China's economic, social and political strength support these approaches.

This Policy Research Report on Environment and Development incorporates the CCICED's 2016 policy research findings and recommendations to the Chinese government, in addition to the document *Progress in Environment and Development Policies in China (2015—2016) and Impact of CCICED's Policy Recommendations* and the *CCICED 2016 Issues Paper.*

We trust it will prove useful to decision-makers, researchers and the interested public.

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Chapter 1
Policy Recommendations to the Government of China

CCICED has submitted its recommendations on environment and development to the State Council of China each year over the past two and a half decades. For recent years, there have been very significant changes in the range and complexity of topics discussed, and we continue to see remarkable efforts and achievement on the part of China to address the challenges and opportunities. Through this prolonged time of learning and hard effort, China now has established a productive strategy and top-level design for ecological civilization construction and green development.

Yet China still faces monumental challenges—serious environment and ecological issues and urgency of ecological civilization institutional reform, and from threats now inadequately addressed at the global level, including environmental protection, climate change, biodiversity decline, and sustainable use of the oceans. We believe these issues and threats currently constrain the full achievement of *Xiaokang* objectives, and may hold back economic and social progress in the decade ahead. Addressing these concerns requires further institutional and legal reform, and technological and management innovation far beyond what has so far been accomplished. People's full participation is needed, especially in development decisions and for new patterns of sustainable consumption to emerge. Fortunately China also has advantages gained through its existing efforts.

CCICED believes that China is well positioned to become a global green leader in future efforts: a) by example through its own present and future improvements; b) by its role in expanded international cooperation and governance; and c) by expanded support to other developing nations. These three leadership roles are the focus of CCICED's 2016 Recommendations to the State Council.

This year's policy recommendations focus on the theme of *ecological civilization: China and the World*. We have come to a general conclusion and propose three major actions. Regarding the general conclusion: First, if it is to achieve the environmental elements for a moderately well off society by 2020, China requires a stronger effort

domestically to promote the ecological civilization construction, and achieve overall environmental quality improvement. Second, the coming several years are the time to demonstrate just how much can be achieved by accelerating the pace of China's efforts to address international goals particularly for the Paris Agreement on Climate Change and the Chinese Implementation Plan for the UN 2030 Sustainable Development Goals (SDG2030). Third, the great potential value to green sustainable development of China's already announced international development initiatives. These initiatives include the Belt and Road Initiative (BRI),AIIB and the New Development Bank (NDB), and South-South cooperation funds, plus China's enhanced ODA and FDI.

The three major actions that we believe should advance strategy of ecological civilization construction, and therefore green transitions, are the following: First, it is timely to introduce ecological civilization as a mainstay of Chinese policy not only for domestic innovation and transformative change, but also in China's international relations. Second, China should use the SDG2030 opportunity to advance global sustainable development via South-South cooperation; promote substantive progress in addressing climate change at the global and regional levels; enhance environmental safeguards in bilateral and multilateral agreements; and foster green action by businesses both domestically and internationally. Third, continue to promote green innovation within strategic international platforms such as the G20, following the successful example of the green financing initiative in this year's G20 Hangzhou meeting. These three actions will work to China's economic, social, and political advantages.

Our major recommendations are based on the findings and recommendations of 2016 task forces and special policy studies[1].

1.1 Policy recommendation 1: Accelerate the progress of ecological civilization and green transformation

The guidance of the 5-in-1 principles of "Innovation, Coordination, Green, Opening and Sharing" is comprehensive. However, China's development is at a critical turning point, and must foster a more rapid green transformation of the economy towards an ecological civilization. Needed are several green transitions that can be undertaken during the 13th Five-Year Plan (FYP). It is recommended that the future Five-Year Plans be titled as the "National Economic, Social and Environmental Development Plan".

1 Task Forces: *China Green Transition Outlook 2020—2050 (interim Report); Rule of Law and Ecological Civilization; Ecological Civilization and South-South Cooperation*. Special Policy Study: *China's Role in Global Green Value Chains*.

1.1.1 Accelerate institutional reform on ecological civilization

1.1.1.1 Establish a national green development governance system

Incorporate the concept, principles and norms of ecological civilization into the Constitution during the 13th Five-Year Plan, and ensure the establishment of a legal system and administrative system under the umbrella of ecological civilization. It is necessary to further strengthen the performance evaluation systems for government officials at both the local and national level. Greater use of green competition mechanisms is needed among the provinces and cities. Conflicts of overlapping administrative systems for resource and environmental management should be rationalized, and the ecological civilization concept should be embedded in urbanization, rural land management and water resource utilization. The recently announced green financial system guidelines need to be followed up with various mechanisms to restrict financing channels for high-pollution and high-energy consumption enterprises, and to assure strict compliance to green standards.

1.1.1.2 Encourage green economy growth by leveling 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 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. Consider how enterprises can play a greater role in China's Implementation Plan for SDG2030.

1.1.1.3 Establish green economy accounting system

Reform current national economy accounting system by introducing ecological environment valuation and environmental cost accounting that embraces the "green is gold" approach; and completely change the situation of excessive pursuit of GDP growth. Green accounting is needed for eco-compensation arrangements, assessment of government officials, and various other tasks covered in the 13th Five-Year Plan.

1.1.2 Continue to accelerate green transformation in major social and economic sectors such as agriculture, industry and service sectors

1.1.2.1 Foster green transformation of agriculture

Modern agriculture is characterized by large-scale monoculture and high input farming, with reliance on high water use, and very high use of chemicals such as fertilizers and pesticides. Ecological agriculture should be vigorously developed through integrated

crop production and livestock breeding for improved product quality and environment outcomes. Innovations for green aquaculture and mariculture are essential for sustainable development in these sectors. Green agricultural processing approaches should be adopted for agriculture and livestock products to reduce impacts on climate change. Promote innovative development of agriculture and agroforestry in the context of the SDG2030.

1.1.2.2 Promote green transformation within key industrial sectors

It is necessary to use innovative technology and management measures to improve the efficiency of traditional industrial sectors; and to improve the efficiency of current industries in China and the efficiency of resource allocation among the whole society through policies of regulation, taxation, tariff and export restrictions. It is necessary to promote "greenization" of traditional manufacturing sectors, and to cultivate corporate social responsibility practices, with emphasis on monitoring and transparent information disclosure. Integrated planning will also be a means for synergic control of climate change and air pollution. Examples include measures for Short Lived Climate Pollutant (SLCP) control, and environmental health initiatives such as those to control indoor air pollution.

1.1.2.3 Support green development in service industries

Newly emerging service industries and new business models such as sharing economy need to be addressed in the context of their contribution to sustainable development and green transitions, and policy support is needed. Tourism deserves much greater attention to its impacts on the environment, on nature reserves and the national park system, and on socio-economy so this sector should be considered as a key area of ecological civilization in China.

1.1.2.4 Broaden efforts for cross-jurisdiction integrated planning and management and for regional green development

Recent initiatives such as Jing-Jin-Ji coordinated development and the Yangtze Economic Belt development plans provide considerable attention to pollution control and other environmental matters. These integrated development approaches reflect the future of green urbanization and coordinated regional planning and management in China, and more such initiatives should be established. The initiatives should take into account siting of rural and suburban low carbon and green industries, green development cities, and other activities supportive of quality of life and environmental improvements.

1.2 Policy recommendation 2: Strengthen rule of law for ecological civilization

In recent years, China has achieved significant progress in applying Rule of Law for environment and development. However, there are still needs to intensify efforts in legislation, justice, law compliance, plus enabling mechanisms that can support sustainable development, ecological civilization and implementation of China's SDG2030 Implementation Plan.

1.2.1 Speed up the introduction of relevant environmental laws and regulations to produce a full Environmental Code for China

1.2.1.1 Develop a national Environmental Code and promote greening of the total law system

It is recommended that development of the Environmental Code should be initiated by focusing on ecological environmental protection, with feasibility study by phases to be carried out, and the formulation of an *Environmental Code* included as part of legislation planning. Clearly define in the Constitution and relevant laws the legal connotation and denotation of "environment", and list environmental rights as an important element of the right of citizenship.

1.2.1.2 Fill important legal gaps in environmental law

In order to give full play to the role of Rule of Law in advancing sustainable development, it is recommended that a Legal Guarantee Plan for China's Sustainable Development be developed. Regularly review legal needs for effective implementation of the *Paris Climate Change Agreement* and other laws. Initiate the development of a Special Law on Atmospheric Environmental Protection in the Beijing-Tianjin-Hebei Region (Jing-Jin-Ji),Hazardous Chemicals Safety and Environmental Management Law, and revise the existing *Environmental Impact Assessment Law* to further clarify the binding authority of EIA on government policies and plans. Strengthen the pollution permit system, enforce the implementation of more strict mandatory emission standards, and promote technological innovation.

1.2.1.3 Include the concept, principle and norm of ecological civilization within specific elements for the Rule of Law

These elements include the Constitution, civil and commercial laws, administrative laws, economic laws, social laws, criminal laws, litigation and non-litigation procedural laws.

1.2.2 Strengthen judicial safeguards system

1.2.2.1 Guarantee the access to justice in environmental matters for citizens, enterprises, communities and social organizations

Support citizens, enterprises, communities and social organizations to participate in environmental legal matters including prevention of environmental harm cases, as well as ensuring their legal rights and justice on environmental damage. Ensure public confidence that judge's decisions will be made on the legal and factual merits of the case.

1.2.2.2 Reform cross-jurisdiction environmental judicial system

Due to the mobility of environmental elements, environmental cases often occur across jurisdictions. Current jurisdictional authority based on administrative regions is not conducive to case investigation, trial and dispute resolution. It is suggested that circuit courts be established on a watershed basis to handle important cross-administrative region environmental cases. Also, encourage the relevant courts to draw upon environmental expertise to handle specialized needs of ecological environmental damage cases.

1.2.2.3 Promote public interest litigation for environmental damage

While the capacity for citizen and social groups to access the courts on environmental matters has improved in recent years, there are still needs for improvement on information access, interveneor status and funding, and on the ability to initiate cases. It is recommended to improve the public interest litigation system for environmental matters and to reduce the restrictions on plaintiffs. Encourage NGOs to actively engage in environmental public interest litigation, and strengthen the public participation and transparency of environmental and resource trials. Promote the establishment of funding system for environmental public interest litigations. Facilitate the connection of environmental litigation and non-litigation procedures, and support the People's Procuratorate to file environmental public interest litigations.

1.2.2.4 Improve environmental crime provisions in criminal laws

It is recommended to add new crimes of water environment pollution and ocean pollution, and add provisions for potential damage offenses to give full play to the deterring role of the criminal law.

1.2.3 Strengthen compliance and law enforcement

1.2.3.1 Broaden environmental information access channels

Establish inventories of corporate environmental information disclosure. Improve penalty and incentive mechanisms for parties involved in the disclosure of corporate

environmental information, and promote self-compliance on the part of enterprises.

1.2.3.2 Enhance law enforcement

Educate, guide and support enterprises on law obedience, supported by monitoring systems to timely detect violation activities. Improve law enforcement capacity. Strengthen monitoring equipment standardization and the use of technologies such as automated monitoring, satellite remote sensing, and drones for monitoring violations. Improve funding mechanisms for environmental supervision and law enforcement by fully integrating funds within the various line items of budgets, all at the same level of government.

1.3 Policy recommendation 3: Proactively promote South-South cooperation for ecological civilization

Achieving global sustainable development goals requires both developed and developing countries to make joint efforts with due considerations of common but differentiated responsibilities, and actively promote South-South cooperation while continuing South-North cooperation. China should continue to adhere to the principles of "Balance, Equality, Protection, Inclusiveness, Transparency, and Compliance", implement major initiatives in the context of green development such as "The Belt and Road" initiative, proactively promote South-South cooperation for ecological civilization with Asia, Africa and small island countries, respond to green developing demand from other developing countries, jointly promote and assist the implementation of the SDG2030, and enhance China's contribution to global environmental governance.

1.3.1 Establish criteria to guide China's selection of priorities in South-South cooperation for ecological civilization

The following five criteria are proposed: a) be consistent with the 2030 Sustainable Development Goals; b) be adaptable to countries at different stages of development and with varying needs; c) provide systematic solutions that balance livelihood and ecology; d) operate with innovative technology and development models; and e) promote environmentally friendly and low-carbon infrastructure. Use of these criteria consistently will send strong signals to partner countries about ecological civilization.

1.3.2 Establish a coordination mechanism for South-South cooperation for ecological civilization

1.3.2.1 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.

1.3.2.2 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 SDG2030 goals and addressing climate change.

1.3.3 Create the enabling conditions for South-South cooperation for ecological civilization

1.3.3.1 Develop medium-term and longer-term strategies for ecological civilization components of South-South cooperation

These strategies should give due consideration of demands of global environment and development, as well as demands from developing countries, including priority fields and programs that can take full advantage of Chinese technological, 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.

1.3.3.2 Develop a broad multi-stakeholder 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.

1.3.3.3 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.

1.3.3.4 Enhance outreach

Systematically elaborate the relationship between ecological civilization and sustainable development goals to promote 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.

1.3.4 Increase Financial Support

Combine various financial sources to achieve an integrated funding efforts, including government aid, development agencies, commercial banks and 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.

1.3.5 Improve Process Management

1.3.5.1 Understand demands of partner countries and stakeholders to improve project implementation in South-South cooperation

Proactively understand 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.

1.3.5.2 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 application of new technologies in South-South cooperation for ecological civilization.

1.3.5.3 Pay close attention to the whole process assessment for large projects in infrastructure, energy, mining and agricultural sectors

In assessments, consider 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.

1.4 Policy recommendation 4: Proactively lead and integrate China into global green value chains

Global value chains add value to raw material, commodities and services by linking production, logistics, consumption and circular economy processes through international trade cooperation. Global green value chains means mainstreaming sustainable development concepts into the rules and practices of global value chains. China should strengthen its role in greening global value chains—with green BRI and ecological civilization South-South cooperation serving as major agents of change. This is crucial to safeguard China's economic security, enhance international production capacity cooperation and strengthen international competitiveness, and promote global sustainable development.

1.4.1 Seek policy synergies and actively participate in global green value chains

China should promote an integrated policy package that addresses investment, trade, standards, certification, and capacity building. Consider creating "ECO-20" in cooperation with Germany and other countries to promote global green value chains in the upcoming 2017 G20 Summit; and promote the greening of global value chain through multilateral forums, for example WTO negotiations on environmental goods and services. Furthermore, China should align its green standards with international standards.

1.4.2 Provide clear policy guidance to encourage Chinese companies to participate in global green value chains

While a large and growing number of multinational companies have begun to act on the sustainability of global value chains, Chinese companies have generally held back, awaiting guidance and support from the government. The government should use fiscal and financial incentive measures to encourage enterprise to procure and produce green products and join voluntary international efforts, such as the growing effort to reduce deforestation and to reduce pressure on ocean fisheries, and establish green value chain standards and systems for traceability.

1.4.3 Advocate a global green chain initiative, and consider it as a priority for the Belt and Road Initiative

Establish green partnerships throughout the BRI region to share best practices.

Advocate the establishment of global green value chains, and help BRI countries to improve their participation capacity. Establish partnership with full participation from government, enterprise and NGOs.

1.4.4 Provide greater investment and financing assistance towards global green value chains

Use bilateral aid and the newly-created multilateral banks to assist trade and investment partner countries to better manage their water, forest and fishery resources, improve resource management capacity, and agricultural productivity.

1.4.5 Promote the establishment of green value chains in 13th Five-Year Plan implementation

Specific measures include: a) Establish traceability systems for main international trade commodities and raw materials to ensure the green and sustainability nature of China's import/export commodities, and further promote the establishment of an international trade system that can ensure legality and sustainability. b) Launch a pilot program to establish best practices for greening the global value chains for soy, palm oil, forest products and fisheries. c) Establish a "Green Global Value Chain South-South cooperation Platform" under the "South-South cooperation Fund on Climate Change" to promote trade of green commodities and materials and to improve green value chain management capacity of participating countries.

Chapter 2
China Green Transition Outlook 2020—2050 Task Force (Interim Report)

2.1 Preamble

The Green Transition is the most comprehensive and profound transformation in the development pattern since the Industrial Revolution, in a manner much more profound and extensive than generally thought environmental issues. While its starting point is primarily to resolve the environmental crisis, the fundamental approach for solving environmental problems is to turn the conflicting relationship between economic development and the environment into compatibility or even a mutually reinforcing relationship by transforming the content and pattern of development. Therefore, the report has two obvious characteristics: a) Although the environmental issue is the starting and end point of report analysis, the report itself is not an environment report. Instead, it seeks solutions to environmental issues from the perspective of transformation in the economic development pattern; b) Analysis and policy views in this report are built on fundamental rethinking of the traditional development patterns that have led to grievous environmental problems.

This report's core message is that the conventional development patterns of the industrial age have resulted in an expensive economy, which is contrary to what is widely thought. However, people usually lose sight of costs such as hidden cost, external cost, and opportunity cost. On the contrary, the green economy, as a new pattern of economy based on ecological civilization, is of lower costs and tremendous new opportunities, representing the future orientation, although, transitioning to it is an arduous task.

This report answers the following questions: a) Why perform the Green Transition and what is its vision? b) In what historical context will the Green Transition take place in China? c) What will the green economy look like after the Green Transition? Why will the Green Transition lead to a more efficient economy, rather than a more expensive one? d) What is the policy framework design and roadmap of the Green Transition and how will its goals be achieved? The research is a flagship project for 2016—2017 of China's Council for International Cooperation of Environment and Development

(CCICED). This interim report presents some preliminary findings and immature policy suggestions, and the final report will be formulated after the analysis is completed at the end of 2017.

2.2 Preliminary findings

2.2.1 In the first part, four core viewpoints will be set out

2.2.1.1 The problem is HOW TO implement Green Transition, rather than WHETHER WE SHOULD do it OR NOT

Industrial civilization denotes the great progress achieved in human history, especially in terms of material wealth. However, traditional industrialization has inevitably brought about a grievous environmental crisis, since material wealth production is based on "high consumption of material resources, high carbon emissions, and high depletion of the environment."Meanwhile, the ends and means of development have been turned upside down to a great extent, and well-being has not been increased proportionally with GDP growth. Furthermore, in such a traditional pattern, only few population in the world represented mostly by the industrial countries can live in opulence while global prosperity is impossible.

2.2.1.2 The new vision of Green Transition

Manufacturing is the core of economic development in the conventional mode of industrialization, which leads to high environmental costs. In the meantime, the factory-like organization of large-scale production and the migration of huge populations from rural to urban areas also have great impact on the traditional social fabric and local culture. Moreover, enormous environmental and social problems have been caused as agriculture is transformed into chemical industrial agriculture, relying heavily on the utilization of fertilizers, pesticides, herbicides, antibiotics and auxin. In a word, the internal characteristics of conventional industrialization determine a conflict relation among economy, environment, culture, society, and governance.

Environmental problems will not be really resolved until the conflict relation is substantially changed through a profound transformation in the development pattern. While a green development concept is emerging with the advent of the digital era, the concept and content of economic development, related resource concepts, and organizational modes are experiencing tremendous changes, and the conventional development concept of the industrial era is becoming history. Therefore, China needs to redefine development on the basis of ecological civilization, and build a benign development vision where "economy, environment,

culture, society, and governance" promote one another (Figure 2-1).

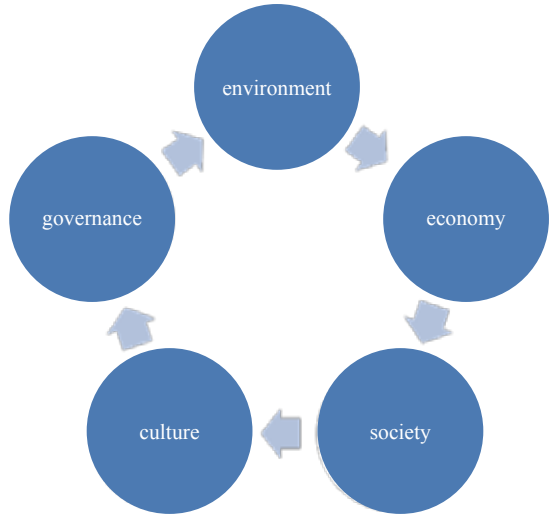

Figure 2-1 Sound cycle of new development prospect

2.2.1.3 Creating a new narrative of green development

According to the existing narrative, the traditional development mode is unsustainable because it leads to huge environmental problems, so a higher cost must be paid to clean-up environment and to realize the so-called green development. There are two problems with the narrative: on the one hand, Green Transition is regarded as a burden and the gigantic benefits of a green economy for growth and well-being are not understood fully; on the other hand, the harm caused by the traditional development to people, especially to contemporary people is not proclaimed sufficiently. According to the theory of behavioral economics (Tversky and Kahneman, 1974), due to risk aversion, the existing narrative will lead to cognitive bias against Green Transition, and people will be unwilling to undertake the risk of transition. Therefore, it is critical to create a new narrative of green development from two aspects—the first is to reveal the traditional development pattern's great harm to the people and nature, especially to contemporary people, and the second is to show the tremendous benefits that Green Transition may bring about.

2.2.1.4 China's Green Transition is of worldwide significance

First, the Green Transition would establish a win-win situation between China and the world, which avoids the competition for resources with other countries and also generates green opportunities for them. Second, China's success in Green Transition will be of significant importance in solving global environmental problems such as climate change. Third, if China plays a leadership role in Green Transition, it would contribute significantly

to world development.

2.2.2 The second part presents an analysis of the historical context in which Green Transition will take place in China between 2020 and 2050 to uncover unique opportunities and conditions

The dramatic changes in these historical conditions signifies that we can no longer understand economic development from the traditional industrialization perspective because the "game" of economic development is changing, and that Green Transition marks enormous opportunities and future directions.

Changes in historical conditions include:

2.2.2.1 The growth stage is experiencing historical changes

China will step over the high-income threshold and become the largest economy in the world. Since by 2030 it will become a high-income country, the period up to 2030 is the time window for accelerating its Green Transition. Once China's economy is locked in a non-green state, the transition will require a much higher cost.

2.2.2.2 Resource and environmental constraints are drawing on the threshold value and are extremely hazardous

If Green Transition is not performed, the threshold value will be surpassed with regard to **air, soil, water, food, health, energy, climate and etc**. These changes will become restrictions on development and cause a series of environmental and social problems. In the main report and the technical reports, a detailed analysis will be presented on the environmental hazards in China.

2.2.2.3 The industrial age is turning into a digital age

In the digital era, various concepts such as resource concept, development content, business model, economic organization, and urbanization model are experiencing revolutionary changes, which will redefine development, and has different implications to environment and welfare. It means that the understanding and prediction of development, and the policy suggestions can no longer be from the perspective of traditional industrialization. The new development pattern will be built on digitization and greening.

2.2.2.4 Green market demand is expanding rapidly

With growing income and emerging social and environmental problems of the existing development pattern, people are transitioning to green development concepts, green demand and green preference for all consumption. Consequently, tremendous growth opportunities are emerging, reshaping the entire social and economic structure.

2.2.2.5 Demographic factors are changing

Declining labor force, aging population, low birth rate (one child policy) and its lock-in effects, and increasing health problems due to serious environmental damage all signify that the conventional labor-intensive manufacturing-based economy will have to transition to a greener service-oriented and knowledge-based economy.

2.2.2.6 The international configuration faces drastic changes

Earlier, the international environment was an external factor for the development of China. However, as its economy expands rapidly, China's problems become issues influencing the world. China accounts for a rapidly increasing share in economic output, trade, investment, and resource consumption. Therefore, China's Green Transition is associated directly with the world's development.

2.2.3 The third part concentrates on the transition in the six pillar sectors of industry, agriculture, service, urbanization, rural development, and resources and environment

Quantitative analysis will be undertaken to investigate the high hidden economic and social cost of conventional development patterns, and to show why Green Transition will lead to a more promising scenario. Analysis of each pillar sector starts with a fundamental rethinking of their problems and their hidden costs. Accordingly, their direction of transition is uncovered and the Green Transition scenarios are specified.

2.2.3.1 Rethinking industry and its Green Transition scenario

Besides a discussion on its low efficiency and the high environmental cost of China's industrial structure and institutions, this report concentrates on investigating the intrinsic problems of industrial logic, including why conventional industrialization must result in consumerism and over-consumption, and why consumerism-driven economy inevitably causes environmental problems, especially in China's context. Accordingly, China's industrial Green Transition is analyzed in two co-existing scenarios: the first is the upgrading and transformation of the existing industrial system, including improvement of technological levels and service value added of industrial products, to reduce the environmental footprint of industrial output. These transitions must be based on the Internet, the Internet of Things, industrial design, flexible production, and Industry 4.0. The second is to change consumption patterns from goods to services, contain the immoderate expansion of material "consumerism" and redirect it towards consumption of services using policies such as regulation, taxation, tariff, and export restriction.

2.2.3.2 Rethinking agriculture and its Green Transition scenario

Agricultural pollution is largely attributable to agricultural transformation following industrial logic. Unsustainable environmental problems have been caused by chemical industrial agriculture that flourished since World War II, featuring large-scale monoculture and confined animal feeding operations (CAFO). The industrial agriculture relies on the extensive application of chemical fertilizers, pesticides, herbicide, antibiotics, and auxin. It registers a higher cost than eco-agriculture, actually, as its hidden costs include substantial agricultural subsidies, environmental pollution costs, biodiversity damage, reduction in rural community value, product quality costs, and damage to human health. Accordingly, in this report, agricultural transition is analyzed in two co-existing scenarios. First, efforts are made to reduce the ecological footprint of the industrial agriculture through new technologies, such as precision agriculture and facility agriculture. Second, efforts are made to transition the industrial agriculture to ecological agriculture and substantially reduce the use of chemical fertilizers and pesticides.

2.2.3.3 Transition in the emerging service sector

Due to cognition limitation in the industrial era, there are some misunderstandings about the nature and development potential of the service sector. Therefore, it is necessary to re-recognize the service industry. First, there is huge potential in the service sector. Many activities that being thought of as creating no value in the traditional opinion are actually valuable and can serve as an important source of economic development. Second, technically being non-rival, many service activities substantially overweigh industrial products in productivity and are environmentally sustainable. Third, upgrading the traditional service industry through new business models, such as sharing economy, or forming new service sectors can improve the efficiency and reduce resource consumption significantly. Accordingly, the analysis is conducted for two co-existing scenarios. One is the scenario of service development following the similar traditional service path of industrialized countries, and the other is a scenario where full play is given to emerging service sectors.

2.2.3.4 Green urbanization

To transition to green urbanization, we must start with the question: why do cities exist? The existing urbanization models are somehow an outcome of the industrial age centering on manufacturing. The urbanization model may experience huge changes, with the advent of the digital era and rapid transport and development content is turning to the lightweight trend. Certainly, instead of a simple deurbanization of population, it signifies that production and lifestyles will experience profound changes, obscuring urban and

rural boundaries. Accordingly, the Green Transition of urbanization is analyzed in two co-existing scenarios: one is the transition of stock urban areas, that is, greening the high-carbon urbanization of the industrial age through new concepts and techniques, including urban space transition, rebuilding of urban communities, and commercial activities and energy-saving retrofit of buildings. Examples include Smart City, zero (near-zero)-energy passive housing and ecological technology. The other is the increment transition scenario, which means forming a new green urbanization pattern through new concepts and patterns.

2.2.3.5 A new path for the green development of rural areas

Rural decline is largely an inevitable result of traditional industrialization-led development. In the traditional development pattern of industrialization and urbanization through the massive transfer of agricultural population, rural areas are a supply base for agricultural products and surplus labor; their potential for cultural, relaxation, aesthetic, and sport values is overlooked to a large extent in favor of employment potential, which is tapped further. In the meantime, agricultural transformation based on industrial logic and chemical agriculture has further reduced the employment capacity of rural areas, with huge impact on their social and ecological systems, causing problems such as hollow villages, left-behind elderly and children, family separation, local cultural destitution, and grievous pollution. Therefore, the value of rural areas must be re-discovered and their development potential expanded substantially without the constraint of traditional industrialization thinking. Analysis of the rural development scenario rests with the recognition and redefinition of rural development. Accordingly, analysis is conducted for two co-existing scenarios: one is the rural development scenario following the existing industrialization and urbanization paths, and the other is the scenario based on new development definitions.

2.2.3.6 Environmental effects of Green Transition

The fundamental transition in the above-mentioned development patterns will thoroughly transform the relations between economy and environment, making good eco-environment and culture an important source of economic growth. On the one hand, the report will present an analysis on the effect of Green Transition on environmental improvement in China. It will analyze the environmental impact under various Green Transition scenarios from the perspectives of resource consumption, carbon emissions (emissions and two degree) and eco-environmental issues (pollution free China, ecology). On the other hand, this report will also undertake analysis of the influence of China's Green Transition on global environmental issues under various scenarios.

2.3 Preliminary policy suggestions: Five policy instrument packages

The overall strategic objective is to achieve China's Green Transition on the basis of ecological civilization, and build a Five-in-One self-enforcing mechanism of development. After a moderately prosperous society develops by 2020, the well-being oriented national development strategy shall be implemented, a green development measurement and assessment system shall be established, and China shall lead the world in green development. In terms of approach, local governments shall be fully mobilized under the central government's top design of ecological civilization and green development concepts, and an effective green development pattern shall be formed through bottom-up local competition.

Systematic policy instrument packages are proposed in the following five aspects—

2.3.1 Package I : Forming new mindset, social normal, and green transition consensus on the basis of a new narrative of green development

The objective is to implement green development actually, not orally. Governments at all levels and the general public will understand the substantive differences between ecological civilization and green development and traditional development, and make green development operational. This report proposes a "new narrative→education→demonstration" policy suggestion as follows:

First, create a new narrative of green development so that the public knows about the severely harm caused by environmental problems as well as the major opportunities offered by green development. The new narrative will reduce action impedance and also form a new social psychology for green consumption and facilitate the development of green industries.

Second, undertake extensive green development education to remove the cognitive bias against green development. Further, conduct training about the apprehension of the public and governments at all levels regarding green development and have adolescents accept the green development concept through courses.

Third, transform an abstract green development concept into a specific and operable one through demonstration of green development regions and projects, making it easier to understand and accept.

2.3.2 Package Ⅱ: Green industry promotion policies that focus on fair competition and empowerment

The objective is to create conditions for fair competition and empowerment, since subsidies is not the most needed for green industries. Efforts may be made in the following aspects.

First, effectively internalize the external cost of non-green products by enacting strict environmental standards and laws to improve the competitiveness of green products. In particular, mobile Internet technology and dispersive supervisory mechanisms can substantially reduce the cost of enforcing environmental law and make the law more enforceable.

Second, re-evaluate subsidy or support policies for fossil energy, chemical agriculture, chemical industry etc., and make adjustments according to green standards.

Third, give awards to green products for their environmental benefits, which means shifting the huge governmental expenditure of pollution improvement from end-of-pipe treatment to source treatment.

Fourth, re-define the nature of subsidies for green industries into "the payment for their provision of environmental services" , instead of extra subsidies.

Finally, support green industries in capital, R&D, talent cultivation, infrastructure, and green government procurement.

This project will assess green industry, green agriculture, and green service as well as new energy, green building, electric cars, and green transport from the above-mentioned aspects and present targeted policy measures.

2.3.3 Package Ⅲ : Making breakthroughs in the establishment of incentive mechanisms for green development, and conducting holistic pilot projects in some regions

The objective is to make systematic changes, as many institutions and policies are inconsistent with the requirements of green development because they were established under and serve the traditional development pattern. Seen from methodology, initially, many policies can be piloted in an all-round way in a small region.

Establish new development performance measurement indexes to surmount the disadvantages in the single measurement of GDP. For instance, pilot regional ecological capital accounting, assess it comprehensively, and evaluate all aspects of the influence of economic growth on the aggregate wealth of society to a prevent GDP growth leading to a

decrease in social aggregate wealth and well-being.

Performance assessment of cadres. GDP assessment shall be faded. After a moderately prosperous society develops by 2020, in particular, the weight of GDP assessment shall reduce sharply and well-being oriented assessment policies shall be implemented thoroughly.

Land. While sticking to land ownership as specified in the Constitution, farmers' idle land shall be vitalized and their land revenue increased through the separation of "ownership, contracting right and operating right" of land, and the various forms of rural-urban cooperation including sharing economy.

Green fiscal tax. First, substantially increase the taxes imposed on "high-energy, high-pollution and resource-intensive" products; second, expand the range of consumption tax and establish a taxation system on the principle of "where there is consumption, there is tax"; and third, build a green transfer payment system.

Finance. Introduce green standard into all financial system, and establish green development funds and inclusive finance.

Resource . Ecological and environmental protection policies.

Green insurance system. Provide disaster insurance and market insurance for the transition in ecological agriculture.

2.3.4 Package Ⅳ : Building a digit-based green economy for the future through the "new green stimulus plan"

The objective is to substantially improve the confidence in green development by issuing landmark policies and to inject great momentum into the development of green industries.

New stimulus plans for green investment. Different from the conventional plans of investment in infrastructure such as water and electricity pipelines and manufacturing, the new plans focus on investment in next-generation digital infrastructure, new eco-environment, culture, and other non-conventional green infrastructure intended to create conditions for green supply.

Stimulate green service demand by adjusting vocation system and improving career flexibility. For instance, conduct study on the implications of reducing weekly working hours, prolonging the statutory paid leave year by year, and implementing diversified vacation systems such as unpaid leave, job retention with suspended salary, flexible vacations, and flexible working hours.

Assess China's strategy in the areas with the heaviest ecological footprint, such as new

energy, electric vehicle, thermal power plants, and green building, and discuss whether it is feasible to establish pilots with a small scope and promote Green Transition more boldly similar to some Nordic countries.

Achieve breakthroughs in new business models based on "Internet Plus," such as sharing economy (traffic, accommodation, catering, and inclusive finance).

Implement strict green standards in strategies such as the Belt and Road Initiative, South-South cooperation, and China's outward investment.

Green poverty relief strategy. While 90% of the ecological function zones are located in poverty-stricken counties, targeted adjustments should be made to development policies of existing ecological function zones according to green development requirements.

2.3.5 Package V : Building a more inclusive society and a more resilient economy

The objective is to provide assistance to specific groups, sectors, and regions that are impacted by the Green Transition, and establish corresponding all-round risk prevention and control systems.

An important aspect of this is the national uniform unemployment insurance system. While de-capacity and removal of zombie enterprises are in progress, support should be given to special projects and capacity building. Special transfer payments should be performed in regions (especially counties) where the revenue is largely sourced from high-pollution enterprises to reduce this dependence. Much attention should be paid to the substantial overlap between impoverished areas and main functional zones and targeted measures should be promulgated. Accordingly, integrated risk prevention and control mechanisms should be developed to improve economic resilience.

Chapter 3
Rule of Law and Ecological Civilization Task Force

3.1 Legal guarantee scheme for China's sustainable development by 2030

3.1.1 New requirements for environmental legislation in the 2030 Agenda

Goals under the Agenda involving environmental legislation for sustainable development include:

① Ensure availability and sustainable management of water and sanitation for all.

② Ensure access to affordable, reliable, sustainable and modern energy for all.

③ Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

④ Make cities and human settlements inclusive, safe, resilient and sustainable.

⑤ Take urgent action to combat climate change and its impacts.

⑥ Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

⑦ Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Taking this into account, the Task Force believes that it is necessary to develop a Legal Guarantee Scheme to use the rule of law to advance ecological civilization by addressing issues such as pollution prevention and control, environmental protection, response to climate change, and green and circular development.

3.1.2 Formulation

3.1.2.1 Guiding ideas and principles

In line with the spirit of the CPC Central Committee on promoting ecological

progress, China is pushing forward sustainable development in an innovative, coordinated, green, open and shared manner in the context of the "five-in-one" layout and the "four-comprehensive" strategy.

The rule of law covers legislation, law enforcement, justice, compliance and supervision. Legislation addresses law formulation and includes its amendment, revocation and other legislative activities. Law enforcement, justice, compliance and supervision can be collectively referred to as law implementation.

China's legal system has taken the initial shape, but the content of the legal system is still far from perfect. The quality and design of legislation have yet to be improved, and the legislative process needs to be based on a sound scientific basis. It is therefore necessary to continue to strengthen the legislative work. The focus of future legislation, different from the past, should be gradually shifted from development of new laws to revision and perfection of existing laws, paying more attention to the quality of legislation while ensuring the coordinated development of law implementation and perfection.

3.1.2.2 Content

The goal of the Legal Guarantee Scheme is a) by 2020, to establish the basic ecological civilization system and shape the legal framework for promoting ecological progress, such as laws concerning soil pollution, toxic and harmful chemicals and environmental protection in major regions and basins; b) by 2030, to establish a full-fledged legal system for promoting ecological progress and boosting green, circular and low-carbon development, and complete the environmental codification.

The Legal Guarantee Scheme envisages legislative ideas and planned steps to guarantee sustainable development by 2030. It will serve as a cornerstone for drafting the legislative plan for sustainable development by 2030. It is recommended to develop the legislative plan once the draft is completed.

3.2 Improving sustainable development legislation at present and in the future

3.2.1 Improving sustainable development legislation

3.2.1.1 Advancing the implementation of five-year legislative plan in convergence with the Agenda

Current legislative work for sustainable development in the legislative plan outlined by the 12th NPC Standing Committee is consistent with the Agenda. Many laws have been formulated and revised, covering environmental protection, environmental impact

assessment, air pollution prevention and control, wildlife protection, tourism, cultural relic protection, and exploration and exploitation of deep seabed marine resources. Some laws in the legislative plan have not yet completed.

It is recommended that resources be mobilized to overcome difficulties and ensure completion on schedule. These include water pollution prevention and control law, soil pollution prevention and control law, forest law, standardization law, mine safety law, marine basic law, nuclear safety law and mineral resources law.

3.2.1.2 Problems with existing legislation

China's environmental legal system has evolved over the past three decades with the country's new framework law, the Environmental Protection Law, adopted in 2014.

While China's system of environmental laws is broad ranging providing many of the legal tools used in developed countries, the system is not unified and contains gaps and weaknesses.

Overlapping regulatory responsibilities between government departments have resulted in fragmented, overlapping and inconsistent laws as well as gaps in the system. The fragmented and incomplete management of toxic and hazardous chemicals is one example posing an immediate risk. Other examples include lack of soil pollution control legislation and inconsistencies between environmental laws and specific resource laws relating to water, forestry, grasslands, agriculture and energy.

Civil, economic, administrative and other related laws do not take account of environmental principles such as sustainable development. Nor do these laws recognize the ecological values of natural resources for the benefit of the whole community. Environmental laws can be challenged on the basis of their inconsistency with other laws and there is no clear legal responsibility for environmental damage or for compensation measures.

Laws requiring the strategic environmental impact assessment of development plans and programs are limited. There is also a need for a comprehensive and unified set of laws governing the ownership and management of natural resources, biodiversity conservation and natural reserve management. Laws to facilitate market -based mechanisms are also required. These include laws to support pollution trading programs and green finance and insurance reforms.

There are weaknesses in the design of some laws. For example, existing laws are not integrated and do not link and co-ordinate essential legal tools such as EIA, spatial planning and ecological redlines, and permitting. Linking these tools optimizes their effectiveness and avoids duplication.

Environmental law is an area where there are regular conflicts with competing priorities like economic development. These require not only clear laws but also procedures for transparent, fair handling of inevitable conflicts, including conflicts between jurisdictions at all levels. In particular, there is a need for an open process for determining a fair distribution of regulatory burdens between these jurisdictions. This applies not only among local jurisdictions but also between central and local jurisdictions.

Progress to solve cross-boundary pollution (such as air pollution in the BTH region and water management in the Pearl River and Yangtze deltas) has been hampered by the absence of laws and institutional mechanisms to guarantee implementation of integrated plans that meet the criteria of cost effectiveness and fairness between jurisdictions.

For more information on China's existing legislation see the Taskforce's 2015 report.

3.2.1.3 Incorporation of an environmental code into the legislative plan of the 13th NPC Standing Committee

The Taskforce recommends building a complete and coherent legal framework for ecological civilization facilitating green, circular and low-carbon development. Unifying laws will solve the contradictions and conflicts within the environmental legal system and improve implementation. The framework should provide an Environmental Code for China serving as the basic law for pollution control and ecological protection.

Unifying legislation and providing a more integrated approach to pollution control and ecological protection is consistent with approaches in countries with highly developed environmental legal systems.

The development of the Environment Code is by no means a simple integration of existing environmental protection laws. It involves a major adjustment to existing environmental protection laws and regulations, including the addition of new environmental protection ideas, principles and systems, such as civil environmental right, information disclosure and public participation, environmental tax and ecological compensation, compensation for pollution damage, and jurisdiction of cross-administrative regional pollution, and specialized environmental courts.

Whether and how these changes are to be made needs in-depth argumentation through the broad and deep involvement of the relevant administrative and academic departments and the parties concerned. To this end, it is suggested to adopt a "two-wheel" legislative approach: a)to commission or organize senior experts on environmental protection to lead and conduct research and demonstration and produce the drafting proposal; and b) to let the Law Committee of the NPC Standing Committee lead the relevant departments and relevant committees to draft the laws.

3.2.2 Formulation of the special law on atmospheric environmental protection in the Beijing-Tianjin-Hebei region

3.2.2.1 Why necessary

At present, environmental legislation in China comprises an integrated basic law and special laws concerning the control of air, water, noise, and solid waste pollution and protection of water, forest, wildlife, and grassland, as well as management-oriented laws including the *Law on Environmental Impact Assessment, Law on Circular Economy Promotion,* and *Law on Cleaner Production Promotion*.

In the current transitional period that may last for about another 20 years, many problems specific to regions and domains have emerged and need tobe resolved through special rules. Well-designed regulatory schemes can help to solve these problems. The need to protect atmospheric environment in the Beijing-Tianjin-Hebei region is one good example.

(1) The special problems facing the Beijing-Tianjin-Hebei region need to be addressed through legislation that further clarifies the measures made by the *Law on Air Pollution Prevention and Control* and defines into rights and obligations of the parties to make mandatory. This will provide experience for joint pollution prevention and control in other regions.

Targeted legislative systems, frameworks and mechanisms are needed to address special legal issues in the Beijing-Tianjin-Hebei region. Given the special status of the region, the environmental security, in particular air quality, of Beijing, the capital city and an international metropolis, should be considered in the international context. Fog and haze in Beijing cannot be solved solely within the metropolis and shared governance by Beijing, Tianjin and Hebei is needed to substantially improve the atmospheric environment. Regional pollution control has not been heeded and become deeply rooted until an amendment to the *Law on the Prevention and Control of Air Pollution* that requires regional joint prevention and control. However, this law is too general to clearly define the measures aimed at restrictions on motor vehicles and businesses in the special circumstances of the Beijing-Tianjin-Hebei region. For example, the environmental permit needs refinement to be more checkable, measurable and target accessible. The existing planning specially for environmental protection in the region, namely the *Outline for the Plan for Coordinated Development of the Beijing-Tianjin-Hebei Region*, also fails to lay down enforceable and mandatory measures. Hence, a special law for the region is expected. It will set an example and provide reference for other regions, such as the Yangtze River Delta and Pearl River Delta.

(2) Facing the situation of air pollution and ecological damage, there is a need to sort out administrative laws and regulations, sectoral rules and local rules, plans and standards to allow case-specific treatment and priority pilot and extend the reform measures for promoting ecological progress to the Beijing Tianjin-Hebei region.

Pollutant emissions in the Beijing-Tianjin-Hebei region far exceed the environmental carrying capacity. In 2012, sulfur dioxide, nitrogen oxides, and smoke (dust) emissions registered 1.66 million tons, 2.273 million tons and 1.387 million tons, respectively, accounting for 7.8%, 9.7% and 11.2% of the national total, and the emissions per unit area is 3.5 times, 4.3 times and 5.0 times the national average, respectively. $PM_{2.5}$ pollution has become the cause of "the heart and lung disease" of the local residents. In 2013, 11 cities in the region made into the top 20 $PM_{2.5}$ polluted cities and 7 into the top 10. The annual average $PM_{2.5}$ concentration reached 106 $\mu g/m^3$, 1.5 times the average of 74 cities, and 13 cities in the region failed to meet the standards by exceeding 0.1 to 3.6 times the proscribed levels. To effectively address the issue of serious air pollution, the region is forced to develop a special law by consolidating the administrative laws and regulations, sectoral rules and local rules, plans and standards. Targeted at regional problems, the special law will serve as a clear and effective legal basis for effectively protecting and improving the atmospheric environment. In addition, China is stepping up the reform for promoting ecological progress and putting a number of measures into practice. Pilot is carried out for measures to promote integrated environmental monitoring network, to practice vertical environmental supervision system for departments below the provincial level, to encourage third-party environmental governance and push ahead the environmental protection industry. These measures need to be legalized and guaranteed by a special law.

(3) Uncoordinated provincial planning and disorderly competition among local governments lead to industrial duplication and overcapacity. It is necessary to carry out the supply side reform to form complementary industries and maximum benefits among regions, and to integrate the forces and resources of various localities and departments so as to enhance the overall industrial capability of environmental protection.

The specific planning of the three cities and provinces hardly harmonizes with the overall regional planning provided by the *Outline of the Plan for the Coordinated Development of the Beijing-Tianjin-Hebei Region and Ecological Environmental Protection Plan for the Coordinated Development of the Beijing-Tianjin-Hebei Region*. Industrial overcapacity and duplication is a common problem because of widespread disorderly establishment of industrial parks and green light for high-polluting enterprises by local governments in the context that GDP serves as the main

criteria for government performance assessment. Driven by interests, Beijing, Tianjin, and Hebei consider more their own conditions and development objectives than regional coordination in planning development. Uncoordinated planning results in serious industrial overcapacity and duplication in the region. Considering own atmospheric conditions, the Beijing-Tianjin-Hebei region should pool capital and resources to the supply side reform that encompasses the development of dominant industries through mergers and integration, support for low-carbon and low-emission enterprises, and introduction of basic transformation and new technologies to reduce pollutant emissions and consumption of traditional fossil fuels. The future industrial planning, including the optimization of the whole industry, should be based on regional integration and aimed at formation of regional complementary industries and maximum benefits.

(4) Provincial policies and systems do not converge, making possible trans-boundary pollution transfer and undermining structural upgrading and supply side reform of the Beijing-Tianjin-Hebei region, and therefore should be integrated into unified deployment.

Beijing, Tianjin and Hebei as separate provincial administrative areas have adapted the environmental protection system to their respective realities. For example, Beijing and Tianjin have more developed economies and better environmental situation than Hebei, so their atmospheric environmental supervision systems are relatively more stringent. The Notice on Issues Concerning Adjustment of Pollution Charges issued in Hebei proposes raising pollution charges in three steps by 2020, but the standards remain far behind those of Beijing and Tianjin. The ratio of pollution charges in Hebei, Beijing and Tianjin is approximately 9：7：1. The transfer of polluting enterprises in the border area between Beijing and Tianjin also hinders the structural upgrading and supply side reform of the region.

(5) Measures advance unevenly in the region due to provincial mismatched rights and obligations and information asymmetry and fair implementation and work coordination is needed.

Work proceeds orderly based on fairness that rights match with obligations. However, in practice, it is more often than not that large and small contributors to regional air pollution control bear the same obligations or the benefited area and the damaged area enjoy the same rights. This will undoubtedly dampen the enthusiasm of large contributors or damaged areas, resulting in stagnation of regional air pollution prevention and control. For a long time, in order to ensure the economic development of Beijing and Tianjin, Hebei has made huge concessions and sacrifices both in the development and utilization of resources and phase-out of backward production capacity in Beijing and Tianjin.

The coordinated development of Beijing, Tianjin and Hebei, especially in

environmental protection, involves a wide range of matters and complex interests. While the NIMBY phenomenon is inevitable, either the consciousness and awakening of citizens or planning and policy guidance is enough to ensure balance of interests. Even intergovernmental cooperation agreements, which are not necessarily widely representative and mandatory, are likely to cause discontent and revolt of citizens and further risks where the interests of the relevant people and social organizations are endangered. Therefore, legislation, or more specifically, legal guarantee, should be put in place for the coordinated environmental protection of the region.

(6) Regional synergy is difficult due to poor coherence of provincial administration and some special measures require special legal authority.

The governments of Beijing, Tianjin and Hebei concern more about their own administrative areas than the region as a whole, which undermines the communication and cooperation. Due to the lack of regional coordination bodies, the collaboration carried out to varying degrees in many fields is non-institutional and the cooperation, generally reflected in commitments of local government leaders, shows low legal validity and stability and fails to reach consensus when it comes to the core interests. To address air pollution in the region, measures are intensified during 2016—2017, including greening rural coal consumption and eliminating coal-fired boilers and furnaces within the deadline, outlining coal banned zones and coal quality control zones, completing shutdown and phase-out tasks within the deadline, improving urban management, strengthening motor vehicle pollution control, reinforcing comprehensive management of volatile organic compounds, completing pollution control in key industries in transmission channel cities, practicing discharge permit to strengthen "elevated source" regulation, strengthening the response to heavily polluted weather events, and practicing production control in industrial enterprises of transmission channel cities. It is best to grant legal authority for these special measures. To protect the atmospheric environment in the region, a law is needed to divide the general and special duties and obligations of the three places and to systematically stipulate how to effectively control the atmospheric environment.

Box 3-1 Regulating regional air pollution in the United States

Although the U.S. has made significant progress in improving air quality, regional air pollution problems remain an unresolved challenge. Boundary problems (i.e., a mismatch between the scope of enforcement authorities and environmental problems), technical difficulties in monitoring and calculating cross-jurisdictional pollution contributions, and disputes over fairness and legality in the allocation of burdens have all contributed.

The United States currently regulates regional fine particulate ($PM_{2.5}$) and ozone pollution problems using the Cross-State Air Pollution Rule (CSAPR; effective Jan. 1, 2015). Earlier examples of regulatory programs aimed at regional air pollution issues include: a) the Acid Rain "cap and trade" program established by Title IV of the 1990 Clean Air Act amendments; b) the creation of the so-called NO_x SIP Call and various interstate ozone transport bodies; and c) the Clean Air Interstate Rule (CAIR), which has subsequently been replaced by the CSAPR.

CSAPR is expected to generate significant pollution reduction and health benefits that far outweigh the costs of the program[1]. By implementation of Phase 2 (to commence January 1, 2017), the program is expected to lower power plant emissions from 2005 levels by 6.4 million tons per year of SO_2 – a 73 percent reduction, and 1.4 million tons per year of NO_x – a 54 percent reduction (which includes 340,000 tons per year of NO_x during ozone season).

These reductions are expected to produce health benefits, including annual avoidance of: 13,000 to 34,000 premature deaths; 15,000 nonfatal heart attacks; 19,000 hospital and emergency room visits; 1.8 million lost work days or school absences; 400,000 aggravated asthma attacks. The final CSAPR is expected to yield annual health and environmental benefits of $120 to $280 billion. In contrast, the costs are $800 million annually plus $1.6 billion of sunk capital costs.

3.2.2.2 Legislative design and outcomes

(1) Legislative design

First, the Special Law is a special measure for solving atmospheric environment problems of the Beijing-Tianjin-Hebei region while reflecting the general requirements of *Environmental Protection Law* and *Action Plan for Air Pollution Prevention and Control*. It encompasses particular systems and mechanisms, with measures intensifying during 2016—2017, including greening rural coal consumption and eliminating coal-fired boilers and furnaces within the deadline, outlining coal banned zones and coal quality control zones, completing shutdown and phase-out tasks within the deadline, improving urban management, strengthening motor vehicle pollution control, reinforcing comprehensive management of volatile organic compounds, completing pollution control in key industries in transmission channel cities, practicing discharge permit to strengthen "elevated source" regulation, strengthening the response to heavily polluted weather events, and practicing production control in industrial enterprises of transmission channel cities. These measures are not regulated and are not enforceable under existing laws.

Second, the Special Law should consider ecological protection and air pollution control and overcome the weaknesses of *Action Plan for Air Pollution Prevention and Control*.

Third, the legislation should target regional responsibility, regional action and regional coordination.

1 https://www3.epa.gov/airtransport/CSAPR/index.html; https://www3.epa.gov/airtransport/CSAPR/basic.html; https://www3.epa.gov/crossstaterule/pdfs/FinalRIA.pdf.

Fourth, the Special Law should be comprehensive and contain provisions relating to trans-regional civil legal liabilities and innovations in the environmental judicial system. While the legislation will mainly be applicable to Beijing, Tianjin and Hebei, it will serve as a model for designing requirements for Inner Mongolia, Shanxi, Shandong, etc.

(2) Outcomes

The Beijing-Tianjin-Hebei region should gradually improve atmospheric environment quality by facilitating the implementation of integrated planning and decision-making based on principles of complementary advantages and shared governance. Guided by the objectives in the Outline of the *Plan for Coordinated Development of the Beijing-Tianjin-Hebei Region* and the *Ecological Environmental Protection Plan for the Coordinated Development of the Beijing-Tianjin-Hebei Region*, innovations are favored under the framework of the *Action Plan for Air Pollution Prevention and Control*, targeted at improved co-ordination and consistency and promotion of the win-win philosophy.

Box 3-2 Legal instruments against trans-boundary air pollution: European Union and Germany

1. Legal measures against trans-boundary pollution in Germany

EU law provisions are implemented in German law through the Federal Emission Control Act and according subordinate law.

(1) Clean air plans for the prevention of trans-boundary pollution

Clean air plans, set up to fight air pollution, generate different effects. If critical values/standards are exceeded by emissions, which originate from outside of the area of a set plan, the competent regional or local authority is obligated to develop a plan as well.[1] If critical /standards are exceeded by a significant amount of trans-boundary air pollution, the member states authorities are obligated to

① cooperate;

② take joint measures, e.g. developing a coordinated clean air plan; and

③ inform the competent member states authorities as usefully and fast as possible;[2]

④ It is then the responsibility of the member state to inform its own concerned public.

(2) Industrial installations related protection against trans-boundary air pollution

The provision of permission is the most important instrument for the prevention of trans-boundary air pollution. Material requirements, e.g. compliance with critical values, and formal requirements, such as the participation of the affected authorities and the public, need to be met before permission is granted.

The operator of the industrial installation is burdened with the proof of compliance, which he can demonstrate by submitting his application and providing the according documents.

1 Article 47 (4)(4) of the Federal Immission Control Act.

2 Cf. Article 29 of the 39th Ordinance for the Implementation of the Federal Immission Control Act.

The following needs to be noted concerning the prevention of trans-boundary air pollution by industrial installations:

① In matters of material requirements, critical values/standards set on EU-level in connection with transboundary air pollution are applied at first when reviewing an industrial installation's compliance with permission requirements.[1]

② In matters of formal requirements, authorities of neighboring states, in which trans-boundary emissions are expected, have to be included in the process just as much as the national authorities and have to be given the right to inspect application documents and raise objections.[2]

The neighboring state's public has to be included in the same manner the permitting state's public is included. Participation in the context of pollution control law means "Everyman-participation", a specific interest or violations of rights is not required. Participation means the access to the relevant permission documents, which are primarily the application papers and the environmental impact assessment.

The public has furthermore the right to take up a stance within a certain period of time. Risen objections need to be demonstrated.[3]

The authorities of the neighboring state can ask the permitting state's authorities to take appropriate measures, when the operation of the industrial installation is expected to affect the neighboring state substantially.[4]

The authorities of the neighboring state have to be involved in the issuance of retroactive orders as well, just as the public, if it is affected by any of those orders.[5]

Natural and legal persons originating from neighboring states can file a suit for the revocation of the permission or the issuance of retroactive orders, if critical values are exceeded that serve the protection of the population.

2.Examples for trans-boundary joint measures in Germany

(1) Reciprocal recognition of environmental badges

One example for trans-boundary joint measures in the context of air pollution control is the reciprocal recognition of environmental badges governed by anti-pollution law between the Czech Republic and the Federal Republic of Germany. A motor vehicle being granted a said badge is not affected by an access restriction based e.g. to a city on a clean air plan due to its minor pollutant emissions. Via German support, the Czech Republic has enacted a regulation that constitutes a spacious access restriction for the most polluting vehicles (environmental zones) in Prague. Air pollution control laws are to be revised additionally. It was decided that environmental badges following an identical standard should be recognized reciprocally.

1 Article 5 of the Federal Immission Control Act in conjunction Article 3.

2 Article 10 of the Federal Emission Control Act in conjunction with Article 11a (1), (3) of the 9th Ordinance for the Implementation of the Federal Emission Control Act.

3 Article 10 of the Federal Emission Control Act in conjunction with Article 11 a (4) of the 9th Ordinance for the Implementation of the Federal Emission Control Act.

4 Article 10 of the Federal Emission Control Act in conjunction with Article 11a of the 9 th Ordinance for the Implementation of the Federal Emission Control Act.

5 Article 17 (1a) of the Federal Emission Control Act.

Based on a decree of the Federal Environment Ministry, all federal states of Germany have ensured the recognition of Czech environmental badges accordingly.

(2) Mutual clean air plans

In Germany regional or local authorities are competent for the development of clean air plans. Trans-boundary cooperation with foreign neighboring cities exists at least in the eastern Germans states. One example is the mutual clean air plan of the German city Görlitz and its bordering Polish city Zgorzelec.[1]

3.2.2.3 Basic issues

(1) Legislative objective

The Special Law is formulated to make the Outline of the Plan for Coordinated Development of the Beijing-Tianjin-Hebei Region and other environmental protection specific plans mandatory for removing atmospheric environment problems, especially the heavy haze, from the region, and provide support for economic development of the region.

The legislative purpose is summarized as: the Special Law is formulated to protect the atmospheric environment, promote the joint prevention and control of air pollution, relieve haze, safeguard public health and propel the coordinated development of the region while considering the regional realities, pursuant to the *Environmental Protection Law, Action Plan for Air Pollution Prevention and Control.*

(2) Strategy

The strategy of atmospheric environmental protection in the Beijing-Tianjin-Hebei region can be defined as follows: considering the development and realities of Beijing, Tianjin and Hebei, the regional atmospheric environmental protection needs to break down administrative barriers with a view to regional integration, practice joint prevention and control of air pollution caused by coal, industry, motor vehicles, dust and agriculture and integrated prevention and control against air pollutants and greenhouse gases (GHGs), such as particulate matters, sulfur dioxide, nitrogen oxide, volatile organic compounds and ammonia, while establishing unified plans, standards and measures, as well as a sound fund raising and use system.

(3) Regulatory system

China's current regulatory system lays particular emphasis on supervision over administrative areas and industries, which goes against the transformation of the mode of development and life. Therefore, changes must be made towards both supervision of administrative areas and trans-administrative areas. According to the 13th Five-Year Plan, the first consideration is to set up the "Regional Environmental Protection Division"

1 http://www.internationales.sachsen.de/17648.htm.

and "River Basin Environmental Protection Division", of which the former take charge of supervision centers except that of the Beijing-Tianjin-Hebei region. Furthermore, the Beijing-Tianjin-Hebei Regional Environmental Protection Agency can be added to the North China Environmental Protection Supervision Center.

3.2.2.4 Major Systems

(1) Integrated EIA system for planning, industrial restructuring and regional development strategies and policies

When developing regional integrated environmental planning, the three places should make concerted efforts to identify solutions and measures based on the issues. Through integrated planning and industrial restructuring, it is possible to change the current unreasonable distribution and maximize economic and environmental benefits while promoting atmospheric environmental protection.

(2) Integrated regulation system and urban growth boundary system

By way of regulation integration, it is possible to coordinate the scale and target of each plan, make rational layout of urban and rural areas and industrial parks, and integrate related industries to phase out outdated capacity and improve competitiveness, and also let development follow the regulation. The urban growth boundary system controls the excess expansion of cities and protects the ecological environment by keeping ecological land from occupation.

(3) System for overall environmental protection, including unified measures, and area-specific and period-specific measures

The atmospheric environment is only one part of the whole ecological environment that consists of atmospheric environment, basin environment and regional ecology. The protection of atmospheric environmental in the Beijing-Tianjin-Hebei region should be considered in the context of environmental protection and take advantage of the links among all environmental factors. The unified measures include motor vehicle control, industrial policy and environmental access threshold. Given the presence of potential serious environmental problems, area-specific measures and period-specific measures are also necessary before overall industrial restructuring is achieved in the region, whether it is 2016—2017 or thereafter. Among them are completing clean alternative to rural coal use within the deadline, phasing out coal-fired boilers and furnaces within the deadline, strengthening the response to heavily polluted weather events, coal banned zones and coal quality control zones, and production control in industrial enterprises of transmission channel cities.

(4) Unified system of standards and technical specifications

Currently, the national environmental quality standards without any difference are prevalent in Beijing, Tianjin and Hebei, but the actual environmental problems call for higher standards. In this light, the Special Law should set unified standard for the atmospheric environment in the region, such as uniform standards of oil product and emission charges. Besides, it should be stipulated that Beijing and Tianjin should appropriately support Hebei Province with funds to gradually achieve the unification of waste-discharge standards.

(5) Unified system for raising and using government funds

The Special Law should include specific provisions on the funding for protecting the atmospheric environment. A unified system for raising and using government funds should be built. Appropriate fund raising measures reflecting the common but differentiated principle are designed according to the regional realities. Funds should be provided by the three places according to a negotiated ratio with Beijing and Tianjin bearing the main portion. As for the use of funds, Hebei Province should be given the preferential support. In addition, the funding sources should be expanded by encouraging social investment and donations, and additional charges for ecological environmental protection introduced, such as additional charges on power and fuel.

(6) System for total quantity control of coal and oil reflecting atmospheric environmental quality objectives

Through the implementation of the Special Law, the social energy mix will be optimized in the region. The proportion of electric power in the end-use should be increased, making electric power the main final energy source in the future, with a view to foster an energy structure dominated by electric power and supplemented by gas. Coal use will be strictly restricted in social life and mainly seen in coal-fired power plants. The requirement for ultra-low emissions will be applied to ensure centralized and effective control of air pollutants and carbon emissions and facilitate emissions trading. The Special Law is expected to provide details on matters untouched or unspecified by the *Law on Air Pollution Prevention and Control*, set out targets and measures of total quantity control, and define the roadmap to a unified emissions trading scheme.

(7) Unified system for environmental monitoring, emergency response, and pollution prevention coordination

Early warning and emergency response are the major links of an integrated pollution prevention and control system. The regional mechanism for early warning consultation (based on monitoring data) and emergency response to severe pollution should be built to

facilitate unified warning, joint emergency response, and accountability while enhancing leadership and supporting facilities. Platforms should be put in place to share monitoring and warning information and (including the Internet) release forecasting and warning information. The relevant departments within the region should actively consult with each other and launch the unified emergency plan in a joint response to expected regional severe pollution.

(8) Unified measures for information disclosure, public participation and public interest litigation

It is recommended that the administrative areas above the county level in the region disseminate to the public, on a yearly basis, the work and cooperation on environmental protection. Enterprises shall disclose information as required on a voluntary and/or compulsory basis, and those that fail to do so shall be fined on a daily basis. A special issue to be considered is how to conduct environmental public interest litigation, especially initiated by social organizations on air pollution. It is necessary to guarantee the independence of these organizations that frees them from too much government interference. More funding support is expected by expanding funding channels. A regional environment public interest litigation system should be established, explaining how the litigation is handled in the three places. It is suggested to stipulate, in the Special Law, that the first instance shall be trialed in Tianjin Intermediate Court, and the second instance in Tianjin Supreme People's Court, and the judicial interpretation for civil public interest litigation by the Supreme People's Court and Supreme People's Procuratorate and for administrative public interest litigation by the Supreme People's Procuratorate.

Box 3-3 Clean Air Policy in Germany – Legislation, Instruments, Enforcement and Judicial Review

The Clean Air Policy in Germany rests on two foundations that are linked: National and the European Union's legislation (EU-legislation).

Initially, the national legislation, in particular the Federal Emission Control Act from 1974 (BImSchG), primarily aimed at reducing installation-related emissions by providing for source-based measures, such as introducing permits for installations.

In contrast, the European legislation is rather emissions-related[1], which means that it mainly focuses on the sensitivity of the pollutants' receptors, the legally protected goods like human, air, water, soil, animals, plants, ecosystems, etc. by introducing standard settings and planning instruments.

1 E.g.: Directive 2008/50/EC of the European Parliament and the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, Official Journal of the European Union L 152/1.

Clean Air Plans provide for measures that permanently reduce air pollution. National authorities in cities and municipalities enjoy discretion to decide which one of these measures they choose to avoid limit exceedances (e.g. environmental zones, city congestion charges). *Plans for short-term measures*, on the other hand, contain measures that instantly reduce air pollution, such as traffic restrictions or operational restrictions for industrial installations.

Clean air plans and *plans for short-term measures* can be effective instruments for national authorities to react instantly to changing conditions but also to influence the long-term development of urban fine-particle pollution.

In Germany, citizens are entitled to bring suits against public authorities' omissions regarding clean air plans. The ECJ has also ruled that NGOs must also have access to justice in any case in which European Environmental law is infringed (ECJ Case 240/09 - Slovak brown bear-Case, 8th of March 2011).

In one case brought by an NGO in Germany, the court ruled in January 2016 (Decision of the 11.01.2016 - 4 N 1727/15WI) that cities and municipalities that do not draw up clean air plans face penalty payments.

German clean air policy and the administrative law in general have been and will be shaped by the European's environmental legislation. In the future, the question of enforcing clean air policy and its legislation will be crucial. In particular, the standing to sue for NGOs will be one of the main procedural questions.

Citizens and NGOs can and must be entitled to supervise the state's and public authorities' activities and the court ruling is a step in the right direction. Enforcement of environmental law depends on a competent and independent administrative law system.

(9) Special liability systems and mechanisms

① Special civil liability system and implementation mechanism

Regional civil liability, such as regional ecological compensation and pollution damage liability, can be assumed through unified financial transfer by local governments. The specific implementation can be determined by the Ministry of Environmental Protection (MEP), with relevant budget transferred by the Ministry of Finance (MOF).The legislation should also regulate regional ecological compensation in the region, taking full account of differences among the three places, in order to achieve coordinated protection of the ecological environment.

② Special administrative liability system and implementation mechanism

The liability prescribed in the Special Law should focus on the regulatory responsibilities of government departments, and environmental protection and ecological progress should be incorporated into the tenure assessment and examination system for party and government bodies and leading cadres at all levels. The assessment of subordinate areas should consider environmental quality improvement, and that of major

departments should highlight the implementation of pollution prevention measures.

The accountability procedure should be unified for the whole region, and a regional environmental protection division can be set up which assesses the performance of leading cadres in fulfilling environmental responsibility and transfers cases to discipline inspection organs and organization (personnel) departments if necessary.

Unified accountability standards are established by referring the *Action Plan for Water Pollution Prevention and Control*. In case of failure in passing annual assessment, the leading agency for coordinated development of the Beijing-Tianjin-Hebei region would contact responsible persons of provincial governments and relevant departments, and propose, supervise and urge corresponding rectification. Where the local government has been contacted more than twice because of pollution, the responsible person shall be called to take the responsibility. EIA approval limits can be adopted for construction projects in relevant areas and enterprises. The unit or person that fails to make an effective response to pollution incident due to breach of duty, intervenes and fabricates data, or fails to complete annual target shall be investigated and held accountable according to law. The leading cadre whose blind decisions result in deterioration of environment quality and serious consequences shall be recorded, and punished, depending on the seriousness, in accordance with organizational regulations or party and government discipline. The life-long accountability system shall apply for cadres.

3.3 Reinforcing law-based administration and public compliance

3.3.1 Enhancing law-based administration

The following recommendations are put forward to ensure the true and effective implementation of *Environmental Protection Law*:

3.3.1.1 Improving China's environmental regulatory system towards a coordinated and efficient system

Efforts should be made to accelerate the legislation on improving the protection of the ecological environment and strengthening government development, with focus on the establishment of a full-fledged, scientific, standardized, and effective system of administration according to law. Administrative decisions should be made in a scientific, democratic, and legal manner, to ensure quality based on scientific system, procedural justice, open process, clear responsibility. The credibility and execution of administrative decisions needs enhancement while illegal, improper, and delayed decision-making

should be minimized and corrected promptly. At the same time, it is necessary to safeguard and protect the citizen's right to know. The system of government information disclosure should be improved to ensure the legal access of citizens, legal persons and other organizations, increase government work transparency and promote administration according to law.

(1) Optimize the environmental management system, combine centralized regulation and decentralized regulation, and integrate law enforcement and supervision

Firstly, establish a uniform Environmental Administrative Organization Law to create a clear division about the rights and liabilities of competent environmental administrative departments as well as other relevant departments.

Clarify the differences between unified monitoring and separate responsibility under the Environmental Protection Law.

Give comprehensive coordination and unified management authority to the environmental protection departments to avoid the occurrence of buck passing arising from unclear rights and liabilities.

If possible, follow the ideas of super-ministry system reform to establish a super-ministry of environmental protection responsible for unified guidance, coordination, and supervision of environmental protection activities.

Secondly, optimize the division of duty for environmental regulation between central and local governments. It is necessary to re-evaluate the effectiveness of the current system of simplifying administrative procedures and delegating powers to lower levels according to the principle of "combining central-level supervision and local-level regulation and integrating higher-level assessment and lower-level accountability".

Launch a new round of environmental governance reform, delegate administrative licensing and regulatory power to lower levels, and give intermediary organizations a role in providing technical services. Take back supervisory and assessment power from lower levels.

Apply the principle of "accountability of party committee and government", so as to ensure the local party committees and governments maintain a positive attitude to environmental regulation and fulfill their regulatory duties. This work could be started in the early stage of the 13th Five-Year Plan.

Thirdly, build a high-level environmental management coordinating body for the current problems, especially for watershed and cross-regional pollution problems.

For example, set up a national environmental protection committee, locating the general office in the Ministry of Environmental Protection, set up a watershed environmental protection coordination body within each watershed, and set up a

coordination body within each key area for atmospheric pollution prevention and control. This work may be started in the early stage of the 13th Five-Year Plan.

(2) Improve accountability and supervision of party committees and governments at all levels for environment protection

There are two reasons for making the party committee and the government accountable in the field of environmental protection. Firstly, the progress of environmental protection requires the joint efforts of local party committee and local government. Secondly, in environmental management activities the local government is often held accountable for environmental pollution or accidents while the local party committee keeps out of it.

Generally speaking, major local decisions are made at the standing committee meeting or government work meeting. This means that the local party committee takes part in local environmental decision-making and so should also be responsible for the consequence of the decision-making.

The concept of "two responsibilities for one post" should be applied in the field of environmental protection because the protection of the environment is not just the responsibility of environmental protection departments alone, but also requires the cooperation of other departments. If an investment promotion department only cares about the economic benefits of an enterprise to an area and ignores the possible environmental damage it may cause, there will never be an improvement in the environment no matter how strictly the local environmental protection department enforces the laws.

To implement the system of "accountability of party committee and government, two responsibilities for one post, and accountability of delinquent officials", the Ministry of Environmental Protection should work with the Organization Department of the CPC Central Committee and the Central Commission for Discipline Inspection (Ministry of Supervision) to formulate the procedural rules for questioning, accountability and rectification from September 2015 onwards, in accordance with the *Measures for the Accountability of Party and Government Leaders for Damages to Ecological Environment* (for Trial Implementation) issued by the General Office of the CPC Central Committee and the General Office of the State Council.

The procedural rules should provide for who will start the process of questioning a local party secretary, who shall cooperate, who shall investigate and collect evidence, and who shall impose punishment.

In addition, the National People's Congress and its standing committee should work for the relevant reforms, formulate the measures for the implementation of supervision

and accountability for the environmental protection activities by local People's Congress and its standing committee at all levels, and require local People's Congresses and their standing committees to supervise and call the parties concerned to account for environmental problems in accordance with such measures.

3.3.1.2 Independent administrative law enforcement in accordance with law, without improper interference of local governments

The independent exercise of powers by environmental protection departments according to the law is key to improving the environmental management system and strengthening environmental law enforcement. Much attention has been paid to the capture of these departments by local government interests.

For example, the *Water Pollution Prevention and Control Law* promulgated in 2008 gave the environmental protection department power to order violators to dismantle illegally built drain outlets. However, the environmental protection departments have seldom exercised this power and it exists in name only. How to solve this problem? In view of the issued *Guiding Opinions on the Pilot Reform of Vertical Management System for Environmental Monitoring, Supervision*, and *Law Enforcement by Environmental Protection Agencies Below the Provincial Level*, it is recommended to a) early put in place mechanism, equipment and personnel support and adapt the relevant laws to the vertical management system; b) establish a complete substantive law and procedural law to deepen the standardization of law enforcement; c) reinforce law enforcement foundation and capacity building, so that environmental legislation can be effectively implemented; d) set law enforcement access threshold and strengthen law enforcement personnel training; e) strengthen standardization of monitoring equipment and application of technical means including automatic monitoring, satellite remote sensing, and unmanned aerial vehicles; and f) improve the funding mechanism for environmental supervision and law enforcement by integrating the funds into the scope of full-range fiscal guarantee at the same level. The answer is to emphasize the independence of the environmental protection departments.

The first recommendation is to strengthen the leadership responsibility of governments, especially local governments. Require that "the local people's governments at or above the county level must assume the leadership responsibility for environmental law enforcement and regulation within their respective administrative areas" as specified in the Circular of the General Office of the State Council on Strengthening Environmental Regulation and Law Enforcement, letting the government be the backer of the environmental protection department, and thereby getting the environmental protection department out of its current

predicament.

The second recommendation is to establish and improve the mechanisms for specifying government authority and responsibilities. In accordance with the requirements of the Decision of the CPC Central Committee on Major Issues pertaining to Comprehensively Promoting the Rule of Law adopted at the Fourth Plenary Session of the 18th Central Committee of the Communist Party of China (CPC), clarify the responsibilities and authority of the environmental protection department and related departments to ensure that the government carries out all its statutory functions and duties in accordance with the law. This work may be started at the end of 2015.

3.3.1.3 Strengthen and promote environmental legal responsibility, enhance public participation and supervision

(1) Establish and improve the tenure accountability system

The recent Circular of the State Council General Office on Strengthening Environmental Regulation and Enforcement proposed a life-long investigation system for liabilities for eco-environmental damage. This system needs to be perfected.

The purpose of the system is to address the situation where directors and staff of environmental protection departments do not carry any responsibility for failures to enforce the law after transfer or retirement.

The new Environmental Protection Law gives environmental departments powerful teeth in the form of daily penalties and administrative detention. Up until now, the system has focused only on administrative punishments. It needs to be extended to examine the use of the powerful new tools provided by the new law.

(2) Improve civil public interest litigation, establish administrative public interest litigation, and give play to public supervision

China has launched various attempts at environmental public interest litigation. The following recommendations are based on experience gained from these attempts.

Firstly, improve the system of the procuratorate filing requests for public interest litigation. There is an irresistible trend for the procuratorate itself, as the organ of legal supervision, to file public interest litigation in place of the social organization. There are differences between the procedures of litigation filed by the procuratorate and social organizations.

To improve efficiency, set up two procedures for the procuratorial organs filing environmental administrative public interest litigation. One should be for suspected illegal acts involving administrative organs. Under this procedure, the procuratorate should be able to make recommendations asking the administrative organ for rectification within a

specified time. If the administrative organs think that they have done nothing wrong or refuse to rectify, then it will enter into the second procedure automatically.

According to the intra-Party regulations, before initiating environmental administrative public interest litigation, the procuratorial organs should submit the evidence for the case to the local Party committee at the same level for discussion. If the standing committee of the local Party committee coordinates successfully and the administrative organ corrects its mistakes in time, the procuratorate will not file the case. Otherwise it will. This method recognizes the organic connection and coordination between the intra-Party regulations of environmental protection and national legislation to reduce political risks.

Secondly, loosen the restrictions on social organizations filing public interest litigation. The social organizations willing and able to file environmental public interest litigation are really limited. This undermines the whole system. The qualifications allowing social organizations to take part in environmental civil public interest litigation needs to be broadened to make it easier for environmental protection organizations to file litigation. For example, reduce the time limits for specialized environmental protection public interest activities and reduce the requirements for registration. It is recommended that registration according to law anywhere in the country should be enough.

The third recommendation is to establish a system of environmental administrative public interest litigation allowing individuals and organizations to file these cases during 2025—2030 after the completion of economic and social transition. This is a medium-term goal.

3.3.1.4 Strengthen capacity for implementation and enforcement

Implementation and enforcement of environmental laws requires adequate staff with capacity to do the job, adequate financial resources and the support of the public. It is necessary to build talented teams, use special funds, conduct publicity and mass education, and to introduce and develop advanced technology to guarantee effective implementation and law enforcement.

(1) Set up the entry qualifications for law enforcement personnel, and strengthen training of law enforcement personnel

Implementation and enforcement is carried out by people, many of whom work at the grassroots level. If they are unqualified to do the work assigned to them, the goals of the legislation will not be achieved. The quality of environmental administrative enforcement officials directly determines the efficacy of environmental laws and regulations. Consistent with the provisions of the Circular of the State Council General Office on Strengthening Environmental Regulation and Enforcement, this report makes the following training recommendations.

Firstly, establish the entry threshold for environmental law enforcement and regulation personnel in terms of profession, education background, qualifications and record of service, laying a foundation for the building of a qualified environmental law enforcement and regulation team.

Secondly, there should be a strong emphasis on the training of enforcement officials at the grass roots level. They are the front line of environmental administrative enforcement. Only by improving the quality of grassroots enforcement officials can we make the fundamental improvement required for effective implementation and enforcement of China's environmental laws.

Thirdly, there should be training of all the current environmental enforcement officials. Only after being tested and meeting the standards for a position, should they be able to undertake the functions of that position.

(2) Reinforce public education

Publicity and mass education are important ways to lead the public to take part in environmental law enforcement. It will reinforce the authority of environmental laws, improve public awareness of the need for environmental protection, and gain public support for the work of environmental protection departments.

The decision of the Fourth Plenary Session of the 18th Central Committee of the Communist Party of China (CPC), clearly resolved to "perfect the publicity and mass education mechanism of law popularization" and to "bring law-related education into the contents of constructing spiritual civilization, launch mass law-related cultural activities, perfect the public interest law popularization system of media, and strengthen the utilization of new media and new technology in law popularization to improve its effectiveness."

Therefore, publicity and mass education about environment protection must continue to be reinforced, thereby promoting and increasing meaningful and orderly public participation.

(3) Standardize environmental law enforcement and monitoring equipment

The standardization of monitoring equipment would help the environmental protection departments to regulate a great number of enterprises with limited manpower.

The Circular of the General Office of the State Council on Strengthening Environmental Regulation and Law Enforcement recognizes, for example, for the need for equipment for investigation and evidence collection, and the need to ensure the availability of vehicles for grassroots regulation and enforcement. More than 80% of the environmental monitoring agencies are required to be equipped with and use portable handheld terminals for the

standardization of law enforcement activities by the end of 2017.

The Circular also requires technical monitoring to be strengthened, for example, automatic monitoring, satellite remote sensing, and unmanned aerial vehicles as well as improving the mechanism to ensure adequate funding by including the funds for regulation and enforcement into the financial budget. The Circular establishes a timetable for the popularization of advanced monitoring technologies among the environmental monitoring agencies, showing China's firm resolution of stepping up efforts to promote the application of advanced monitoring technologies.

As a practical example of what can be achieved, Shaoxing started the preparation and establishment of the automatic pollution source monitoring system in 2007, and it has invested 70 million Yuan for environmental monitoring capacity building as of 2011. The system has covered 80% of wastewater discharge enterprises in Shaoxing city. It monitors the waste water discharge situation of the city effectively, and masters the regular patterns of waste water discharge from pollution sources by comparing the enterprise waste water discharge data from different seasons and times, providing an important basis for the rational use of resources for law enforcement.

(4) Standardize the use of special funds for environmental protection

As environmental protection becomes more and more important and complex, the funds required also increases. Special funds are essential. The environmental protection special fund is a major initiative. This report makes the following recommendations for perfection of the environmental protection special funds.

Firstly, perfect supervision and accountability for the funds. Separate construction from management to avoid the situation where the one department is both the "chess player" and the "rule maker".

Secondly, introduce performance audits of the use of environmental funds, evaluating both the expenditure of the funds as well as the performance of environmental protection departments and their staff.

Thirdly, establish detailed procedures for the use of funds to ensure due process and supervision.

3.3.2 Promoting compliance

3.3.2.1 Promoting compliance of all the people and strengthening public participation

Improving the rule of law for sustainable development is a systematic project that requires the participation of all social forces. It is necessary to enhance legal awareness

in the whole of society. There should be a social atmosphere of consciously learning and abiding by the law. The broad masses of the people need to know how to express demands and resolve disputes according to legal procedures, and use the weapon of law to protect their legitimate rights and interests.

The members of Party and government organs at all levels, especially those closely related to sustainable economic and social development, should take the lead in abiding by the Constitution and laws, establish the idea of sustainable development and enhance the awareness of rule of law, and make good use of law to solve practical problems challenging sustainable economic and social development.

Sustainable development concerns the common interest of all the members of the whole society. The public is the most direct bearer, most widespread witness and most powerful judge of the actual effect of legislation, law enforcement and justice of sustainable development. It is therefore necessary to improve the supervisory capability of the public and the media, including social organizations of all kinds.

Favorable conditions should be created to constantly expand the scope of public participation and facilitate public access to information and public supervision. The people's right to know, to participate, to express and supervise can and is being achieved through the Internet. The Government's attention and support is of great significance for the Internet-based legal supervision over sustainable development.

It is suggested that China create a social atmosphere of consciously learning, obeying and using the law. It is recommended to make environmental courses widely available in universities.

3.3.2.2 Building the corporate environmental information disclosure system

For enterprises, the ultimate goal of production and operation is to maximize profits. When the price of environmental pollution affects profits, they will inevitably cover up environmental pollution information in pursuit of short-term interests at the expense of environment. Further, the disclosure of environmental information may lead to a decrease in the attractiveness of local investment or even bankruptcy of polluting enterprises, resulting in a reduction of government revenue.

Enterprises generally do not take the initiative to publish unfavorable environmental information unless forced by administrative power and public pressure. The current *Measures for Environmental Information Disclosure* provides voluntary disclosure of environmental information for general enterprises and mandatory disclosure for those included in the list of polluting enterprises. Citizens may only apply to the government for access to corporate environmental information. If it is classified as commercial in

confidence it will not be disclosed.

In view of this, the Task Force believes it necessary to strengthen the environmental information disclosure system for enterprises. The disclosure of corporate environmental information, by either environmental protection departments or enterprises, is of high significance for safeguarding citizens' environmental right and public rights, fulfilling corporate social responsibilities, and protecting the environment.

To protect against environmental emergencies, or when the country enters a state of emergency, enterprises must be required to disclose information.

The corporate environmental information disclosure list is favored, including classification of information and degree of openness, to standardize the way to disclose information. The relief, penalty and incentive mechanisms should be improved for parties involved in the disclosure of corporate environmental information.

3.4 Strengthening judicial safeguards

3.4.1 Reforming jurisdictions across administrative areas

Environmental problems in recent years cover large areas and are caused by a wide range of influences. For example, fog and haze is not unique to a city or a province and usually occurs in several provinces.

At present, courts are often not capable of hearing environmental cases that cross administrative areas. As a result, intermediate courts of many provinces and cities have set up environmental tribunals

Under the existing system, cross-jurisdictional trial is undoubtedly a very sensitive issue. According to the law, courts are established in line with administrative divisions and have jurisdiction of cases in certain administrative areas. In other words, courts do not have the jurisdiction of cross-administrative cases.

Environmental tribunals in Qingzhen, Guiyang are set up in accordance with watersheds. The jurisdiction of disputes across districts and counties within the city is designated by the Intermediate People's Court, and beyond the city, by the Provincial Supreme People's Court. To solve the problem of large geographical scope, Qingzhen City Court adopts a "Circuit Trial" approach to hear cases on site. The judicial practice ushers in the transition from designated jurisdiction to exclusive jurisdiction of cross-administrative environmental cases.

3.4.1.1 Problems facing the jurisdiction over cross-administrative environmental damage cases

(1) Administrative divisions in the jurisdiction

The principle of designated jurisdiction under Article 37 of the *Civil Procedure Law* seems to provide a basis for environmental tribunals to deal with environmental problems in trans-boundary watersheds. As a matter of practice, the Supreme Court of Guizhou has designated two environmental tribunals in Guiyang to administer environmental cases involving the "two lakes and one bank" beyond the administrative area of Guiyang.

However, the designated jurisdiction of watershed environmental cases will face difficulties. For example, the environmental problems in the Huaihe River Basin affect the interests of the four neighboring provinces, and the jurisdiction by environmental tribunals in any of the provinces, even if designated by the Supreme People's Court, is bound to face objection. Environmental tribunals, as an integral part of ordinary courts, cannot overcome the chronic obstacle caused by administrative divisions.

In practice, Wuxi Environmental Tribunal, established in strict accordance with the traditional administrative divisions more than a year ago, has trialed very few cases, leaving the impression of little function. The widespread environmental tribunals in Yunnan Province are also worrying. Is the environmental tribunal adaptable to the current needs of environmental justice? It may be more appropriate to set up "environmental circuit courts" in watersheds. The Environmental Tribunal of Guiyang City accepted two cases in August 2010, of which one concerns water pollution in Fuquan, Qiannan and the other concerns air pollution in Liupanshui City. The affected people turned to environmental tribunal heard from the media as the local environmental protection departments prevaricated and delayed the cases for all kinds of reasons. Nevertheless, the environmental tribunal cannot fully resolve the problems due to geographical constraints.

Drawing on the experience of other countries while considering the operation of environmental tribunals in China, we believe that China should separate jurisdiction and administration in the establishment of environmental tribunals. In other words, instead of administrative divisions, environmental tribunals are set up according to juridical divisions based on statistical population, number of disputes, traffic and communications. They form an environmental judiciary system across provinces and cities (counties). It effectively alleviates local protectionism while following the laws of nature and thus resolves the dilemma of jurisdiction in the specialization of environmental justice in China.

US federal courts offer experience that may be beneficial to Chinese reform. The US federal court system has district courts within states and circuit courts with jurisdiction

spanning several states. Matters concerning federal law or involving litigants from different jurisdictions can be tried in the federal courts. Federal courts and their judges are funded by the federal government and selected through a process involving Presidential appointment with Senate approval. One reason the federal courts were originally established involved concerns about potential local protectionism and bias in the state courts. This institutional set-up has proven effective and, in the area of environmental regulation, courts have been an essential backstop against local protectionism of polluting enterprises.

This basically avoids local protectionism caused by the same administration and jurisdiction. Once judicial districts are outlined, the work is to define the jurisdiction of environmental tribunals within the judicial districts in accordance with the principle of centralized jurisdiction and designated jurisdiction.

(2) Specialized technical problems in environmental cases

Environmental cases often span several administrative areas. In practice, pollutants discharged by two or more polluters flowing through the river often overlap and accumulate in the river basin, eventually leading to environmental problems. It is difficult to identify polluters responsible for such complex pollution or extent of responsibility of polluters.

The victims, compared to perpetrators, tend to be vulnerable groups, and as ordinary members of the community, know little about keeping and obtaining evidence. In accordance with Article 74 of the *Supreme People's Court's Opinion on Several Issues Concerning the Application of the Civil Procedure Law of the People's Republic of China*, it is the responsibility of the defendant to present evidence in environmental damage cases. Even so, the victim is required at least to prove the damage, which often depends on the support of scientific and technical evidence and is subject to a number of economic and technical conditions, making filing and winning a suit difficult. Judges generally encounter difficulties in the trial of environmental cases and make judgments based on environmental damage assessment and appraisal. However, in China, there are neither authoritative assessment agencies nor clear laws on assessment and appraisal procedures, standards and methods. As a result, chaos arise in reality that assessment agencies draw sharply different conclusions based on different standards, which often make the judge at a loss.

It should be made clear that the assessment opinions serve as only a kind of evidence and a tool for the judge, and by no means replace the court decision. To bridge the "knowledge gap" formed by scientific evidence and resolve the judicial risk brought by uncertainty in fact identification, it is necessary to improve the corresponding legal mechanisms that combine reviewing science-based evidence and meeting other value

requirements of legal procedures.

3.4.1.2 Recommendations on jurisdiction over cross-administrative environmental cases

The Outline of the 4th Five-Year Reform Plan of the People's Court (2014—2018) points out that it is necessary to "explore the establishment of judiciary system properly separated from administrative divisions", including the establishment of environmental tribunals. It is a move to overcome such drawbacks as localization of justice and inequality of litigation and judicial resources, while addressing the particularity of environmental cases.

(1) Extent of jurisdiction defined according to the environmental region and its characteristics

The newly amended *Environmental Protection Law* stipulates in Article 20 that "the state shall establish the coordination mechanism for joint prevention and control of environmental pollution and ecological destruction in key regions and river basins across administrative areas and implement unified planning, standards, monitoring, and measures."

The *Opinions of the Supreme People's Court on Strengthening the Trial over Environmental Resources in an All-round Way and Providing Strong Judicial Safeguard for the Construction of ecological civilization* (SPC [2014] No. 11) (hereinafter referred to as the Opinions) further called for "gradually change the model of jurisdiction that divides naturally formed watersheds and other ecological systems and exploring the establishment of special juridical agencies based on watersheds and ecological functional zones across administrative areas while considering the natural attributes of environmental factors such as water and air and the amount of environmental resources in each region."

Therefore, the jurisdiction of environmental resource cases particularly needs to break the traditional pattern of civil, administrative and criminal jurisdictions and follow the appropriate division of labor and power of courts at the first instance, to achieve systemic response and solution to disputes. The key premise is to straighten out the relationship between judicial divisions and administrative divisions and then to resolve the connection between the three traditional kinds of litigation.

(2) Fiscal guarantee policy

The power and expenditure responsibility of major livelihood cases including inter-provincial environmental pollution cases and judicial affairs including administrative litigation cases involving provincial governments should be centralized. As there are no corresponding local environmental resources courts and administrative courts, commissioned jurisdiction and designated jurisdiction can be applied. The cases shall be handled by a cross-administrative tribunal unrelated to interests and a superior court

unrelated to interests shall act as the Court of Appeal. The corresponding expenditure shall be centralized and all the involved properties turned over to the central treasury. The funds for handling cases shall be safeguarded by the central fiscal budget, or included as a special item (subsidies for environmental cases)in the project expenditure of the departmental budget of the Supreme People's Court.

Special funding channels should be safeguarded by the central fiscal budget for major political cases or criminal cases involving leaders at provincial and ministerial levels, as well as complex and difficult criminal cases with national influence, if handled off-site as designated by the Supreme People's Court. First, based on the existing resources, the grassroots courts are still basically set according to county divisions. The jurisdiction of cases subject to local influence needs adjustment through the improvement of upgraded jurisdiction and designated jurisdiction. Second, combining with provincial-county reform, appropriate adjustment should be made to the jurisdiction of intermediate courts by establishing, if necessary, cross-administrative tribunals, to achieve the appropriate separation from administrative divisions.

Reforms should be made to promote the unified management of courts below the provincial level. The system of "unified management, two-level guarantee" should be implemented. The properties of local courts should be brought under the unified management of courts at the provincial level and above, to strengthen the central and provincial management responsibilities, while the expenditure shall be shared, depending on the responsibility.

(3) Promoting specialized trial of environmental cases

The Opinions of the Supreme People's Court stipulate that specialized judicial bodies on environmental resources shall be set up. There are currently the four trial modes, namely environmental resource tribunal, environmental resource court, environmental resources circuit court and environmental resources dispatch court. In local judicial practice, the environmental resources tribunal is most common.

Environmental resources tribunals have been set up under the Intermediate People's Courts, Higher People's Courts and Supreme People's Courts. In view of the uneven distribution and specialization of environmental resource cases, environmental resources tribunals are not necessary for all grassroots people's courts.

The "three-in-one" integrated trial mode is favored in Opinions by the Supreme People's Court and should provide guidance on trial mode for environmental resources tribunals of local people's courts.

3.4.2 Promoting public interest litigation

3.4.2.1 Situation of environmental public interest litigation

(1) Limited cases and difficulties in filing cases, obtaining evidence and implementing the verdict

Environmental public interest litigation is more complex and faced with many problems, compared with environmental civil litigation.

First, the constraints on who can bring environmental public interest litigation leads to a small number of environmental resources cases or even no cases.

Figures show that there were less than 60 environmental public interest litigation cases nationwide during 2000—2013. The situation has improved since the implementation of the newly amended *Environmental Protection Law*, but some local courts insist environmental disputes be resolved by government departments, and are reluctant to accept cases that are difficult to hear. Even if accepted, a case may end up with nothing definite due to intervention from local governments. In 2015, a total of 62 cases of environmental public interest litigation were accepted at first instance (56civil cases and 6 administrative cases), but only 20 were concluded (17 civil cases and 3 administrative cases). In January 2016, there were 7 newly accepted first instance cases of environmental public interest litigation, including one administrative case. As of the end of January 2016, a total of 50 environmental public interest litigation cases came to the trial of first instance (46 civil cases and 4 administrative cases) At the end of February 2016, the national courts were hearing 49 cases, including 45 civil cases and 4 administrative cases. After the pilot was carried out, the national courts accepted 3 civil cases and 6 administrative cases of environmental public interest litigation and closed 3 cases.

The second problem is that it is an almost impossible task for victims of environmental pollution to collect the necessary evidence. If the local government supports the polluting enterprises, the local environmental protection bureau will not provide plaintiffs with pollution data for public interest litigation. In addition, the plaintiff is often rejected when requesting assessment of losses to seek compensation. The lack of the assessment of losses becomes an important reason for the loss of cases by plaintiffs.

Third, the verdict is rarely implemented. Implementing the verdict as required is even more difficult than filing a case and collecting evidence. In some cases, enterprises refuse to fulfill the obligation of environmental compensation on the grounds of loss. In some cases, environmental disputes go on for several years and a large number of environmental violations cannot be punished and corrected in a timely manner leading to continued overall deterioration of the ecological environment.

(2) Narrow scope of administrative public interest litigation

Many problems arise in environmental public interest litigation cases due to ambiguous scope of such litigation. For example, Article 58 of the newly amended *Environmental Protection Law* provides that: suits can be brought to the people's courts for acts involving environmental pollution, ecological damage, and damage to the public interest. This provision expands the scope of environmental public interest litigation defined by Article 55 "Litigation on Environmental Pollution that Harms Social Public Interests" of the *Civil Procedure Law*. It clarifies that public interest litigation can be instituted against the behavior of ecological destruction and also expands the scope of environmental civil liability. In addition, according to Article 64 of the *Environmental Protection Law*, there are two types of environmental damage cases: environmental pollution and ecological damage, which sharply differ in filing standards, jurisdiction levels and scope, and evidence rules and principles.

In practice, environmental pollution cases account for the majority, and there are mature trial rules, trial procedures and excellent trial examples. However, the situation for ecological damage cases is not so good: small numbers and no trial experience.

To maintain and enjoy a beautiful environment is the basic right of mankind, but also the ultimate goal of judicial trial on environmental resources. The principles of public participation and prevention first are not well implemented. More emphasis is required on cases to enforce the implementation of systems for risk prevention, environmental impact assessment, and planning and inspection. Where damage has occurred, efforts should be made to achieve maximum restoration of the original landscape of the ecological environment and even improvement and optimization.

Given the extent of environmental pollution and ecological destruction, the strength of the government alone is not enough to protect the environment. Public participation and supervision is required.

The principle of public participation is established by Paragraph 3, Article 2 of the *Constitution of the People's Republic of China* that stipulates that "the people shall manage state affairs, economic and cultural undertakings and social affairs in various ways and forms in accordance with the law."

Public participation in environmental protection includes participation in environmental legislation, administrative law enforcement and judicial practice. The public needs to be involved in environmental governance and the process of solving public nuisance. The public use of judicial means to solve the problems of environmental pollution and ecological destruction will enhance public awareness of environmental

protection and build public trust in the safeguarding their own environmental rights. This will create a good public foundation for environmental public interest litigation.

Environmental public interest litigation also serves as a safeguard for the "principle of prevention first" defined in the environmental law. Compared with private interest litigation, public interest litigation does not depend on damage having occurred. Cases can be brought to court based on the potential for environmental harm even if it has not yet occurred. This can protect the public interest by nailing violations in the bud. In environmental public interest litigation, this preventive function is particularly significant and important.

China is no exception in that environmental protection is mainly carried out by executive authorities. Environmental protection departments of governments at all levels, in the name of the state and legal form, fully exercise, supervise and manage environmental protection, as well as forecast and make decisions on environmental protection of the whole society. Practice has proved that the mechanism fails to provide practical and effective protection of the environment.

While citizens do not have environmental litigation rights, environmental violations are little constrained. Some local administrative organs connive and ignore, for economic reasons, a variety of behavior harmful to the environment. This can impact on the whole society without directly affecting the interests of any single citizen. However, in these cases, citizens cannot litigate according to the current *Civil Procedure Law* and *Administrative Procedure Law*, and hence there is simply no oversight even for the most dangerous government actions.

This single-track operation mechanism that excludes the participation of citizens has intensified the environmental problems in China. Sole reliance on law enforcement by the executive authorities is no longer sufficient.

(3) Inadequate legal provisions on plaintiff eligibility

The amended *Civil Procedure Law* of 2012 stipulates for the first time the environmental civil public interest litigation system. Article 55 provides that "legal authorities and relevant organizations can bring cases to the people's courts against acts damaging the public interest such as environmental pollution that infringes upon the legitimate rights and interests of many consumers." This still has not sufficiently expanded the traditional rules on plaintiff eligibility. Article 55 treats "environmental pollution" as a cause of prosecution and does not consider the act of ecological destruction or the prevention of potential harm. "Legal authorities and relevant organizations" have not been defined. This seriously hinders the application of the provision in practice.

Under the amendment to the *Environmental Protection Law* released on January 1, 2015. (Article 58), social organizations that "have been lawfully registered in the civil affairs departments of the people's governments at the city level or above" and "specialized in environmental protection public benefit activities for more than five consecutive years with no illegal records" can initiate environmental public interest litigation. Judicial practice shows that this strict and "high threshold" does not reduce the sole reliance on administrative law enforcement to protect the environment. The traditional rules of plaintiff eligibility are still impeding the promotion of public interest litigation in China.

The government policy authorizing procuratorial organs to bring public interest litigation and the implementation methods of the Supreme People's Court reflect the deficiencies of the new *Environmental Protection Law* and *Civil Procedure Law*. The actual effect of gradual "decentralization" remains in doubt.

The established environmental public interest litigation systems in the world allow citizens and organizations to initiate public interest litigation. The United States citizen suit is the product of public participation.[1] The current legal provisions on environmental public interest litigation plaintiff qualification lag behind the needs of judicial practice, hindering citizens from environmental public interest litigation and effective environmental protection.

3.4.2.2 Promotion of environmental public interest litigation

(1) Improving the environmental public interest litigation system and relaxing the plaintiff eligibility

The newly amended *Environmental Protection Law* provides for public interest litigation, but does not provide related procedures. Although courts have attached importance to the establishment of environmental public interest litigation procedures, the regulations vary on plaintiff qualifications, burden of proof, and adoption of evidence formed in law enforcement, including inquiry records, test reports, monitoring data, expert testimony and appraisal conclusions. This undermines judicial unification and hinders the promotion of environmental public interest litigation.

Efforts are needed to formulate detailed implementation rules and methods, establish fund system, and encourage active participation of environmental social organizations. This will facilitate the orderly development of environmental public interest litigation and increase public participation and judicial openness of trial over environmental resources. In the process of trial, courts should insist on fairness and put forward the correct advanced

1 Michael S. Greve, The Private Enforcement of Environmental Law, 65 Tulane Law Review 339 (1990); Neil A. F. Popovi, The Right to Participate in Decisions that Affect Environment, 10 Pace Environmental Law Review 683 (1993).

viewpoints with the law as the basis and the facts as the yardstick. Meanwhile, media is favored to spread the spirit of environmental law and guide public participation.

Plaintiff eligibility is a core issue in environmental public interest litigation. The regulations on the qualification of plaintiffs differ in countries, but the general trend is to widen the scope. Plaintiff qualification is also the most controversial issue in China's theoretical and practical circles. The severe restrictions on the social organizations that can bring environmental public interest litigation imposed by the *Environmental Protection Law* impacts on the healthy development of environmental public interest litigation.

(2) Supporting public participation in environmental protection through convergence of environmental judicial litigation and non-litigation procedures

For a long time, China has mainly relied on administrative supervision to protect the environment. The idea has not fundamentally changed in the newly revised *Environmental Protection Law*.

Foreign judicial practice shows that environmental justice plays a decisive role in the protection of ecological security and prevention of environmental pollution. The combination of environmental law enforcement and environmental justice is more effective than environmental law enforcement solely. Public participation is an important component and measure to facilitate the healthy development of environmental governance.

Alternative dispute resolution mechanisms are often used in foreign environmental judicial practice, in order to speed up the trial of cases and reduce the cost of litigation. Mediation has been widely applied. For example, the Vermont Court of the United States has been using these mechanisms since the late 1990s. The New South Wales Land and Environment Court in Australia has been developing alternate dispute mechanisms since it was established in 1980. The practice enhances the efficiency of the justice system.

Box 3-4 The NSW Land and Environment Court

The NSW Land and Environment Court has comprehensive jurisdiction in environmental matters. For example, it can issue orders against private and public enterprises to prevent ecological damage and to restore the ecological system. It can require government institutions to implement environmental laws in accordance with the requirements of those laws. The Court also has jurisdiction to review the quality and legality of government decisions to approve or refuse projects by the private sector. This is by far its largest volume of work. Government institutions, citizens and NGOs have the right to bring cases to the court and to participate in court processes.

The Court also has a criminal jurisdiction and can make a wide range of orders for the punishment of offenders. In addition to fines and imprisonment, it can order the offender to make good any environmental damage and to pay costs to anyone who has suffered loss. It can also

order the offender to publicise the offence and to carry out a specified environmental project in a public place or for the public benefit.

The Court operates as a multi-door courthouse. This means it can deal with the multiple facets of an environmental dispute between parties without the problem of jurisdictional limitations. Specialization and in-house experts give the Court a better appreciation of the nature and characteristics of a dispute and help it to screen, diagnose and refer cases to the most appropriate dispute resolution mechanism. This has the advantage of avoiding full –blown litigation that is costly and slower.

Alternate dispute mechanisms available to the Court include mediation, conciliation and neutral evaluation. Essentially, these are processes in which the parties, with the assistance of an impartial expert develop options, consider alternatives and try to reach agreement. The difference between the mechanisms is the role of the impartial expert and the extent to which that expert can influence the outcome. Court technical experts generally perform the role of the impartial expert to ensure quality, effectiveness and efficiency, however, accredited external experts may also be appointed by the Court in certain circumstances.

Seventy-one percent of cases that come to the Court are resolved without the need for a court hearing. Court hearings are required for criminal cases.

The Supreme People's Court issued the *Opinions on Establishing a Perfect Litigation and Non-litigation Dispute Resolution Mechanism* on July 14, 2009. Great importance should be attached to incorporating the people's mediation, referred to as the "Oriental experience" by the Western society, into the practice of environmental tribunals.

(3) Supporting the people's procuratorates to file environmental public interest litigations, in an effort to promote environmental governance and social justice

The *Decision of the CPC Central Committee on Major Issues Concerning Promoting the Rule of Law in an All-Round Way*, adopted at the 4th Plenary Session of the CPC Central Committee, put forward "exploring the establishment of prosecution instituted public interest litigation system", providing guidelines for the procuratorial organs to use the right to prosecute to safeguard public welfare. In order to strengthen the protection of the public interests of the state and community and urge law-based administration and strict law enforcement, China has introduced the *Decision of the National People's Congress Standing Committee to Empower the Supreme People's Procuratorate to Carry Out Public Welfare Litigation Pilot in Some Areas, Pilot Program for Public Welfare Litigation Filed by Procuratorial Organs*, and *Implementation Plan for the Pilot Program for Public Welfare Litigation Filed by the People's Procuratorates*.

3.4.3 Establishing an environmental damage assessment and appraisal System

A growing number of environmental damage disputes arising in recent years involve special problems such as pollutant identification, damage assessment and causality that need to be judged from the professional and technical point of view. As a result, assessment and appraisal becomes an important means of support for the trial in the people's courts.

Scientific, authoritative, objective and impartial appraisal results lay a sound foundation for fair adjudication, and further the protection of legitimate rights and interests of victims and resolution of disputes according to the law.

3.4.3.1 Main problems facing environmental damage assessment and appraisal

(1) Diversified kinds of assessment and non-unified technical and qualification standards

It is difficult for experts to carry out forensic appraisal across fields as the applicable technical standards vary.

The technical specifications for assessment and appraisal are also deficient and contradictory. The assessment and appraisal of environmental damage involves many administrative departments covering environmental protection, agriculture, land, forestry, and ocean. The technical specifications differ from department to department or even fail to include technical standards in some aspects.

Qualification standards are not unified. There are currently no unified qualification standards and evaluation criteria for environmental damage assessment institutions. In practice, many institutions engaged in environmental damage assessment and appraisal do not have the appropriate capability and experience to provide authoritative and impartial technical support on all aspects of the case.

(2) Low access threshold and decentralized management

At present, the management of environmental damage assessment and appraisal falls into the responsibility of administrative departments including environmental protection, agriculture, land, forestry, ocean, and fishery. As a result of decentralized management, there are no unified qualification standards and low threshold of access. Good and bad assessment institutions spring up, giving rise to disorderly competition.

In practice, some institutions do not comply with the laws, regulations and standards or lack integrity, and as a result, the appraisal opinions produced fail to meet procedure and quality standards, causing complaints. There is no standardized national environmental damage assessment and appraisal system.

3.4.3.2 Establishment of a sound environmental damage assessment and appraisal system

A reasonable and scientific assessment and appraisal system for environmental damage will directly influence the specialization, fairness, authority and credibility of forensic identification and promote effective environmental law enforcement. It is key to the healthy development of a environmental damage assessment and appraisal industry.

(1) Improving the assessment and appraisal system by standardizing the establishment, qualifications and standards of assessment institutions

It is recommended that the State Council develop unified regulations on the establishment and qualification of assessment institutions, encompassing technical specifications, technical methods and working procedures. The regulations will ensure scientific, reliable and credible assessment, increase the access threshold, and define a unified management mechanism, thus improving the environmental damage assessment and appraisal system.

It is also suggested that environmental damage assessment institutions should be established on a neutral and professional basis to eliminate the nature of administrative power and level existing in the appraisal system.

(2) Perfecting the work mechanism to reduce costs and enhance credibility

There should be an expert pool that provides advice on the trial of major difficult cases, difficult technical issues, and development of regulatory documents. The involved parties should have the right to require experts to appear in court and express their views, and applicants that meet the requirements should be notified in a timely manner so that experts can provide in court opinions that help the judge with the technical issues.

Second, if possible, the judge should be able to make decisions or preside over the mediation in resolving difficulties in environment damage assessment. Drawing on the practice in intellectual property trials, technical experts should be hired as judge assistants or technical ombudsmen, and together with the judges, form the trial team, to provide the necessary technical capability.

(3) Review of appraisal opinions

Appraisal opinions should not be used as a basis for determining the facts and giving the verdict unless legitimized by courts. Assessors are only responsible for making judgments on factual matters. The format and content of forensic instruments must meet the standards of the Forensic Appraisal Procedure and Specifications for Forensic Appraisal Instruments.

Chapter 4
South-South Cooperation for Ecological Civilization Task Force

4.1 Domestic and international status of South-South cooperation for ecological civilization

Based on the traditional philosophy of the unity of man and nature, China reflects deeply upon ecological problems brought about by industrialization and advances the ideas that underpin ecological civilization, including respecting nature, adapting to nature, protecting nature, and promoting harmony between man and nature. The goals are to redefine the relationship between humanity and the environment, and establish long-term mechanisms that promote the rational development of state land, the efficient and low-carbon use of resources, and the safety and health of the natural environment. China's notion of ecological civilization is largely consistent with the global Sustainable Development Goals.

As economic globalization continues, China's economic influence and impact continue to expand and increase. At the same time, China has become more closely connected and integrated with other developing countries. As a result, implementing South-South cooperation for ecological civilization is an important and logical way to identify innovative development pathways for the developing world. China has made a proactive choice to accept the responsibility of helping to realize human prosperity and sustainable development in the developing world.

4.1.1 The international situation

Global sustainable development faces multiple challenges. Society should not only address the environmental challenges posed by the overuse of resources, but it should also take poverty and social issues into account. In this industrial era, a series of environmental problems have been caused by the excessive consumption of natural resources, including air pollution, a worsening of water quality, excessive heavy metals in the soil, species

extinction, deforestation, energy shortages, desertification, and climate change. These impacts have not only led to environmental crises, they have changed the quality of human life. At the same time, there are still 836 million people living in extreme poverty in the world,[1] and 1.2 billion people (17% of the global population) do not have access to electricity.[2] Extreme weather events resulting from global climate change not only cause the loss of property and lives,[3]they exacerbate the poverty of people who are facing a shortage of clean drinking water, sanitation services, and educational opportunities. To achieve ecological civilization, humanity must take action towards greening the economy.

Green transformation has become an important goal for global development and international cooperation. Since the World Commission on Environment and Development put forward the concept of "sustainable development" for the first time in the report "Our Common Future" in 1987, the international community has responded with a series of institutional mechanisms and bilateral agreements. The Rio Conference, held in 1992, successfully adopted the "Earth Charter", signed the "Convention on Biological Diversity", the "Framework Convention on Climate Change", and the "Convention on Combating Desertification". These agreements brought great credibility to the idea of connecting environmental protection with social well-being and economic development, and promoted cooperation and dialogue between developed and developing countries to address the challenges. The "2030 Agenda for Sustainable Development", adopted in September 2015, put forward 17 sustainable development goals (SDGs) and set the direction of social and economic development and environmental protection for the 15-year period, 2015—2030. The "Paris Agreement", adopted in December 2015 under the UNFCCC, established clear targets for mitigating climate change and adapting to its impacts. The Agreement created the post-2020 global climate governance system, incorporating all countries in the pursuit of a positive destiny for all humanity.

Innovation in development and the pursuit of ecological civilization are required to achieve green transformation. The existing development model needs to be fundamentally changed. Development needs to be less resource-intensive, more energy-efficient, and production and consumption patterns need to change. Innovation in these areas will ultimately lead to achieving ecological civilization.

1 UN SDG web page, October 27, 2016. www.un.org/sustainabledevelopment/poverty

2 IEA Energy Access database, October 27, 2016.http://www.worldenergyoutlook.org/resources/energydevelopment/energyaccessdatabase/.

3 A. Shepherd, T. Mitchell,K. Lewis, et al. "The geography of poverty, disaster and climate extremes in 2030", 2013. http://www.droughtmanagement.info/literature/ODI_the_geography_of_poverty_disasters_climate_extremes_2013.pdf

According to Kuznets' theory, along with the increase of GDP per capita, the degree of environmental pollution will form an inverted "U" curve – first rising then falling. An innovative development pathway would abandon the idea of the environmental Kuznets' curve and try to achieve the same level of economic development at a lower environmental cost. This would happen by paying more attention to the quality and efficiency of economic growth, restricting the development of industries with a high degree of negative environmental impact, and constantly stimulating sustainable economic growth. Among all factors, technological innovation is the most important driver in achieving an appropriate development path. Through the use of renewable energy, human beings can gradually reduce their dependence on fossil fuels. An effective transition to renewable energy would protect the environment without compromising social well-being and economic development. An effective transition would also create more jobs by creating new opportunities for economic growth that do not damage the environment.

Cooperation among developing countries is beneficial to a global green transformation. In recent years, the total economic output of developing countries has increased rapidly. In 2013, the collective GDP of developing countries accounted for 50.4% of the world's total GDP,[1] exceeding the collective GDP of developed countries for the first time in history. By 2018, the estimated collective GDP of developing countries will be 53.9% of the world's total. With rapid economic growth and improvements in quality of life, developing countries need to pay more attention to environmental protection. Southern countries, as a whole, are still in the early stages of rapid economic development. The development choices they make will, to a large extent, determine the out come of global transformation. In this context, the advantage of South-South cooperation compared with North-South cooperation is that southern developing countries are more likely to share similar circumstances, and are therefore better positioned to work together to increase global market shares, innovate together to design green and inclusive development pathways, and thus achieve sustainable development together with the least environmental impact.

4.1.2 The domestic situation

The vision of China's economic transformation and restructuring is consistent with the achievement of ecological civilization. Even as the country has experienced remarkable growth and social achievement, it has also experienced several challenges caused by environmental issues. Having reached the status of a middle-income country, China needs

1 National Bureau of Statistics, People's Republic of China, October 27, 2016. http://www.stats.gov.cn/tjsj/zxfb/201402/t20140227_516899.html

to focus on the quality of future development so that it moves the country to a state of ecological civilization. The pursuit of ecological civilization should underpin the country's economic transformation.

Implementation of the sustainable development agenda and the process of achieving ecological civilization are interrelated and complementary. Firstly, the path to ecological civilization and the implementation of sustainable development overlap significantly. The two processes aim to promote the harmonious development of society, the economy, and the environment. Accelerating the pursuit of ecological civilization is the main means for China to implement the 2030 Agenda for Sustainable Development and to achieve the targets of the Paris Agreement. Secondly, the shared foundation of ecological civilization and sustainable development is the promotion of innovative development pathways to reduce reliance on natural resources, and minimize negative impacts on the environment. Both approaches also promote human progress within the carrying capacity of ecosystems and with the sustainable use of natural resources. Thirdly, China's practical experience in ecological civilization will play an important role in its South-South cooperation. Over the past decades, China has made remarkable progress in reducing poverty and hunger, improving education and health care, accelerating economic growth, increasing employment opportunities, strengthening in frastructure, and accelerating urban construction. The country has accumulated rich experience and has learned many lessons about environmental protection and the sustainable use of natural resources. China's pursuit of ecological civilization is a model for many developing countries as they undergo industrialization (Table 4-1).

Table 4-1 Comparison between China's ecological civilization construction process and the Sustainable Development Goals

		SDGs	Ecological Civilization
Similarities	Motivation	Recognition of and reflection on the relationship between the environment and development	
	Goal	Lasting development in harmony with natural resources and the environment	
	Dimensions	Economic growth, social progress, and environmental protection	
	Tool	Green economy and "greenization" (lowering resource consumption, boosting green industries, and promoting a low-carbon, thrifty lifestyle)[1]	

1 "Chinese leaders push for 'greenization'." XinhuaNet, March 24, 2016. http://news.xinhuanet.com/english/2015-03/24/c_134094125.htm.

		SDGs	Ecological Civilization
Similarities	Pathway	"Integration" and "inclusion"	
	Process	Consistent and adequate	
	Relationship with environmental policy	Derived from, but not limited to, environmental protection	
	Opportunities and risks	Key opportunities coupled with implementation, financing, and capacity challenges	
Differences	Theoretical basis	Theories of environmental carrying capacity, environmental value, social inclusion and equity, human agency and accountability, and integrated development	Ecology, economics, sociology, ethics, and Chinese traditional philosophy
	Philosophical status	Concept of human development	Governing philosophy
	Scope of application	Applicable across the globe and accepted worldwide	National identity and specificity and not applicable worldwide
	Enforcement	Mainly expected targets and measures of no binding force, neither legislatively nor administratively	Plans and programs integrated with binding targets

(Source: based on Yu Hai, Zhang Yongliang, CCICED Background Report, Overview and Implications of the Sustainable Development Process: the World and China, October 2015, p47)

China and other developing countries have a good foundation of cooperation, and have advocated for global and regional green development. China has been an advocate for and practitioner of South-South cooperation. It started its cooperation with and provided assistance for many developing countries in Asia, Africa, and Latin America with the founding of New China. The country consolidated mutual trust and gained mutual benefits while cooperating with these countries and established a network of cooperation. In recent years, China has participated in international cooperation efforts with an increasingly positive attitude, as demonstrated by its participation at the United Nations, its constant expansion and deepening of bilateral and regional cooperation, and the launch of a number of cooperation initiatives including the Belt and Road Initiative, the New Development Bank and the Asian Infrastructure Investment Bank, there by providing even more opportunities for international cooperation, especially for South-South cooperation. At the same time, in order to promote green transformation in developing countries, China has paid attention to the implementation of the concept of green development in South-South cooperation, and will continue to promote ecological civilization and the technological improvement of relevant industries to better serve such cooperation.

Box 4-1 South-South cooperation for ecological civilization and the Belt and Road Initiative

In 2013, China launched an ambitious and unprecedented multi-billion dollar economic and foreign policy initiative called the Belt and Road Initiative (BRI),[1] also referred to as the One Belt, One Road (OBOR), to revive and strengthen connectivity between China and the rest of the world for a rebalanced global economy. Corridors cutting across Central Asia, Russia, India, Pakistan, and Europe (the terrestrial route) and also running along the coasts of Asia and East Africa (the maritime route) are being developed. Taken together, the BRI is envisioned to span more than 60 countries accounting for 70% of the world's population, 55% of global gross national product (GNP), and 75% of the world's known energy reserves.[2] In monetary terms, in 2015, participating financial institutions and companies may have raised funds well over USD 800 billion to support the BRI,[3] double the total GDP of 30 low-income countries in 2015.

The BRI undoubtedly provides economic opportunities. That said, if implemented without taking into account the environmental needs and ecosystem services to local communities, it can cause environmental degradation on an unprecedented scale to many Protected Areas (PAs), key landscapes, ecoregions, and key (flagship) species with outstanding biodiversity features and representative value. Meanwhile, the long-term economic return of Chinese investment cannot be guaranteed without an appropriate assessment of potential environmental risks especially in the context of global goals for sustainable development and climate change.

In 2016, President Xi Jinping called for a "green, healthy, intelligent, and peaceful" Silk Road and suggested that the participating countries "deepen cooperation in environmental protection, intensify ecological preservation, and build a green Silk Road".[4] This provides an encouraging sign that China is receptive to integrating environmental sustainability and the ecological civilization into the BRI. Immediate and concrete actions at the implementation level are needed to keep pace with private investment.

China has the responsibility and capacity to provide the world with more environmental public goods and to promote innovative development pathways. After decades of rapid development, China's economy ranks second in the world, and its national strength has been significantly enhanced. China has become the world's largest trading nation

1 This initiative goes by several different names, all reflecting slightly different interpretations: e.g., "One Belt, One Road (OBOR)", which is the short version of the "Silk Road Economic Belt and the 21st-Century Maritime Silk Road", used in the original Chinese proposal, the "New Silk Road (NSR)" and the "Maritime Belt and the New Silk Road." "The Belt and Road Initiative (BRI, or the B&R Initiative)" is the official name used by the Chinese government for OBOR. Herein, the terms "BRI" and "New Silk Road"are used interchangeably.

2 N. Casarini, "China's inroads into the West", Chatham House, 2015. https://www.chathamhouse.org/publication/twt/chinas-inroads-west.

3 M. Grimsditch, "Financial platforms that may support projects in the 'One Belt One Road' route", Inclusive Development International (IDI), 20 October 2015.

4 State Council Information Office of the People's Republic of China, 2016. See References.

and second largest investor overseas, and the operating scale of its foreign projects has ranked first in the world for several consecutive years. The internationalization of Chinese enterprises has become an increasingly important factor in green transformation and sustainable development around the world, especially indeveloping countries. In the development process over the years, China has made the transition from extensive growth without any regard for the environment, to a style of development characterized by the pursuit of balance between growth and environmental conservation. China has accumulated a wealth of valuable experience in understanding this balance. As Chinese enterprises continue to accelerate their internationalization, China has the ability to provide environmental goods, services, and appropriate technologies and solutions through South-South cooperation to help other developing countries innovate as they shape their development pathways.

4.2 China's South-South cooperation for ecological civilization: Activities and challenges

In the early 1950s, the Chinese government began to provide assistance to other developing countries, focusing on infrastructure construction, and industrial and agricultural development. Environment-related projects mainly consisted of water conservation and irrigation projects, river management and drinking water projects, hydrological and geological survey projects, and other such initiatives. In the 1980s and 1990s, China's foreign aid initiatives were mainly clean energy projects based on the utilization of biogas.

When China entered a stage of rapid economic growth in the initial period of industrialization, it did not have a profound understanding of the balance between economic development and environmental protection, and thus did not promote South-South cooperation from the perspective of ecological civilization. Instead, its foreign aid activities only responded to developing countries' urgent needs. In the 21st century, China has been deeply integrated into economic globalization and its domestic enterprises have accelerated the pace of "going global". The concept of ecological civilization is also going global as China has an increasingly strong sense of the importance of environmental protection. The Chinese government has responded to the UN Millennium Development Goals and Sustainable Development Goals, and has designed and implemented aid measures for environmental protection and has also paid more attention to the impact of enterprises' overseas economic activities on the environment. It encourages and guides

enterprises to fulfill their social responsibilities at home and abroad. In pursuing South-South cooperation on ecological civilization, China has made important progress but also faces challenges that require attention.

4.2.1 Activities of China's South-South cooperation for ecological civilization

4.2.1.1 The central government sets South-South cooperation policies and is responsible for most funds and resources

China's South-South cooperation in the form of foreign aid is administered by the central government. Ministries and commissions are responsible for policy-making and finance allocation within their fields, and they coordinate and cooperate with each other to some extent. First, the Ministry of Commerce (MOFCOM) is China's leading foreign aid department and its main functions include formulating and organizing the implementation of foreign aid policies and plans. It is in charge of around 70% of China's bilateral aid funds, part of which is used for South-South cooperation in the area of environment. Second, the National Development and Reform Commission (NDRC) is the authority responsible for climate change issues, and its main functions include taking the lead to undertake the country's relevant work to implement the UNFCCC, taking the lead to participate in international negotiations on climate change jointly with other departments; coordinating international cooperation and capacity building to cope with climate change; and managing the newly established China South-South Climate Cooperation Fund. Third, the Ministry of Foreign Affairs, the Ministry of Environmental Protection, the Ministry of Science and Technology, the Ministry of Water Resources, and the State Forestry Administration are also carrying out international exchanges and cooperation with developing countries on environmental protection within their areas of responsibility; some of them also participate in implementing cooperation projects managed by MOFCOM or NDRC. That said, compared with MOFCOM and NDRC, they can only mobilize very limited financial resources for their work in this area.

4.2.1.2 Provinces in border regions participate in South-South cooperation for ecological civilization with neighbouring countries

China has a long border and it neighbours a number of developing countries with which their ecological system is closely linked. Provinces and Autonomous Region such as Yunnan, Guangxi, Tibet, Inner Mongolia, and Xinjiang have conducted many cooperation programs. Yunnan Province launched an initiative to promote the cross-border protection of wild elephants with the support of the World Wildlife Fund (WWF). Funded

by the Asian Development Bank, with the support of Yunnan Provincial Department of Environmental Protection, the Biodiversity Corridor Demonstration Village of Yunnan Province becomes a demonstration project for the countries in Southeast Asia. Tibet and Xinjiang have projects with Nepal and central Asian countries focusing on biodiversity and water resource management. And the Inner Mongolia Autonomous Region will cooperate more closely with Mongolia in the prevention of desertification. Generally speaking, bordering provinces have the geographic and cultural conditions to conduct cross-border ecological protection programs with neighbouring countries. While some important initiatives are underway, there is still great opportunity for improvement.

4.2.1.3 The diversification of South-South cooperation for ecological civilization

China's environmental South-South cooperation used to be limited to certain construction projects like irrigation, wells, methane tanks, and small-scale hydropower facilities. Since 2000, China has become more and more active in developing initiatives for South-South cooperation for ecological civilization as a positive response to the Millennium Development Goals. Areas of cooperation gradually expanded over time and now cover the following fields: water resources, protection of the environment and nature, clean energy, coping with climate change, and urbanization. Cooperation in the field of water resources mainly involves technology for water resource exploration, consulting, and planning, supporting construction of hydropower stations, and the provision of water-saving irrigation equipment and hydrologic measurement equipment. Cooperation in the field of protection of the environment and nature mainly involves wildlife conservation, desertification control, forest protection and management, and bamboo and rattan resource protection. In addition, China is working with other developing countries in the areas of clean energy, climate change response, urban waste disposal, and soil protection.

Box4-2 China's commitments to South-South cooperation for Ecological Civilization in recent years

1. Commitments that have been converted into actions

(1) Among six measures for foreign aid pledged by the Chinese government at the 2008 UN High-Level Meeting on the MDGs: …6)by 2013, China will develop 100 small-scale clean energy projects for other developing countries, including small hydropower, solar power, and biogas projects.

(2) Within the New Eight-Point Plan China pledged at the Fourth FOCAC Ministerial Conference in 2008, China proposed the establishment of a China-Africa partnership to address climate change, senior official consultations on a non-regular basis, and the strengthening of

cooperation in satellite weather monitoring, the development and use of new energy, prevention and control of desertification, and urban environmental protection. The Chinese government decided to assist African countries with 100 clean energy projects focusing on solar energy, biogas, and small hydropower stations.

(3) Among six measures for foreign aid pledged by the Chinese government at the 2010 UN High-Level Meeting on the MDGs,by 2015 China will help build 200 clean energy and environmental protection projects, and will increase assistance to small-island developing states in the fields of disaster prevention and mitigation to help build their capacity for countering climate change.

2. Pledged commitments

(1) In 2012, the Chinese government announced at the UN Conference on Sustainable Development that China would carry out South-South cooperation to respond to climate change and promised that it would arrange about USD 10 million annually to support African countries, the least-developed countries, and small island countries to actively respond to climate change.

(2) In January 2015, the China-Community of Latin American and Caribbean States Forum Cooperation Plan 2015—2019 was passed at the first Ministerial-level Conference. The Plan includes provisions on jointly advancing intergovernmental climate change negotiations; promoting "low-carbon, high-quality at reasonable prices, energy-saving, and renewable technologies to relevant countries"; and enhancing collaboration in the protection of biodiversity, coastal ecological systems and reserves management, environmentally sound technologies, water conservation, desertification control, and pollution control and treatment.

(3) In March and June 2013, during his visit to Africa, Latin America, and the Caribbean, Chinese President Xi Jinping once again said that China would continue to provide support within its capacity for small island countries and African countries under the framework of South-South cooperation.

(4) At the Johannesburg Summit of the Forum on China-Africa Cooperation, Chinese President Xi Jinping promised that "China-Africa cooperation will never be pursued at the expense of local ecosystems and long-term interests" and announced that China will support the implementation of 100 clean energy and wildlife conservation projects, environmentally friendly agriculture projects, and smart city construction projects in Africa.

(5) In December 2015, at the opening ceremony of the climate change conference in Paris, Chinese President Xi Jinping announced the establishment of the China South-South Climate Cooperation Fund (20 billion Yuan) and said China would launch 10 low-carbon demonstration zones, 100 climate change mitigation and adaptation projects, and 1,000 training projects for responding to climate change in developing countries in 2016.It would also continue to promote international cooperation in clean energy, disaster prevention and mitigation, nature protection, climate adaptation-based agriculture, and low-carbon smart city construction, and help improve financing ability for this work.

(6) China's foreign aid planning was incorporated into its 13th Five-Year Plan and points out that China will "expand international cooperation and assistance in the areas of disaster prevention and mitigation, environmental improvement, wildlife conservation, and poverty reduction..."

Sources: White paper of China's Foreign Aid (2011), and Press Release from the State Council Information Office, and related ministries

4.2.1.4 China advances many forms of South-South cooperation

The main forms of South-South cooperation for ecological civilization are: technical cooperation, training and capacity building, material assistance, and substantive projects. In terms of technical cooperation, from 2010 to 2012 China cooperated with Ethiopia, Burundi, and Sudan, promoting the usage of solar, hydro, and other sources of clean energy[1]. In terms of capacity building, China held 150 trainings on environmental protection and climate change responses for over 4,000 officials and technicians from more than 120 developing countries. Topics included the development of low-carbon industries, energy policy, ecological protection, water resources management, water and soil conservation, the development and utilization of renewable energy, forest management, desertification control, early warning of meteorological disasters, and others.[2] In terms of material assistance, from 2010 to 2012 China provided 16 batches of environmental protection equipment and materials for 13 developing countries including Cambodia, Myanmar, Ethiopia, South Sudan, and Micronesia. China also actively promoted South-South cooperation on climate change, signed the "Memorandum of Understanding on Materials Donation to Cope with Climate Change" with nine countries, and donated more than 500,000 energy-saving lamps and over 10,000 energy-saving air-conditioners to nine countries including Grenada, Ethiopia, Maldives, and Samoa.[3]

4.2.1.5 China actively participates in multilateral exchanges and cooperation

The Chinese government attaches great importance to the implementation of international environmental conventions. China has joined more than 50 international environmental conventions and has established an internal management mechanism for international conventions. China has cooperated with Asian and African countries in capacity building for the implementation of international environmental conventions on biodiversity, chemicals, and others. An example of such cooperation is an environmental compliance project launched in Ethiopia. The Chinese government actively supports the multilateral and regional organizations' environmental activities. In June 2012, at the Rio + 20 Summit, China announced the donation of USD 6 million to the Trust Fund of the United

1 "White Paper:China's Foreign Aid 2014",The State Council Information Office of the People's Republic of China, p. 23.

2 "White Paper:China's Foreign Aid 2014",The State Council Information Office of the People's Republic of China, p. 24.

3 "White Paper:China's Foreign Aid 2014",The State Council Information Office of the People's Republic of China, p. 23.

Nations Environment Programme in order to help developing countries launch projects and activities to enhance their capacity for environmental protection. In 2008 and 2014, China donated USD 30 million and USD 50 million respectively to FAO, which helped Uganda, Mongolia, and other developing countries enhance their resilience to climate change[1]. In addition, through the Forum on China-Africa Cooperation, the Lancang–Mekong Cooperation Mechanism (LMCM), and the Community of Latin American and Caribbean States, China strives to establish high-level mechanisms for environmental cooperation and explore the evolving paradigm of South-South cooperation. The China-ASEAN Environmental Protection Cooperation Center (CAEC), which was established in 2010 by the Chinese government, is a regional cooperation organization designed to promote South-South environmental cooperation. At present, with the joint efforts of all parties, positive progress has been made in the development of China-Africa Cooperation on the Environment and the Lancang–Mekong River Environmental Cooperation Center[2].

4.2.1.6 NGOs are participating in South-South cooperation for ecological civilization

Environmental NGOs in China have begun to launch projects in Southern countries. WWF China and GEI are two NGOs participating more actively in South-South cooperation projects. GEI, for example, has launched a project in Myanmar to promote regional environmental governance by helping the government of Myanmar to improve environmental governance capacity and to make innovative changes to the market mechanism, in order to promote sustainable development in investment and trade. In December 2015, WWF China released a policy document "Economic resources corridor–the necessity of enhancing the environmental and social standards in infrastructure construction". The document aimed to identify the countries along the Belt and Road Initiatives and the African Economic Corridor as key sustainable global economic growth points through reasonable policies, plans, and project planning. In South-South cooperation, NGOs can play an important role. However, due to a lack of funds, a lack of policy support, a lack of experience, and the large number of domestic projects requiring the attention of NGOs, their participation in South-South cooperation is still very limited.

4.2.1.7 Chinese enterprises overseas have been attaching more importance to the environmental impacts of their projects

In recent years, Chinese enterprises have increasingly realized the importance of

1 M. Weigel,. "More money, more impact?China's Climate Change South-South Cooperation to date and future trends", UNDP in China Research Paper, April 2016, p. 8.

2 Li Xia, Liu Ting, and Lu Diyin. "Promoting South-South Cooperation to Achieve Green Development".

demonstrating corporate social responsibility. Chinese enterprises have been especially aware of the significant environmental impacts caused by forestry and the mining industry and have gradually attached more importance to protecting the local environment and sharing development outcomes with the local residents. In the operation of Sepon Mine in Laos, for example, China Minmetals Group adhered to the construction of a green mine and the implementation pit filling for reclamation; purchasing local water and electricity to make it possible for renewable resources to be used for production; evaluating possible impacts on local wildlife habitats and formulating protection plans, all guided by the principle of mutual benefit. On June 17, 2016, with the support of the State Forestry Administration of China, the Ministry of Water Resources and Forests of Gabon, and WWF, 12 Chinese enterprises invested in Gabon jointly launched the "Sustainable Forest Management Initiative". These enterprises made the joint commitment that they would obey the "Guideline for the Sustainable Operation of Chinese Enterprises' Overseas Forests" and all relevant laws, regulations, and international conventions. They intend to engage in responsible forest management, introduce a product tracking system, eliminate and prevent illegal logging, minimize the risk of forest degradation, jointly protect the environment of the forest, respect local culture and customs, actively get involved in community construction, help the poor, support public welfare and charity, and embrace and demonstrate corporate social responsibility.

Admittedly, Chinese enterprises still have a long way to go to achieve more comprehensive corporate social responsibility and, in particular, to guide their business activities under the concept of ecological civilization. Currently, most of the enterprises that embrace corporate social responsibility in South-South cooperation are powerful, large state-owned enterprises. Private businesses, especially individual businesses, still use crude and sometimes destructive means of production due to poor awareness of environmental impacts or weak structures. All Chinese enterprises – state-owned and private – shape China's international image, so China should attach more importance to guide enterprises to follow the concept of ecological civilization and to act responsibly.

4.2.2 Challenges faced by China in implementing South-South cooperation for ecological civilization

4.2.2.1 There is a lack of inter-ministerial coordination and unified strategic planning for South-South cooperation for ecological civilization

At present, China's ecological civilization-based South-South cooperation is mainly carried out by the relevant ministries, commissions, and local governments based on their

respective needs. The relevant ministries and commissions have developed their policies and programs with limited coordination with each other. There is neither a national strategy nor top-level design and planning, and there is little coordination with other forms of South-South cooperation, so opportunities to join forces are lost. Also, because South-South cooperation is delivered through multiple channels, there could be confusion within partner countries and weaknesses in bilateral exchanges and program management. To this end, China needs to consider why it should carry out South-South cooperation for ecological civilization and how to advance such conduct cooperation effectively and in a coordinated way.

4.2.2.2 Insufficient attention is paid to ecological projects and there is limited financial support

In recent years, China has placed greater importance on South-South cooperation for ecological civilization and has increased investment in the area, but the number of projects remains small and funding remains low. There are a number of reasons for this. With South-South cooperation, China tries to meet the needs of recipient countries to the extent possible. For some developing countries, economic development is the most urgent imperative. Most of the requests for cooperation submitted to China focus on economic and social infrastructure projects. Environmental protection projects are usually not expressed as priorities. In addition, China's style of funding projects from a single source makes coordination difficult and it makes it more difficult to change the nature of South-South cooperation.

4.2.2.3 There is only limited participation of actors beyond the central government

Currently, China's South-South cooperation for ecological civilization is mainly carried out by central ministries and commissions, with some limited participation from local governments, NGOs, and private enterprises. China's resources for South-South cooperation are mainly allocated to the central government departments, and there is neither an effective institutional mechanism nor financial support to mobilize the enthusiasm of local governments and other actors. In addition, protection of the environment and nature is a relatively new area of China's South-South cooperation, and local governments, NGOs, and private enterprises still lack experience in this area. Domestic environmental protection is a major responsibility which makes it difficult for many local governments and NGOs to rally around South-South cooperation for ecological civilization. Also, the limited involvement of non-government actors is not conducive to the effective use of overall resources.

4.2.2.4 China's South-South cooperation does not yet have an evaluation system with clear indicators for the protection of the environment and nature

Under China's current South-South cooperation, evaluation is still relatively weak. China has not yet established a coordinated evaluation system and indicators for South-South cooperation, especially for evaluating the impact of aid and investment projects on the local environment and nature. In recent years, MOFCOM, the Ministry of Environmental Protection, the State Forestry Administration, and other relevant ministries have issued a series of policy documents and regulations to regulate Chinese investment and guide enterprises to protect the local environment. Environmental protection is also more carefully considered than before in project feasibility studies and post-project assessments. However, the economic and social effects of projects are still considered more seriously than the environmental impacts. This is partly because partner countries emphasize economic development, but it is also related to China's lack of clear and strict evaluation systems that place sufficient importance on environment impacts.

4.2.2.5 There is a lack of inter-disciplinary expertise

To effectively implement South-South cooperation for ecological civilization, China requires more coordinated expertise among experts in technology, international politics, and the specific needs of developing countries. But in China such combined skill sets are very limited. At the government level, there are people who understand international affairs, the needs of specific countries, and emerging technologies. That said, very few government officials have the combined expertise. As for NGOs, they have cultivated experts for domestic environmental protection, but these experts lack experience in international cooperation, they know little about the needs of developing countries, and they lack experience in introducing Chinese knowledge and technology to developing countries. All in all, China lacks the expertise for South-South cooperation for ecological civilization. Cultivating talents at all levels is an urgent priority.

4.2.2.6 There is a lack of meaningful public information and effective guidance on public communication

China has not established a data collection and analysis system and a platform for public information about South-South cooperation for ecological civilization. Only a limited amount of information is shared with domestic and international audiences. There is also no unified and clear communication mechanism among ministries on South-South cooperation for ecological civilization. The domestic public, civil society organizations of partner countries, as well as the international community know little about the positive impacts of China's South-South cooperation for ecological civilization. Without such

knowledge, it is difficult to gain broader support and a wide understanding. In addition, China's South-South cooperation is facing the challenges of language and cultural differences with other developing countries, which has led to ineffective communication with local communities.

4.3 Experience of developed countries in environmental development aid

Development aid has been the major funding source for environmental capacity development, projects, and policy work in developing countries. That said, environmental support has not been as important a feature in aid as economic development, which in many cases has had negative environmental effects. For a long time, the approach in aid arrangements has been to grow now, and clean up later.

In 1992, the UN Conference on Environment and Development in Rio de Janeiro made a strong statement about changing this "environmental blind spot" of development thinking and called for integrating environmental and social objectives into economic policy-making for development. In 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development which calls on all signatories to respect the limited carrying capacity of ecosystems when working to enhance human prosperity at home and abroad. The 2030 Agenda thus sets all on a new collective learning path.

4.3.1 Promoting environmental and development objectives through aid

Developed countries' cooperation with Southern countries on environment started around 1972 with the UN Conference on Human Environment. The 1992 UN Conference on Environment and Development in Rio de Janeiro more strongly connected development and environment and thus pushed donors into this policy area. In the 1990s, development was mainly understood as a catching-up process characterized by poverty reduction and economic development in the South. Economic globalization was considered to contribute positively to poverty reduction, and liberalized markets were an important element of this strategy. Environment was seen as encompassing local and global change which could have adverse effects on human prosperity now and in the future. The main policy approach was to strengthen environmental institutions and to fund projects that mitigated the most salient problems in cities (e.g., air pollution, waste and water management) and in rural areas (e.g., protection of forests and biodiversity).

Thus in the 1990s, a sectorial view on the meaning and operationalization of the

development-environment interface prevailed. The main priority of development agencies remained economic growth and poverty reduction. Aid for environment was strengthened, but it did not become a priority nor did it change the funding strategies of donors (see Figure 4-1). Avoiding dangerous global environmental change was basically seen as the responsibility of developed economies, which entailed reducing the environmental impacts of their consumption and production patterns, but without questioning the basic technological pathways or organizing principles of globalization.

Donors from industrialized countries have been organized under the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD) since 1961. The DAC's purpose is to promote development cooperation, and to improve coordination and management of development finance for greater impact. The DAC has 29 members; the World Bank, International Monetary Fund, and the United Nations Development Programme participate as observers.

The DAC has been collecting data on aid for the environment since 1995 and defines environmental expenditure as general environmental protection encompassing environmental policy and administrative management, biosphere protection, biodiversity, site preservation, flood prevention/control, environmental education/training, and environmental research.

In 1998, the DAC introduced the "Rio markers" to record support to developing countries for the implementation of the UNFCCC, the United Nations Convention on Biological Diversity, and the United Nations Convention to Combat Desertification, as the industrialized countries had committed to do. Only in 2010 a marker was introduced for adaptation to climate change (before, only climate change mitigation was recorded). A scoring system is used in which donors "mark" whether their development cooperation activities are targeting the environment or the Rio Conventions as the "principal" objective (score "2"; fundamental to the design and purpose of the activity); a "significant" objective (score "1", the objective is explicitly stated but is not the primary purpose); or whether they do not target these objectives at all (score "0").

DAC members spent USD 45,630 million on general environmental protection between 1995 and 2014 (Figure 4-1). This represents 2.35% of total ODA in this period. Countries with the highest absolute expenditures in environment-related ODA are Japan, France, the U.S., Germany, and Norway. This coincides with the group of largest DAC donors, with the notable exception of the United Kingdom, which in this subgroup is replaced by Norway. Countries that spend the highest proportion of their ODA on environment are Norway, Japan, France, Denmark, and Germany. To illustrate

the difference between these two perspectives: Norway spent USD 4,192 million on the environment in total between 1995 and 2014. That represented 6.82% of its total ODA. The U.S., by contrast, spent the third largest absolute sum on environment with USD 6,446 million, but this represents only 1.51% of its total ODA. In general, aid expenditures have not only been low, but also very volatile over the years (Figure 4-1).

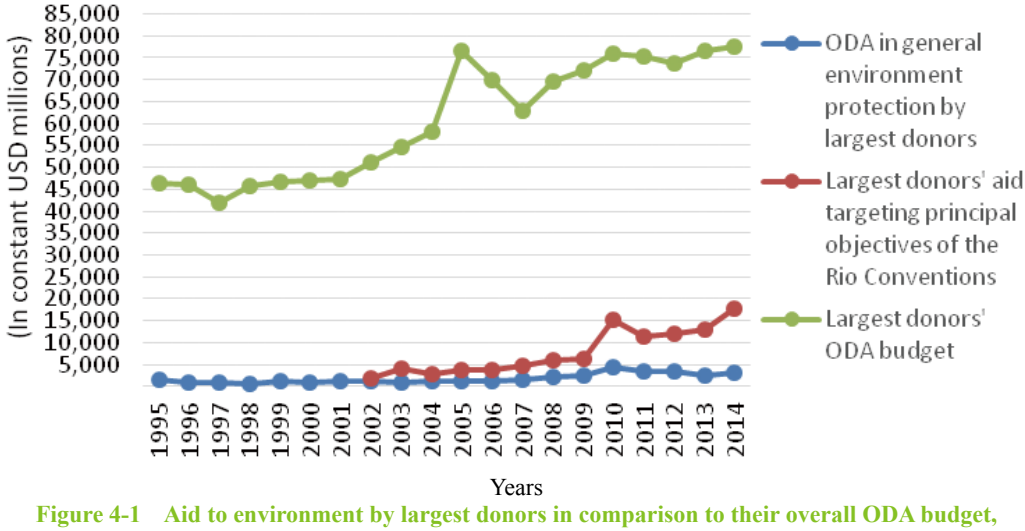

Figure 4-1 Aid to environment by largest donors in comparison to their overall ODA budget, 1995—2014

Source: OECD DAC Statistics; largest donors in environment refers to absolute expenditures and includes Japan, the United States, France, Germany, Norway, and Denmark.

The DAC defines the overall purpose of ODA as a contribution to improving human welfare in developing countries. The easiest way to make aid for environment compatible with ODA was to fund activities that address local environmental impacts of economic growth. This is demonstrated by an analysis of bilateral and multilateral projects funded between 1988 and 1999[1]. The same analysis shows that development projects with environmental externalities decreased while neutral projects increased. Controversy arose with regard to using ODA to prevent dangerous global environmental change – such as global warming and biodiversity loss – because developed countries would also benefit from such activities(Figure 4-2).

1 R.L. Hicks, B.C. Parks, T.J. Roberts and M.J. Tierney, "Greening Aid? Understanding the Environmental Impact of Development Assistance", Oxford University Press, 2008.

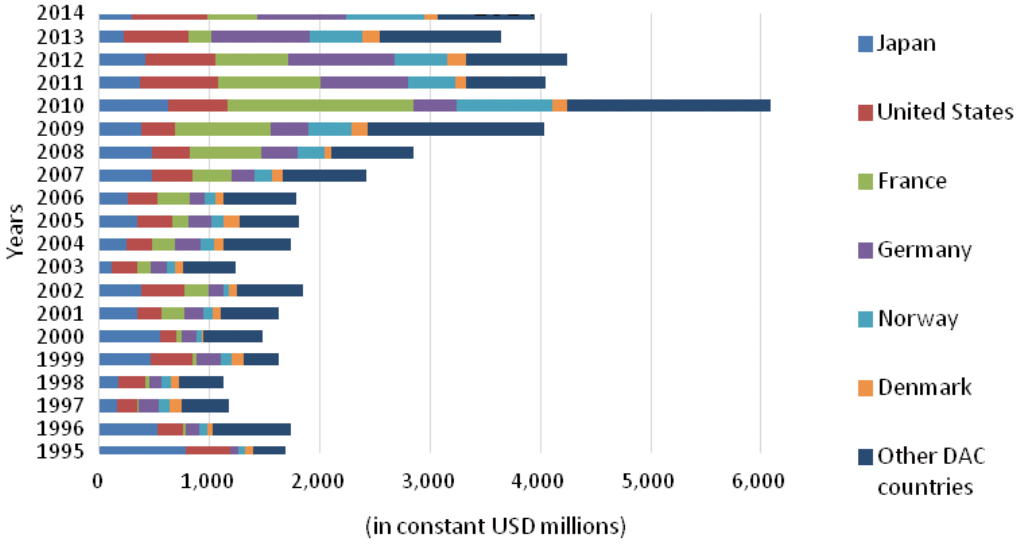

Figure 4-2 ODA in general environmental protection by DAC countries 199—2014

Source: OECD DAC

In the 1990s, donor countries developed quite varied approaches to ODA[1]. Denmark, for one, moved from infrastructure and agriculture to urban projects and made an effort to mainstream environmental considerations into all development cooperation. Germany invested first strongly in water and land management, and then moved on to biodiversity and climate change (with a focus on renewable energy technologies). Japan first tied development aid to natural resource exploitation (thus linking ODA to national economic interests). Increasing protests led to some adjustment by Japan, but the share of projects causing environmental damage remained high. The U.K. was a latecomer to environmental projects in development cooperation, as was the U.S., which pursued security and commercial interests through its environmental programs.

In the 2000s, the DAC data show that donors started to step up their investment with regard to the Rio Conventions (UNFCCC, UNCBD, and UNCCD). (The orange line in Figure 4-1 shows total donor expenditures for the Rio Conventions as their principal objective. Figure 4-3 shows how ODA is distributed among the three Conventions). Most of these funds go to the mitigation of climate change and to the energy sector (renewable energy sources, energy efficiency) (Figure 4-3).

1 R.L. Hicks, B.C. Parks, T.J. Roberts and M.J. Tierney, “Greening Aid? Understanding the Environmental Impact of Development Assistance”, Oxford University Press, 2008.

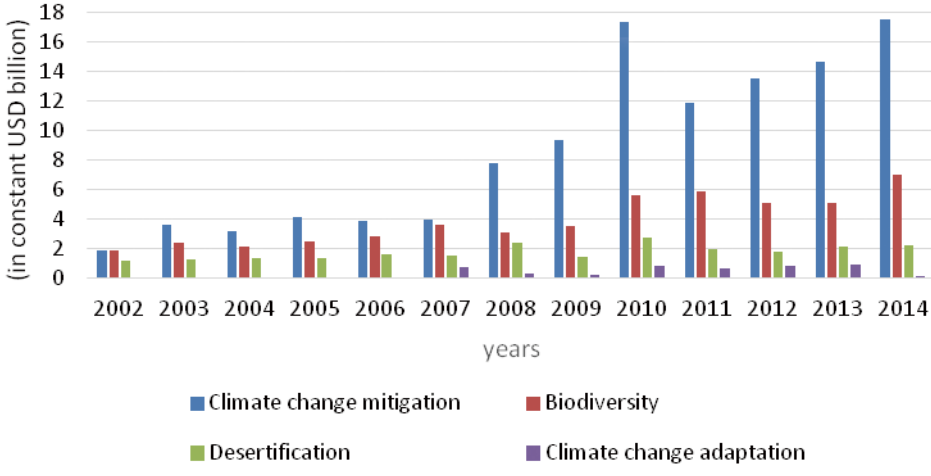

Figure 4-3 Total DAC ODA targeted at the objectives of the Rio Conventions (2002—2014)

Source: OECD DAC Statistics

4.3.2 What works in aid for environment and what does not?

During the last 25 years, DAC donors invested considerably in knowledge creation and human resources on environment and development. They set up specialized departments in development ministries, agencies and banks, and invested in evaluating the results of bilateral and multilateral programs and projects. Complementing this engagement, universities established graduate programs related to environment and development, and funding for research in developing countries was increased considerably. In addition, non-governmental development organizations also started to invest in this area while environmental NGOs learned to understand the social and economic dimensions of environmental protection.

When climate negotiations under the UNFCCC gathered momentum after the Kyoto Protocol entered into force in 2005, governmental and non-governmental actors had to intensify their engagement. With the Copenhagen Accord of 2009, European donors learned that emerging economies and other developing countries are important actors in global climate and environmental affairs. They stepped up their political and financial engagement accordingly (Figure 3). Together, all of these activities and investments created a solid basis of knowledge and experience in international environmental cooperation.

Three instruments can be considered relevant for environment-related development cooperation: political conditionality; environmental policy dialogue; and triangular cooperation. The first two are important because they refer to the context in which technological or financial transfers are embedded, and which can either facilitate or hinder

the objectives connected to the cooperation. The third instrument, triangular cooperation, is important as it facilitates learning between Northern and Southern donors, as well as between other non-governmental stakeholders involved.

Political conditionality is an instrument often used by DAC donors to apply pressure for reform. As ODA is an important funding source, donors tend to apply green conditionality (tying aid to environmental reforms) in order to reward partner governments or as a bargaining tool to generate environmental investment. The success of this instrument, however, has been limited. Early research[1] shows that political conditionality has worked best when a government has already committed to green reforms (without strong domestic opposition), when there were no commercial interests involved on the donors' side, and when there were no alternative funding options (i.e., it required strong coordination and agreement among donors). Furthermore, donors had to ensure a long-term commitment and sufficient funding because institutional change is not achieved rapidly.

Climate finance is an example of the slow pace of change. Offers by donors to introduce innovative technologies (i.e., renewable energy) or reforms did not automatically unleash massive change, due to technological path dependency and incentive structures that favoured conventional technologies. Donor support was often too weak and short-term to encourage recipient governments to intervene in markets and provide "policy rents" for investments in sustainability while withdrawing rents from polluting investments.[2]

Environmental policy dialogue is an alternative or complementary instrument that aims to strengthen public, political, and civil society actors in the partner country. The rationale behind this approach is to raise awareness of environmental issues in all areas of society. The success of environmental policy dialogue requires a long-term commitment by donors and partners, recognition of the important role of NGOs as change agents, long-term investment in capacity development (particularly technical and analytical knowledge), and a deep understanding of local political and economic contexts. This approach includes placing environmental protection on the agenda of other policy fields by emphasizing its social and economic benefits.

It is clear that both approaches – political conditionality and environmental policy dialogue – require a broad and deep network of cooperation that goes beyond conventional aid and the provision of technological solutions to specific environmental

1 D. Fairman and M. Ross, "Old Fads, New Lessons: Learning from Economic Development Assistance",in: R. Keohane and M. Levy, (eds.). "Institutions for Environmental Aid: Pitfalls and Promise", MIT Press, 1996.

2 A. Pegels, (ed.). "Green Industrial Policy in Emerging Countries", Routledge, 2014.

problems. Indeed, cooperation needs to include the sub-national level (i.e., districts and municipalities) in order to support bottom-up approaches adapted to specific local conditions. Participants at the sub-national level would include local governments, community associations, farmers, and civil society organizations. At national level, it is also important to go beyond government, as environmental objectives cannot be implemented without the active support of the private sector, science, and civil society. Additionally, advocacy and education are fundamental for expanding environmental awareness in the private sector and among the public at large.

Finally, triangular cooperation (cooperation that typically involves a Northern and Southern donor and a Southern recipient) is mentioned in the 2030 Agenda and in the Addis Ababa Action Agenda as an instrument for implementing the Sustainable Development Goals. According to a survey by the OECD DAC, the value of triangular cooperation is often characterized as "working in horizontal partnerships, building trust, learning among all partners, strengthening networks, and increasing intercultural understanding", and as an instrument that helps partners to "share knowledge, learn together, facilitate capacity development, collaborate, and jointly create solutions to development challenges".[1] This is supported also by the experience and activities of the UN Office for South-South cooperation. DAC donors engage in this form of cooperation because capitalizing on the expertise and technology of Southern partners, as well as the cultural similarities, has proven effective. Furthermore, cooperative engagement in joint projects promotes mutual understanding. This is especially valuable when promoting learning for sustainability as changes need to be achieved within very short timeframes.

4.3.3 New approaches are required for implementing the 2030 Agenda

Twenty years after the first Rio Conference, the limitations of the sectoral approach to environment and development – and economic policy –became apparent, in rich and poor countries alike. Despite some improvements regarding some types of pollution, many environmental trends continued to proceed in the wrong direction.[2] Developed countries did not manage to sufficiently dissociate their economic growth from consumption (and the environmental degradation it causes), while in developing countries, the goal of catching-up was often associated with significant environmental consequences that became difficult to control, not to mention social and economic costs. Focusing exclusively on local reform

1 OECD DAC,"Dispelling the myths of triangular co-operation – evidence from the 2015 OECD survey on triangular co-operation". Paris, OECD, 2016.

2 J. Rockstroem et al.,"Planetary boundaries: Exploring the safe operating space for humanity". Ecology and Society, Vol. 14, No. 2, 2009.

was insufficient because cumulative global effects have taken us beyond certain safe resource-use thresholds, and because the impacts of global warming occur even in regions that hardly contributed to the phenomenon.

The 2030 Agenda reacts to this assessment by adopting goals that refer in an integrated manner to the social and economic dimensions of human prosperity, its dependence on the environment and on ecosystem functions, and by emphasizing common but differentiated responsibilities for the global commons. The Sustainable Development Goals are conceived as a horizontal network of targets related to several goals. This reflects the indivisibility between goals and the interdependencies among them which have to be taken into account by implementation strategies.[1]

Promoting the 2030 Agenda in domestic policies as well as in external relations, including South-South cooperation, offers opportunities for closing the credibility and coordination gap and for making policies more effective.

Under these circumstances, greening development takes on a different meaning which was shared in interviews with Chinese institutions and partners in developing countries. Chinese interviewees stressed the need to substantially improve the coordination of economic, environmental, and social policies among responsible Chinese and partner country institutions. The goal should be to establish criteria for Chinese South-South cooperation which clearly take into account the interdependencies among economic, social, and environmental objectives; to improve communication; and to take into account the demand side when defining objectives, projects, and measures. These positions are consistent with the results of more recent evaluations of environmental development cooperation.[2]

Other emerging economies are also taking steps toward adopting an integrated approach in their South-South cooperation. The Network of Southern Think Tanks (NeST) recently developed a first conceptual framework for monitoring and analyzing South-South cooperation.[3] The framework notes two key aspects to be considered when promoting "inclusive partnerships, citizens' protection, and

1 M. Nilsson, D. Griggs and M. Visbeck, "Map the interactions between sustainable development goals". Nature, 2016, Vol. 534, p. 320-322.

2 IEG. Environmental Sustainability – An Evaluation of the World Bank Group Support. Washington DC: World Bank Group, 2008 and S. Morrisson-Metois and H. Lundgren. Forests and sustainable forest management. Evaluation evidence on addressing deforestation to reduce CO_2 emissions. Paris: OECD DAC Network on Development Evaluation Secretariat. OECD Evaluation Insights No. 11, April 2016, OECD.

3 N.A. Besharati, N. Moilwam, K. Khunou, and O. Garelli Rios, (eds.) "Developing a Conceptual Framework for South-South Co-operation", Working Document, Johannesburg: SAIIA, 2015.

empowerment":"It is the responsibility and remit of each partner country to set its labor, land, and environmental standards, but if these frameworks are missing in the recipient country, the provider of South-South cooperation needs to follow at least the standards it has set up for itself. Partner countries need to balance considerations of economic growth with protection and sustainability of the environment".[1]

4.3.4 Conclusions about Chinese South-South cooperation for ecological civilization

Sustainable development cannot be achieved if economic development is not integrated with social and environmental objectives from the start, at the strategy stage. This is valid for all countries, North and South. Moreover, in today's globalized world, local effects cannot be separated from global effects. Therefore, the integrated approach also needs to consider transnational effects of domestic policies, and pursue sustainable development in all areas of international relations. As the concept of ecological civilization is very similar to the concept of sustainable development, these considerations also apply to the implementation of ecological civilization within China and in China's international relations, including South-South cooperation.

The following conclusions can be drawn from the analysis in this part. These conclusions refer to the changes needed within DAC member countries and to the policy recommendations described in more detail in part 4.6:

(1) The design of development cooperation strategies requires coordinated strategic planning to integrate environmental, social, and economic objectives from the start in order to achieve coherent results and avoid environmental harm. Such coordinated strategic planning should also consider the activities of other individual ministries and enterprises, in order to avoid incoherence in policies and activities, as well as gaps in credibility.

(2) Increased funding is needed to promote cooperation on environmental issues and the implementation of the Rio Conventions. Such funding, however, will not be effective without strong environmental institutions, laws, and incentives that embed and promote necessary reforms and change processes.

(3) Environmental institutions need to be strengthened in order to enable them to enforce environmental laws and regulations, and to demonstrate the benefits that accrue in the short and the long term. Environmental capacities also need to be strengthened in other policy fields, including transportation, economic policy, housing/urban development, and energy. Such capacity building will help to improve coordination among policies and

1 Ibid., 41

ministries.

(4) Cooperation with non-governmental and sub-national actors at the local level is fundamental for raising environmental awareness and for calling attention to the need to change economic development pathways.

(5) Effective international cooperation in environment requires: a) adequate and long-term external funding by donors; b) plans for stepping up domestic funding; and c) investment in evaluation, research, and knowledge creation, and in development cooperation training for the academic sector at large in donor and partner countries.

4.4 Developing countries'demands for ecological civilization

China's South-South cooperation is demand-driven. In recent years, the demands of developing countries toward achieving sustainable development are adjusting to changing circumstances. Understanding the partners' views and the demands on cooperation with China, and to provide corresponding assistance, is of great importance for China as it identifiesits priorities for South-South cooperation for ecological civilization and seeks ways to improve outcomes. This chapter summarizes the demands of developing countries' in South-South cooperation for ecological civilization. The summary is based on the analysis of questionnaires and direct feedback from the Nairobi seminar which included participants from 20 developing countries across Africa, Southeast Asia, and Latin America,. This information lays a foundation to identify the areas where China has comparative advantages on the supply side.

This analysis notes that stakeholders (except for GGGI, accounting for seven questionnaire responses) represented a diversity of organizations and countries. Therefore, this information should only be considered as one input into forming policy recommendations.

4.4.1 Common developing country viewpoints on ecological civilization

Throughout the questionnaire and workshop exercises, a number of trends related to ecological civilization challenges and opportunities were apparent. Although a diversity of issues was raised, there were a number of common threads:

(1) Although most countries understand that environmental preservation and protection of natural resources are important, they do not distinctly recognize the

opportunity for green growth (i.e., the fact that economic growth can be achieved in ways that also promote environmental sustainability and social inclusiveness).

(2) Most countries recognize that the development of clean energy technologies creates jobs and can facilitate progress toward achieving the Sustainable Development Goals. They also recognize that China is an important partner in providing these technologies, as well as the policy and technology infrastructures associated with them.

(3) Although challenges to developing countries'ecologies are diverse, there is clear agreement that deforestation, soil and water degradation, industrial pollution, and bad city planning are issues of great urgency as they are ecological issues that directly affect the economy and the quality of life of citizens.

(4) Most countries agree that cooperative programs with China involving technology transfer, investments in renewable energy, and capacity building for their policy-makers and decision-makers, is the best way that South-South cooperation can have a positive ecological impact. It should be noted that customized programs will be required as each country faces unique as well as common challenges.

4.4.2 Challenges with South-South cooperation for ecological civilization

4.4.2.1 Limited awareness of ecological civilization

The Chinese concept of ecological civilization does not yet enjoy wide global visibility compared to sustainable development. Further communication is required about its role, and greater efforts are required to connect the needs of developing countries with the concept. Meanwhile, as ecological civilization is a concept that belongs to Chinese philosophical tradition and emerged from recent experiences of rapid economic growth and its environmental impact, it is clear that its application to other countries requires that the specific national conditions and localized needs of developing countries need to be paid special attention.

4.4.2.2 Barriers to public and private investments on environment projects

Economic and political issues in many developing countries have a negative impact on the investment worthiness of long-term environment projects. Some of the issues are technology-based, such as a lack of local renewable energy assessment data. Other issues are political in nature but nevertheless translate into high risk for investors, such as the stability of regimes. Cooperation should address these issues through mutually agreed technology and policy solutions that enhance understanding on both sides and quickly lead to reduced project financing risk.

4.4.2.3 Accountability of Chinese enterprises in environmental protection

China's South-South cooperation for ecological civilization and green growth necessarily involves private sector projects in other developing countries. These are primarily large capital and infrastructure projects that are so far only sporadically engaged in the process of implementing green policies. Chinese companies and programs are relatively new to global cooperation from an ecological perspective, and while feedback about effectiveness and economic impact is generally good, blowback from investments in brown industries and local ownership issues must be mitigated. This can be achieved through enhanced training on recipient country issues and strengthened stakeholder engagement.

4.4.3 Demand of developing countries for South-South cooperation for ecological civilization

Questionnaire and workshop feedback concluded that there are number of policy and technology sectors within the context of South-South cooperation that can strengthen green development across a wide range of developing countries. The following sections have been separated into policy and technology recommendations, however, it should be noted that these two categories are not mutually exclusive. In fact, the deployment of technology solutions requires that appropriate policy infrastructures are in place.

4.4.3.1 Policy cooperation

Knowledge sharing and capacity building programs are required for policy-makers and decision-makers in other developing countries to advance green growth policies, technologies, and the concept of ecological civilization. The Task Force noted that a large number of respondents in fact had little understanding of the Chinese definition ecological civilization. This should be addressed by China through any knowledge sharing and capacity building programs.

Strengthen capacity building on legal, financial, and technological issues, with the aim of strengthening local structures, enhancing the investment worthiness of large capital projects, and reducing the risk of financing these projects. Cooperation activities would include: a) expert exchanges with policy-makers and other stakeholders on China's best practices on legal infrastructures supporting accelerated deployment of green capital projects; b) knowledge sharing and expert exchanges on innovative financial models that overcome traditional barriers to green capital projects; and c) technology policy cooperation which utilizes China's existing data and experience to prime and accelerate green project markets, and enhance the investment worthiness of projects.

Environmental protection and enforcement policies in the areas of deforestation, biodiversity conservation, water management, and pollution were emphasized by the respondents.

(1) Development of policies regarding accountability of Chinese corporations operating in other countries

While China strives to ensure investment in infrastructure projects in other developing countries is low-carbon and green, many of our survey responses have shown that this is especially important with regards to accountability and enforcement. Respondents from Pakistan stressed that, so far, environmental concerns and compliance with environmental laws have not been incorporated in the CPEC.[1] They also noted that more in-depth cooperation is necessary with regards to Pakistan's legal framework, implementing authority, early-stage decision-making, and localized ecological solutions. Interviews in Kenya showed that even in countries with demanding environmental laws, interest in expanding the transport and energy infrastructure is so strong that governments do not insist on strict compliance. A study on the Bui Dam in Ghana built by Sinohydro corroborates this impression.[2] This means that if China wants to align its South-South cooperation with ecological civilization, it needs to: a) enforce compliance with environmental laws and regulations for Chinese enterprises' activities abroad; and b) support partner governments in strengthening their own environmental institutions in order to promote compliance with existing environmental laws and regulations.

Meanwhile, China also needs to strengthen the capacity of Chinese companies and investors to navigate sensitive political environments in other developing countries (for example, through strengthened stakeholder engagement capacity). Again, this view was shared especially by African stakeholders, who cited long and strained relationships with many Western countries and organizations that are unfamiliar with powerful local sentiments and concerns about the history of colonialism in Africa, and the implications of neocolonialism and its association with ownership, shareholder control, and territoriality. Chinese companies and organizations with operators in Africa who are unaware of these nuanced on-the-ground dynamics risk losing funds and spending time embroiled in local

1 The China-Pakistan Economic Corridor (CPEC) is a 3,000-kilometer network of roads, railways, and pipelines across Pakistan to China. As one of the six economic corridors under China's ambitious Belt and Road Initiative, CPEC has been made part of China's 13th Five-Year Plan. Due to rampant flooding in the CPEC region, in 2016 senior Pakistan officials called for making an action plan to green CPEC to reduce environmental degradation and secure Chinese investment.

2 O. Hensengerth, "Interaction of Chinese institutions with host governments in dam construction: the Bui Dam in Ghana", in: W. and O. Hensengerth (eds.) "Evolutionof Dam Policies", Springer, 2014, p. 229–270.

politics that could compromise even the best-intentioned environmental projects.

(2) Build awareness of best-practice models regarding investment and aid projects in Africa

As a whole, our assessment of the China-Africa relationship on ecological civilization, is that: a) China is responding rapidly and reliably to foreign aid and investment requests from Africa; b) China is seen to be investing a lot of resources into capacity building before, during, and after aid and FDI activities; c) China is generally considered a responsible partner that respects local and international laws and regulations on environment, and respects generally accepted business practices, particularly corporate social responsibility; d) China's offshore response is fast and effective; and e) China is comparatively well-structured and organized both domestically and abroad. Basically, China is increasingly considered to be a trusted and respected development partner.

However, deeper discussions revealed that more needs to be done with regards to stakeholder engagement and the adaptation of capital projects to more appropriately address the needs of African countries and individual communities. Interviews with stakeholders from a number of African countries, including Ethiopia, Uganda, Niger, South Africa, Nigeria, Kenya, Sierra Leone, Zambia and Zimbabwe, indicated that social inclusion and community engagement were essential for deploying successful capital projects in Africa. This recommendation advocates for training, education, and social assistance–relocation subsidies, for example–to be included in business plans and financial modelling for large capital projects.

The Kengen Geothermal power plant in Kenya serves as an example of best practice, where housing for displaced communities, consideration for local wildlife, and training and education funds were factored directly into initial project planning and design. This initial investment in both the local community and staff bolsters long-range stability, innovation, and growth in otherwise politically sensitive communities.

Initial investment in community training and education programs is also a good way to ensure the availability of a local labour force in the future. Whereas in many developing countries, such as China and India, large capital projects result in long-term jobs in operations and maintenance, the lack of appropriate education in Africa results in pressure on local populations as community members entering the workforce are forced to relocate.

Therefore, investing in appropriate education for communities surrounding capital projects ensures that local people have the right skills to find employment related to the project in the short and long term. This is especially relevant to long-lifespan and internal rate of return on projects such as those in renewable energy, which can last 30–50 years or longer.

(3) Focus cooperation on environmental protection, enforcement of regulations, and climate change mitigation/adaptation, specifically deforestation and water and soil degradation

Responses by country stakeholders across diverse regions (Latin America, Africa, and Southeast Asia) indicated that deforestation and soil degradation were challenges shared by the majority. The important of deforestation and soil degradation is directly associated with economic reliance on agricultural and commodities in many developing countries. Many respondents stressed the importance of cooperation on policies and technologies related to agricultural land use and the goals of increased productivity and higher efficiency, water vs infrastructure development, as well biodiversity conservation.

This can be achieved by ensuring China's South-South cooperation also includes strong bilateral government cooperation, in addition to technology and policy cooperation at the local level. For instance, Peru's response illustrated the understanding of ecological civilization as a Chinese concept, and has recommended the implementation of bilateral action plans such as an "Action Plan on Prevention and Control of Air Pollution" and an "Action Plan on Prevention and Control of Water Pollution" to facilitate environmental aspects of Sino-Peruvian cooperation.

4.4.3.2 Technology sectors

Technology cooperation in a number of environmental sectors and associated subsectors was identified as a high priority among developing country respondents. More indepth communication and analysis with governments and stakeholders is necessary to clarify specific sub-sector cooperation interests.

(1) Renewable energy. Respondents indicated that renewable energy was among the top technology priorities for South-South cooperation for ecological civilization, with solar and wind energy seen as offering the greatest benefit. UNDP research[1] concurs with the observation that renewable energy is a vital area for cooperation. Besides direct technology transfer cooperation, programs between technical institutes would prime the market and accelerate deployment opportunities.

Priming markets for accelerated deployment of renewable energy could include cooperation with technology institutes on renewable energy codes and standards, localized power purchase agreements, community solar project structures, and other initiatives. The investment worthiness of projects can be enhanced through low-cost technology cooperation such as support around resource assessments, best practices on wind farm configurations, and best practices on integrating renewable energy into existing

1 M. Weigel, "More Money, More Impact? China's Climate Change South-South Cooperation to Date and Future Trends",UNDP research paper, 2016.

infrastructures.

Furthermore, China's geographic and climactic diversity enables more direct sharing of local policy support regarding accelerated renewable energy and energy efficiency. This includes, for instance, climactic data such as ambient humidity impact on solar efficiency, and airflow differential data relating to wind farm configurations.

(2) Energy efficiency. China also specializes in industrial energy efficiency (IEE), and although many developing countries lack the type of manufacturing infrastructure that China is currently adapting to greater efficiency methods, many Chinese practices can be transferred to power sectors in developing countries. This would offset huge amounts of carbon emissions and pollutants related to coal-fired power plants. Cooperation on IEE technologies can also help offset carbon emissions from highly energy-intensive local industries such as iron, cement, and steel production, as well as agriculture and mining industries. UNDP research also regards energy efficiency is a vital area for technology cooperation.

(3) Green transport. The transportation sector in developing countries has been identified as having a negative impact on air quality, energy intensity, and quality of life due to urban congestion. While few countries highlighted cooperation on electric vehicles (EVs) and EV infrastructure as a priority, many want to cooperate on technologies offering higher fuel-standards resulting in lower carbon emissions per vehicle, as well as on public transportation solutions.

Box 4-3 The China-Pakistan Economic Corridor (CPEC)

CPEC is a notable case study of a country stakeholder experiencing green development challenges, and how calls for green applications could secure Chinese investment. As one of the six economic corridors under China's ambitious Belt and Road Initiative, CPEC has been referenced in China's 13th Five-Year Plan.Pakistani officials predict that the project will result in the creation of upwards of 700,000 direct jobs from 2015 to 2030, and add 2 to 2.5 percentage points to the country's annual economic growth. However, most of the road network is being constructed in the Indus River basin where the country has suffered much from annual floods causing thousands of fatalities and billions of dollars of losses. After the study tour to China in June 2016, a senior governmental delegation from Pakistan called for making an "Action Plan to Green CPEC" to reduce environmental degradation and secure Chinese investment.

(4) Climate mitigation/adaptation technologies. Responses from a diverse range of countries identified climate mitigation technologies as an area of high need, specifically with regards to flood protection and the prevention of biodiversity loss. However, even

these sub-sectors require greater resolution in determining specifically how cooperation can achieve the greatest impact. For example, in Panama, prevention of flooding and biodiversity loss is a water management issue related to the sustainable management of the country's 52 watersheds. Cambodia, however, cited flooding as an urban planning issue requiring greater cooperation on mitigating unstructured urbanization and rapid population growth.

China has great experience in implementing diverse sustainable cities solutions across a wide variety of areas, including floodwater management under the Chinese concept called "sponge cities". The sponge cities concept is characterized by new and retrofit city planning safeguards that are designed to mitigate flooding and manage floodwater collection through a combination of floodwater utility systems, municipal services, and floodwater remediation technologies.

(5) Waste management. The area of waste management was highlighted as an opportunity for cooperation and clean investment by a variety of countries in Asia, along with Uganda and Peru. They specified the need for best practices in policy-making and technologies for waste management services and systems, including wastewater treatment works, solid waste disposal, and solid waste management. The need for progress in waste management was also raised within the context of urbanization, suggesting that waste management opportunities are evident the municipal waste sector.

Due to China's strong experience in urban management – shaped largely by its sheer number of municipalities – China can share best practices and services as well as applicable technologies and case studies about waste management. An example of an interesting pilot project is in Shandong Province where waste heat from a large aluminum plant is used to process municipal waste into biomass and ecologically friendly compost.

(6) Agricultural production. Given the importance of agriculture to the economies of many developing nations, respondents indicated that cooperation on innovations in land use, energy efficiency, and technologies for the agricultural sector was vital. Specifically, stakeholders highlighted the need for scalable policies and technologies that could improve agricultural production on existing farmland so that more space would not be needed.

4.5 Analysis of China's priority areas for South-South cooperation for ecological civilization

As a large developing country with a vast territory and diverse ecosystems, China has nearly four decades of experience in industrialization, modernization, urbanization, and internationalization. The country has accumulated a wealth of experience in balancing

economic growth and environmental protection, so it can provide other developing countries with innovative ideas, pathways, and solutions that differ from those resulting from North-South cooperation. Over the years, China has been providing assistance according to the needs expressed by other developing countries, focusing on infrastructure construction while seldom applying its environmental protection expertise. This chapter attempts to identify priority areas for South-South cooperation for ecological civilization in accordance with the global Sustainable Development Goals. The objective is to promote the organic convergence of developing country needs and Chinese aid. This would enhance the effectiveness of assistance and help countries learn from each other on the road to ecological conservation.

4.5.1 Criteria for identifying priority areas for China to promote South-South cooperation for ecological civilization

4.5.1.1 Related to the global SDGs

The Sustainable Development Goals adopted by the United Nations General Assembly[1] are widely accepted by the international community, as a guide for development for the next 15 years. Compared with the Millennium Development Goals, the Sustainable Development Goals are more extensive as they comprise economic, social, environmental, and political goals. For the majority of developing countries, it is not easy to achieve these goals as scheduled. Among the 17 goals, the 6th, 7th, 12th, 13th, 14th and 15th goals[2] are directly related to environmental protection, encompassing agriculture, food security, sustainable industrialization, and urbanization. The concept of ecological civilization put forward by China is consistent with the Sustainable Development Goals. While advancing South-South cooperation, China should also help developing countries to achieve ecological civilization. China has made great strides in achieving the Millennium Development Goals and has gained experience and started to adopt appropriate policies for achieving a balance in economic and social development, and for paying more attention to the welfare of vulnerable groups, which is an important example for developing countries.

1 United Nations, "17 Sustainable Development Goals", 2016.http://www.un.org/sustainabledevelopment/sustainable-development-goals/

2 These five goals are: to ensure the availability and the sustainable management of water and sanitation for all; to ensure access to affordable, reliable, sustainable, and modern energy for all; to take urgent action to combat climate change and its impacts; to conserve and sustainably use the oceans, seas, and marine resources for sustainable development; and to protect, restore, and promote the sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

4.5.1.2 Adaptable for countries at different stages of development and with different development needs

Due to the constraints of technology and talent, it is often difficult for developing countries to effectively use technologies and equipment transferred from developed countries. In addition, sophisticated environmental technology and equipment is often expensive, which poses a financial burden for many developing countries and reduces the amount of public funds available for national development. Finally, in order to successfully apply the sophisticated technologies and development models of the developed world, China must face the challenge of customizing technology so it is effective locally. Having gained such experience during its development process, China can provide targeted technologies to meet other developing countries' requirements for applicability, cost performance ratio, and customization.

4.5.1.3 Providing systematic solutions that balance livelihoods and the environment

Ecological civilization is a systemic process. In recent years, international research on the effectiveness of development assistance demonstrates the mutual influence among environmental protection, emissions reduction, and other social goals. The focus has moved from specific targets to more systemic overall development goals. China has started to make effective progress in these areas, especially in the process of regional economic development. It takes into account the protection of different natural environmental systems, and provides support for traditional livelihoods and new economic models of local communities. China still needs to learn more about this advanced concept, but it can take the lead to share its experience of combining practical actions with advanced theories with the developing world.

4.5.1.4 An innovative technology and development model

Leapfrogging development means that developing countries do not need to follow the development paths of developed countries. They can jump directly from their current technological state to a more contemporary and sophisticated reality. In African countries, for example, people rarely used landline telephones and instead leaped directly to the wide use of mobile phones.[1]Similarly, with the continuous decline in the prices of renewable energy and the development of distributed power, it is possible for developing countries to skip the traditional grid pattern of a centralized power supply and instead move to a system that primarily depends on decentralized clean renewable energy. In addition, innovations in mobile Internet and financial systems also provide a new investment and financing model for clean technology and ecological civilization. With the rapid development of big data

1 CCTV website, 2016.http://finance.cctv.com/20061205/101081.shtml

and Internet technology, developing countries must try to learn more advanced concepts for energy development in the future to cope with climate change. They should consider China's experience in the development of energy systems, as they will benefit from the contribution of China's huge market to the reduction of the cost of renewable energy.

4.5.1.5 Environmentally friendly infrastructure-related technologies and investment

One of China's important experiences in its rapid development is the great importance it has placed on infrastructure construction related to economic development. From transportation to hydropower, and then to health care, education, and other social services, infrastructures that the Chinese government or Chinese have supported are almost everywhere in developing countries. Well-designed infrastructure that supports environmental protection can help achieve the goal of ecological civilization. Under South-South cooperation, China has made environmentally friendly infrastructure investment a priority area based on its own experience. This was also one of the major topics of the G20 Summit that was held in China in September 2016.

4.5.2 Priority areas for China to promote South-South cooperation for ecological civilization

Based on the above, we can evaluate some of China's technological advantages for South-South cooperation for ecological civilization to identify priority areas and opportunities. Five priority areas have been identified: wastewater and water resources management; ecosystem protection; urbanization; clean energy and air quality; as well as adaptation to climate change. This section analyzes China's advantages and opportunities for providing assistance to developing countries.

4.5.2.1 Analysis of the priority areas

(1) Wastewater and resources management

Currently, 80% of the world's untreated sewage is being discharged directly into the sea, and the problem is particularly serious in developing countries.[1] Restricted by economic and technical conditions, many developing countries have limited capability to construct water supply, drainage infrastructure, and sewage treatment projects. China has made much progress in the development of regulations and standards on drinking water, standardized construction, water treatment, and clean water supply. These accomplishments can serve as a model for other developing countries and be an important feature of China's foreign aid.

1 Du Ming, "Promote China to share sewage treatment technology and experience with the world", *Economic Daily*, Fifteenth edition, April 7, 2015.http://finance.cctv.com/20061205/101081.shtml

(2) Sewage disposal

China is competitive among developing countries in terms of water pollution control technology. By introducing foreign-advanced technologies and learning from them, China has gradually reached an advanced level of sewage treatment, has accumulated rich experience in the construction and operation of sewage treatment infrastructure, has acquired a variety of low-cost, efficient technologies and equipment with independent intellectual property rights, and has cultivated a number of leading environmental protection enterprises with their own brands and core technologies. China's urban sewage treatment capacity has been expanded from 120 million tons in 2010 to 182 million tons in 2015. Ninety-one percent of urban sewage is now treated and China now has one of the best sewage treatment capacities in the world.[1] Some rural areas have also deployed sewage treatment technology. Tonglu County of Zhejiang Province, for example, promoted contiguous remediation in rural areas under government leadership. The project was based on local conditions and needs, and is a good model for improving the sewage treatment capabilities of rural areas.

Box 4-4 Tonglu County's effective model of rural sewage treatment[2]

In 2009, Tonglu County launched an ambitious rural sewage treatment initiative, adopting three strategies for rural sewage disposal, namely: artificial wetlands, unpowered anaerobic treatment, and small biogas digesters. In 2012, Tonglu became the first county in Zhejiang Province to deploy sewage treatment projects covering the entire rural area. The initiative included nearly 2,000 decentralized sewage treatment projects, a sewage pipe network of 2,500 kilometers, and more than 70,000 inspection wells. The initiative not only meant that sewage would be treated, it also contributed to the greening of villages and the beautification of the environment.

Effective long-term management is the key to ensuring the project's enduring positive impacts. Over the past three years, in accordance with the requirements of "full coverage of villages, a wide range of beneficiaries, normal facility operations, and effective pollution control", Tonglu County adopted the "Four New" mode to ensure the long-term operation and good performance of rural sewage treatment projects.

(3) Drinking water safety

Rural drinking water safety has been a difficult challenge and a defining feature of the country. Over the years, China has accumulated a wealth of experience in balancing urban and rural development, multi-channel financing, and the standardized construction of rural drinking water projects. During the 12th Five-Year Plan period, China solved the drinking

1 "China Environmental Status Bulletin 2015"

2 http://www.zjjs.com.cn/n18/n84/n85/n103/n105/c346254/content.html,October 26, 2016.

water safety problem of nearly 300 million rural residents, including 40 million rural teachers and students. The proportion of people benefitting from the rural centralized water supply rose from 58% at the end of 2010 to 82% at the end of 2015; tap water penetration rate reached 76%; and the quality of water was improved significantly.[1] At the same time, China has relatively mature water purification technology and has witnessed the rapid development of efficient flocculent technology. Its ultra-filtration membrane water treatment technology, and new materials and technologies for the removal of fluoride from drinking water, are world-class which positions China to help other developing countries to improve the safety of drinking water.

(4) Resource management in key rivers

In addition to the management and treatment of rural and urban sewage, China also places great importance on water resource management and pollution control work at the river basin level. China has implemented the most stringent source protection system, compensation system, and accountability system. And it has established long-term environmental protection systems featuring effective use of markets and incentives to promote environmental protection. Also, China has launched a pilot project on inter-provincial watershed ecological compensation in the Xin'an River Basin which has achieved good results in watershed management. Eighteen provinces have implemented the watershed ecological compensation mechanism. Meanwhile, through the effective combination of flood prevention and land use approaches-and by setting up a professional management organization for flooded areas-China has already made important progress in flood prevention and relief, and has coordinated the management of environmental protection and agricultural production.

(5) Ecosystem protection

The Chinese government places great importance on environmental protection and biodiversity conservation. By the end of December 2015, China's forest coverage rate had increased steadily, rising from 16.6% at the beginning of this century to nearly 22%[2]; the National Committee on Biodiversity Protection was established and the *Biodiversity Protection Strategy and Action Plan (2011—2030)* was released; and populations of some rare and endangered species have been gradually restored. China's experiences in environmental protection include its establishment of a long-term compensation mechanism for environmental benefits, and its vigorous promotion of projects that convert environmental challenges from "dilemmas" into "win-win" situations.

1 http://www.gov.cn/xinwen/2016-01/11/content_5031970.htm, October 26, 2016.

2 From the report of the environment minister, Mr. Ji-ning Chen, "Improving environmental quality as the core and making up the ecological environment shortcomings", April 19, 2016.

(6) Desertification control

China has done a lot of work in the field of sand fixation with plants, sand control by engineering, chemical sand fixation, water conservation, and the development of degraded land. China has also conducted moderate development, and has advanced a number of agricultural and animal husbandry technologies. In the field of agriculture, China mainly launched water diversion projects for flushing sand dunes, farmland transformation projects, rice cultivation with sand lining membrane, saline alkali land improvement, greenhouse cultivation and breeding, plastic film mulching cultivation, and the development of soil-less culture technology. In animal husbandry, China mainly launched initiatives on reasonable grazing, grazing based on the state of grasslands, pasture improvement, and the development of greenhouse cultivation technology. The integrated farming and animal husbandry technologies mainly include the "small biological economic circle" technologies and small watershed management technologies. These experiences can be seen as models for South-South cooperation.

(7) Ecosystem protection and recovery

The Chinese government has vigorously implemented eco-restoration projects such as the protection of natural forests, restoring farmland to forests, and restoring grazing lands to grasslands. Since 2005, more than 360 billion Yuan has been spent in natural forest protection, effectively protecting about 1.05 million square kilometers of natural forest. China's forest area has increased by 100,000 square kilometers since 2005. Grassland coverage in key areas has increased by 11%;more than 2,800 $km^2$of degraded wetlands, including mangroves, has been restored; and 720,000 km^2 has been protected from soil erosion.

(8) Ecological space management and control

China encourages the establishment of environmental red line control systems. By delineating and strictly adhering to the upper limits of resource consumption and the bottom line of environmental quality and protection, China has limited development that harms the environment. China can share this knowledge in the context of South-South cooperation for ecological civilization.

(9) Cities and urbanization

Urbanization is, to a large extent, the dominant trend in the development of civilization, as it tends to mark a country's modernization. However, urbanization also produces environmental challenges, and thus needs to be integrated with the concept of ecological civilization. Most developing countries are still at the early stages of urbanization, and this leaves great opportunities for China to advance South-South

cooperation in this area.

Since 2001, China's urbanization rate increased by approximately one percentage point per year. In 2015, urbanization reached 56% and 22 cities each now have more than 5 million residents. In linking urbanization and ecological civilization, China learned a great deal from international experiences in earlier years, and then made changes according to its own conditions and characteristics, including its development programs for low-carbon cities. It has nurtured its industrial capacities with comparative advantages, while gaining experience. All this has set a solid foundation for China's South-South cooperation in urbanization.

(10) Urban infrastructure construction

Through the development and improvement of the urban infrastructure network, China can provide better public services, and support innovation and power for economic development. For developing countries, the Chinese government's experience in urban infrastructure construction including water, electricity, roads, gas, and network construction can be a key element of South-South cooperation. South-South cooperation in infrastructure construction can be government-led or based on public–private partnerships. China should encourage the enhancement of public infrastructure, which is essential to the successful future development of cities.

(11) Green, low-carbon transport

By optimizing urban traffic systems, controlling traffic levels, developing public transport, and promoting new, environmentally friendly automobiles, the Chinese government has vigorously promoted green transportation reform. In 2014, there were a total of 143.9 million private cars in China, 14 times more than in 2002.And the public transportation use was up 93.9% over 2002.[1] In order to reduce the pollution caused by urban traffic, the Chinese government has vigorously improved the quality of oil, encourages the transformation of gasoline-powered cars into electric vehicles, and promotes the use of blade electric vehicles (BEV), natural gas vehicles, and fuel cell vehicles. Profound changes are taking place in global transportation. With the rapid development of rail transportation, green transportation, and intelligent transportation systems, the Chinese government can use its experience and technological advantages to provide strong support for the efficient transformation of urban transportation through South-South cooperation.

(12) Green construction

The construction sector has been one of the main sources of urban energy

1 National Bureau of Statistics, *China Statistical Yearbook 2015*, p. 599.

consumption and greenhouse gas emissions. Reducing construction's energy consumption and optimizing construction's energy structure are two major strategies to promote sustainable development of the construction sector. The main ways to reduce the energy consumption of buildings include: the reasonable control of building size; improving building energy efficiency; and promoting energy conservation during construction. Promoting the use of low-carbon energy sources in the construction sector is an important key, especially the use of renewable energy in cooling and heating buildings. Currently, China is mainly promoting the transformation of heating systems, such as the use of gas-fired boilers instead of traditional coal-fired boilers, and the use of the latest geothermal heating technology.

(13) Energy and air

Since 2006, China has surpassed the United States and has become the world's largest energy consumer, but the dependence on a coal-based energy structure has brought great damage to the environment, especially air quality. Many developing countries also rely on cheap coal as a primary source of energy, and many cities suffer from serious air pollution due to heavy traffic and poor fuel quality. To promote ecological civilization in South-South cooperation, all partners must place importance on the promotion of clean energy and the improvement of air quality.

(14) Technologies for the clean use of coal

China has made significant progress in ultra-low-emission technology for coal-fired power plants. China has advanced coal-fired power generation units and environmental protection technologies, and can significantly reduce the emission concentration of pollutants with special removal technologies. Additionally, China has mature energy-saving technologies for the transformation of turbines, the recovery and utilization flue gas waste heat from boilers, frequency conversion of motors, and heating system transformation, thereby reducing coal consumption significantly. After the transformation, the average standard coal consumption of the coal-fired generating units fell from 333 g/ kWh in 2010 to 315 g/ kWh in 2015,[1] up to a world-leading level.

For some developing countries, their natural resource endowment and rapid economic development means that they must use cheap fossil energy-especially coal-to provide electricity. Therefore, deploying clean and energy-saving technology in coal-fired power plants is of great significance to meeting the increasing energy needs of developing countries. At the same time, China also needs to seriously consider the overall environmental impacts of coal-fired power plants and make its greatest efforts to meet the

1 Ministry of Environmental Protection, *Bulletin on China's Environment 2015*.

strictest environment standards in an effort to achieve ecological civilization in South-South cooperation.

Box 4-5 The Bali Island Coal-fired Power Plant Project in Indonesia

As the largest overseas thermal power project invested by China Huadian Corporation, the Bali Island Coal-fired Power Plant Project in Indonesia is based on an agreement signed between China Huadian Corporation, the Indonesian government, and Indonesia's National Electric Power Company. With installed capacity of 426 MW, the plant produces 40% of the island's power supply.

China Huadian Corporation invested USD 670 million in the project and will dominate its operation for 30 years as the primary share holder. The project was launched successfully in August 2015.[1]

The power plant adheres to the highest engineering and safety standards, and has strictly complied with environmental regulations throughout the whole process from design to construction and operation in order to reduce its environmental impact. To prevent the possible pollution caused by an open coal yard, Huadian established the first fully enclosed circular coal yard in Indonesia, retaining coal dust particles in a ware house, as opposed to having them drift in the air. In order to reduce the impact on the environment, the power plant established an effective desulfurization system. The sulfur dioxide and dust emission concentration was only 185 mg/m^3 and 19 mg/m^3 respectively, far below the national standard of Indonesia. The project's standard coal consumption is 317.46g/kWh, an advanced level by international standards.

After the coal-fired power plant in Bali Island was put into operation, it greatly alleviated the island's power shortages, reduced the cost of power generation, reduced the dependence on crude fuel and gas power generation, reduced the huge subsidy pressure on the local government, and produced good social and economic benefits.

(15) New energy transportation

Due to the poor fuel quality and low motor vehicle emission standards, the transportation sector usually emits pollutants in the city, causing serious air pollution and haze. After a period of serious air pollution in 2013, the Chinese government decided to implement a national vehicle emissions standards, and "fifth stage" gasoline and diesel fuel standards, close to those of the European before 2015. In addition, the Chinese government enthusiastically promotes the development of new, environmentally friendly automobiles, and resolutely eliminates low-emission vehicles not up to environmental standards. By developing fuel and emissions standards, China has prompted vehicle manufacturers and fuel suppliers to improve environmental standards-a lesson learned from the experiences of Europe and the United States. China cooperates with relevant agencies indeveloped

1 http://news.bjx.com.cn/html/20150906/659814.shtml.

countries, and is effectively promoting this pattern within the developing world where the vehicle industry is expanding rapidly.

(16) Renewable energy

In recent years, China has experienced rapid development in the field of renewable energy, especially in the fields of small hydropower, photovoltaic power generation, solar water heaters, and biogas. In these areas, China has world-leading technology. Over the past few decades, making good use of its technological advantages, China has carried out small hydropower and renewable energy projects in rural areas to improve access to electricity and to alleviate poverty. These projects contributed to improved living conditions and the economic development of Chinese villages. In the process, China gained a great deal of development experience.

By importing advanced technologies from other countries and innovating with them, China has effectively reduced the cost of renewable resources. Wind power and photovoltaic manufacturing have become important domestic industries producing world-leading technology. With the advantages of China's photovoltaic equipment manufacturing industry, the Chinese government implemented a poverty alleviation project in 2014 to help needy families in some poor counties to install distributed household appliances or photovoltaic power generation systems for agricultural facilities. These photovoltaic poverty alleviation projects promoted the growth of incomes and employment in impoverished regions in developing countries. In addition, wind and solar power generation, energy storage systems, solar water heaters, and biogas technologies also provide good energy solutions for areas not covered by the power grid in poor and remote regions in developing countries.

(17) Coping with climate change

As the largest developing country in the world and the one most vulnerable to the impacts of climate change, China places great importance to tackling the issue. Through institutional development and top-level design, China has taken positive action to mitigate and adapt to climate change, and has achieved remarkable results. China also actively promotes South-South cooperation in response to climate change, takes the initiative to hold technical and capacity building training events for the developing world, and has established the South-South cooperation Fund of 20 billion Yuan to address climate change. Since 2011, China has granted a total of 720 million Yuan to provide materials and equipment to developing countries to address climate change. Those donations include more than 13,800 sets of LED street lamps, more than 20,000 energy-saving air-conditioners, more than 10,000 solar photovoltaic power generation systems, 10,000 clean

stoves for cooking, and one meteorological satellite data collection processing system.[1]

(18) Improving energy efficiency

In the transportation field, China has designed a low-carbon traffic system framework for green recycling, issued a series of green transportation evaluation index systems, and further reduced the energy consumption of vehicles, shipping, ports, and civil aviation by promoting the monitoring of energy consumption monitoring and the implementation of fuel consumption standards. In the field of construction, China has revised energy-efficient design standards for public buildings[2] and green building evaluation criteria,[3]formulated and issued green store building evaluation criteria,[4] and further promoted green construction, heat monitoring, and energy-saving renovations of existing residential buildings.

(19) Increasing forest carbon sinks

China has made important progress in increasing its forest carbon sink and reducing emissions through policy and technology support. During the 12th Five-Year Plan period, China advanced the 12th Five-Year Plan for Forestry Development and the *Key Points for the Action of the Forestry Sector to Cope with Climate Change during the 12th Five-Year Plan Period*, and developed a series of technical programs such as the *Outline of National Afforestation*, the *Provisions for the Job Design of Forest Tending*, and the *Measures for Forest Tending Inspection and Acceptance*. During the 12th Five-Year Plan period, China had completed the reforestation of 450 million Mu and the tending of 600 million Mu[5] of forest. In addition, China has formulated the *Key Points for the Action of the Forestry Sector to Cope with Climate Change during the 13th Five-Year Plan Period* and has set a new target for increasing forest carbon sinks.

(20) Climate change adaptation in agriculture , forestry, and water

China increased investment in conservation tillage and adaptation initiatives, and issued more than 54 billion Yuan for the construction of water conservancy works. In 2016, China issued the *Forest Stewardship Action Plan for Climate Change Adaptation (2016—2020)*, making clear its objectives for climate change adaptation related to forest

1 "Xie Zhenhua: 720 million RMB Accumulated to Support Africa in Addressing Climate Change." *The China Youth Daily*, July 10, 2016.

2 "Design specification for building energy conservation:GB 50189-2015", China Architecture & Building Press, 2015.

3 "Evaluation Standard for Green Building GB/T 50378-2014", China Architecture & Building Press, 2014.

4 "Evaluation Standard for Green Commercial Architecture", China Architecture & Building Press, 2015.

5 Mu, a unit of area (=0.0667 hectares), from "Afforestation of 450 Million Mu Completed in 12 Five-Year Plan", Xinhua Net, January 10, 2016.

stewardship. It took effective measures to achieve its goals, including strengthening the comprehensive management of forests, strengthening the development of forestry nature conservation and wetland protection, and strengthening the protection of grasslands. Meanwhile, China also actively promotes environmentally friendly water policies and has launched or completed 100 national pilot projects addressing water conservation and seven on water rights. It has also launched 105 national pilot projects to reduce the impact of climate change on water resources.[1]

(21) Disaster early warning systems and forecasting

China's disaster warning systems and meteorological networks are the best in the world. China has a number of experts that understand how disaster warning systems can be adapted to conditions in developing countries. China has a number of experts that understand how disaster warning systems can be adapted to conditions in developing countries. China has therefore been able to effectively help developing countries to improve their resistance to climate change, building important partnerships along the way.

4.5.2.2 Evaluation of specific priority areas

It can be concluded that rural water pollution and drinking water, urbanization infrastructure, and renewable energy are China's priority areas for South-South cooperation. These are followed by agriculture and forestry, water resources, combating climate change, and disaster warning systems. Based on the needs of various countries and the changes in China's relative ability, more specific analysis needs to be carried out on the priority areas and indicators. This evaluation index system can help the Chinese government and enterprises clarify the development direction and priorities in South-South cooperation.

Through organizing experts to evaluate prioritization of the sub-areas analyzed above with criteria such as "Degree of relevancy with SDGs", "Appropriate technology", "Systematic solutions", "Innovativeness", "Linkages with infrastructure", etc., we have identified that "Water resources in rural areas", "Infrastructure construction in the process of urbanization and low-carbon transportation", "Renewable energy", "Energy efficiency", "Adaptation measures in agriculture, forestry, and water resources", "Disaster early warning systems" and other areas should be prioritized. Nevertheless it is also noted that these priority areas are not just limited to the areas highlighted above, and case-by-case analysis upon areas and indicators should be made based on the specific needs of recipient countries and changes in China's comparative capacity.

Generally speaking, in South-South cooperation for ecological civilization, China

1 "China's Policies and Actions for Addressing Climate Change (2015)", The National Development and Reform Commission, 2016.

should take into account not only its priority areas and technical abilities, but also the specific needs of developing countries. It should determine the priority areas for cooperation and set practical development goals. In the meantime, China should prioritize the areas where it can effectively improve people's livelihoods in the developing world, help achieve the Sustainable Development Goals, provide strong support for these areas, and actively cooperate with developing countries to jointly set more practical development goals and establish appropriate models of cooperation.

4.6 Policy recommendations for China to promote South-South cooperation for ecological civilization

China has become the second largest economy in the world, and is experiencing transformation from being a regional economic power to a global one. China has the responsibility and capacity to promote the transformation and expansion of South-South cooperation, which should contain the essence of ecological civilization. South-South cooperation for ecological civilization does not only mean a simple increase in aid budget to help developing countries achieve the Sustainable Development Goals, but an initiative that calls for working together to find innovative pathways of development. The Belt and Road Initiative and international production capacity cooperation are also consistent with South-South cooperation for ecological civilization. Altogether, China is enriching and innovating the idea of South-South cooperation and making a positive contribution to global governance and well-being.

The specific policy recommendations for China's South-South cooperation for ecological civilization will focus on three levels. First, to create a new strategy for China's environmental friendly foreign aid by standardizing and regulating traditional aid modalities and projects.Second, to increase assistance for ecological environmental protection, link developing countries' demand for green development closely with China's supply capacity, and provide direct support for developing countries to achieve ecological civilization. Third, to highlight the important role of the government's foreign aid to promote South-South cooperation for ecological civilization in a broader sense, taking trade and investment into account.

4.6.1 Principles

4.6.1.1 Balancing environment, livelihoods, and social development

Break through the traditional development mode of "grow first, clean up later". While

tapping into the substantial natural resources of developing countries, it is important to achieve a new development path that balances environmental protection, livelihoods, as well as social development.

4.6.1.2 A partnership of equals

South-South cooperation for ecological civilization does not refer to the traditional granting of aid and passive acceptance. Instead, it means partners will complement each other's advantages. China will share its development expertise with other developing countries and develop appropriate technology and design solutions to advance ecological civilization.

4.6.1.3 Active protection of the environment and nature

China should adapt to the transformation of its status from a regional power to a global power, actively address the environmental impact caused by its economic growth, and take the initiative to provide to the world more public goods reflective of ecological civilization.

4.6.1.4 Openness and inclusiveness

Encourage diversified actors, including domestic and foreign governments, civil society, and the private sector to participate in South-South cooperation for ecological civilization, so that the results of cooperation will benefit all. Additionally, do not exacerbate social inequality by allowing negative impacts on poor and vulnerable groups.

4.6.1.5 Transparency and compliance with rules

Enhance public information and use data and case studies to demonstrate the effectiveness of South-South cooperation for ecological civilization. Introduce environmental standards and permit South-South cooperation projects to be open to external monitoring.

4.6.2 Policy recommendations

4.6.2.1 Establish a high-level coordination mechanism for South-South cooperation for ecological civilization

(1) To establish a high-level central coordination mechanism led by the Premier or Vice-Premier to coordinate and embed ecological civilization into all of China's South-South cooperation initiatives. This mechanism should entail working in a coordinated way across the pertinent ministries and agencies. At the macro-level, enhance coordination and consultation among the pertinent ministries and agencies for strategy-and policy-making for South-South cooperation for ecological civilization as well as environmental evaluation of significant South-South cooperation projects. At the micro-level, undertake

regular performance assessments of the goals for each stage, policy implementation, and the impacts of significant projects, and formulate an accountability mechanism for South-South cooperation for ecological civilization. The mechanism would also be central for helping ministries to manage the increasing amount of financial resources available for promoting low-carbon development and for implementing the Sustainable Development Goals in developing countries. NGOs should also be invited to play a constructive role in coordination and implementation. Furthermore, the establishment of an "International Advisory Group for South-South cooperation for ecological civilization" would promote the concept of ecological civilization among partner countries and allow for joint learning.

(2) With this coordinating mechanism, a number of pertinent ministries and agencies should assume the mandate to mainstream ecological civilization into all their activities, from the macro-level of goal-setting, policy guidance, and establishing principles, to the micro level of institutional arrangements, process management, monitoring, and evaluation. This requires a shared understanding among ministries that there is a joint responsibility and accountability for delivery, and that the expertise and experience of all relevant ministries are needed. Close cooperation among MOFCOM, NDRC, MEP, and MFA will be helpful for ensuring that other departments, such as the Ministry of Water Resources, the State Forestry Administration, and the Ministry of Land and Resources, engage in this process. Furthermore, establish an independent development cooperation agency at an appropriate time to integrate South-South cooperation in different ministries.

(3) Develop a "Green Action Guide for China's Foreign Aid" to guide and regulate the activities of China's foreign aid that have an environmental impact. Give full play to the positive spillover effects of foreign aid on trade, investment, and other forms of South-South cooperation. Through the establishment of high-quality environmental protection indicators for the whole process of foreign aid projects, establish good models for commercial investment projects and green finance. Gradually improve green finance standards, as well as the monitoring and evaluation of the environment impacts of Chinese foreign investment.

(4) Establish a ministerial level "Chinese Agency for International Cooperation" at an appropriate time to lead and coordinate South-South cooperation work that is now conducted by different ministries, to incorporate the concept of ecological civilization in all aspects from the macro-level of goal-setting, policy guidance, and establishing principles, to the micro-level of institutional arrangements, process management, monitoring, and evaluation.

4.6.2.2 Create the enabling conditions for South-South cooperation for ecological civilization

(1) Develop medium- and long-term plans for South-South cooperation for ecological civilization, including plans for cooperation in priority fields and programs for different regions and countries. These should consider international trends, the needs of developing countries, and China's comparative advantages and capacity. These plans and programs should form a coordinated planning system to ensure that South-South cooperation for ecological civilization is conducted in an orderly manner. Integrate the concept of ecological civilization into South-South cooperation in other sectors, such as infrastructure, agriculture, and health care.

(2) Develop an enabling environment that allows inclusive participation. Actively mobilize China's local governments, especially border provinces. Make full use of Chinese enterprises investing in developing countries, and encourage them to undertake South-South cooperation projects, which could illustrate their commitment to corporate social responsibility and advance ecological civilization. Explore cooperation with international NGOs in project implementation and joint research, and encourage domestic NGOs to cooperate with NGOs in host countries. Use the UN and other multilateral platforms to promote South-South cooperation for ecological civilization. Explore triangular cooperation to encourage recipient countries to put forward and lead programs in support of South-South cooperation for ecological civilization.

(3) Strengthen research and capacity building at relevant institutions and for designated personnel in China. Strengthen awareness of environmental protection among staff involved in South-South cooperation. Adjust government staffing structures in support of South-South cooperation and find ways to enrich the talent pool. Promote exchanges with international organizations and relevant institutions. Enrich basic research, especially systematic in-depth study of regions and countries, special fields, technical research and development, and quantitative research about the impact of cooperation, which could provide a theoretical and data basis for policy-making.

(4) Promote the release of information and strengthen public communication. With the Sustainable Development Goals in place, link ecological civilization with the SDGs to make the concept of ecological civilization better known and discussed by the international community. Strengthen information and data collection for South-South cooperation for ecological civilization, and establish an official channel to release relevant policies, data, and project information systematically and with a clear focus. Objectively and scientifically present the results of South-South cooperation for ecological civilization. Establish a

platform for government and civil society to talk about South-South cooperation for ecological civilization, and to enhance the public support for the idea.

(5) Encourage the participation of domestic NGOs and select NGOs with international reach to participate in South-South cooperation for ecological civilization. Enhance non-governmental organizational exchanges and cooperation.

(6) Enhance international exchanges and cooperation in the field of environmental protection to promote ecological civilization through a variety of channels. First, China can increase support for UN agencies like the UNEP and UN HABITAT, by establishing special funds. Second, encourage traditional donor countries as well as other participants in South-South cooperation to share their experiences. Third, encourage China's NGOs in the field of environmental protection to cooperate and engage in dialogue with NGOs in developing countries.

4.6.2.3 Increase financial support and improve the effectiveness of expenditures

(1) Increase the amount of aid funds as well as the proportion of aid for environmental protection in China's total foreign aid budget. Make effective use of grants, interest-free loans, and concessional loans, and the combined effects of the mixed funding. Develop coherent overall planning for government funding of South-South cooperation, while clarifying the roles of relevant ministries.

(2) Innovate forms of development finance, and try to combine foreign aid with funds from development finance institutions and commercial banks. With a focus on South-South cooperation for ecological civilization, use public funds to play a leading role and thereby encourage the private sector to invest.

(3) Select appropriate topics that are consistent with the goals of South-South cooperation for ecological civilization, increase China's input, and explore program cooperation.

4.6.2.4 Improve whole-process management, especially evaluation

(1) Place great importance on the quality of the empirical data used for project planning and approval. Strengthen the understanding of partner countries' demands, and enhance coordination and consultation with relevant stakeholders from partner countries in the whole process. Broaden the sources of cooperation projects, so that more ecological protection projects can be included in the South-South cooperation projects database.

(2) Integrate existing foreign aid methods. While maintaining support for infrastructure development, further strengthen technical cooperation and knowledge sharing with developing countries. Establish a knowledge-sharing platform on South-South cooperation for ecological civilization. Make reference to China's experience in

industrial planning, legislation, and policy formulation, to help developing countries implement natural resource evaluation, industrial planning, the establishment of policy and legislation framework, management platforms, and other areas to promote technology transfer to and the capacity building of developing countries. Closely follow technology trends and actively promote the application of new appropriate technologies for South-South cooperation for ecological civilization. Prioritize ex-ante environmental impact assessments for large infrastructure, energy, mining, and agriculture projects. Also, embed ecological protection as an important post-evaluation indicator along with economic effects and social impacts. Consider the interaction of ecological, economic, and social impacts throughout project approval, monitoring, and evaluation.

4.7 Roadmap for South-South cooperation for ecological civilization

South-South cooperation for ecological civilization is a long-term effort that needs to always consider development trends and conditions. Between 2017 and 2050, South-South cooperation for ecological civilization can be divided into three stages: the stage of laying a solid foundation; the stage of deepening and scaling-up cooperation; and the stage of development and transformation. For each stage, specific implementation approaches and key actions will be needed. Here is what we foresee:

4.7.1 Stage One: Laying a solid foundation for long-term development (2017—2020)

4.7.1.1 Vision and goals

The global economy gradually recovers from the financial crisis, and the polarization of international politics grows deeper and deeper. Cooperation among countries is damaged by some forms of protectionism in international trade and investment, which causes decreasing marginal benefits in North-South cooperation. However, at the same time, the depth and breadth of South-South cooperation have been constantly enhanced as the emerging countries thrive. As one of the largest developing countries, China is taking a key role in setting the global development agenda. China consistently stands by developing countries, upholding the principle of common but differentiated responsibilities. South-South cooperation for ecological civilization that is initiated and implemented by the Chinese government will determine the direction of economic growth, industrial transformation, and social development in developing countries, guiding cooperation

among developing countries to a new level.

In this stage, China's specific goals for South-South cooperation for ecological civilization include: a) to significantly increase the proportion of environmental projects in all South-South cooperation implemented by China; b) to establish a system of South-South cooperation for ecological civilization; c) to convert cooperation initiatives announced recently by Chinese leaders into concrete results to set a good example for other fields; and d) to raise awareness of South-South cooperation for ecological civilization among domestic and international audiences and to strengthen participant bodies.

4.7.1.2 Approaches for implementation

At the national strategy level, develop a five-year strategy for South-South cooperation for ecological civilization and prepare for incorporating it into the 14th Five-Year Plan. The five-year strategy should adopt relevant requirements of other national strategies including the 13th Five-Year Plan, the Belt and Road Initiative, and international production capacity cooperation. At the enabling system level, enhance top-level design, including a consolidation of existing systems related to South-South cooperation for ecological civilization, thereby improving the policy and institutional framework for South-South cooperation. Accelerate the establishment of new funds for development aid and standardize the use of these funds; formulate relevant regulations to standardize how the funds are used; and encourage relevant ministries to issue application guidelines and measures for using these funds. Improve monitoring and evaluation mechanisms. At the participating body level, promote South-South cooperation for ecological civilization among local governments, civil society organizations, and private enterprises, and build capacity by sharing knowledge and experience among actors. Increase awareness and participation among the general public, in order to lay a foundation for the next stage.

4.7.1.3 Suggestions for key actions

(1) Institutional arrangements

Develop a Green Action Guide for China's Foreign Aid. Formulate country-specific plans for South-South cooperation for ecological civilization (2018—2023). Improve the rules governing the use of the South-South cooperation Assistance Fund and the China South-South Climate Cooperation Fund. Under the guidance of a high-level coordination mechanism for South-South cooperation for ecological civilization, establish a knowledge-sharing platform for South-South cooperation for ecological civilization.

(2) Global and regional actions

Convert initiatives announced recently by Chinese leaders at the UN Summit, FOCAC, Paris Climate Conference, and LMCM, into concrete results. Initiatives should

include, but not be limited to: the Ten, Hundred, Thousand cooperation plan and the Lancang-Mekong Exchange Center for Environmental Protection. Deepen triangular cooperation with international organizations, especially professional organizations like UNEP and UNHABITAT. Fully assess the environmental impact of China's growing foreign investment cooperation, especially the impact of cross-border industrial parks, infrastructure, production capacity cooperation projects, and the economic corridor. Working with the neighbouring countries, take the lead to establish the Asian Big Cat Fund as a way to promote cross-border wildlife protection.

(3) Bilateral actions

Implement on-the-ground environmental protection projects that are closely related to people's livelihoods in developing countries. For example, to address challenges with water security, access to electricity, and sanitation in Central Asian, South Asian, and Southeast Asian countries, we recommend to implementing solutions such as small water treatment devices and small hydropower stations. In Africa, implement the One Hundred projects on clean energy, wildlife and plant protection projects, environmentally friendly agricultural projects, and smart city solutions, which were announced in FOCAC 2015. In addition, launch national "Water-Energy-Food Action Plans" in selected countries. In Latin America and Pacific Island countries, build low-carbon cities and industrial zones for demonstration in selected countries, launch cooperation projects on clean energy, and work on cross-border protection of tropical rain forests in Latin America. In the area of climate change mitigation and adaptation, continue providing material assistance, but also work toward breakthroughs in project design and technical cooperation.

4.7.2 Stage Two: Deepening and scaling up cooperation (2021—2030)

4.7.2.1 Vision and goals

In the decade after 2020, the contribution of emerging countries to global economic growth would continue to increase, and cooperation among developing countries would be the main driver behind deepening globalization. In this period, various countries will make important progress in achieving the Sustainable Development Goals. To remain at a high level, these efforts will require international cooperation. By 2021, China will have become a well-off society and will have achieved its five goals including the overall improvement ecosystems and the environment.[1]During this decade, South-South cooperation would be a mainstreamed aspect of China's international cooperation; private enterprises and NGOs

1 Premier Li Keqiang, "Goals and Requirements of Accomplish Building a Comprehensive Well-off Society",People's Daily Newspaper, November 6, 2015, p. 3.

will constantly evolve to reflect this reality. In this period, ecological civilization would be deeply integrated into all aspects of the China-led South-South cooperation.

In this stage, China's specific goals for South-South cooperation for ecological civilization include: a) to deepen the extent to which South-South cooperation for ecological civilization is incorporated into the overall strategy for international relations; b) to scale up the quantity and quality of projects in South-South cooperation for ecological civilization, and encourage developed countries to increase the proportion of environment-related projects under their ODA; c) to shift the focus from quantity of projects to quality in an effort to enhance overall effectiveness while reducing the negative social and environmental impacts; and d) to further deepen bilateral and regional cooperation, and gradually expand the number of participants.

4.7.2.2 Approaches for implementation

At the national strategic level, incorporate South-South cooperation for ecological civilization into the China's overall strategy and plans of international cooperation, including the strategies and plans of local governments and ministries, including the "going out" strategy in foreign investment and trade. At the enabling system level, shift the focus from the establishment of institutions to institutional development, including improving rules and regulations relating to South-South cooperation for ecological civilization. Gradually improve the transparency of the policy process, enhance the degree of public participation, and raise public awareness of global environmental protection with the support of new media. Further increase financial support by combining different types of funds, and comprehensively promote green finance for South-South cooperation. In terms of the capacity building, develop a strong foundation for cooperation and create a professional team to service South-South cooperation for ecological civilization. At the participating body level, motivate local governments (with a particular focus on border provinces), explore South-South cooperation for ecological civilization through public-private partnerships, and encourage the participation of the public and private sectors in Southern countries.

4.7.2.3 Suggestions for key action

(1) Institutional arrangement

Under a high-level coordination mechanism for South-South cooperation for ecological civilization, make a comprehensive assessment of the first stage to summarize the experience and the lessons learned. Further improve the guiding policy for South-South cooperation for ecological civilization. Cooperate with the China-Africa Development Fund, the China-Africa Production Capacity Cooperation Fund, the China-ASEAN Fund,

the Silk Road Fund, and the China-Latin America Fund, among other mechanisms. Include non-governmental organizations, research institutions, and evaluation agencies in host countries into South-South cooperation for ecological civilization. Study the feasibility of triangular cooperation, fully agreed and led by the host country. Enhance investment in basic and policy research on South-South cooperation for ecological civilization.

(2) Global and regional actions

Promote South-South cooperation for ecological civilization through regional governmental cooperation mechanisms such as the African Union, FOCAC, the Shanghai Cooperation Organization, and ASEAN 10+1, among others. Include South-South cooperation for ecological civilization in G20 and BRICS discussions. Explore cooperation channels and consider roles for new development banks such as the Asian Infrastructure Investment Bank and the BRICS Development Bank. Launch regionally targeted regional and programs.[1]

(3) Bilateral actions

Select targeted countries willing to get involved, and provide technical assistance or capacity building projects to integrate the concept of ecological civilization with the countries' plans to achieve the Sustainable Development Goals. Gradually encourage and guide environmental compliance by China's private enterprises that conduct business internationally.[2]Analyze to understand the specific needs of cooperating countries for green development from the perspectives of infrastructure, technology, policy, education, research, and culture. Assist the host country to improve its capacity in environmental monitoring and the enforcement of laws and regulations.

4.7.3 Stage Three: Development and transformation (2031—2050)

4.7.3.1 Vision and goals

By the mid-21st century, the economic growth rate of emerging countries would maintain the trend of exceeding that of developed countries, but the living standards in developing countries would still be lower than those of developed countries.[3] Developing

1 For instance, "International Mountain Future Action Plan" and "Lancang-Mekong River Ecological Compensation Plan", and promoting the "Water - Energy - Food Action Plan" to East Africa, etc. Interviews conducted in July 2016, in Shanghai and Kunming.

2 For example, formulating the guideline for environmentally friendly development in cooperation with the government of Pakistan, developing green industrial park projects jointly with the Ethiopian government, and formulating the China-Myanmar cross-border forestry protection plan jointly with the Myanmar government. Information is the survey about developing countries' demands, from roundtable discussion with Pakistan government delegation in June 2016 and frominterviews conducted in July 2016 in Beijing.

3 "Looking to 2060: Long-term Global Growth Prospects", A Going for Growth Report, OECD, November 2012.

countries will have a larger population and a stronger consumption capacity than they have now, which would increase global environmental pressures. Environmental resources would be allocated unevenly, which might be a factor that causes regional conflicts. After 2030, the world would focus on setting new development goals, which would focus more on the relationship between environmental and social development. And the environment would have a greater impact on people's happiness and well-being.

Prior to 2049, building a modern country would become the focus of the government's work. By then, China would enter the ranks of middle- to high-income countries. The development gap between China and developed countries would be narrowed, but the gap with developing countries would be widened. As a global power, China needs to assume more international responsibility for the environment. Also, as a leader of South-South cooperation, China would have acquired enough experience and expertise to lead required reform of the international development aid system. Also, with the improvement of China's environmental governance capacity and a larger talent base, China would provide improved public products with enhanced technology to Southern states. The capacity to design global cooperation initiatives in ecological civilization and green development would increase, and China would be able to play a leading role in promoting the implementation of relevant action plans globally. Therefore, China-led South-South cooperation for ecological civilization would experience a positive transformation and enter a new stage.

In this stage, China's specific goals for South-South cooperation for ecological civilization include: a) to give new meaning to South-South cooperation for ecological civilization according to the global trends, and incorporate this evolving approach to South-South cooperation for ecological civilization into national strategies; b) to stand with developing countries and work together on a new global post-2030 development agenda that incorporates South-South cooperation for ecological civilization; c) to lead global innovation, and to pursue disruptive science and technology in the area of ecological civilization to benefit people in the developing world; and d) to embed South-South cooperation for ecological civilization as a major global trend that plays a positive role in deepening the mutual understanding and interdependence, and preventing international conflicts.

4.7.3.2 Approaches for implementation

At the national strategic level, through the "200-Year Goals" and Five-Year Plans, incorporate the evolving nature of South-South cooperation for ecological civilization into the national strategies, and prepare for a transformation of South-South cooperation

for ecological civilization as China enters the ranks of middle-high-income countries. At the enabling system level, continue to improve the transparency of the policy process for South-South cooperation for ecological civilization. Lead the reform and transformation of international environmental cooperation mechanisms. In terms of financial support, continue to improve the efficiency of South-South cooperation funds and conduct fundraising at the global level. As for capacity building, develop a new generation of development practitioners as the foundation of South-South cooperation for ecological civilization. Expand capacity building to go beyond simple projects to include communication between people to enhance mutual understanding through South-South cooperation for ecological civilization. At the participant body level, expand the participation of local governments, private enterprises, and the public, and make the South-South cooperation for ecological civilization an inclusive development process that engages people and communities throughout society.

Detailed descriptions of China's road map for South-South cooperation for ecological civilization are shown in Table 4-2.

Table 4-2 China's roadmap for South-South cooperation for ecological civilization

<table>
<tr><th colspan="2"></th><th>2017—2020</th><th>2021—2030</th><th>2031—2050</th></tr>
<tr><td rowspan="5">Vision and goals</td><td rowspan="3">Vision</td><td>Multi-polarity; protectionism; decreasing marginal benefits of North-South Cooperation</td><td>Emerging countries would contribute to global growth; SSC would become the main driver of globalization</td><td>Economic growth rate of emerging countries would continue
to exceed that of developed countries, but living standards would stay lower</td></tr>
<tr><td>Depth and breadth of SSC enhanced</td><td>SSC would also be mainstreamed into China's international cooperation</td><td rowspan="2">Environmental resources would be allocated unevenly, which could cause regional conflicts</td></tr>
<tr><td colspan="2">Standing by developing countries upholding the principle of CBDR</td></tr>
<tr><td colspan="3">Irreversible trend to regulate and standardize China's traditional foreign cooperation</td><td>A time to set new development goals</td></tr>
<tr><td rowspan="2">Goals</td><td>To significantly increase the proportion of projects related to EC</td><td rowspan="2">To scale up quantity and quality of projects, but shift the focus to quality and social and environmental impact; encourage developed countries to increase the proportion of environment-related projects</td><td>Give new meaning to SSC for EC, to support the transformation of the national strategy</td></tr>
<tr><td>To accomplish the development of a system of SSC for EC</td><td>Promote SSC for EC
as a major global trend that deepens mutual understanding and interdependence, and prevents conflicts</td></tr>
</table>

<table>
<tr><th colspan="2"></th><th>2017—2020</th><th>2021—2030</th><th>2031—2050</th></tr>
<tr><td rowspan="2">Vision and goals</td><td rowspan="2">Goals</td><td>To convert international cooperation initiatives into practices</td><td>To deepen the extent that SSC for EC is incorporated into the overall strategy</td><td>Stand with developing countries and work on a new agenda together</td></tr>
<tr><td colspan="2">To enlarge participant bodies</td><td>Lead global innovation in the pursuit of disruptive science and technology</td></tr>
<tr><td rowspan="3">Approaches for implementation</td><td>National strategy</td><td>Develop a five-year strategy for SSC for EC that relates to the 13th Five-Year Plan and the Belt and Road Initiative requirements</td><td>Incorporate SSC for EC into the China's overall strategy; consider the strategies of individual ministries and local governments as well</td><td>Incorporate SSC for EC with new content into the national strategy, and prepare for entering the ranks of medium-high-income countries</td></tr>
<tr><td>Enabling system</td><td>Top-level design with improved institutional settings; accelerate the establishment of new funds; improve monitoring and evaluation mechanisms</td><td>Shift the focus from the establishment of institutions to institutional development; improve transparency; combine different types of funding and promote green finance; put a professional team in place</td><td rowspan="2">Continue to improve the transparency of the policy process; lead the reform and transformation of international environmental cooperation mechanisms; continue to improve the efficiency of SSC funding and conduct fundraising globally; develop a new generation of development practitioners that are the foundation of SSC for EC</td></tr>
<tr><td>Participating body</td><td colspan="2">Include local governments, civil society organizations, enterprises, etc., and build capacity by sharing knowledge and experience among them; promote social mobilization to increase awareness and participation among general public; include PPP model</td></tr>
<tr><td rowspan="4">Suggestions for key actions</td><td>Domestic institution</td><td>Develop a Green Action Guide for China's Foreign Aid</td><td colspan="2">Study the feasibility of triangular cooperation, fully agreed to and led by the host country; enhance investment in basic and policy research</td></tr>
<tr><td rowspan="2">Global and regional</td><td>Convert initiatives into concrete results;deepen cooperation with international organizations</td><td colspan="2">Promote SSC for EC through appropriate global development dialogues and cooperation mechanisms, such as G20 and BRICS; launching regionally targeted initiatives and programs</td></tr>
<tr><td colspan="3">Fully considering the environmental impacts of China's growing foreign investment cooperation; encourage and guide the environmental compliance of our "going global" enterprises engaging in international trade and investment</td></tr>
<tr><td>Bilateral</td><td>Implement a number of on- the-ground environmental protection projects</td><td colspan="2">Integrate EC with the host countries' plans to achieve the SDGs; analyze to understand the specific demands of cooperating countries for green development; assist host countries in improving their capacity in environmental monitoring and the enforcement of laws and regulations</td></tr>
</table>

Chapter 5
China's Role in Greening Global Value Chains

Abbreviations

AIIB—Asia Infrastructure Investment Bank
APEC—Asia-Pacific Economic Cooperation
ASC—Aquaculture Stewardship Council
BCI—Better Cotton Initiative
BRI—Belt and Road Initiative
CCCMC—China Chamber of Commerce of Metal, Minerals and Chemicals
CCICED—China Council for International Cooperation on Environment and Development
CDB—China Development Bank
CFNA—China Chamber of Commerce for Foodstuffs and Native Produce
COFCO—China National Cereals, Oils, and Foodstuffs Corporation
CQM-PCC—China Quality Mark Certification Group Production Certification
EGA—Environmental Goods Agreement
FAO—Food and Agriculture Organization
FSC—Forest Stewardship Council
GDP—Gross Domestic Product
GHG—Greenhouse gas
G20—Group of Twenty
IUU—Illegal, unreported or unregulated
MEP—Ministry of Environmental Protection
MSC—Marine Stewardship Council
MOFA—Ministry of Foreign Affairs
MOFCOM—Ministry of Commerce
NDB—New Development Bank

NDRC—National Development and Reform Commission
NGO—Non-governmental organization
OECD—Organization for Economic Co-operation and Development
PEFC—Program for the Endorsement of Forest Certification
RSPO—Roundtable on Sustainable Palm Oil
RTRS—Roundtable on Responsible Soy
SASAC—State-owned Assets Supervision and Administration Commission
SDGs—Sustainable Development Goals
SOE—State-owned Enterprises
SPS—Special Policy Study
UN—United Nations
UNDP—United Nations Development Programme
UNEP—United Nations Environment Programme
WTO—World Trade Organization

5.1 Global commodity value chains-importance and opportunities

The world's ability to achieve the ambitions of the SDGs and the Paris Agreement will depend significantly on how it manages the global value chains that are the arteries of the global economy. Global value chains for commodities are both mainstays of developing economies and also significant drivers of many of the most acute sustainability challenges—including depletion of water resources, conversion of forests and other habitat, degradation of the oceans, and climate change. The imperative of greening global value chains for commodities thus runs like a red thread through the SDGs. Recent developments offer promise, however, that collaboration among governments, enterprises, and civil society can move the world onto a more sustainable course.

5.1.1 Importance–the impact of global commodity value chains

It is well-documented that the rapid growth in the world's demand for resources is straining the Earth's capacity to support us. The International Resource Panel convened by UNEP, for example,found that global material use (including minerals, fossil fuels, and biomass) has tripled over the past four decades[1],and estimated that the world could run out of recoverable minerals and energy resources before the end of the next century.

More broadly, WWF's Living Planet research estimates that over those past forty years, human consumption has outstripped the planet's regenerative capacity.[2] This growing pressure has already caused a precipitous decline in the health of the planet's living systems. The United Nations (FAO-UNDP) reports that 51% of the world's arable lands are moderately to severely degraded.[3] Half the world's moist tropical forests-the planet's most biologically diverse ecosystems – have been lost to logging and clearance for agriculture in the past 50 years[4].In many water basins, water is being withdrawn faster than its being replenished. One analysis found that, if current trends continue, stocks of all remaining food fish are predicted to collapse by the middle of the century.[5]

1 UNEP. (2016). Global Material Flows and Resource Productivity. Nairobi, Kenya: United Nations Environmental Programme.

2 WWF. (2014). Living Planet Report 2014: Species and Spaces, People and Places. Gland, Switzerland: The World Wide Fund for Nature.

3 Gomiero, T. (March 28, 2016). Soil Degradation, Land Scarcity and Food Security: Renewing a Complex Challenge. Sustainability, 8(2):1-41.

4 Mongillo, J. &Zierdt-Warshaw, L. (2000). Tropical Forests. In Encyclopedia of Environmental Sciences. Rochester, NY: University of Rochester Press.

5 Worm, B. (2006). Impacts of Biodiversity Loss on Ocean Ecosystem Services. *Science*, 314, 787.

In short, many of the vital resources and natural systems that underpin the global economy have become so depleted or degraded that they may not be available at any price if near-term action is not taken to manage them more sustainably.

Global value chains play a prominent role in driving this decline. A recent analysis found that expansion of commercial agriculture was responsible for 71% of the destruction of tropical forests over the past fifty years.[1]Agriculture accounts for 70% of water use globally, and "thirsty" crops grown for export, such as cotton and sugar, are a large part of that burden in some regions[2]. Overfishing is driving depletion of fish stocks – the FAO estimates that more than 90% of commercial fish stocks are now are overfished or fully exploited.[3] Global commodity production is a major contributor to climate change – the IPCC found that agriculture and deforestation account for 24% of global GHG emissions.[4]

Governments have often found it difficult to address these challenges. Global market demand creates enormous pressure to continually expand production, despite the mounting costs. Where governments have taken steps to assure more sustainable production of commodities and conserve their natural resources, their efforts have often been undermined by rampant illegal trade. It is estimated that 12% to 27% of the global wild fish catch is harvested illegally.[5]Recent analyses suggest that 15% to 30% of the annual volume of timber in international trade has been harvested illegally (and as much as 90% in certain countries). And illegal deforestation continues to underpin commodity production, including an estimated 39% of palm oil and 19% of soy.[6]

5.1.2 Opportunity to transform global value chains

Global value chains are vast and complex, and linking destructive practices in an exporting country to a specific final product in a different country is challenging. The distances between the sites of production and consumption are usually long, the chains of custody are opaque and cross multiple jurisdictions, and the raw commodity in international trade may be unrecognizable by the time it gets to the market because it has been transformed in a steel mill or a textile factory or, in the case of soy, in the gut of a

1 Lawson, S., Blundell, A., Cabarle, B., Basik, N., Jenkins, M., & Canby, K. (2014). *Consumer goods and deforestation: An analysis of the extent and nature of illegality in forest conversion for agriculture and timber plantations*. Washington, DC, USA: Forest Trends.

2 WWAP, 2012.

3 FAO. (2014). State of World Fisheries and Aquaculture. http://www.fao.org/3/a-i3720e.pdf.

4 IPCC. (2014). Climate Change 2014: Mitigation of Climate Change. Assessment Report 5.

5 Agnew, D. J., Pearce, J., Pramod, G., Peatman, T., Watson, R., Beddington, J. R., & Pitcher, T. J. (2009). Estimating the Worldwide Extent of Illegal Fishing. *PLoS one*, 4(2), e4570.

6 Lawson et al., 2014.

pig. “Greening” those chains may thus seem a quixotic quest. But the SDGs and the Paris Agreement provide a valuable foundation for action, embodying government commitments to address these challenges. And three developments offer the prospect of mobilizing the private sector and civil society to come to help grips with this challenge.

5.1.2.1 The Pinch Point

A first important insight is that while global value chains involve literally billions of actors – from producers to consumers – one does not have to reach or engage all of those actors in order to affect change. Each value chain has a pinch point – a relatively modest number of very large enterprises – traders, manufacturers, retailers – who control most of the trade.

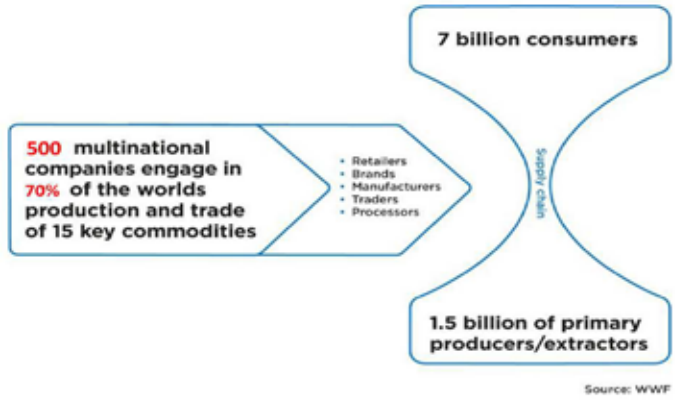

Figure 5-1 The pinch point of global commodity value chains

Source: Adapted from WWF, Better Production for a Better World, 2012 based off OECD. (2014). Building Green Global Value Chains: Committed Public-Private Coalitions in Agro-Commodity Markets

WWF analyzed the 15 commodities that are most responsible for the pressure on the Earth’s resources – the principal drivers of deforestation, fisheries depletion, and greenhouse gas emissions from land use. They found that approximately 500 companies accounted for 70% of the trade in those commodities(Figure 5-1). If one can engage those companies, many of which are Chinese companies or multinationals doing business in China, one can shift entire sectors.

5.1.2.2 The Rising Importance of Voluntary Standards

A second breakthrough has been the proliferation of broader international collaborations, among companies, NGOs, and in some cases governments, to create voluntary sustainability standards. The Better Cotton Initiative (BCI), the Extractive Industries Transparency Initiative (EITI), Fair Trade, the Forest Stewardship Council (FSC), the Marine Stewardship Council (MSC), the Roundtable for Responsible Soy (RTRS),

and the Roundtable on Sustainable Palm Oil (RSPO), to name a few examples, have established standards for social responsibility or sustainability and regimes for certifying compliance. Many of these systems have been built through robust multi-stakeholder processes – the RSPO, for example, has over 3,000 members, including producers, traders, buyers, NGOs, and governments. Voluntary standards are rapidly gaining prominence in global markets. For example, 20% of global palm oil production is now certified under the RSPO standards; [1]14% of wild-caught seafood is certified under one voluntary regime or another, and that share is growing at a rate of 35% per year. UNEP has estimated that the market for certified agriculture and forest products will be $225 billion in 2020.[2]

These initiatives show heartening potential. They also face significant challenges, including engaging small producers in developing countries and in continuing to build market share, especially in emerging economies. Many committed buyers, producers, and governments are worried that their efforts will not succeed in the long run without stronger engagement and leadership from China. In fact, as these initiatives take off, China has a singular opportunity, as the largest player in the market, to engage these efforts and to shape global value chains that provide sustained supplies of valued commodities while safeguarding the ecosystems and resources that produce them.

5.1.2.3 Transparency and traceability

A third rapidly developing breakthrough is the dramatic advances in tools for transparency and traceability. We are in the midst of a data revolution that includes, advances in generation and collection of new data sources, from remote sensing to social media; new analytical tools for extracting insights and making predictions, such as machine learning and artificial intelligence; and new ways to put information in the hands of users, such as smartphone apps and RFID tags. This revolution is creating radical transparency in supply chains – illegal or unsustainable activity anywhere is visible everywhere, and in real time. It is also increasingly enabling governments, companies, and consumers to trace products from the store shelf back to the origins of each ingredient and component, monitoring behaviors and environmental impacts at every link in the value chain.

(1) Transparency: A few examples illustrate the possibilities

Deforestation: Brazil's success in controlling deforestation in the Amazon was

1 Pan, J., & J. Forgach. (2012). Going Global, Going Green – China Investment, Trade and Environment. *China Council for International Cooperation on Environment and Development*.http://www.iisd.org/pdf/2012/going_global_going_green.pdf.

2 TEEB. (2010). The Economics of Ecosystems and Biodiversity Report for Business – Executive Summary. United Nations Environmental Program.

made possible by its cutting edge satellite monitoring capability. Similar capability is now available to the rest of the world through WRI's Global Forest Watch, which uses satellite data to monitor deforestation and forest fires around the world. Satellite data is rapidly improving-offering resolutions of up to 30 centimeters, for example, and new flocks of satellites that will take a picture of the entire Earth every day. Satellite data is complemented by initiatives like Eye on the Forest, in Indonesia, which use social media to allow communities to report illegal activities. Together, these capabilities provide the potential to spot deforestation as its happening, to stop it, and to name the culprits.

Fish: Several initiatives combine data from multiple sources to monitor fishing activity. Project Eyes on the Seas, for example, combines data from radar and cameras on satellites and from transponders on boats to create highly accurate real-time maps of fishing vessel movements, and automatically alert relevant authorities to illegal activity.

Agriculture and water: Remote sensing data can increasingly be used to monitor agricultural practices, including the use of chemical inputs and extraction of water for irrigation. Satellites can also be used to monitor the status of surface water resources and even to measure and monitor groundwater reserves.

(2) Traceability

While we are quickly gaining much greater visibility over what happens in the production of commodities, it is often difficult to trace specific products from the producer to the store shelf. Some of the certification regimes described above have established robust "chain-of-custody" systems to ensure that traceability. Data innovations are also opening up new possibilities. Some Chinese companies are already using QR codes on meat, for example, to allow customers to trace products back to individual farms. RFID tags allow a company to track individual products through their supply chains. The cost of DNA analysis has fallen so precipitously that some seafood companies are developing tools for "DNA barcoding" – a molecular-based system that allows consumers to trace the source of tuna and other large fish. Other companies are applying blockchain technology– which underlies Bitcoin and other virtual currencies – to create unforgeable digital "passports" for physical products that allow businesses and customers to trace and audit the environmental, social, and economic footprint of each individual product throughout its supply chain.

This explosion in transparency and traceability creates new risks, of course – enterprises and countries will face even greater scrutiny of the activities and impacts in their global value chains. These advances also create huge new opportunities, however, for countries, enterprises, and consumers to ensure that global value chains are serving

their priorities and their values, and to gain market advantage by assuring that their own products are green.

5.2 Six case studies of global value chains of commodities

To better understand the global value chains for commodities and their implications for China, we undertook case studies of six commodities – seafood, soy, palm oil, cotton, timber, and copper. These six were chosen to represent the diverse roles that commodities play in the Chinese economy, the diverse sustainability challenges they present, and the range of solutions that are possible and, in some cases, underway. These six cases may be usefully considered in three groupings – commodities that are important to China's food security; renewable commodities important to the economy; and non-renewable ("hard") commodities.

5.2.1 Food

China has established rigorous programs to assure that it is self-sufficient in some staple crops – notably wheat and rice. Over the past two decades, however, China has become increasingly reliant on global markets to supply other commodities that are vital components of its food supply, and to buy commodities it produces. Seafood, soy and palm oil are examples.

5.2.1.1 Seafood

Seafood is the most important source of animal protein in China. It is also the most important component of the agricultural economy – accounting for 22% of total agricultural revenue. China is the world's largest producer of seafood, producing 16% of wild catch, and 62% of aquaculture. China is also the world's leading seafood exporter, supplying 14% of total trade.[1]

This burgeoning industry now faces formidable natural constraints. Since 1985 global wild catch has stagnated at 80 million MT a year, with 31% of fisheries overharvested, and a significant share that is illegal, unreported, or unregulated (IUU). The World Bank estimates that this unsustainable harvest is costing the global economy US$80 billion annually. The only way to maintain and increase production for the long term is to control overfishing now so that stocks can recover and offer a higher, sustainable yield.

Fish farming, which has been expanding at 5.5% per year over the past 20 years, offers the greatest promise in the long-term for meeting expected growth in demand for

1 FAO. (2016). The State of World Fisheries and Aquaculture. Rome.

seafood in China.[1] Further expansion faces significant challenges, though. Most of the high quality growing areas have already been developed. Intensive and unregulated aquaculture has caused severe pollution in fresh and coastal waters. Feed relies heavily on wild-capture fish and soy, both of which face sustainability issues.

If China is to establish the longer-term security of its seafood supply, it must also continue to tighten regulations to ensure that all wild catch operations are both legal and sustainable, while simultaneously seeking more efficient and environmentally sustainable methods to enable further growth of its aquaculture sector.

There are now significant international efforts to come to grips with these challenges. Several governments are taking action to control trade in illegal seafood. The EU has enacted regulations requiring that all seafood imported into the EU be from legal and reported sources. The Transpacific Partnership requires all trading partners to ensure that all seafood trade comes from legal sources. The Port State Measures Agreement, negotiated under the FAO, also imposes important safeguards against IUU fish.

Voluntary certification regimes, including the Marine Stewardship Council and Aquaculture Stewardship Council, have established international standards. Many multinational companies have committed to compliance with those standards. All fish in Filet-O-Fish sandwiches sold at McDonald's in the United States, Canada and Europe is MSC-certified. IKEA has committed to sourcing 100% of its seafood from MSC- or ASC-certified sources. More than 90% of Walmart U.S., Sam's Club and Asda's (U.K.) fresh and frozen farmed and wild seafood are certified by either MSC or the Global Aquaculture Alliance, or engaged in a fisheries improvement program.[2]

These market requirements have fueled a 35% annual average growth rate in the adoption of voluntary sustainability standards globally over the past decade.[3] As of 2015, 14% of global seafood production was certified under one or another voluntary sustainability standard.[4] Maintaining China's competitiveness in the fish processing sector moving forward will require comprehensive and credible demonstration of compliance with international sustainability and legality requirements.

To move China's seafood sector toward sustainability there are a few urgent priorities.

1 World Bank. (2013). Fish To 2030: Prospects for Fisheries and Aquaculture. Agriculture and environmental services discussion paper no. 3. Washington, DC: World Bank Group.

2 Wal Mart. (2016). Wal Mart - Sustainable Food. http://corporate.walmart.com/global-responsibility/environment-sustainability/sustainable-agriculture.

3 Potts, J., Wilkings, A., Lynch, M., &McFatridge, S. (2016). State of Sustainability Initiatives Review: Standards and the Blue Economy. Winnipeg: International Institute for Sustainable Development (IISD).

4 Potts et al, 2016.

The first priority is implementation of a mandatory national system to assure the legality of all traded seafood products. A second priority is to subsidize a transition to compliance with internationally recognized sustainability standards – for both imported seafood and domestic production, wild-caught and farmed. Compliance would both assure stronger traceability of seafood products, and secure enhanced access to international markets. Implementation of strong standards for China's booming aquaculture sector would also help create a path for its continued expansion – curbing the eutrophication and land conversion that threaten to undermine future prospects. A third priority is to help drive long-running WTO negotiation fisheries subsidies to conclusion, to help curb subsidies that are fueling overcapacity and overfishing.

5.2.1.2 Soy

Over the past fifty years, global soybean production increased 15-fold to become the leading agricultural commodity in global trade; the area of soy plantations expanded from less than 30 million hectares to more than 140 million.[1] This expansion has caused widespread conversion of tropical forests and other natural ecosystems, resulting in significant carbon emissions, loss of biodiversity, soil erosion and social inequality in the major producer countries such as Brazil, Argentina and Paraguay.

Until very recently, China was the world's largest producer, producing 12 million tons annually. It is still the largest grower of non-GMO soy, but today China is also the largest importer of soy, purchasing 60% of the soybeans traded on the world market[2] – more than 80 million tons per year[3] – to meet demand for animal feed and vegetable oil.

Food security is the most pressing issue for China previously. Chinese government has, historically, given priority to stable supply of agricultural commodities to ensure food security. Chinese and multinational companies importing soy into China have not yet seen sustainability as important to their business in the China market.

This status quo may be shifting, however, as the largest global buyers and traders of soy have made commitments to greening the global soy value chain, with a particular focus on eliminating deforestation. Altogether, more than 250 multinational companies have committed to eliminating deforestation from their supply chains. In 2006, buyers such as McDonald's and traders such as Cargill and ADM joined with growers in a

1 WWF. (2014). The Growth of Soy: Impacts and Solutions. WWF International, Gland, Switzerland.

2 The Observatory of Economic Complexity. (2014). Which Countries Import Soybeans? http://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/show/all/1201/2014/.

3 USDA-FAS. (2 November 2016). China: Oilseeds and Products Update. http://www.fas.usda.gov/data/china-oilseeds-and-products-update-13.

moratorium on sale of soy produced from deforestation in the Amazon. In conjunction with vigorous measures by the Government of Brazil, that moratorium has helped achieve a 70% reduction in deforestation in the Brazilian Amazon over the past 12 years[1], while supporting a 60% increase in soy production in the region (Figure 5-2).

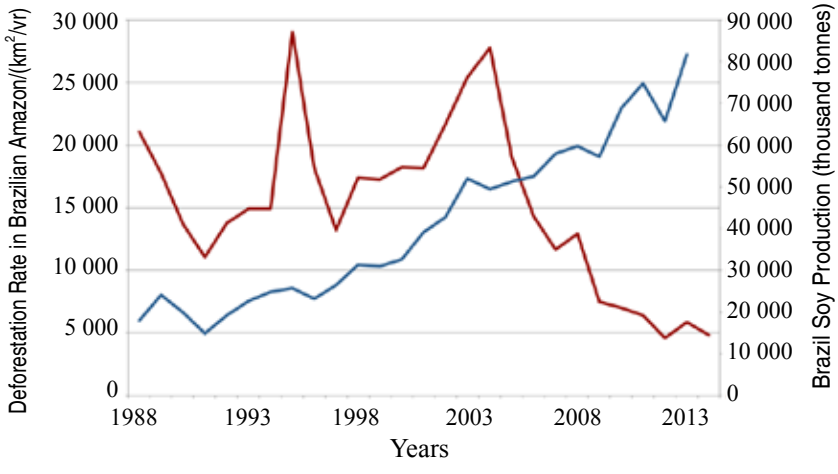

Figure 5-2 Brazil's deforestation rate and soy production since 1988

Source: Brazil National Institute of Space Research. (2015). ProdesTaxasAnuals. FAO. (2014). FAOSTAT statistics database. Rome:FAO.

The international conservation community has been working hard with governments and farmers in Brazil and other South American countries to build on this success and reduce conversion of natural habitats across the continent. Farm level certification schemes such as the Round Table for Responsible Soy and jurisdictional sustainability approaches have been developed to increase the sustainability of soy plantations.

Joining global efforts on soy would strengthen China's reputation on the international stage, its relations with producing countries, and the competiveness of Chinese companies in the global market. It would also reduce China's contribution to climate change – deforestation from expansion of soy and other major commodities accounts for more than 10% of global emissions.[2]

Strong laws now in place, such as the Forest Code in Brazil and measures expected

1 Howard, B. (5 June 2014). Brazil Leads World in Reducing Carbon Emissions by Slashing Deforestation. http://news.nationalgeographic.com/news/2014/06/140605-brazil-deforestation-carbon-emissions-environment/

2 Schaap, B. & Thiel, A. (11 December 2015). The Paris REDD+ Roller Coaster. http://forest-trends.org/blog/2015/12/11/the-paris-redd-roller-coaster/.

in other jurisdictions, mean that it is now possible for China to forge Sustainable Sourcing Agreements that improve the sustainability of its imports while still securing adequate volume. Sustainable Sourcing Agreements with China's most important trading partners– either national governments or key states – would allow China to achieve this win-win. Chinese government should then also provide development assistance to key producing countries and states to help them implement programs to ensure supply of large quantities of soy with credible verification of sustainability.

5.2.1.3 Palm oil

In recent decades, palm oil has become the world's leading vegetable oil, used not just as cooking oil but as an ingredient in a wide range of products, from cup noodles to ice cream to lipstick.[1]To meet this global demand, palm oil production has expanded from just 2 million metric tons in 1980 to more than 56 million metric tons in 2013.[2] Half of global production is in Indonesia and another third in Malaysia, but palm oil is also expanding rapidly in Central and West Africa, and in parts of Latin America. China is the second largest buyer of palm oil in the international market, importing 10% of total global production.[3]

Oil palm is a very efficient source of vegetable oil, yielding four times as much oil per hectare as other oil crops. The rapid expansion of oil palm plantations has been a major driver of deforestation, however. In 2015, more than 120,000 fires swept across the Indonesian islands of Borneo and Sumatra, burning forests and peatlands that had been dried out by palm oil and pulp plantations. The World Bank estimated that the fires caused a 2% decline in Indonesia's GDP.[4]A recent study estimated they caused nearly 100,000 deaths.[5] The fires also produced massive greenhouse gas emissions, exceeding the annual emissions of Japan and Russia. Indeed, on many days in September and October 2015, the emissions from the fires exceeded the total daily emissions of China.[6]

1 Byerlee, D., Falcon, W., & R. Naylor. (2016). The Tropical Oil Crop Revolution: Food, Feed, Fuel, and Forests. Oxford University Press.

2 FAOSTAT. (n.d.) Production of Palm Oil, World. [Data file]. Food and Agriculture Organization of the United Nations – Statistics Division.Retrieved August 30, 2016 from http://faostat3.fao.org/.

3 FAOSTAT, 2016.

4 Glauber, A. J., &Gunawan, I. (2016).The Cost of Fire: An Economic Analysis of Indonesia's 2015 Fire Crisis. The World Bank Group: Jakarta, Indonesia.

5 Koplitz, S. N., et al. (2016). Public health impacts of the severe haze in Equatorial Asia in September–October 2015: demonstration of a new framework for informing fire management strategies to reduce downwind smoke exposure. *Environmental Research Letters*, 11(9), 094023.

6 Morales, A. (October 28, 2015). *How Indonesia's Fires Made it the Biggest Climate Polluter*. Bloomberg News. http://www.bloomberg.com/news/articles/2015-10-28/how-indonesia-s-fires-made-it-the-biggest-climate-polluter.

The Roundtable on Sustainable Palm Oil has established principles and standards for sustainable production; 20% of palm oil produced today is certified under those standards.[1]Forty-four Chinese companies have joined RSPO, but none has yet committed to full implementation of its standards.[2] In recent years, the largest international, Indonesian and Malaysian companies that grow, trade and buy palm oil – accounting for more than 60% of the global market – have made broader commitments to "no deforestation." The Government of Indonesia has also announced a moratorium on further clearing. The support of China and Chinese companies will be decisive.

The China Chamber of Commerce of Foodstuffs and Native Produce (CFNA) has called for action: "For Chinese enterprises involved with palm oil, the coming five years will be a critical period for the development of a robust sustainability approach that will offer better guarantees for the future stability of the palm oil sector and its contributions to food security, economic prosperity and global environmental improvement."[3] In the near-term, a clear signal from the government encouraging companies to demand deforestation-free supplies, and to begin developing national guidelines on sustainability would set change in motion. In the longer term, the government should use procurement requirements and preferential tariffs to incentivize a shift to sustainable palm oil, and use its development assistance to help producing regions implement sustainable production.

5.2.2 Commodities of economic importance

Soft commodities are also an important input to China's economy. As just noted, China is the world's leading processor and exporter of seafood. Cotton and forest products also are vital inputs to important industries.

5.2.2.1 Cotton

China's textile industry is the largest in the world, producing 30% of global output.[4] It is a significant export industry – 40% ～ 45% of production is for export[5] – and a significant employer, accounting for 10% of industrial employment in the country.[6]

1 Roundtable on Sustainable Palm Oil. (31 July 2016). Impacts. http://www.rspo.org/about/impacts.

2 RSPO. (1 December 2015). *China & Sustainable Palm Oil: From Challenge to Partner*. http://www.rspo.org/news-and-events/news/china-and-sustainable-palm-oil-from-challenge-to-partner.

3 CFNA &Defra.(2011). *Prospects and challenges of sustainable palm oil for China*. Beijing: China Chamber of Commerce for Imp. and Exp. of Foodstuffs, Native Produce and Animal By-Products.

4 USDA.(2016). Annual Economic Outlook for Cotton.http://www.cotton.org/econ/reports/annual-outlook.cfm.

5 Estimates based on Chinese National Bureau of Statistics, FAO International Cotton Advisory Committee's World Apparel Consumption Survey and World Trade Organization export data.45

6 Macdonald, 2015; Macdonald, S., Gale, F. & Hansen, J. (2015) Cotton Policy in China.USDA.

Cotton is a mainstay of that industry. China has long been the largest source of cotton, although it has recently been overtaken by India, and cotton growing is the main source of income for more than 7 million farmers across the country. China is also a significant importer, sourcing cotton from the US, Australia, India, Uzbekistan and Brazil(Figure 5-3).

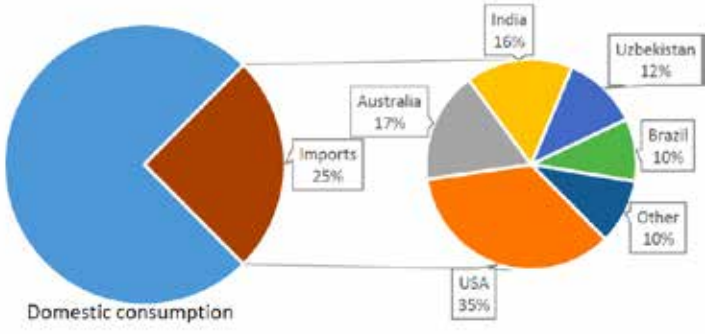

Figure 5-3 Chinese reliance on cotton imports (2015—2016)

Source:Consumption and imports: USDA. "World Agricultural Supply and Demand Estimates," September 12, 2016. http://www.usda.gov/oce/commodity/wasde/latest.pdf.

Cotton cultivation relies heavily on inputs – both chemicals (pesticides and fertilizers), and water. Although cotton is grown on only 2% ～ 3% of the world's arable land, it accounts for 14% of global insecticide use;[1] it is China's most chemical-reliant crop, accounting for 25% ～ 30% of all pesticide use in the country.[2] More than 90% of farmers in China now use Bt cotton[3] (a GMO), which reduces dependence on pesticides, but there are indications that pest resistance to Bt cotton is increasing, giving rise to doubts about long-term effectiveness.

Cotton tends to be grown in regions, like Xinjiang Uygur Autonomous Region, that are hot and dry, so cultivation typically depends on intensive irrigation. Use of water to grow cotton has been a major cause of water scarcity. Most notoriously, cotton farming drained the Aral Sea, which shrunk from 200,000 km^2 in 1920 to 50,000 km^2 in 2005.[4] In Xinjiang, irrigation caused a 4~6 m drop in groundwater levels in the Tarim River Basin

1 FAO AQUASTAT. (2014). Irrigated Crops. http://www.fao.org/nr/water/aquastat/infographics/Irrigated_eng.pdf.

2 Wu, K.M., Guo, Y.Y., (2005). The evolution of cotton pest management practices in China. Annu. Rev. Entomol. 50, 31–52.Xiao, J., Zhao, J.B., 2005.Farmland plastic.

3 ISAAA. (2015). ISAAA Brief 49-2014: Executive Summary. http://www.isaaa.org/resources/publications/briefs/49/executivesummary/default.asp; Pan, J., Chu, C., Zhao, X., Cui, Y., Voituriez, T. (2008). Global Cotton and Textile Product Chains Identifying challenges and opportunities for China through a global commodity chain sustainability analysis. Winnipeg: IISD and MOFCOM.

4 Kooistra, K.J., Pyburn, R., Termorshuizen, A.J. (2006). The Sustainability of Cotton: Consequences for Man and Environment, Science Shop Wageningen University & Research Centre. Report 223.

between 1960 and 1980, and the lower reaches of the Tarim River have run dry.[1]Many of the world's major producing regions – in China, India, Australia, Uzbekistan, and Mali – face growing water scarcity.

Soil pollution is also a looming challenge. Heavy use of pesticides and fertilizer contaminates soils. Intensive irrigation leads to salinization – it is estimated that soil salinity affects one-third of the irrigated cropland in Xinjiang, for example.

Acute water scarcity and the depletion and contamination of soils pose fundamental threats to the long-term viability of the cotton sector. Recognizing these challenges, there is now a significant NGO and private sector movement to implement voluntary sustainability standards for cotton. Several of the world's largest buyers, including Levi Strauss, Adidas, H&M, Ikea, and Nike, have committed to sourcing sustainable cotton. Market share for certified sustainable cotton is growing very fast. The leading standard is the Better Cotton Initiative, which focuses particularly on reducing reliance on inputs and thus has been able to reduce impacts while also increasing income for farmers. From 2012 to 2015, Better Cotton expanded its market share 56% per year.[2]It now has 11.9% of the global market, and aims to reach 30% by 2020.[3] It is reasonable to project that these international standards will soon become accepted international norms, and the price of entry to the global market.

China has taken various measures to improve the sustainability of domestic production, through subsidy programs, for example. But embracing international standards will be vital to China's interests in two ways – in helping it ensure the continued viability of suppliers overseas; and in maintaining its competitive position in the global market for textiles by assuring export customers that its textiles are made with cotton that meets international expectations. First priorities are to translate international standards to the local conditions of Xinjiang, and provide subsidies and technical support to help farmers come into compliance. Preferential tariffs for certified sustainable cotton could also help Chinese textile producers shift their purchasing. Through these steps, China can set its industries on a path that assures the long-term sustainability of the textile and cotton sectors, and a continue leadership position in export markets.

5.2.2.2 Forest products

Unsustainable logging and pulp plantations are important drivers of deforestation and

1 Soil salinity impacts about one-third of the total irrigated cropland in Xinjiang. See Zhao, X., Wu, P., Gao, X., &Persaud, N. (2015). Soil quality indicators in relation to land use and topography in a small catchment on the Loess Plateau of China. *Land Degradation & Development*, 26(1), 54-61.

2 Better Cotton Initiative. (2016). *2015 at a Glance.* http://bciannualreport.org/2015-at-a-glance.html.

3 Better Cotton Initiative. (2015). *Better Cotton Initiative Annual Report 2015*. Geneva: Switzerland.

degradation.[1] Global trade of forest products reached $492 billion in 2015.[2] It is estimated that 10%~30% of this comes from illegal logging.[3] The World Bank and INTERPOL calculate that illegal logging is costing countries at least $10 billion per year with loss of tax income and revenue.[4]

China is the largest player in global forest products value chains, accounting for one third of global export and import in 2015, amounting to 4% of China's overall trade, up from 2% in 2005.[5] China imports forest products in mostly unprocessed forms (e.g., pulp, industrial logs, lumber, waste paper, etc.) and exports them mostly as furniture and paper to developed countries. China has also become a leading investor in forestry globally, with 61 million hectares of forests concessions in 20 countries.

The improvements made in the sustainability of the global forest products sector owe much to both private and public innovations. In the early 1990s, a group of environmental organizations and retailers created the Forestry Stewardship Council to establish standards and systems to certify forest land owners and companies who comply with its sustainability principles and performance based metrics – awarding "carrots" rather than the "sticks" of traditional boycotting campaigns. As of June 2016, FSC certified forests are found in 81 countries, covering over 190 million hectares. FSC has awarded 30,588 chain-of-custody certificates in 118 countries.[6] Currently, 14% of timber products and 55% of pulp and paper (recycled) is FSC certified.[7]Together FSC and the Programme for the Endorsement of Forest Certification (PEFC) certify over 10% of world's forest.[8]

Some major importing countries have also established legislation to curb the flow of illegal timber. In 2003, the EU created the Forest Law Enforcement Governance and

1 WWF and IIASA. (2015). Chapter 5 Saving Forests at Risk in WWF Living Forest Report. The World Wide Fund for Nature, Gland, Switzerland.

2 FAO defines forest products to include timber produced on the basis of forest resources and other products using timber as raw material. The term primarily refers to logs, lumber, wood-based panel, finished and semi-finished wooden products, wood pulp, paper and paper products that use wood as raw material.

3 Hoare, A. (2015). Tracking illegal logging and related trade: what progress and where the next. Chatham House, UK.

4 INTERPOL/World Bank. (2009). Chainsaw Project: An INTERPOL perspective on law enforcement in illegal logging. INTERPOL General Secretariat, Lyon.

5 Chen, S. (2016). Chinese Forest Products International Trade Policies under Global Context. Presentation at State Forestry Administration Center for Global Forestry Products Trade Research Annual Conference and Forestry Sector Green Investment International Seminar.

6 FSC.(2016). Facts & Figures.Forest Stewardship Council. https://ic.fsc.org/en/facts-figures.

7 FSC, 2016.

8 UNECE. (2015). Forest Products – Annual Market Review 2014—2015. United Nations Economic Commission for Europe.

Trade program, which provides for Voluntary Partnership Agreements between the EU and timber-producing countries to support their efforts to combat illegal harvesting. The EU Timber Regulation (EUTR), in effect since 2013, prohibits illegally harvested timber and products derived from such timber in EU markets.[1] The U.S. and Australia have enacted similar requirements.

The Chinese government and relevant stakeholders have also experimented with an evolving range of tools. Starting around 2006, a unique multi-stakeholder FSC National Initiative, convened by SFA, drafted a localized and also internationally competitive standard. As of June 2016, China has 892,508 hectares of FSC certified forests and 4,472 companies chain-of-custody certified.[2] Companies involved in the production, use and sale of FSC products include both multinational business like Wal-Mart, Tetra Pak, IKEA and Kimberly Clark and leading Chinese businesses such as Vanke, Jilin, Heilongjiang Forest Industry Group, Sun Paper Group, Yi Hua Timber and An Xin Floors. Seven out of China's top ten paper manufacturers are FSC certified.[3]

China collaborated with the UK government to pilot the Chinese Timber Legality Verification System (TLVS) since 2009 with a two-pronged strategy. SFA entrusted the China National Forest Products Industry Association (CNFPIA) with the development of responsible purchasing and due diligence policies for a voluntary legal timber verification system, based on international experience. The pilot also aims to foster direct bilateral agreement with timber exporting countries on standards to identify legal products. Under the APEC framework, China has called on countries to establish a mechanism to mutually recognize their legality verification system.

To address issues in China's overseas direct investment,SFA issued the Guideline for Sustainable Forestry Management and Utilization for Chinese Overseas Enterprises in 2007 and has been drafting the Guideline for Sustainable Trade of Forest Products and Investment for Chinese Overseas Enterprises since 2013. But the implementation of the guidelines by companies overseas remains a question.

The most important step the Chinese government could take to improve the sustainability of the forest products value chain would be to accelerate implementation of the national legality verification system, to stop illegal trade and enable domestic policies such as green public procurement. It can tap into the green credit system to support

1 Due diligence is when traders perform a risk management exercise to minimize chances of supplying illegal timber.

2 FSC.(2016). Home Page. https://cn.fsc.org/cn-cn

3 FSC. (2012). *Future is bright for FSC certification in China thanks to productive relationship with Chinese authorities*. https://ic.fsc.org/en/news/national-news/id/161.

sustainable and responsible forest companies in both domestic and overseas concessions. SFA should strengthen training and guidance to companies to enhance their compliance with legal requirements. The government could also support expansion of Chinese companies' participation in FSC and other private sector initiatives aimed at building sustainable supply chains.

5.2.3 Hard commodities

In this study, we focused principally on "soft" commodities which pose sustainability challenges that are both significant and often ignored. But China also depends vitally on imports of "hard" commodities, including fossil fuels, of course, and also minerals like iron and copper. We considered the case of copper.

5.2.3.1 Copper

Copper is an essential input into the global economy, and China is both the largest producer and the largest consumer. Although China has only 4% of the world's copper reserves, it accounts for 11% of the world's production.[1] While much of China's copper use is for export products, domestic consumption is expected to be the major driver of future demand, projected to grow from 5.4 kg/yr to 11 kg/yr over the next 20 years. China already depends on imports for two-thirds of its supply(Figure 5-4).[2]

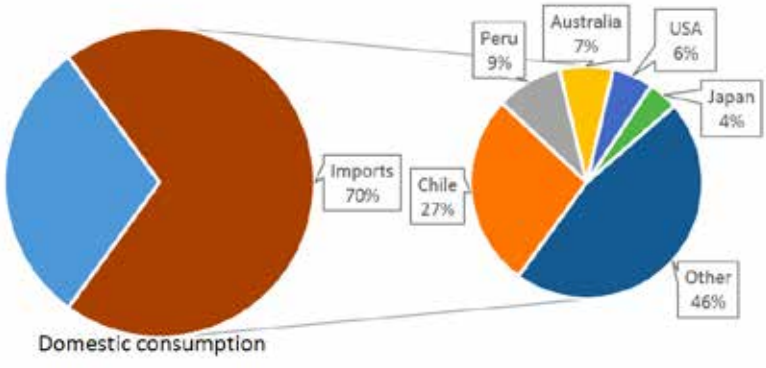

Figure 5-4 Chinese reliance on copper imports

Source: Henry Sanderson, and Neil Hume. (6 January 2016). Beijing Moves to Support Copper Producers. https://www.ft.com/content/880a753a-b48b-11e5-8358-9a82b43f6b2fand United Nations. (2015). UN comtrade database.

1 Potts, J., Huppé, G. A., Dion, J., Voora, V., and Forstater, M. (2014). *Meeting China's Global Resource Needs Managing Sustainability Impacts to Ensure Security of Supply, The IISD Supply Risk Tool Methodology*. Winnipeg, Canada: International Institute for Sustainable Development. http://www.iisd.org/library/meeting-chinas-global-resource-needsmanaging-sustainability-methodology.

2 Potts et al., 2014.

If poorly managed, copper mining can produce severe toxic pollution. In China, pollution from copper mines has been blamed for lifeless waterways, abandoned agricultural land and "Cancer Villages."

In an effort to secure supplies, Chinese SOEs and private enterprises have invested more than $50 billion over the past decade to acquire mining operations overseas.[1] In many cases, these operations have run into conflicts with local communities, unhappy with environmental and social protections. In Peru, for example, the government sanctioned Chinalco Mining for toxic pollution, and the company had to shut down its Toromocho mine; local opposition forced Zijin to suspend its Rio Blanco copper project; and three people were killed and 17 wounded in clashes between farmers and police around a $7.4 billion China Minmetals project in the highlands. In Myanmar, Wanbao Mining Copper has faced contentious protests at its Letpadaung Mine since 2011. In Zambia, the government has banned China's Nonferrous Mining Corporation from running a $832 million project because of environmental and labor violations.

Inadequate environmental and social performance in the operations of Chinese companies have thus translated directly into cancellation of those companies' social licenses to operate. They also pose a broader threat – by damaging China's reputation as a trade and investment partner, these problems threaten to undermine China's ability to continue to get access to the copper resources that will become increasingly important to its industries and consumers, and also to undermine China's access to export markets, which are increasingly demanding products that are made with sustainably sourced inputs.

There are two clear remedies to these problems. First, international guidelines for more responsible mining–such as the Extractive Industries Transparency Initiative, the Equator Principles, and the Intergovernmental Forum on Mining and Minerals–provide accepted benchmarks for performance. Through active engagement in these fora and rigorous implementation of their standards, China could play a key role in shaping the future of the sector and at the same time secure its position and the position of its companies as responsible producers. China could start by establishing incentives for compliance with the China Chamber of Commerce of Metals, Minerals and Chemicals Importers and Exporters (CCCMC) "Social Responsibility Guidelines for China's Overseas Mining Investment." Through Sustainable Mining Partnerships with its most important

1 In the first six months of 2011, Chinese entities announced 75 acquisitions in the global mining sector worth $4.7 billion, according to Price waterhouse Coopers (PwC). Citibank, on the other hand, has reported 217 mergers and acquisitions involving Chinese companies since 2003, with a market value of $50 billion. See Kirschke, J. (16 September 2013). Engineering & Mining Journal News. Engineering and Mining Journal. http://www.e-mj.com/features/3263-the-dragons-enter-chinese-mining-companies-shake-the-world-of-sustainability.html#.V8xf2U197IV.

copper trading partners–Chile, Peru, Mexico and Myanmar–China could also assure both the sustainability and security of supply from those partners.

Second, copper can be recycled. China is already a leader – recycling provides about 30% of China's current supply.[1] Increasing the recycling of copper stocks requires international cooperation in ensuring that products are designed to facilitate recycling and that discarded products are collected. China could and should take the lead in launching an international platform to promote enhanced copper recycling efficiency.

5.3 China's priorities and global value chains

As noted above, production of commodities poses significant sustainability challenges. These issues thus lie at the heart of China's quest for an ecological civilization. In this section, we review the evolution of China's economy and priorities, and then outline why greening global value chains are important to the long-term security of China's access to the resources that it needs, and more broadly for China's role in the world – its partnerships, especially across the South; its "brand"; and its success in reshaping global governance and commerce.

5.3.1 Context–The evolution China's economy and priorities

5.3.1.1 The evolution of China's economy

Starting in the late 1970s, China focused its Reform and Opening policies on realizing rapid industrialization and market reforms guided by heavy state investment and labor-intensive export manufacturing. This approach delivered double-digit annual GDP growth for nearly four decades, pulled over 700 million people out of poverty, and transformed China into a middle income country, but it also brought severe pollution, growing income inequalities and structural imbalances between supply and demand. Now China is moving into a new stage of development, with a greater emphasis on consumption and innovation as drivers of growth and a more decisive role for the market in allocating resources.

China's leadership continues to stress reform and opening, but with some important differences from the past. Instead of focusing solely on the rate of growth, economic policies now seek to enhance the *quality* of development by increasing personal incomes, broadening the social safety net and providing equal rights and equal opportunities for all. The economic structure will shift to reduce the role of heavy industry and exports of

1 Risopatron, Carlos R. (12 April 2013). Copper and Copper Alloy Scrap Use and Trade in China and the Rest of the World. 2013 ISRI Convention. http://www.eisourcebook.org/cms/July%202013/China,%20Copperalloy%20Scrap-use%20&%20Trade%20in%20China%20&%20Globally.pdf.

resource-intensive products; growth will be driven increasingly by services and domestic consumption. The new style of industrialization is intended to be green, innovative and high-tech. With guidance from markets, the government has set out to push structural reform on the supply side, including elimination of over-capacity in the economy and support to development of strong, efficient new industries.

5.3.1.2 New priorities

A crucial aspect of China's new development direction is a commitment to building an ecological civilization. Western countries addressed the environmental effects of industrialization only after growing rich, and did so in large part by moving polluting industries to developing countries. China's leaders are rejecting this path, and expressing a commitment now to sustainable development.

Ecological civilization emphasizes resource-efficient growth, conservation of the environment, and the harmony of people and nature. It entails a different way of planning and evaluating development that balances GDP growth against environmental impacts. And as its name implies, ecological civilization doesn't isolate environmental protection as a sector, but is an over-arching philosophy guiding China's economic, social and cultural development and its engagement in improvement of the global governance system.

Meeting China's goals of doubling its 2010 GDP by 2020 while building an ecological civilization is a daunting challenge, requiring a re-structuring not just of China's domestic economy but also of its external economic relations. The Belt and Road Initiative (BRI), is a critical platform for this transformation. BRI is a new approach to regional cooperation that goes much deeper than conventional free trade agreements. Because it integrates free trade, financial harmonization, overseas direct investment and capacity cooperation, BRI will transform and strengthen connectivity among the European, African and Asian continents and the oceans between them, improving global and regional governance models and finding new growth triggers.

Global value chains are central to BRI. As the leading economic power along the Belt and Road, China is committed to an approach based on shared benefits and common prosperity, so that China can address its over-capacity issues but not upgrade its own economy by down-grading others. In other words, BRI sets out to establish global value chains that embody an optimized international division of labor, developed in a way that creates and builds value at every step along the chain from primary production to manufacturing to distribution, marketing and even disposal, recycling or re-use. It has the potential to be a win-win solution.

5.3.2 The importance of green global value chains to China's priorities

Through the work we have done in the Study, we have concluded that assuring the sustainability of China's global value chains, including in particular the value chains for commodities, will be critical to China's priorities, both for its own development and for its engagement with the world.

5.3.2.1 Greening global value chains is essential to securing the resources China needs

The most pressing reason for China to take action on global value chains is that its economic future depends on access to raw material imports. Because it has limited arable land and is already exploiting its domestic resource base with high social and environmental costs, China has increased imports to ensure a steady and growing supply of agricultural and mineral commodities from abroad as its economy has grown. In the 1990s, China's natural forest base was nearly exhausted from over-harvesting and its domestic soy production was unable cost-effectively to keep up with rapidly growing demand for meat. In response, the government removed trade barriers and imports soared. This trend continued with China's accession to the World Trade Organization (WTO) in 2001 and today – with the exception of a few strategic grain crops – China is fully integrated into the global trading system as a major importer of raw materials.

The downside of this deepening participation in the global economy is a growing dependence on value chains that begin outside of the country. Table 5-1 shows the degree to which China depends on imports to meet domestic demand for many important raw materials.

While it makes sense economically to buy from other countries those commodities that would be more expensive to produce inside China, this approach also leaves the country vulnerable in the face of unstable global markets and geopolitics. Many of the commodities for which China depends on imports are vital to the country's economic development (e.g., copper and other minerals) or food security (e.g., soy, palm oil). The Going Out policy has helped China address this vulnerability, moving China beyond being just a buyer on global markets to become a leader in global investment, much of which is geared toward securing commodity supply lines against such unpredictable market and political forces.

Table 5-1 Chinese consumption met by commodity imports

Commodity	Consumption met by imports
Palm Oil	99% ① in 2014/2015
Soybean	90% ② in 2014/2015
Seafood	19% ~22% ③ in 2013
Cotton	25% ④ in 2014/2015
Rubber	74% ⑤ in 2011
Wood Fiber	36% ⑥, ⑦ in 2014
Copper	70% ⑧ in 2016
Iron	79% ⑨ in 2014

① USDA. (n.d.). PSD Online – Custom Query. http://apps.fas.usda.gov/psdonline/psdquery.aspx.
② USDA. (12 September 2016). World Agricultural Supply and Demand Estimates. http://www.usda.gov/oce/commodity/wasde/latest.pdf.
③ FAO-FIAS. (n.d.) Food balance sheet of fish and fishery products in live weight and fish contribution to proteinsupply. https://ftp.fao.org/FI/STAT/summary/FBS_bycontinent.pdf.
④ USDA. (12 September 2016). World Agricultural Supply and Demand Estimates. http://www.usda.gov/oce/commodity/wasde/latest.pdf.
⑤ FAOSTAT. (2012). Rome, Italy: FAO. http://faostat3.fao.org/home/E.
⑥ GVMI. (2 March, 2016). Opinion: How Will China's Hunger for Wood Be Satisfied in the Upcoming Years? *GlobalWood Markets Info*. https://www.globalwoodmarketsinfo.com/china-wood-consumption-logging-bans/.
⑦ RISI. (n.d.) China's Timber and Forest Products Imports Expected to Increase by 60 Million Cubic Meters by2025. *RISI – Objective Insights*. http://www.risiinfo.com/press-release/chinas-timber-and-forest-products-importsexpected-to-increase-by-60-million-cubic-meters-by-2025/.
⑧ Sanderson, H. & Hume, N. (6 January, 2016). Beijing Moves to Support Copper Producers. *The Financial Times*.https://www.ft.com/content/880a753a-b48b-11e5-8358-9a82b43f6b2f.
⑨ Chen, W., Lei Y., and Jiang, Y. (2016). Influencing Factors Analysis of China's Iron Import Price: Based on Quantile Regression Model. *Resources Policy* 4(8): 68–76.

5.3.2.2 The risk of resource scarcity

But is overseas investment enough to guarantee that China will always have access to the raw materials it needs and realize its resource security? Our research suggests that it is not.

China's leaders have recognized the dangers of environmental degradation *inside* the country, and taken steps to protect natural systems from pollution and over-exploitation. Our findings suggest, however, that long-term access to many vital resources also depends on how sustainably the resources are managed *outside* of China. Much of the environmental damage described above that is currently occurring in source countries is tied to land use conversion and resource extraction for export to big importing countries including China.

Such unsustainable practices are degrading the ecosystems that support key supplies, or in the case of overfishing, threatening to wipe out those supplies entirely. Long-term access to commodities vital for China's future rests on the sustainable management

of resources like forests, fisheries and farmland in source countries. The single most important action China can take toward this end is to green its global value chains.[1]

5.3.2.3 The risk of losing social licenses to operate

The risk to China's long-term supplies of vital resources is not only a matter of total resource exhaustion through activities such as overfishing, however. Just as important is the geopolitical and social context of international commerce, and the prospect that Chinese companies could lose their "social license to operate" in key markets. Chinese companies that invest in unfamiliar political and social environments abroad carry a high level of risk, and that risk is exacerbated if they are insensitive to the effects of their operations on the land and people of the host country. This is true even if the project is supported by the local government. In Zambia, Myanmar, Ecuador, Honduras, Peru and other countries, there have been public protests against Chinese investment projects over employment, safety and environmental issues; the copper case study, above, cites several examples.[2] Social backlash has forced investors to postpone or cancel projects, or source country governments to close or restrict operations.[3]

5.3.3 Greening global value chains is important to China's future competitiveness

5.3.3.1 China's "brand"

China's long-term success in global value chains – its ability to source the commodities it needs, and to sell the commodities or products it produces – will also depend on its reputation, its national "brand." If Chinese companies are seen – by producing country governments and their citizens, or by consumers – as flouting the law or causing undue environmental or social harm, that perception undermines the political legitimacy of China's trade and investment relationships. The milk contamination scandal

1 Potts, J., et al. (2014). *Meeting China's Global Resource Needs Managing Sustainability Impacts to Ensure Security of Supply: The IISD Supply Risk Tool Methodology*. Winnipeg, Canada: International Institute of Sustainable Development.

2 Kaiman, J. (25 February 2016). Peru has copper. China wants it. And now BetoChahuayllo is dead. Los *Angeles Times*. http://www.latimes.com/world/mexico-americas/la-fg-peru-china-mining-20160224-story.html

3 Mataka, K. &Wangwe. M. (25 October 2015). China Copper Mines closes down. *The Post*. http://www.postzambia.com/news.php?id=12641.

of 2008 is a vivid reminder that those perceptions persist.[1] This is the political danger of thinking narrowly about trade and investment, instead of sustainability and value chains.

Box5-1 Lasting impact – The milk scandal

In 2008, infant formula tainted with melamine sickened nearly 300,000 babies; six died. The scandal rocked China's dairy industry, and it has not recovered. Many countries stopped importing baby foods containing milk from China. Foreign brands' share of the market went from 30% before the crisis to over half. Imports of milk powder jumped from 40,000 tonnes to 120,000 from 2008 to 2014.

China's recent action on ivory trade indicates the government's recognition of these risks – and of the surpassing importance of safeguarding China's reputation. Ivory carving has long been upheld as a protected national cultural heritage in China. UN monitoring data, however, indicated that China's market for ivory was a major contributor to the poaching crisis that has caused a precipitous decline in elephant populations across Africa. Seeing the global concern over the poaching crisis, the Chinese government has taken bold steps to curb the trade – in May 2016, the government announced that it would phase out all commercial processing and sale of ivory products.[2]

5.3.3.2 China's Competitiveness

Conversely, if China can green its global commodity value chains, it will also strengthen the reputation and competitiveness of Chinese firms in global markets. Consumers in Japan, Europe and North America have a growing preference for green and healthy products. And, as incomes rise in China, domestic consumers are also increasingly clamoring for products that are safe, healthy and green. International surveys indicate that consumers in China already express a much greater concern for companies' social and environmental performance than consumers in other countries.[3] In a recent Accenture survey of 30,000 consumers across 20 countries, 44% of Chinese consumers surveyed said

1 Lu Li. & Liu, X. (2014). How will Chinese milk powder rebuild Consumer Confidence in face of Foreign Milk Powder's Advance. *China Milk and Cow 8: 3-7*. For more on the competition, seeHorney, L. (2014). China clamps down on baby formula imports. *Financial Times*. https://www.ft.com/content/eb09d3d2-d41e-11e3-a122-00144feabdc0 and Sun, C. (2015). Foreign firms boosted by China's new law on baby formula. *South China Morning Post*. http://www.scmp.com/news/china/money-wealth/article/1895908/foreign-firms-boosted-chinas-new-law-baby-formula.

2 Xu, Y.; Xiao, Y.; Guan, J. and Lau, W. (2016). An Act to Save African Elephants: A Ban on Commercial Ivory Trade in China, A Feasibility Study Briefing. WWF and TRAFFIC, Beijing, China.[85]

3 In the 2010 good purpose survey by Edelman, nearly 80% of consumers in China expect brands to be involved in good causes and at least 70% of them will more likely recommend a brand if it supports social causes (higher than mid-50% in Western Europe). http://www.edelman.com/p/6-a-m/good-purpose-goes-global

they "actively look for information on product sustainability," compared to only 13% in Germany and 14% in the U.S. Working mothers are especially vocal – 90% of working mothers surveyed in China said "they actively recommend ethical, sustainable brands."[1]

Box 5-2 Greener consumers

Chinese e-commerce giant Alibaba reported that in 2015, 65 million people, or 16.2% of its active users, purchased more than 5 categories of green products from its site. This is up from 4.3 million people in 2011, a 14-fold increase over a four-year period.

Source: Ali Research . (2016). China's Green Consumers Report.

Most major multinational corporations have made sustainability commitments. Some Chinese companies have begun to address these issues. As noted in the cases, many processors of seafood and wood products have obtained international sustainability certifications to secure their access to Western markets. COFCO, China's largest commodity trader, has published traceability guidelines and standards recently and has taken initial steps by joining international initiatives to source sustainable soy and palm oil. But most Chinese firms have yet to make firm commitments to sustainability. By failing to do so, they risk losing ground in those markets.

By making a strong commitment to green value chains, China can transform its global brand. Doing so is also consistent with plans to restructure and upgrade China's economy. When Japan and South Korea moved up the manufacturing ladder from low- to high-value products, they did so by improving the performance and quality of their goods. In today's economy, high-value products also need to embody values such as "low carbon," "energy efficient," "organic" or "sustainable." Greening global value chains is thus essential not only for China's food security and domestic development, but also for its global competitiveness.

5.3.4 Greening global value chains is important to China's growing global role

While China's most pressing reasons for greening value chains may be domestic, it should also consider the importance of these issues to its growing role in the global economy and in global governance. In an interconnected world, sustainability concerns are inextricably linked to economic globalization. No longer just an importer from the South

1 Hayward, R., McLean, E., and Jhanji, A. (2014).*The Consumer Study: From Marketing to Mattering-The UN Global Compact-Accenture CEO Study on Sustainability*. Accenture, UN Global Impact, and Havas Media.

and exporter to the North, China is also an investor, lender and aid donor, particularly in its South-South economic relations. China is already the world's second leading source of Overseas Direct Investment (ODI), and is pursuing capacity cooperation with many Southern partner countries, helping build the economies of others while reforming its own economic structure.

5.3.4.1 Upholding the ideals of an ecological civilization

China has taken a more proactive role in a whole range of bilateral, regional and multilateral initiatives where sustainability is a key issue, such as the G20, APEC and WTO. Along with this expanded role, China has also adopted a more expansive vision of development embodying the philosophy of ecological civilization. Greening commodity value chains is a key approach to integrating the philosophy of ecological civilization into China's growing international engagements, including the Global Going Out Strategy, BRI, and the Asian Infrastructure Investment Bank (AIIB).

As China's role in the world grows, the environmental and social performance of Chinese companies and their suppliers is coming under increasing scrutiny, and the irresponsible actions of individual firms could undermine positive initiatives such as BRI and AIIB. By improving the environmental performance of Chinese firms and their suppliers, China can demonstrate its commitment to a new model of cooperative and mutually beneficial development.

5.3.4.2 South-South cooperation

China has emphasized its partnerships with other Southern countries, especially the BRICS. Global value chains for commodities are at the heart of China's trade with the BRICS countries – comprising 50% of its imports from India, and more than 80% of its imports from Brazil, Russia and South Africa. Fossil fuels are a major part of this trade, of course, but China is also the dominant player in many other sectors. China accounts for 40% of Russia's exports of fish and seafood, for example; and 21% of Russia's exports of timber.[1] China has a robust trade relationship with Brazil, and more than 80% of that trade is commodities.[2]The majority of this comes as soybeans, comprising 41% of total Brazilian exports to China in 2014.

In many cases, the production of these commodities has massive environmental impacts. Those impacts are not captured on trade balance sheets, but they are felt in the source countries and decried globally. A strong focus on greening commodity value chains

1 WWF-Russia.(Forthcoming). *Export of Timber from the Russian Far East 2004—2014*.

2 Observatory of Economic Complexity (OEC). (n.d.) What does China import from Brazil? 2014. Retrieved October 10, 2016 from http://atlas.media.mit.edu/en/visualize/tree_map/hs92/import/chn/bra/show/2014/.

will be essential to ensuring that China's South-South partnerships are strong.

5.3.4.3 The Belt and Road Initiative

BRI can and should be an opportunity to explore and demonstrate this new direction. Incorporating not just economic efficiency but also social utility and environmental sustainability into global value chains throughout BRI will not only build an ecological civilization, but also help uphold BRI's principles of mutual respect and common prosperity.

In discussions of BRI, the focus has typically been on development, infrastructure and increasing trade. Discussions of the environmental aspects of BRI tend to focus on the direct impacts of infrastructure investments. Those discussions do not seem to be addressing the sustainability of global value chains. Yet, in fact, BRI is building the China-led global value chains of the future. Those value chains will be a major part of its impacts on the environment, and on the communities and countries it engages. There is both an opportunity and an urgent need to ensure that they are green.

The Chinese government has stated that, in pursuing BRI: "We should promote ecological civilization in conducting investment and trade, increase cooperation in conserving the environment, protecting biodiversity, and tackling climate change, and join hands to make the Silk Road an environment-friendly one."[1] The single most effective way to achieve this will be to ensure sustainability at every link in the value chain, from the processes of extracting raw materials all the way to what happens at the end of a product's life. This will help upgrade the quality of the economy, since pollution and waste are forms of economic inefficiency in resource use. And it will demonstrate China's commitment to a new form of mutually beneficial economic cooperation by providing China the products it needs while protecting natural ecosystems, long-term environmental health and resource endowments of partner countries.

5.3.5 Green global value chains are important to China's global obligations

Value chains, especially agriculture and forest value chains, are also central to China's global development and environmental commitments. With the landmark climate change agreement in Paris and the creation of Sustainable Development Goals for 2030 (SDGs), the world has embarked on a new, more serious quest for sustainability. China played a leadership role in forging these new agreements, and China's continued leadership will be essential to their success. That will require paying attention to the impacts of the global

1 NDRC, MOFA, and MOFCOM of the People's Republic of China. (March 2015). Visions and Actions on Jointly Building Belt and Road.Xinhua News. http://news.xinhuanet.com/english/china/2015-03/28/c_134105858.htm.

value chains that are the lifeblood of the global economic development and that are also a major source of greenhouse gas emissions.

5.3.5.1 The Paris agreement

China has made a strong commitment to reducing its greenhouse gas (GHG) emissions. The carbon footprint of China's commodity imports should be addressed as part of that effort. As noted above, agriculture and deforestation account for 24% of global GHG emissions.[1] Four commodities – soy, palm oil, timber and pulp, and beef – are the principal drivers of deforestation.[2]As a major consumer, China is in a unique position to engage its trading partners to help ensure the sustainable production of those commodities; and Chinese firms have tremendous power to influence the practices of their suppliers. Many major multinational firms from around the world have made commitments to eliminate deforestation from their value chains, but without stronger leadership from the world's leading buyer of these commodities, progress has been slow. With her increasing ability, China has an obligation as a signatory to the Paris Agreement to think beyond its own borders and help clean up the value chains of its commodity imports associated with tropical deforestation. By doing so now, China will enhance its position as a leader in helping move forward the global fight to save the climate.

5.3.5.2 Addressing the Agenda 2030 Sustainable Development Goals

The UN Sustainable Development Goals emphasize the urgent need to address water scarcity, deforestation, illegal fishing and other impacts associated with global commodity value chains. China played a central role in the success of the predecessor to the SDGs– the 2015 Millennium Development Goals (MDGs). China's dramatic and broad-based economic growth in the 1990s and 2000s was the key to the achievement of the MDG's poverty reduction target. The SDGs will require a much broader engagement.

In support of the SDGs, China has formulated its 2016 *National Plan on Implementation of the 2030 Agenda for Sustainable Development*. The National Plan includes several measures that will be important to greening global value chains. It calls for action to "effectively regulate harvesting and end overfishing, illegal unreported and unregulated fishing and destructive practices," for example, and commits to provide incentives and financial support to developing countries to advance sustainable forest management. It calls for "expand[ing] the scope and scale of green procurement," and for mobilizing China's South-South cooperation Fund on Climate Change to help developing

1 IPCC. (2014). *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

2 Lawson et al., 2014.

countries to enhance their capacity for climate change mitigation.

These commitments are an important beginning. They do not yet fully reflect the cross-cutting nature and importance of value chains for achieving the SDGs, however. Whereas China's contribution to the MDGs came entirely through domestic economic growth, the opportunity for making a decisive contribution to meeting the SDGs is in strong action to raise the sustainability of its global economic relationships.

5.4 Policy tools to green global commodity value chains

The Government of China can promote green global value chains through direct action, such as regulation or its own purchasing, through its mandates to enterprises, and through its international engagements. China's own experience and the experience of other countries illustrate the possibilities.

5.4.1 Role of government

The Government of China can play a direct role in greening global value chains through its own procurement, and through the regulation of imports into China.

(1) Green public procurement: Governments can use their own purchasing power to help create a market for sustainably produced goods. In cases where the government is a major buyer, this shift in purchasing can play an important role in moving the market toward sustainability. Some governments have included sustainable commodities in their procurement requirements. In 2012, for example, the UK's Government Buying Standard was amended to require that the government achieve 100% sourcing of credibly certified sustainable palm oil by the end of 2015.[1]

China, too, has an opportunity to use its own public procurement as a lever for sustainability. Already, the Ministry of Finance and MEP have jointly published a government green procurement recommendation list, which targets energy-saving and environmental friendly products and services. If extended to the concerned commodities, it could, for example, require that government agencies purchase only commodities that were produced in compliance with applicable local and international laws, or with international or national sustainability standards. With government purchases in 2010 amounting to 842 billion RMB, or 2.1% of China's GDP, China can drive significant change through green

1 UK Department for Environment, Food and Rural Affairs. (October 2015). *UK Consumption of Sustainable Palm Oil*.

public procurement.[1]

(2) Verification of Legality: Illegal trade undermines a producing country's efforts to manage its resources and undercuts responsible producers. So a first step in greening global value chains is to ensure that commodities have been produced in compliance with the laws of the producing country and applicable international laws. Through regulations like the U.S. Lacey Act and the European Union Timber Regulations, some importing countries are protecting natural resources and wildlife specifies by requiring compliance with domestic and international laws as a condition for accepting imports.

China's Timber Legality Verification System is a first step towards establishing legal timber governance, discussed earlier. There is great potential to make it more robust. Already, the EU and China are working to integrate EU-licensed timber in the guidelines.

Opportunities to improve legality are not limited to timber. As noted earlier, a significant share of the global wild fish catch is harvested illegally, and illegal deforestation continues to underpin commodity production, particularly for palm oil, soy and beef.

(3) Economic incentives: Tariffs and taxes have been widely used to encourage environmentally responsible behavior. Other countries have used these tools to address challenges like deforestation – India factors forest protection into allocation of government revenues to municipalities; Brazil imposes credit sanctions on municipalities that fail to control deforestation. China has used tax relief to promote green industries, and to encourage consumption of some imported goods. Preferential taxes or tariffs, keyed to internationally recognized sustainable production and natural resources management practices, could be applied to commodity production, investment and trade – incentivizing importers to prefer sustainable goods and producers to produce sustainably.

(4) Green finance: The movement for green finance is growing, and China has been in the vanguard. In 2012, China Banking Regulatory Commission published the *Green Credit Guidelines*. In August 2016, China adopted "guidelines for establishing a green finance system," which represent an integrated policy to promote a shift towards a green economy. This announcement was made on the eve of the 2016 G20 summit, in which, for the first time, green finance was an integral part of the meeting agenda. Innovative financial mechanisms can be an important part of enabling a transition to sustainable commodity production and stronger resource management in China and its trading partner countries, opening up options for integrated public-private financing that reduces risks for the private

1 Wang, P. (2011). *Regional: Asia Pacific Procurement Partnership Initiative*. Asian Development Bank. https://www.adb.org/sites/default/files/project-document/60662/43149-012-reg-tacr-05.pdf.

sector to invest in sustainable commodity production.[1]

Box 5-3

In December 2015, China became the first government to establish rules for green bonds. In the first half of 2016, China issued a total of $11.2 billion USD in green bonds. If China applied sustainable commodity production standards to these bonds, they would become a powerful vehicle for promoting green global value chains.

Source: Xinhua News. (31 August 2016). China to establish green financing mechanism for greener growth. http://news.xinhuanet.com/english/2016-09/01/c_135649154.htm

5.4.2 The role of enterprises

Major companies have played an important part in international efforts to green global value chains. As China addresses this challenge, Chinese companies could help lead industry-wide green transformations, working both upstream and downstream in the supply chain. To do so, however, they will need a clear signal from the government that this a national priority.

(1) Guidelines: Governments or trade associations have issued guidelines as a way to encourage enterprises to act without, or as a step toward, regulation. Guidelines provide a clear signal of a government's priorities and an explicit statement of government interests, and leading firms may see guidelines as both license and impetus for action.

Overseas, the European Feed Manufacturers' Federation issued *Soy Sourcing Guidelines* in 2015, which set forth baseline criteria and verification requirements for the soy sector. In China, as noted earlier, guidelines have been issued by some trade associations, including CCCMC, for due diligence and ethical sourcing in the mining industry, and CFNA, for sustainability and best management practices in palm oil. A note of caution is in order, though. An International Institute for Environment and Development study of a series of Chinese overseas investment guidelines found that without carrots or sticks to companies, guidelines often have little effect,[2] so follow up is crucial.

(2) Company commitments and alliances: Company commitments and alliances can help create critical mass for movement towards green value chains. Globally, members

1 Xu, N. & Yao, W. (29 July, 2016). China's green bond market booms with more clarity in policy. *China Dialogue*. https://www.chinadialogue.net/article/show/single/en/9128-China-s-green-bond-market-booms-with-more-clarity-in-policy.

2 Weng , X. and Buckley, L. (eds.) (2016).Chinese businesses in Africa. Perspectives on corporate social responsibility and the role of Chinese government policies. IIED Discussion Paper. London, UK: International Institute for Environment and Development.

of the Consumer Goods Forum, an association of the world's largest consumer products companies and retailers, have committed to eliminating deforestation from their supply chains by 2020. That goal is now supported by the Tropical Forest Alliance, a partnership of NGOs, companies and governments. Chinese companies have also established their own initiatives. In 2016, 48 real estate companies launched a green supply chain initiative;29 of which specifically committed to sustainably-sourced wood products.[1] By banding together, companies, NGOs and governments can send strong signals demanding sustainable global value chains and supporting producers.

Box 5-4 An alliance on soy

A consortium of 10 leading international and Chinese soy traders, including ADM, Wilmar, Bunge, Cargill, COFCO and five other Chinese companies, convened by the Paulson Institute, have committed to jointly implement a phased transition to sourcing of sustainably produced soy from South America.

(3) Traceability and transparency: As explained above, advances in data technology are rapidly expanding the tools available to ensure that global value chains are traceable and transparent. Traceability and transparency provide a powerful incentive for sustainability. Traceability allows enterprises and consumers to know the origins of the products they buy, tracking them from raw material extraction to production to finished goods. Transparency provides visibility over the environmental or social impacts of each step in that supply chain. Together, these tools create accountability for environmental performance, and allow consumers to buy with confidence.

Many international voluntary standards systems establish traceability regimes. FSC and MSC, for example, offer robust chain of custody regimes for certified products. In fact, over three hundred Chinese businesses have been awarded the MSC's chain of custody certification, which provides ship-to-shelf traceability for wild-caught fish that have been MSC certified, and over 4,000 have achieved FSC chain of custody certification. Some Chinese companies have begun to establish their own systems: COFCO recently published traceability guides and standards to manage the sustainability of its suppliers.

Increasingly, consumers and regulators are demanding more information about the safety, quality, security and sustainability of products. To respond to this rising demand, China could require greater traceability for traded goods or strengthen regulations to eliminate false or misleading product labels. China could also build an information base

1 WWF China. (6 June, 2016). *Green Compact – Chinese Companies Launch Responsible Timber Supply Chains*. http://www.wwfchina.org/pressdetail.php?id=1698

to monitor, report and disseminate information on the social and environmental impacts of commodity industries in order to ensure the credibility and sustainability of Chinese companies domestically and internationally.[1] Actions such as these could play an important role in ensuring the sustainability of China's global value chains, and the competitiveness of Chinese enterprises.

5.4.3 International partnerships

As noted above, China has established itself as a leader in the global effort to address climate change, and more broadly to foster sustainable development. In support, China can advance sustainable commodity value chains through its international engagements.

(1) Alignment of Chinese and international standards for sustainability: International standards lie at the heart of many global efforts to improve the sustainability of commodity production. China, too, has developed, or is developing, national standards to regulate the environmental impacts of its commodity production. Its China Forest Certification Scheme resulted from a careful study of forest certification standards worldwide, and has been endorsed by the PEFC, one of the two major systems for forest certification. In the palm oil industry, China Quality Mark Certification Group Production Certification (CQM-PCC), one of the largest Chinese certification agencies, entered a memorandum of understanding with the RSPO to jointly identify ways to implement RSPO standards. Continued engagement with international standards, and additional action to align national standards and labels with international ones will help improve the sustainability of goods coming into China and strengthen the position of Chinese goods in the global market.

(2) Development assistance: Many global value chains are currently unsustainable because governments are unable to effectively manage their resources, and producers lack the technical skills or resources to move to more efficient and sustainable production and gain access to global markets. Many donor countries are helping their commodity-producing trade partners to improve environmental performance and maximize development benefits by providing capacity building support and technical assistance. They are helping to improve productivity of small producers, for example, strengthen management of forests, fisheries, and other resources, and improve land tenure and governance. China has also provided important support to partner nations, for example, by establishing Agricultural Technical Demonstration Centers in 17 countries and dispatching more than 1,000 experts to provide training since 2010.

1 Potts, J., et al. (2014). The State of Sustainability Initiatives Review 2014: Standards and the Green Economy.

Recognizing the climate impacts of land use, some governments have gone further to offer payments for reducing deforestation. Norway has been a leader here, notably committing US$1 billion each to Brazil and to Indonesia, and US$150 million to Liberia, to be disbursed as progress is made in reducing deforestation.

Through these and other models, expanded assistance for sustainable commodity production can help key producing nations strengthen their capacity and step up to the standards that China and international markets expect.

(3) Trade agreements: Countries can promote and incentivize sustainable sourcing of commodities through trade-related agreements, and potentially through bilateral sustainable sourcing agreements. In 2014, 17 WTO members, including China, the US, the EU and Japan, began negotiations on the Environmental Goods Agreement (EGA), which aims to reduce tariffs on more than 50 environmental goods. While this does not yet include sustainably produced commodities, the EGA's product coverage is still under negotiation, and could be expanded to include commodities. Recently, WTO Members have also revived their negotiations on fishery subsidies aiming for practical results by the eleventh Ministerial Conference (MC11) of the organization in 2017; China's leadership and constructive engagement will be the key to success. The U.S. and the EU have promoted sustainable forest management in trade-related agreements, which aim to promote legal trade in timber products and to combat illegal logging. Both have entered agreements on illegal logging with China.

There is particular promise in bilateral sourcing agreements between China and its supplier countries that assure both sustainability and long-term supply. As noted above, the soy industry is a good candidate. Now that Forest Code compliance is a requirement for soy farmers and exporters by the Brazilian government, for example, bilateral sustainable sourcing agreements could send a demand signal that both accelerates Forest Code implementation in Brazil and demonstrates that the demand for soy in China is compatible with improved sustainability in exporting countries. Bilateral sustainable mining partnerships, discussed in the copper case study above, could similarly be a promising solution for key hard commodities.

As these examples demonstrate, there are many tools that can be used to green China's global value chains. We were encouraged to see that Chinese private firms, SOEs and government agencies have already begun experimenting with many of these tools, but so far their use is tentative and uncoordinated. A strong and clear signal from the central government is needed to move this greening process forward. Such a signal would not just be heard by Chinese companies and suppliers. It would also tell the world that China is

serious about its global leadership in a new type of international economic cooperation that is fair and sustainable.

5.5 Recommendations

5.5.1 The journey

Green global value chains – value chains that are environmentally, socially, and economically sustainable – will play a crucial role in the green rise of China. New frameworks for green global value chains are vital to China's continued economic development and resource security, to the goals of BRI and the Going Out Strategy, and more broadly in shifting world trade on to a path that the Earth can sustain. Global value chains for commodities are a particular priority – vital to China's continued economic development and food security, and to its relations with trading partners and its global commitments.

Chinese agencies and enterprises have begun exploring the potential for green global value chains and Chinese consumers are increasingly demanding green products, but bold action from Beijing is required to set this new direction and enable the shift. We therefore have the following recommendations:

5.5.1.1 Recommendation 1: The Government of China should play a leadership role in promoting the sustainability of global value chains in international governance and policymaking through an integrated policy package that addresses investment, trade, standards, certification and capacity building

Ultimately, international laws and institutions must support green global value chains. Already, institutions like APEC and the Council of the European Union have sent clear-policy signals for global value chain development and cooperation.[1] With rising importance in global markets, its commitment to an ecological civilization, and its commitment to international action on climate and the SDGs, leadership from China is crucial. China can lead through both multilateral and bilateral engagements by:

① Promoting green global value chains through creation of an "Eco-20", launched with Germany and other countries at the next G20, to implement Hangzhou Summit's outcomes, and to shift to sustainable production, consumption and trade by smart, green and inclusive innovations;

② Promoting green global value chains in multilateral trade negotiations, including

1 Council of the European Union. (12 May 2016). Proceedings from The Council of the European Union: The EU and Responsible Global Value Chains. http://data.consilium.europa.eu/doc/document/ST-8833-2016-INIT/en/pdf.

the WTO negotiations on environmental goods and services, a relaunch of the WTO negotiations on fishing subsidies, and negotiations within APEC;

③ Initiating an agenda to green global value chains in order to protect biodiversity as the applicant to host the 14th COP of the Convention on Biological Diversity;

④ Incorporating greening of global value chains in its bilateral trade agreements. In particular, China should enter sustainable sourcing agreements with key trading partners for important commodities, such as Brazil, Argentina and Paraguay for soy and beef, and Indonesia and Malaysia for palm oil, and Chile and Peru for copper;

⑤ Aligning Chinese sustainability standards with international standards, and reaching consensus with major commodity production countries on the verification schemes for the specific and concerned commodities.

5.5.1.2 Recommendation 2: The Central Government should send a clear policy signal, through issuing "Guiding Opinions on Practicing Sustainability Principles for Chinese Enterprises in International Trade and Overseas Investment" by the State Council, to encourage Chinese companies and multinational companies trading in China to green their global value chains

In many sectors, leading multinational companies have begun to take action to promote more sustainable practices. Chinese companies have generally held back from joining such international efforts to green global value chains, awaiting an indication that the Government would support their engagement. A Guiding Opinion from the State Council could set out important principles and actions, including:

① Encouraging and authorizing companies to enter voluntary sustainability commitments and alliances with other Chinese and international companies in their sector;

② Applying internet of things and big data to establish systems for traceability to provide assurance of the origin, legality and sustainability of commodities in trade;

③ Adopting international standards or trade association guidelines for more sustainable sourcing;

④ Providing financial incentives, such as preferential tariffs for sustainably produced commodities or preferential lending to companies that practice sustainable sourcing.

5.5.1.3 Recommendation 3: The NDRC, Ministry of Foreign Affairs and MOFCOM should create an initiative or an action plan for greening global value chains as a core priority for the Belt and Road Initiative

The goal of the Belt and Road Initiative is to expand economic cooperation, improve the governance system and generate new growth opportunities across more than 60 countries, accounting for 60% of the world's population. Its most important benefits and

impacts will come from the greatly expanded trade and investment cooperation that it yields.[1]Ensuring that those value chains are green will be vital to China's interests and to sustainable development in BRI partner countries. Actions to promote green global value chains through BRI could include:

① Setting up systems and measures to verify legality and sustainability of traded commodities;

② Providing green finance – e.g., by incorporating sustainable trade finance into the Green Lending Guidelines; by developing commodity sector-wide financing mechanisms to provide long-term, first-risk capital to leverage investment from commercial investors.

③ Establishing a partnership among BRI countries to share best practices on low carbon, circular economy, and efficient economy transition.

5.5.1.4 Recommendation 4: China should champion constant innovations in South-South collaboration models through bilateral and multilateral international aid.It should also invest aid and other finance resources in greening global value chains

Recognizing the central importance of global value chains to many of its partner countries, China should use its bilateral aid, the new multilateral banks, the Silk Road Fund, and the South-South cooperation Fund for Climate it has created, to help its trading and investment partner countries move to more sustainable production by funding, for example, programs to:

① Strengthen resource management capacity in producing countries;

② Improve agriculture productivity, especially by small producers;

③ Build stronger systems for traceability and labeling to ensure that Chinese imports are legal and sustainable;

④ Provide grants to Chinese and local NGOs to support producers to improve sustainability in production and trade.

5.5.2 First Steps

We suggest that China take three concrete first steps to get started on the journey toward green global value chains:

5.5.2.1 First Step 1: The State Council should mandate State-Owned Enterprises to lead in making commitments to assure the sustainability of the commodities they buy

SOE's are often the largest companies in their sectors and wield tremendous influence with their peers. The State-owned Assets Supervision and Administration Commission

1 Garcia-Herrero, A. and Xu, J. (2016). China's Belt and Road Initiative: Can Europe Expect Trade Gains? *Working Paper*. Issue 5. Brussels: Bruegel.

(SASAC), together with NDRC and other agencies, can clarify the important role SOEs should play in greening global value chains, and mandate the leadership of SOEs in sparking action by private companies in their sectors. Concrete measures include individual commitments to sustainable sourcing – such as traceability, measures to assure legality, a commitment to no deforestation – as many multinational companies have done. SOEs could also encourage Chinese companies to join together or with their international peers. The commitment of 48 Chinese real estate companies to sourcing sustainable wood products, and the newly established alliance of international and Chinese traders for sustainable soy are striking examples of the potential.

5.5.2.2 First Step 2: The Government of China (led by Ministry of Commerce, Ministry of Agriculture, General Administration of Quality Supervision, Inspection and Quarantine, and Ministry of Environmental Protection) should launch a pilot program to establish best practices for greening the global value chains for soy, palm oil, and forest products

Soy, palm oil and timber are three of the largest drivers of deforestation globally, and thus major contributors to accelerating climate change. Many of the world's leading companies and some governments have committed to action on deforestation; success of those efforts will depend in large measure on China's leadership. An integrated initiative, bringing together multiple policy tools to move these commodities to sustainability, could be a powerful pilot for the Green Global Value Chain agenda. Elements could include:

① Including soy, palm oil and wood and paper products fulfilling green standards in green public procurement requirements;

② Signing bilateral sustainable sourcing agreements with major supplier countries to reach consensus on the key elements of sustainable production and trade, including the verification schemes for sustainability;

③ Encouraging Chinese companies to join international sustainable sourcing commitments and establishing traceability system in their supply chains for verification of legality and sustainability;

④ Requiring State-Owned Enterprises to comply with sustainability standards in their overseas investment in production and sourcing;

⑤ Directing South-South cooperation and development aid to support producing countries in implementing sustainability requirements;

⑥ Providing preferential tariffs for imports of goods certified under standards that comply with the WTO Technical Barriers to Trade Code of Good Practice.

5.5.2.3 First Step 3: NDRC, together with Ministry of Finance, MOFCOM, etc., should jointly launch a "Green Global Value Chain South-South Cooperation Platform" under the newly-established "South-South Cooperation Fund on Climate Change" to support the sustainable and low-carbon production and trade of commodities

Global value chains are fundamental components of China's trade and investments with the BRICS, and many other developing countries, and thus lie at the very heart of China's South-South relations. Investing in greening those global value chains and low-carbon development thus is a natural part of the South-South cooperation Fund on Climate Change, and an area where NDRC, MOF, MOFCOM, etc. can play a key role. We suggest that the initiative focus on the following aspects:

① Establishment of a "Green BRI Alliance of Enterprises" to foster collaboration of enterprises of China and BRI countries on sustainability;

② Capacity building for resource-concentrated partners of China on environment and resource protection;

③ Training of Chinese leading companies and their counterparts in Southern countries on green supply chain management and sustainable sourcing practices.

Chapter 6
Progress in Environment and Development Policies in China (2015—2016) and Impact of CCICED's Policy Recommendations

6.1 Foreword

A high-level policy advisory body approved by the Chinese government, the China Council for International Cooperation on Environment and Development (CCICED, the Council) is responsible for proposing policy recommendationson important issues in these fields. At the Council's annual general meetings, Chinese and foreign members engage in policy discussions based on policy research. These discussions lead to policy recommendations that are submitted to the State Council and to central government departments. The CCICED's organizational objectives are to further fulfill its unique role, improve its effectiveness,strengthen understanding of policy progress in China, and assist members to better offer advice and suggestions.

Annually since 2008 the support group for the Council's Chinese and international chief advisors has reported on Progress of Important Policies Pertaining to China's Environment and Development, and Impact of CCICED Policy Recommendations. The report aims to provide Council members and others with an overview of China's progress during the previous year and determine whether policy shifts are consistent with recommendations submitted by the CCICED to the government of China.

It is always difficult to attribute policy shifts to any single source, especially over time frames as short as one year. It is decision-makers who must determine the real impacts of the CCICED on China's environmental and development policies. But it is useful for the Council to examine whether or not general policy thrusts are heading in directions it advocates.

This paper is the ninth report provided by the Chinese members of CCICED's support group to its chief advisors. Some changes in presentation have been made to enhance clarity and accessibility: The first part of the report lists the key polices adopted in the previous year, grouped under broad environment and development policy rubrics; the second part

presents in a concise table the linkages between CCICED recommendations and China's major policy shifts of the past year.

6.2 2015—2016 Environment and sustainable development policy progress

6.2.1 Planning for environment and development

6.2.1.1 Outline of the 13th Five-Year Plan indicates directions for further improvement of ecological civilization in the next five year

This document was issued in March 2016 by the National People's Congress (NPC). It puts forward a development model based on "innovation, coordination, green, openness, and sharing". The document emphasized adherence to the basic national policy of resource conservation and to environmental protection and sustainable development. It further commits to developing civilization and improving production, outlining the possibility of achieving more affluent lifestyles while remaining ecologically sound. Other main points include accelerating the construction of a resource-saving, environment-friendly society, establishing modern approaches to construction where people are in harmony with nature, contributing to a beautiful China and hence, to ecological security across the globe.

According to this document, major eco-environmental objectives include general improvements to the environment, green and low-carbon production and consumption, efficient energy use, energy and water conservation, rational use of construction land, controls over total carbon emissions, a significant decrease in total emissions of major pollutants, spatial planning and the creation of ecological protection zones. The document lists 10 binding resource and environment indicators, when the 12th Five-Year Plan Outline listed only eight. More specifically, the Outline stipulates that during the next five years, there should be significant cuts in water consumption (23%), energy consumption (15%) and CO_2 emission per unit of GDP (18%); forest coverage should increase to 23.04% of the landmass, the total discharge of the four main pollutants will decrease by 10% ~15%; moreover, there should be over 80% of days with good air quality in cities at or above the prefecture level. There should be a decrease of 18% in the cities at or above prefecture level that fail the air quality standards in terms of fine particulate matter($PM_{2.5}$). Finally, there should be more than 70% of China's surface water that meets Grade III or above quality.

The document invokes a "reform of the fundamental system of environmental governance" which states that local governments must fulfill their environmental

responsibilities, environmental protection supervision and inspection must take place, and an environmental quality target-oriented responsibility system must be established, encompassing a monitoring and evaluation process. The document advocates the implementation of a vertical management system for the monitoring, supervision and law enforcement of environmental protection agencies below the provincial level. It proposes the establishment of a trans-regional environmental protection agencies, as well as coordinated watershed, trans-regional and rural-urban joint prevention and control mechanisms. There is also mention of carrying on integrated monitoring and control of multi-pollutants, of setting up an enterprise discharge permit system for all fixed pollution sources, and putting in place a "one-license" management process for pollutants discharge. The Outline recognizes the need to build a sound system for the trading of emissions permits, to tighten up enforcement of environmental law, to carry out trans-regional enforcement, and to step up the monitoring of enforcement and investigation. Efforts should also be made to establish an environmental credit record and to keep a "blacklist" of enterprises that illegally discharge emissions. At the same time, the Outline states enterprises should increasingly be responsible for openly reporting their pollutant discharge and environmental information; that public participation channels need to be activated, and that the environmental public interest litigation system should be improved. Finally, the Outline recommends the audit of environmental protection responsibilities of leading officials.

6.2.1.2 Production, living and ecological plans should be coordinated for urban development

In December 2015, a Central Urban Work Conference was convened 37 years after the question of "urban work" was, for the first time, elevated to the central level for targeted research and action. The conference clarified the spatial plans and functional orientation of urban development. Urban agglomerations should be integrated into a scientifically designed urban plan to ensure urban spaces are compact, densely used, and efficient in terms of green development. It is necessary to develop a number of urban areas and central regional cities in China's central and western regions while optimizing and upgrading eastern cities. Taking into account resources and regional advantages, cities should determine their leading industries, those that make up a region's character, and strengthen industrial cooperation and collaboration, especially between large, small, and medium-sized cities and towns. Urbanization must be synchronized with agricultural modernization and keep pace with agriculture, rural society and agricultural industries, generating a new pattern of integrated urban and rural development. Production, livelihoods and

ecology need to be coordinated in order to improve the livability of cities, and a sound understanding of the linkages among those components if required in order to put into effect regional plans that promote densification, livability, affordability, environment and resource efficiency. Green, circular, and low-carbon development should be built into the planning and construction of urban infrastructure, including transportation, energy, water supply and drainage, heat, sewage and waste disposal.

6.2.1.3 Big data planning for environmental protection

NDRC released on January 11, 2016 the *Implementation Plan for the Three-Year "Internet+" Green Ecology Action*, calling for the in-depth integration of the Internet and ecological civilization construction, the improvement of pollutant monitoring and information disclosure, the establishment of a dynamic monitoring network for resources and environment carrying capacity comprising the main ecological components, and the availability of interconnected, open and shared eco-environmental data. The document also advocates that there be full use of Internet platforms in reverse recovery logistics, that the trading and use of renewable resources be made more convenient, interactive and transparent. As a result of these measures, China will see a greening of production and consumption.

The Implementation Plan contains three major initiatives.

(1) The first is to strengthen the dynamic monitoring of resources and environment, joining hands with local governments to establish a database for the monitoring and early warning of resources and environment as well as information sharing platform; formulate the *Internet+Forestry Action Plan*; promote the monitoring of ecological redlines and the development of an ecological redlines map; and build a forest standard system corresponding to Internet+Green Ecology.

(2) The second is to vigorously develop "smart" environmental protection approaches, improve the online monitoring system of pollutants discharge making use of smart monitoring equipment and mobile technologies, increase the varieties of pollutants under monitoring, expand the scope of monitoring, and form a 24/7, all-weather and multi-level smart multi-source sensing system; strengthen the acquisition and handling of enterprise environmental credit data, and incorporate enterprise environmental credit records into the national aggregated credit information sharing and exchange platform; improve the information networking for environmental warning and risk monitoring, and improve the capability of preventing and dealing with key urgent risks incurred by heavy metals, hazardous wastes and hazardous chemicals. The last is to improve the system for recycling and online trading of waste resources, formulate the *Internet+Resources Recycling Action*

Plan (2016—2020), support the recycling industry's collection of information, analyze the data and monitor flows using the Internet of Things and Big Data, and popularize the new pattern of "Internet+" recycling.

In March 2016, MEP issued the *Overall Plan for Big Data Construction for Eco-Environment*, stressing that efforts should be made, with the focus on environmental quality improvement, to unify infrastructure construction, perform centralized management of data resources, promote the integration and interconnectivity of systems and the opening and sharing of data, facilitate business collaboration, and improve regulations, standards and data security systems. It is planned that after five years, the framework for an application platform, a management platform and an environmental protection cloud platform based on Big Data will be operational, and that it will be possible for integrated eco-environmental decisions to be made based on scientific evidence, with the capacity to monitor precisely the environment and provide convenient public services for citizens.

6.2.2 Ecosystem, biodiversity and resource conservation

6.2.2.1 Complementary ecological redlining and ecological compensation mechanisms have been implemented

In May 2016, nine ministries and commissions including the National Development and Reform Commission (NDRC), the Ministry of Finance (MOF), the Ministry of Land and Resources (MLR) and the Ministry of Environmental Protection (MEP) released jointly the *Guiding Opinions on Strengthening Resource, Environment and Ecological Redlining Control,* proposing that "efforts be made to observe strictly the environmental red lines". Periodic and regional objectives for air, water and soil quality should be established in order to improve control of total pollutant discharge in each region and each industrial sector. Also advocated is the strict precautions that should be taken against emergent environmental incidents, focusing on the improvement of environmental quality, the protection of human health, and giving overall consideration to such factors as current conditions, economic and social development, technologies for pollution prevention and control, and linkages to local governments' compliance plans. Areas attaining minimum environmental standards should strive to further improve the environment, while those failing to meet standards should formulate plans to reach set standards as early as possible. In relation to air quality, local and regional air quality should improve or at least remain stable, in line with the *Air Pollution Prevention and Control Action Plan* and for the primary purpose of attaining the levels set in the *Ambient Air Quality Standards (GB 3095—2012)*. Regarding water quality, for each region or watershed it should improve or

at the very least not get worse, in line with the *Water Pollution Prevention and Control Action Plan* and the *Opinions of the State Council on Applying the Strictest Water Resources Control System*. As for soil quality, bottom-line indexes for agricultural soils should be established for such heavy metals as cadmium, mercury, arsenic, lead and chromium, as well as organic pollutants such as polycyclic aromatic hydrocarbons and petroleum hydrocarbons; the percentage of agricultural soils meeting quality standards should improve or at least not worsen, in accordance with state provisions for soil pollution prevention and control. Eligible regions should put the quality of contaminated land in cities and those polluted by industry or mining under bottom-line management.

In April 2016, the General Office of the State Council released the *Opinions on Improving the Compensation Mechanism for Ecological Protection*, the foremost ecological compensation policy document issued by the Chinese government. The Opinions outlines measures including: by the year 2020, people living in key areas where exploitation is prohibited in order to preserve ecological functions be covered by an eco-compensation mechanism, in line with the area's economic and social development; there should be notable progress achieved in the demonstration of trans-regional and cross-basin compensation pilot projects; a diversified compensation mechanism should be in draft stages; and a basic compensation system for ecological protection consistent with China's conditions should be established, with impetus given to the formation of green modes of production and livelihoods. In addition, the Opinions contains detailed measures and accountabilities for implementing ecological compensation for the conservation of forests, grasslands, wetlands, deserts, oceans, rivers and cultivated land. The document describes institutional and operational innovations, to designate and implemented lines and formulating eco-compensation policies and related matters including central funding sources, cross-regional arrangements, industrial transfers, capacity building, park development and the setup of pilot projects.

6.2.2.2 The reform of the environmental damage compensation system solves the conundrum of "enterprises pollute, people suffer, and the government pays"

In December 2015, the General Office of the CPC Central Committee and the General Office of the State Council issued the *Plan for Pilot Projects on Reforming the Environmental Damage Compensation System*, supporting the selection of provinces to test these reforms between 2015 and 2017. Once refined, the system would be tried nationwide in 2018. Efforts will be needed to clearly outline responsibilities, remove roadblocks, adopt standard tools and approaches, put in robust safeguards, start to roll out the compensation scheme and ensure the new system is operational across China by 2020.

The compensation system should be applicable to the loss of ecological function due to environmental pollution and ecological damage. The Plan stipulates that the compensation should cover the costs of decontamination, remediation, rehabilitation, replacement, investigation, appraisal and other reasonable expenses. Pilot regions may put forward suggestions for detailed scope of compensation according to circumstances. There will also be incentives for pilot regions willing to carry out exploratory researches and practices in environmental health damage compensation.

The Plan also describes accountabilities and responsibilities for eco-compensation. Any unit or person that violates laws and regulations and causes environmental damage should be responsible for compensation. Authorized by the State Council, provincial governments of the pilot regions will be responsible for compensation under their respective administration.

To implement this Plan, MEP published the *Technical Guidelines for Identification and Assessment of Environmental Damage: General Program* and the *Technical Guidelines for Identification and Assessment of Environmental Damage: Damage Investigation* in June 2016.

The central government's Plan highlights the fact that the state is the owner of natural resources as established by the *Constitution, the Property Law* and other relevant laws, and that China is now enforcing through the Rule of Law. Provincial governments may either claim for compensation against those who destroy the environment, or cooperate with civil society organizations' environmental litigations to exercise the "damage accountability" principle as specified in the new *Environmental Protection Law*.

In June 2016, the *General Principles of the Civil Law of the People's Republic of China (Draft)* was deliberated for the first time at the 21st Session of the 12th Standing Committee of the National People's Congress. It makes mention of "environmental remediation", as another way to bear the responsibility for environmental pollution and ecological damage. According to Article 160, civil liabilities may be borne through: "… (V) rehabilitation, and environmental remediation".

6.2.2.3 Natural resources balance sheets are the foundation of accountability and compensation

In November 2015, the General Office of the State Council issued the *Pilot Plan for Preparing Natural Resources Balance Sheets*. The methodology involves accounting for land, timber, and water resources. A land balance sheet for example tallies upland use for cultivation, woodland and grassland, while taking into account land quality. A timber balance sheet includes the stock volume and the stock volume per unit area of natural,

man-made and other forests. A water balance sheet inventories volumes and purity of surface and ground water. The pilot project aims to support a survey of natural resources, based on a sound, scientific and normative system. In such a manner, China could assess current status of its natural resource assets, and with this baseline be able to monitor, provide early warning and decision support for protecting and using sustainably its natural resources. In the meantime, natural resources balance sheets could be incorporated into the ecological civilization system and linked to other systems such as resources, ecosystems and environmental red lines, control of ownership and use of natural resource assets, audit of natural resource assets for leading cadres and investigation of responsibilities for ecological and environmental nuisance.

6.2.2.4 The amendment to the Wild Animal Protection Law targets the welfare of wild animals

In July 2016, the Standing Committee of the National People's Congress approved the revised *Wild Animal Protection Law*, the first major amendment to a 1988 statute. Article 26 of the amended law specifies that "wild animals shall not be ill-treated" and also contains substantive protection of animal welfare, such as: "the breeding of wild animals covered by national priority protection…shall ensure their access to necessary space for living and activity, fostering good breeding and health conditions, maintain the sites, facilities and techniques corresponding to breeding objectives, species and development, and comply with applicable technical standards and epidemic prevention requirements". In the amended statute, "wild animal conservation" has been changed to "protection of wild animals and their habitats", in recognition of the holistic nature of what needs to be protected. It requests that impacts on wild animals' habitats and migrating channels be demonstrated in the formulation of plans; remedial measures be adopted during the construction of railways and bridges as they may destroy the habitats and migrating channels of some wild animals; state forestry administration departments need to ascertain and release their directory of important habitats of wild animals.

6.2.3 Energy, environment and climate

6.2.3.1 Efforts are made to optimize the energy mix and increase the proportion of renewable energy

In March 2016, NDRC and the National Energy Administration (NEA) released the *Notice on Promoting the Orderly Development of Coal Power in China*, proposing to "exercise strict control over the additional increases of coal power in all regions", and not to approve new coal power construction in provinces with electricity surplus. In provinces

with an electricity gap, priority should be given to the development of local non-fossil energy generation projects, with the intent to use trans-provincial energy transfers and other demand-side management approaches that could curtail the demand for new coal-fired generating plants. Thermal power generators that have gone through many years of service and are not energy efficient, safe or environmentally sound should be phased out, and condensing units below 300,000 kW which have operated for at least 20 years, as well as condensation extractors for thermal power plants that have operated for 25 years or more should be shut down.

In May 2016, eight ministries and commissions, including NDRC, NEA, MOF and MEP, released the *Guiding Opinions on Promoting Electric Energy Substitution*, proposing to: improve the policies ruling electric energy substitution; establish a standardized and orderly operation and supervision mechanism; and build a new energy-saving, environment-friendly, convenient, efficient, technically feasible and heavily subscribed electricity consumption market. Between 2016 and 2020,electric power will be substituted for some 130 million tons of dispersed coal and fuel, which should drive an increase of 1.9% in the electricity generation-to-coal consumption rate and of 1.5% in the electric energy-to-terminal energy consumption rate, allowing non-coal electricity generation to reach approximately 27%.

Also in March 2016, NDRC and NEA promulgated the *Energy Technology Revolutionary Innovation Action Plan (2016—2030)*. The objective of the plan is that by 2020, China should see a significant improvement in independent energy innovation, with major breakthroughs in key technologies and a decrease in foreign dependence for energy technology and equipment, key components and materials. Thus, China will be more competitive in this sector. By the year 2030, a sound energy technology innovation system will be in place, with a capacity to support coordinated and sustainable development of China's energy industry. By then, China should be among the global powers in energy technology. The Action Plan also includes a *Roadmap of Key Innovation Actions for Energy Technology Revolution*, putting forward innovative objectives for 2020, 2030 and 2050 respectively.

6.2.3.2 The foundation for a national carbon market is in place

In January 2016, NDRC issued the *Notice on Effectively Conducting the Key Work for Launching the National Carbon Emission Permit Trading Market*, requesting that local governments tap into market mechanisms to allocate GHG emissions, in line with the government's economic system reform and ecological civilization, as well as targets to control GHG emissions and achieve low-carbon development. The document posits that

the central government, local authorities and enterprises should join forces to facilitate the construction of the national carbon market, to ensure that a carbon emissions permit trading mechanism be launched nationwide and that the necessary regulations be in place starting in 2017. At the first stage, the national carbon market will cover such key sectors as petrochemicals, chemical engineering, building materials, steel, nonferrous metals, paper, electric power and aviation. Participants could include any business or independent accounting firm whose business involves the sectors listed, and which total energy consumption was 10,000 tons of standard coal equivalents or above for any year between 2013 and 2015. Moreover, NDRC requires local governments to audit, report on and inspect the historical carbon emissions of enterprises registered in the carbon trading system.

To ensure the smooth operation of these trading platforms, fourteen ministries and commissions including NDRC, the Ministry of Industry and Information Technology (MIIT) and MOF formulated jointly the *Interim Measures for Management of Public Resources Trading Platforms* in June 2016.

In February 2016, NDRC and the Ministry of Housing and Urban-Rural Development (MOHURD) released jointly a *Work Plan for the Pilot Construction of Climate Resilient Cities*, proposing to incorporate climate resilience indexes into the urban-rural planning system, construction plans and industrial development plans, build 30 climate-resilient pilot cities, improve average cities' climate-resilient management and raise awareness of green buildings to 50% by the year 2020. The document wants to support greater dissemination of scientific knowledge on climate change adaptation, make cities capable of dealing with waterlogging, drought, water shortages, high temperatures, heatwaves, strong winds and ice storms, as well as improving their overall resilience to climate change by 2030.

6.2.4 Environmental governance and the rule of law

6.2.4.1 The Central Environmental Protection Inspection Teams promote greater accountability of party committees and governments and accountability for dereliction of duty

The Central Environmental Protection Inspection Teams work to further ensure that both CPC committees and governments are held accountable, officials take responsibility for workplace safety and those who fail to uphold safety standards are held accountable.

The central pilot environmental protection inspection was carried out in Hebei Province from December 31, 2015 to February 4, 2016 in accordance with the *Environmental*

Protection Supervision Plan (Trial Implementation). The inspection team criticized harshly environmental protection in Hebei, stating that the "former leadership of the CPC Committee in Hebei Province had neither attached importance to, nor worked seriously on, environmental protection between 2013 and July 2015". This caused dismay in Hebei Province and throughout the nation. Up to April 8, 2016, Hebei Province had closed down and banned 200 enterprises that had broken environmental laws, put on record and punished 125 cases, held 123 people under administrative detention, had administrative interviews with 65 people, circulated a notice of criticism against 60 officials and investigated the responsibility of 366 individuals when investigating and dealing with the environmental issues assigned by the inspection team.

The first group of eight central environmental protection inspection teams were responsible for the investigations in Inner Mongolia, Heilongjiang, Jiangsu, Jiangxi, Henan, Guangxi, Yunnan and Ningxia respectively. In one month, they generated an avalanche of formal notices related to pollution control. As of August 19, 2016, over 2,000 leaders and managers of the CPC and government organs in the eight provinces and regions have been held accountable and most of them have received Party or policy disciplinary punishments. [1]

6.2.4.2 Judiciary bodies contribute to ecological progress and green development

In May 2016, the Supreme People's Court (SPC) published the *Opinions on Giving Full Play to the Functions of Trials and Providing Judicial Service and Safeguard and for Promoting ecological civilization Construction and Green Development*. It proposes to "explore actively judicial countermeasures against climate change and promote the building of a national system tackling and governing climate change". The document requires judicial authorities at all levels to "hear carbon emission-related cases according to the law; conduct in-depth research on legal issues related to carbon trading, settle carbon trading disputes, and promote the construction of a national carbon market; hear cases involving electric power generation, steel, building materials and chemicals, in such fields as industry, energy, construction and transportation. The judiciary is expected to facilitate low-carbon development by applying the appropriate laws, administrative regulations, rules and environmental standards concerning energy conservation and emission reduction".

1 "The First Group of Eight Provinces and Regions Covered by the Central Environmental Inspection May Receive a Fine more than 100 Million RMB", available on Economic Information Daily, August 22, 2016.

6.2.4.3 The national pilot zones explore the path and provide experience for ecological civilization construction

The CPC Central Committee and the State Council released the *Opinions on Establishing Unified and Standard National ecological civilization Pilot Zones and the Implementation Plan for National ecological civilization Pilot Zones (in Fujian)*, in an effort to explore options and gain policy experience.

The first group of pilot zones for ecological civilization includes the provinces of Fujian, Jiangxi and Guizhou. Through experiment and exploration, progress can be made in the key tasks pertaining to ecological civilization, with concrete achievements by 2017. The pilot zones will lead in building a sound ecological civilization system, demonstrate what can be achieved and can then be duplicated and popularized across China. There are expectations of significant progress in the efficient use of resources, cleanup of the environment, and in the quality of and benefits from development. The intent is to demonstrate the win-win between socio-economic development and environmental protection, where there can be harmony between man and nature. This demonstrates a powerful institutional commitment to accelerate ecological civilization, realize green development and build a beautiful China by the year 2020.

According to the Opinions, without the approval of the CPC Central Committee and the State Council, government organs shall neither establish nor replicate any pilot, demonstration or other similar project and designate them *ecological civilization*; all ecological civilization pilot and demonstration project that have been started shall end on time, no later than the year 2020.

As an important ecological zone in South China, Fujian province is well positioned to take the lead in this pilot, because it has been implementing its own eco-province strategy for years, with useful attempts made to innovate in this area. The Implementation Plan allows for Fujian to become a test site for scientific land use management the realization of ecological products' value, the reform in environmental governance system and the assessment of China's green development. It is hoped that by 2017, there will be preliminary results which can be duplicated and scaled up, so that by 2020, China will possess an effective ecological civilization governance system.

6.2.4.4 MEP establishes Departments for Water, Air and Soil Environmental Management to address major pollution problems

MEP has gone through institutional reform to strengthen the prevention and control of air, water and soil pollution, establishing three new departments: Water, Air and Soil Environmental Management, In February 2015, the State Commission Office of Public

Sector Reform (SCOPSR) approved MEP's plan to eliminate its departments of Pollution Prevention and Control and of Total Pollutant Discharge Control, and establish the three new departments. Basing the administrative responsibilities on these components of the environment allows for better clarity of accountabilities and responsibilities internally. The objective is to enhance operational efficiency, to ensure all important environmental functions are covered, and to manage the environment by targeting defined air, water and soil quality metrics.[1]

6.2.4.5 Pilot project is launched to test the vertical management of environmental monitoring, surveillance and enforcement

Issued in September 2016, the *Guiding Opinions on the Pilot Reform of Vertical Management System for Environmental Protection Departments below the Provincial Level Concerning Environmental Monitoring, Supervision and Law Enforcement* lists the following objectives:

(1) To strengthen the environmental protection responsibilities of local party committees and governments and relevant departments. The document emphasizes that provincial-level authorities which report to the central government are to oversee the comprehensive surveillance and management of environmental protection, define the responsibilities of relevant departments and develop the list of accountabilities;

(2) To fine-tune local environmental protection management. Municipal environmental protection bureaus (EPB) report to both provincial EPBs and their own municipal governments. They manage and direct county environmental work in their area, and are responsible for budgets for staff and operations. County-level bureaus will now be under the direct management of municipal EPBs. Provincial EPBs will now oversee municipal and county-level bureaus, and will be responsible for monitoring, investigations, evaluations and assessments of the provinces' environmental performance;

(3) To standardize and strengthen local EPBs organizations and staff classifications. These local EPBs are gradually transformed into administrative units integrated into the administrative system, in combination with the reform of institutional system and classified reform of public institutions;

(4) To ensure operations are sound and efficient. The document states it is necessary to strengthen cross-regional and inter-basin environmental management, establish a robust environmental protection coordination mechanism to strengthen collaboration between

1 "The Ministry of Environmental Protection Notifies the Organization of the Department of Water Environmental Management, Department of Air Environmental Management and Department of Soil Environmental Management", available on the website of the Ministry of Environmental Protection, http://www.mep.gov.cn/gkml/hbb/qt/201606/t20160613_354395.htm, last update: August 18, 2016.

EPBs and other departments, and share information about environmental monitoring and enforcement.

6.2.4.6 Making the environmental impact assessment system more effective

MEP formulated the Measures for *Administration of Post Environmental Impact Assessment for Construction Projects (for Trial Implementation)* and the *Measures for Administration of Regional Restricted Approval of Environmental Impact Assessment for Construction Projects (for Trial Implementation)* in December 2015.

The revised *Environmental Impact Assessment Law*, approved by the Standing Committee of the National People's Congress in July 2016, came into effect September 1, 2016. The revision streamlines administration and delegates' power to lower administrative levels, and intensifies enforcement of the law. It also eliminates a priori approval of EIAs for construction projects, stipulating that an EIA approval needs tobe sought along with other approvals, but that it must be obtained before construction starts. The new Measures eliminates regulation stipulating that "any construction project involving water and soil conservation must have a water and soil conservation plan approved by water administration departments"; it revokes the "preliminary review" of competent departments of the corresponding sectors; it enhances EIA planning, requiring government organs that formulate specialized plans to justify their adoption or rejection of an EIA report conclusion. The document allows for more severe penalties for unlawful acts, and cancels the criticized "EIA makeup" regulation. As for construction projects that proceed without EIA approval, environmental protection departments at municipal level and beyond will have the authority to stop the construction and to impose a fine of 1% to 5% of the total cost of the project, depending on the severity of the breach and its environmental consequences; restoration may be ordered as well.

In July 2016, MEP released the *Implementation Plan for the Environmental Impact Assessment Reform during the 13th Five-Year Plan*, with objectives that "top design of strategic and planned environmental impact assessment should be improved further, environmental impact assessment should be binding and its warning system should take initial shape". Efforts should be made to perform EIAs at depth, complete the EIA of the Beijing-Tianjin-Hebei Region, the Yangtze River Delta and the Pearl River Delta strategies, and organize and carry out an EIA on the Yangtze River Economic Zone and the Belt and Road Initiative. Efforts should also be made to "implement pilot regional environmental impact warning; rough estimation and early warning of regional environmental capacity, with the aim to improve environmental quality; environmental impact warning for the Yangtze River Economic Zone and the concerted development of

Beijing, Tianjin and Hebei; pilot resource and environmental bearing warning for typical key development areas and optimized development areas; and spatial red-line warning for typical exploitation-restricted areas and exploitation-prohibited areas".

6.2.4.7 The environmental credit system for enterprises lays the groundwork for differentiated management

In December 2015, MEP and NDRC jointly published the *Guiding Opinions on Strengthening the Construction of the Enterprise Environmental Credit System*, requesting that by the year 2020, this credit system be in place, environmental credit records be established, an information system covering the state, provinces, cities and counties be set up, an incentive and penalty mechanism for environmental credits be in operation and that enterprises' awareness and capacity in terms of environmental credits be widespread.

Jiangsu Province released in December 2015 the *Notice on the Issues Concerning the Trial Implementation of Differential Electricity Prices according to Environmental Credit Rating*, putting into practice a differentiated electricity price policy against heavily polluting enterprises which get a "red" or "black" result in the annual environmental credit rating. To be specific, 0.05 RMB/ kWh shall be added to the current electricity price for "red" enterprises and 0.1 RMB/ kWh shall be added for "black" enterprises. Jiangsu Province then issued in February 2016 the *Notice on Issuing the Implementation Measures of Jiangsu Province for the Collection, Use and Management of Sewage Treatment Fees*, encouraging eligible regions to set up different sewage treatment fee standards according to the enterprise environmental credit rating. This implies that a surcharge of 0.6 RMB/ $m^3$and 1.0 RMB/m^3 will be added to the sewage treatment fees for "red" and "black" enterprises respectively; the higher surcharge will be levied also on enterprises that are assessed "red" for two consecutive years or more.

6.2.4.8 The reform of resources and environmental taxes is helping to optimize production and consumption

In May 2016, MOF and the State Administration of Taxation (SAT) released the *Notice on Comprehensively Promoting Resources Tax Reform and the Interim Measures for the Pilot Reform of the Water Resources Tax*, signaling the comprehensive reform of resource taxes by July 1, 2017. The resources tax reform involves moving from quantity-based tax assessments to a price-based system, which demonstrates that the Chinese Government is starting to incorporate environmental costs into resources pricing.

In the meantime, MOF and SAT have launched a water resources tax reform pilot project, starting first with Hebei province. In Hebei, there is already a trial involving the collection of a water resources tax, whereby the traditional surface and groundwater user

fees are converted into a tax, assessed at a minimum charge of 0.4 RMB/ m^3 for surface water and 1.5 RMB/ m^3 for ground water. Higher rates are charged to water-intensive industries, to entities that go beyond their water allotments, to those siphoning ground water from areas where reserves are shrinking; on the other hand, water levies have not increased for households or for enterprises that use "normal" water volumes.

On August 29, the *Draft Environmental Protection Tax Law* was submitted to the NPC Standing Committee. It is the first single-line tax law, and one which is seen as meeting the legal requirements laid out by the 3rd Plenary Session of the 18th CPC Central Committee in the Legislation Law. The law mandates the collection of sewage charges and will reduce the efforts required for collection. Other areas covered include an environmental protection tax and the link between environmental departments and tax departments in the collection process.

6.2.4.9 Greening consumption and lifestyle entails public participation in the green transition process

In November 2015, MEP published the *Implementation Opinions on Accelerating the Greening of Lifestyles*. The document indicates that by the year 2020, the concept of ecological civilization will be embraced by China's population, that the adoption of green lifestyles will be widespread, and that a system of policies, laws and regulations supporting green lifestyles will be in place. It is expected that by then, green products and services will be widely available, and people will be well acquainted with this way of living, that they will be diligent and thrifty in their adherence to both lifestyles and consumption patterns that are green, low-carbon, civilized and healthy. Essentially, ecological civilization will be the norm.

In February 2016, NDRC, the CPC Central Committee's Propaganda Department and the Ministry of Science and Technology (MOST) published jointly their *Guiding Opinions on Promoting Green Consumption*, signaling acceleration in the transition towards green consumption, in line with green development concepts and socialist core values. There is to be an increase in public information and education to spread what it means to lead a green lifestyle, be diligent and thrifty, and to be a "green consumer". Standards of green consumption will be issued to guide the population. The document mentions the need to tighten up production and market access while increasing the supply of green consumption goods. There is also mention of continuous policy improvements and of incentives to promote green consumption. The document states that by 2020, there will be consensus behind green consumption, that systems will be in place to support it, and that waste and extravagance will be constrained. It is anticipated that by then, there will be a

predominance of green products on offer in the market, leading to ways of life and modes of consumption that are green, thrifty, low-carbon and healthy.

6.2.4.10 Green finance and green supply chains accelerate the greening of enterprises

In August 2016, the *Guiding Opinions on Building the Green Financial System* was issued by seven ministries including MEP and the People's Bank of China, in order to mobilize greater social capital into green industry while suppressing polluting investments. The green financial system encompasses green credit, green bonds, green stock index and related instruments, green development funds, green insurance and carbon finance, and other related policies. The document supports local development of green finance and proposes to integrate environmentally beneficial projects into a green project inventory, also listing them in a national asset trading center in an effort to create various financing arrangements. It also calls for efforts to promote international cooperation in green finance, improve over seas green investments and environmental information disclosure, and explore the use of environmental pollution liability insurance and other tools for environmental risk management.

Initiated by China, the G20 Green Finance Study Group was set up and the *G20 Green Finance Synthesis Report* issued at the G20 Hangzhou Summit, putting the green finance industry on the agenda for the first time.

NDRC released the *Guidelines for the Issuance of Green Bonds* on December 31, 2015. Green bonds are corporate bonds that raise funds to support energy conservation and emissions reduction technology transformation, green urbanization, clean and efficient energy use, new energy development and adoption, the development of a circular economy, conservation of water resources and development and utilization of unconventional water resources, pollution control, ecological agriculture and forestry, energy conservation and environmental protection industry, low-carbon industry, advance demonstration and experiment of ecological civilization, low-carbon pilot demonstrations and other green, circular and low-carbon development projects. Enterprises issuing green bonds benefit from favorable conditions, according to the document.

On June 20, 2016, MIIT released the *Green Industry Development Plan (2016—2020)*, proposing to promote green manufacturing through green supply chain. In August, MIIT, NDRC, MOST and MOF released the *Green Manufacturing Engineering Guide (2016—2020)* which aims to build by 2020, a green supply chain management system in key industries. In addition, the document aims to encourage and promote green supply chains in enterprises.

6.2.5 Pollution prevention, control and mitigation

6.2.5.1 The mid-stage assessment of large-scale pollution control actions shows an overall improvement in air quality

The Chinese Academy of Engineering (CAE) conducted a mid-stage assessment of the implementation of the *Air Pollution Prevention and Control Action Plan* in December 2015. According to the report, China's urban air quality generally improved between 2013 and 2015,with dropping concentrations of various pollutants year on year, and significantly fewer days with serious and heavy pollution, thanks to the implementation of the *Air Pollution Prevention and Control Action Plan*. However, air quality still faces serious challenges. The pollution of fine particulate matters in winter is prominent and ozone pollution in summer is picking up.[1]

6.2.5.2 Water quality is of concern in the guiding opinions on environmental pollution prevention and control in the Yangtze River "Golden Waterway"

In February 2016, NDRC and MEP released the *Notice on Strengthening Environmental Pollution Prevention, Control and Governance of the Yangtze River Golden Waterway*, putting environmental restoration of the Yangtze River uppermost and proposing to control water pollution, and to protect and restore ecological zones of the Yangtze River through zoning, optimizing industrial structures, strengthening source treatment and emphasizing risk prevention and control, with the focus squarely on improving the quality of the aquatic environment. By the year 2017, the water quality along the Yangtze River Economic Corridor is to improve; total discharge of main pollutants will continue to drop; and the system of environmental risk prevention and control of hazardous chemicals will be in place. By the year 2020, water quality in the Yangtze corridor will continue to improve, over 75% of the river's water will surpass Grade III, and water quality in the river's main tributaries will remain stable. The document supports ongoing improvement of guaranteed drinking water safety, with 97% of centralized drinking water sources for cities at or above prefectural level will reach or surpass Grade III. Water quality in the Three Gorges Reservoir will further improve and eutrophication will be controlled in the important lakes of the system such as Taihu Lake.

6.2.5.3 Implementation of the Soil Pollution Prevention and Control Action Plan

The State Council issued the *Soil Pollution Prevention and Control Action Plan*

1 "Clear up Prominent Problems, Put forward Corresponding Suggestions—An Interpretation on the Mid-stage Assessment for the Implementation of the *Air Pollution Prevention and Control Action Plan*", available on the website of the Ministry of Environmental Protection, http://www.zhb.gov.cn/xxgk/zcfgjd/201607/t20160706_357206.shtml, last update: August 5, 2016.

in May 2016, when the action plans targeting air, water and soil pollution had all been promulgated.

The Action Plan embodies the principles of "prevention first", prioritization and risk management. It highlights critical areas, industries and pollutants, advocates for governance based on classification, utilization and staging, proposes strict control over new or increased pollution sources, and supports the phasing out of industrial polluters. The document also proposes the formation a government-led soil pollution control system where enterprises are held accountable, there is public engagement in surveillance, and where the sustainable use of soil resources is promoted. This vision of soils as an integral part of a healthy environment puts the accent on improving the quality of soils in order to ensure the quality of agricultural products and the safety of human settlements.

The document outlines the following as work objectives: By the year 2020, soil pollution will be contained, soil quality will for the most part remain stable, soil quality safeguards will be in place, and risk factors will be under control; by the year 2030, soil quality will see an improving trend, farming and housing lands will be safe, and risks will be fully mitigated; by the year 2050, soils will be of sound quality and a "virtuous cycle" of clean soils in clean ecosystems will be in place.

The key targets set for implementation are: by 2020, 90% of the land for cultivation and for development must be of sound quality; by 2030, the ratio must reach 95% or better.

The document stresses how fundamental soils are to the quality of farm products and human health, and that the priority must be put on land for farming and residential development. It advocates a management of lands based on a classification system that takes into account the severity of the contamination, with priority protection afforded to soils that are not yet severely affected. Lightly or moderately contaminated soils should be used safely, while severely contaminated soils should be strictly controlled. Some measures proposed include setting up a registry of soils, with thorough inventory of contaminated sites and strict controls over access to and use of these lands.

It is recognized that implementation of the Action Plan represents a key strategic tool for improving environmental quality, demonstrating that China has entered the final phase of pollution control, thus ensuring ecological safety and food security.

6.2.5.4 Regional and Global Engagement

On October 31, 2015, China, Brazil, India and South Africa released in Beijing the *Joint Statement Issued at the Conclusion of the 21st BASIC Ministerial Meeting on Climate Change*, declaring their unequivocal commitment towards a successful outcome at the Paris Climate Change Conference through a transparent, inclusive process.

On November 30, 2015, President Xi Jinping addressed the Paris Conference on Climate Change in a speech entitled *Working Together to Build a Win-Win, Equitable and Balanced Governance Mechanism on Climate Change*. He stated that China has always been proactive in combating climate change, and is sincere and determined to contribute to a successful Paris Conference on Climate Change. He said the Chinese government is committed to South-South cooperation on climate change, with China supporting developing countries, especially the least developed, landlocked and small island developing countries, to address climate change challenges. China announced the creation of a RMB 20 billion South-South Climate Cooperation Fund in September 2015, and will fund 10 low-carbon demonstration areas and 100 climate change mitigation and resilience projects, in addition to a climate change training program for 1,000 people in 2016. China will continue international cooperation efforts in the areas of clean energy, disaster prevention and mitigation, ecological protection, climate-resilient agriculture and construction of low-carbon "smart" cities.[1]

Also in March 2016, China and the U.S. published the *U.S.-China Joint Presidential Statement on Climate Change*, committing to specific steps to join the *Paris Agreement*. Both countries also encouraged other parties to the *United Nations Framework Convention on Climate Change* to do so, with a view to bringing the *Paris Agreement* in force as early as possible. The two presidents promised further action to implement the *Paris Agreement* and eliminate climate threats.

On April 22, 2016 coinciding with World Earth Day, China signed the Paris Agreement at the UN headquarters, giving the international community a positive and powerful sign of the willingness to work together with countries to address global warming. On September 3, 2016, the eve of the G20 Hangzhou Summit, the NPC Standing Committee approved China's accession to the Paris Agreement.

In October 2016, the 28th Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer was held in Kigali, Rwanda, reaching a historic consensus on reducing the use of hydrofluorocarbons (HFCs). As co-chair of the conference, China made great efforts bridging differences and forging a consensus.

1 Xi Jinping: Work Together to Build a Win-Win, Equitable and Balanced Governance Mechanism on Climate Change—Address at the Opening Ceremony of the Paris Conference on Climate Change, available on people.cn, http://politics.people.com.cn/n/2015/1201/c1024-27873625.html, last update: August 19, 2016.

6.3 CCICED Policy recommendations and their implications

The report reviews the past year's laws, regulations, plans, policies, rules, opinions, and important leaders' speeches in seven fields related to environment and development. An overwhelming 80% of the concepts embodied in these documents have been the subject of CCICED policy recommendations over the past six years. Some important environmental management concepts, such as ecological compensation, have been suggested by CCICED over the decade and finally incorporated into policies in 2016. The table found in the Annex to this report links policy developments and CCICED recommendations. The implications of these findings are outlined below.

6.3.1 Planning for environment and development

In its 2015 policy recommendations, CCICED proposed a national macro-level strategic environmental risk assessment and prevention system and advocated that environmental risk assessments be conducted for major strategies, such as the Belt and Road Initiative, Beijing-Tianjin-Hebei Integration and the Yangtze River Economic Corridor. The *Implementation Plan for Environmental Impact Assessment Reform During the 13th Five-Year Plan Period* stressed the need to improve designs for strategic and planning environmental impact assessments (EIA), complete the strategic EIA of the Beijing-Tianjin-Hebei region, Yangtze River Delta, and Pearl River Delta, and organize the strategic EIA of the Yangtze River Economic Corridor and the Belt and Road Initiative.

Other suggestions include strengthening environmental science and technology innovation and establishing a national big data network, information system and environmental management platform, so as to enhance decision support capability for environmental governance.

The *Implementation Plan for the Three-Year "Internet+" Green Ecology Action Plan* calls for in-depth integration of the Internet with ecological civilization, green production and life styles with improvements in pollution monitoring and information dissemination. The idea is to, foster a dynamic monitoring network for resources and environmental carrying capacity encompassing the main ecosystem elements, let the Internet serve as a platform in the reverse logistics recovery system, and enhance facilitated, interactive and transparent use and trade of renewable resources. The *"Internet+" Resources Recycling Action Plan (2016—2020)* advocates the "Internet +" recycling model. Issued by MEP, the *Overall Plan for Big Data Construction for Eco-Environment* specifies the need to build

the framework for an application, a management platform and an environmental protection cloud platform based on Big Data, and support evidence-based environmental decision-making, real-time monitoring of the environment and the provision of convenient public services. In addition, MFA released the *"Internet +" Forestry Action Plan*.

6.3.2 Ecosystem , biodiversity and resource conservation

In 2005 and in subsequent years, the CCICED recommended that the Chinese Government introduce ecological compensation to more equitably allocate among those who benefit from, and those who pay for environmental protection policies and initiatives. For example, the Council advised China:

① "to establish a sound ecological compensation mechanism and explore an urban-rural integrated model of environmental governance to advance China's environmental protection cause" (2008);

② "to put in place ecological compensation mechanisms for marine and freshwater ecosystems" (2010);

③ "to allocate the ecological compensation fund in accordance with the eco-functional zoning of China's eastern and middle-western regions"(2012); and

④ "to set up ecological and pollution damage compensation mechanisms on the basis of an accounting of ecosystem services" (2013).

More specific recommendations have been made by CCICED in 2014, including accelerating and improving implementation of the ecological compensation system, adhering to the principle of "polluter pays, destroyer compensates, and protector benefits", and mobilizing local governments to protect the environment. The Council advocated for along-term mechanism that considers land tenure and stakeholders, with direct payment of eco-compensation to landowners or operators of ecological redlined areas, and where major ecological restoration projects are assigned within red-lined zones. Ecological transfer payments take into account the scope and impact of the specific redline policy.

The *Opinions on Improving the Compensation Mechanism for Ecological Protection* formally establishes the ecological compensation system, with many of its provisions echoing CCICED recommendations.

The CCICED addressed ecological red lines in 2013 and the following year, called for ecological redlining legislation. Many CCICED recommendations are reflected in the *Guiding Opinions on Strengthening Resource, Environment and Ecological Redlining Control*. As the Council had advocated, the document states that resource, environment and ecological redlining controls should follow the concepts of resource carrying capacity

(consumption ceiling), environmental quality bottom line, ecological protection red lines and inclusion of all kinds of economic and social activities into the constraints outlined for a specific red lined area.

6.3.3 Energy, environment and climate

In 2013, CCICED drew attention to coordination and synergies of programs and measures targeting energy efficiency, emissions reductions and climate change; it recommended long-term market-based mechanisms for price setting, taxation and emissions trading. In 2014, the Council suggested integrating the goals of tackling climate change and achieving peak carbon emissions as an important component of green transition; it recommended developing a green transition roadmap for the next 10 to 20 years to ensure emissions peak in 2030 or earlier in order to reach as soon as possible the turning point for comprehensive environmental improvements. It recommended accelerating the development and amendment of emissions reduction laws and regulations, and to add climate change to the legislative agenda.

This is echoed in the 13th Five-Year Plan which states that "both mitigation and adaptation should be emphasized, and active efforts needed to control carbon emissions, fulfill emission reduction commitments, enhance climate change adaptation capacity and deepen engagement in global climate governance, so as to contribute to tackling global climate change".

The establishment of an emissions trading system was recommended in 2009 and 2011. Now, preparations are underway for China to have a national carbon market in 2017.The *Notice on Effectively Conducting the Key Work for Launching the National Carbon Emission Permit Trading Market* requires the coordination of central and local governments and enterprises to ensure emissions trading can start nationwide on schedule.

In the area of adaptation, CCICED proposed in 2014 paying more attention tothe capacity of cities to adapt by developing environmental plans and putting in place a risk assessment framework and corresponding financial emergency funds.The government's *Work Plan for the Pilot Construction of Climate Resilient Cities* includes climate resilience indexes for urban-rural, construction and industrial development plans, so as to make cities resilient to flooding, drought, water shortages, high temperatures, heatwaves, wind and ice storms.

6.3.4 Environmental governance and rule of law

The CCICED has focused on environmental governance and rule of law, with a large

number of recommendations issued in this regard over the past years. The impact of this work can be seen in the following areas:

CCICED has highlighted the importance of environmental policy implementation and local environmental accountability over the years. For example, it suggested that:

① "the central government's role should be to monitor and coordinate implementation of the action plan on air pollution by local governments, and that it environmental accountabilities (2013)"; and

② "environmental impacts should be fully accounted for when government makes important decisions, and that government departments reporting to the State Council should be inspected, supervised and evaluated (2015)".

The *Environmental Protection Supervision Plan* (for trial implementation) further strengthens the requirements for dual responsibilities of the local party committees and governments, with accountability for dereliction of duty.

CCICED stressed in 2003 and 2006 the importance of institutional reform to address local protectionism and better implement environmental laws and policies at all administrative levels. The *Guiding Opinions on the Pilot Reform of Vertical Management System for Environmental Protection Departments below the Provincial Level Concerning Environmental Monitoring, Supervision and Law Enforcement* clearly spells out local administrative reforms, strengthening the environmental protection responsibilities of the local party committees and governments and their relevant departments. The document makes adjustments to local environmental protection management, strengthens local environmental protection agencies and personnel; and improves operational efficiencies.

With the ecological civilization pilot project, the CCICED recognized the importance of testing policy options at the local level, advocating that "The Central Government provide economic incentives to encourage demonstration areas at the local level" (2013) and "to accelerate institutional reform for ecological civilization through the establishment of a multi-party environmental governance system, creation of comprehensive experimental zones for green development and transition, and implementation of plans and actions for green transition and governance capacity building"(2015). The *Opinions on Establishing Unified and Standard National ecological civilization Pilot Zones* outlined ideas, regions and objectives for such demonstrations.

In 2016, there was significant progress in environmental economic policies and especially substantial advances in an environmental credit system, environmental finance, and environmental resources tax. In 2014, CCICED advocated green finance as a breakthrough innovation that would encourage financial institutions and enterprises to

issue green bonds. In 2015, the Council recommended actions "to promote green credit, green bonds and green insurance". The *Guidelines for the Issuance of Green Bonds* provide a policy guarantee and also some preferential terms for enterprises to issue green bonds.

Since 2012, CCICED has recognized the importance of an environmental credit system to promote corporate compliance and improve environmental performance. In 2014, the Council recommended a corporate environmental credit rating system bet set up promptly, thereby encouraging enterprises that comply with emissions standards and improve their environmental performance. In 2015, CCICED reissued this recommendation. The *Guiding Opinions on Strengthening the Construction of the Enterprise Environmental Credit System* outlines both goal and roadmap for setting up this kind of credit rating. The *Notice on the Issues Concerning the Trial Implementation of Differential Electricity Prices according to Environmental Credit Rating* creatively links the credit rating with disincentives, demonstrating its fundamental role.

Since 2011, green supply chains have been an important component of the CCICED's recommendations targeting the green transition of enterprises. The Council has championed green consumption and green manufacturing via green supply chains, and provided suggestions on how to support them. In 2011, this was the subject of a major policy research effort and in 2013, and the Council recommended the inclusion of green supply chains as a criterion for public procurement. In 2015, CCICED put forward the need for governments to adopt green procurement practices and to encourage leading enterprises to follow suit voluntarily. Over the past five years, green supply chains have grown rapidly in China. In November 2014, the 22nd APEC Economic Leaders' Meeting adopted the *Beijing Agenda: Building an Integrated, Innovative and Connected Asia Pacific* and agreed to establish the APEC Cooperation Network on Green Supply Chains. The following month, MOC, MEP and MIIT jointly issued the *Green Procurement Guidelines for Enterprises (Trial)*. In 2016, green supply chains with defined targets have been implemented by ministries and local governments and have promoted green consumption, green manufacturing and green industry. In Guangdong Province, green supply chains are considered an important component of supply-side reform.

CCICED recommended resources tax reform in 2014 and the next year, that pricing of important resources be reformed by incorporating environmental costs, starting with coal and petroleum. Further the Council advocated developing a green fiscal policy that reflects the environmental costs of production and consumption.

In terms of resources tax reform, specific recommendations were made in 2012, 2014, and 2015, including ad valorem taxation, integration of environmental costs, and

mobilization of local initiatives to improve green development capacity. CCICED also called for the urgent introduction of environmental taxes in 2009, 2011, and 2012. These ideas are reflected in the *Notice on Comprehensively Promoting Resources Tax Reform*.

As early as in 2009, CCICED recommended the promotion of sustainable consumption patterns and low-carbon lifestyles, and the mobilization of the public and non-governmental organizations for green economic development. The Council has called for green lifestyles yearly since 2011, and in 2015 spelled out key steps towards sustainable consumption, namely "green diets, green clothing, green living and green travel." The *Implementation Opinions on Accelerating the Promotion of Lifestyle Greening states* that by 2020, the value of ecological civilization will be widely adopted, that citizens will have clear concepts of what green lifestyles entail, and that a preliminary system of policies, laws, and regulations will support this new way of life. The *Guiding Opinions on Promoting Green Consumption* also put forth a green consumption policy.

In 2015, CCICED recommended improving the legal framework for environmental protection, strengthening legal interpretation and improving judicial processes, in line with both the rule of law and the integrated reform plan for ecological progress.

China's environmental legislation has seen ongoing improvements this past year. Amendments were made to the *Environmental Impact Assessment Law* and the *Wildlife Protection Law* to adapt to new forms of environmental protection. In 2014, the Council recommended consolidation of all relevant policies, statutes and regulations into ecologically-oriented revisions of the civil law, economic law, criminal law and administrative law, with the basic principles of ecosystem management reflected in each statute. Still in 2015, CCICED suggested defining ecological civilization and establishing the principle of priority for prevention and sustainable use in the general provisions when the *Civil Code* is compiled. The *General Principles of the Civil Law of the People's Republic of China (Draft)* adds "rehabilitation and eco-environmental remediation", another way to bear the responsibility for environmental pollution and ecological damage, which marks a solid step forward towards an ecologically-oriented civil law.

In December 2015, MEP issued the *Measures for Administration of Post Environmental Impact Assessment for Construction Projects (for Trial Implementation)* and the *Measures for Administration of Regional Restricted Approval of Environmental Impact Assessment for Construction Projects (for Trial Implementation)*. In January 2016, NDRC unveiled the *Environmental Protection Supervision Plan (for Trial Implementation)* and MIIT, NDRC, MOST and other five ministries released the *Measures for Administration of Restricted Use of Hazardous Substances* in *Electrical and Electronic Products*. In February

2016, NDRC and AQSIQ revised the *Energy Efficiency Labeling Regulations* and the next month, MEP developed the *Measures for Supervision and Management of Radioactive Material Transportation Safety*. All these documents complete the legislative framework for environmental protection.

6.3.5 Pollution prevention, control and mitigation

In 2013, CCICED proposed that China "focus efforts on addressing prominent environmental issues such as air, water and soil pollution, in order to comprehensively meet the public's basic needs for good environmental quality." Since 2015, government departments at all levels have implemented the *Air Pollution Prevention and Control Action Plan* and the *Water Pollution Prevention and Control Action Plan*.

Still in 2013, CCICED recommended "building the system for preliminary assessment, annual assessment and final assessment for the implementation of the *Air Pollution Prevention and Control Action Plan* and improving the mechanism for regional joint air pollution prevention and control". In December 2015, the national air quality trends and pollution situation were assessed and confirmed using a variety of technical methods and official long-term datasets. The report indicates that with the implementation of the *Air Pollution Prevention and Control Action Plan*, urban air quality in China was improved for 2013—2015, with the concentration of pollutants reduced year by year, and severe pollution days reduced significantly. However, serious challenges remain, including serious winter fine particular matter pollution and rising summer ozone pollution.[1]

In 2015, CCICED suggested the establishment of national strategic environmental risk assessment and prevention system. Environmental risk assessment should be made for strategies such as the Belt and Road Initiative, Beijing-Tianjin-Hebei Integration, and Yangtze River Economic Corridor to form an environmental risk prevention network. The *Notice on Strengthening Environmental Pollution Prevention, Control and Governance of the Yangtze River Golden Waterway* places environmental restoration of the Yangtze River in the forefront and proposes to comprehensively control water pollution, and to protect and restore the Corridor's ecosystems by enforcing zoning, optimizing the industrial mix, strengthening waste treatment at source and emphasizing risk prevention and control.

CCICED has also conducted studies on soil pollution and made recommendations since 2011. It recommended that:

① a package of green programs and policy measures related to pollution prevention,

1 "Clarify the Prominent Problems and Put Forward Targeted Recommendations -- Interpretation of the Mid-stage Assessment of Air Pollution Prevention and Control Action Plan", MEP website, http://www.zhb.gov.cn/xxgk/zcfgjd/201607/t20160706_357206.shtml, last accessed: August 5, 2016.

energy and climate change, resource pricing, ecological compensation and environmental restoration be developed to address soil pollution in traditional industries and mining areas (2011);

② regular disclosure and update of information, including predictions of air, water and soil pollution threatening human health;

③ and, appraisal of government officials' performance based on climate change impacts and adaptation (2014).

The *Soil Pollution Prevention and Control Law* is to be amended into the *Soil Environmental Protection Law*, reflecting legal concept changes (2015). In May 2016, the State Council officially released the *Soil Pollution Prevention and Control Action Plan*, highlighting the fact that there are now complete plans in place to address air, water and soil pollution, and that implementation of these plans is accelerating.

In order to strengthen the prevention and control of air, water and soil pollution, MEP undertook an institutional reform to tighten up responsibilities and accountabilities, improve work efficiency and ensure all management functions are covered in this regard. The newly established departments of Water Environmental Management, Air Environmental Management and Soil Environmental Management have now clear purviews with definite performance targets.[1]

6.3.6 Regional and international engagement

CCICED has long focused on climate change and made recommendations to the Chinese Government to address this. In 2015, the Council recommended China's green action for foreign aid to strengthen South-South environmental cooperation and build a green, low-carbon, eco-friendly and growing the Belt and Road Initiative. The *Joint Statement Issued at the Conclusion of the 21st BASIC Ministerial Meeting on Climate Change and the U.S.-China Joint Presidential Statement on Climate Change* have enabled support for the *Paris Agreement*, demonstrating China's critical role in climate change adaptation and mitigation, and the importance of its involvement in international environmental governance.

6.4 Summary of policy highlights for 2015—2016

The fingerprints of past CCICED policy recommendations can easily be detected in

1 "MEP Informs the Establishment of New Departments for Water, Air and Soil Environmental Management", MEP website, http://www.mep.gov.cn/gkml/hbb/qt/201606/t20160613_354395.htm, last accessed: August 18, 2016.

China's main policy initiatives in the area of environment and development over the past year. The Council has long advocated targeted and focused efforts to tackle air, water, and soil pollution, green economic policies, ecological legislation and an eco-compensation system, and these concepts can be seen in China's recent initiatives to promote ecological progress and to implement new environmental laws. There is now a solid foundation laid for future environmental policy development and environmental governance. It is now clear that China has boldly embarked upon what is often referred to as green transition.

Firstly, ecological civilization construction has gradually evolved from a general concept to implementation and practice, with the introduction of key documents such as the *Integrated Reform Plan for Promoting Ecological Progress, Opinions on Establishing Unified and Standard National ecological civilization Pilot Zones* and *Implementation Plan for National ecological civilization Pilot Zones (in Fujian).*

Secondly, supervision of all levels of governments with respect to their environmental performance has been tightened, with specific, tangible actions taken by the Central Government to ensure local governments fulfill their responsibilities. As a result, local governments have held polluters and responsible officials accountable, and remedial action promptly taken.

Thirdly, China's environmental pollution prevention and control system has reached a new level. Action plans are now in place to address air, water and soil pollution, and the Ministry of Environmental Protection has gone through reorganization in order to be more effective. The Chinese Government is responding more decisively to public demand for a healthy environment and is forcing a green transformation of the traditional economic and development paradigms.

Finally, China is now leveraging market forces to foster green development. Environmental protection depends on both the government and the market, which in turn is determined by producers and consumers. The government has introduced over this past year a series of economic incentives for enterprises such as green bonds, a corporate environmental credit rating, ad valorem resource taxation, and also a series of economic incentives which in turn support the shift of consumers towards green consumption and green lifestyles. Clearly, China is increasingly relying on market forces to promote green development.

2016 is the first year of the 13th Five-Year Plan. There are now pilot programs well in place to road test the kind of systems that will promote ecological civilization and greater progress can be reasonably be expected over the next five years.

The influence of CCICED policy studies and recommendations, particularly those of

the last decade, is palpable. Many policy recommendations have been fully incorporated into formal national policies and translated into national action plans.

It should be noted that the Chinese Government has taken decisive action this past year, in view of a rapidly changing global environment and development context, in some cases leapfrogging or going beyond the scope of the Council's advice. This is particularly evident in global platforms to address climate change. While this area has in past Phases been considered slightly outside the purview of the Council, it is expected that climate change mitigation and adaptation will become an important focus during Phase VI.

Annex6-1 Overview on the relevance of the New Policies and CCICED recommendations

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Planning for Environment and Development			
Outline of the 13th Five-Year Plan	Achieve overall improvement in eco-environmental quality, and green and low-carbon improvements in modes of production and life, in pursuit of innovative, coordinated, green, open and shared development	2013	Study major environmental and development issues during the 13th Five-Year Plan period. In the mid-to-late 12th Five-Year Plan period, the Chinese Government should start to analyze the situation of economy, society, resources and environment during the13th Five-Year Plan period and develop medium and long-term targets and measures concerning green development, environmental protection, energy conservation and emission reduction in the next 5—10 years
	Establish the national space planning system and coordinate space planning based on main functional zoning planning to promote integrated planning.	2015	Incorporate environmental risk assessments into integrated planning
	Reform the fundamental system of environmental governance	2015	Speed up the reform for promoting ecological progress; improve the environmental legal system to provide a solid legal safeguard for green transition; reform the green financial system to promote green industrial transformation and upgrading; build a highly efficient system of environmental risk prevention and control to safeguard public health and ecological security
	Establish the marine ecological redlining system	2012	Set ecological red lines for important ecological zones in areas restricted or/and prohibited from development, nature reserves, terrestrial and marine environmental sensitive areas and ecological fragile areas
	Increase transfer payments to main agricultural producing areas and major ecological functional areas, and improve the basin-wide horizontal ecological compensation mechanism	2009	Take the development of green economy as an important way to promote the transformation of economic development patterns and formulate a national strategy for developing green economy as soon as possible while standing at the height of the Scientific Outlook for Development and promotion of ecological progress, and giving strategic consideration to strengthening the country's long-term global competitiveness

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Central Urban Work Conference	Grasp the internal link among space for the three purposes to achieve intensive and efficient production space, livable and moderate living space, and clean and beautiful ecological space. Practice green, circular, and low-carbon development in the planning and construction of urban infrastructure, covering transportation, energy, water supply and drainage, heat, sewage and waste disposal	2012	Develop region-specific sustainable urban development plans, and strive to form a new pattern of urban development in the eastern, central and western regions in a resource-conserving, environment-friendly and cost-effective, harmonious manner, in accordance with the principle of gradualness, land conservation, intensive development and rational distribution
		2013	Promote people oriented urbanization with respect for ecosystems, ecological services and green space; attach a high degree of attention to resource and environmental challenges in urbanization and explore the green urbanization model
		2014	Accelerate the implementation of new urbanization strategy, explore the ecological oriented urbanization model, and formulate and implement specific policies
	Respect the right of residents to know, participate in, supervise urban development decisions, and encourage the participation of enterprises and residents in urban construction and management in various ways, to truly achieve urban co-governance, co-management and co-construction, and shared urban development	2005	Establish multi-level government-private partnerships (PPPs) to improve urban transportation, strengthen environmental protection facilities, and promote the development of water, energy and material efficient buildings
		2013	Set up consumer consulting centers in cities, providing advisory services on recycling, product sharing, energy and water conservation, and food safety, in order to enhance the consumption awareness of the next generation
Overall Plan for Big Data Construction for Eco- Environment	Build the framework for an application platform, a management platform and an environmental protection cloud platform based on Big Data, and achieve scientific integrated eco-environmental decisions, precisely monitored eco-environment and public services provided for public convenience	2015	Establish nationwide big data network, information system and environmental management platform for the ecological environment, so as to enhance information technology and decision support capability for environmental governance

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Implementation Plan for the Three-Year "Internet+" Green Ecology Action	Strengthen the dynamic monitoring of resources and environment, and join hands with local governments to establish a database for the monitoring and early warning of resources and environment as well as information sharing platform		
"Internet+" Forestry Action Plan			
"Internet+" Resources Recycling Action Plan (2016—2020)			
Ecosystem, Biodiversity and Resource Conservation			
Guiding Opinions on Strengthening Resource, Environment and Ecological Redlining Control	Resource, environment and ecological redlining control refers to the delineation and strict observance of resource consumption ceiling, environmental quality bottom line, ecological protection red line and inclusion of all kinds of economic and social activities into control of redlining constraints. Observe strictly the red line of environmental quality. Set up periodical and regional objectives of air, water and soil environment quality to enhance the control of total pollutants discharge for each region and each industrial sector and take strict precautions against emergent environmental incidents. Require areas attaining the environmental quality standard to further improve their environmental quality and those failing the standard to formulate relevant plans and attain the standard as early as possible	2014	Develop as soon as possible the Measures for Ecological Redlining Management that stipulate the definition and connotation of ecological protection redline, delineation methods and management system
		2013	strengthen redlining control on important and fragile ecosystems, environmental quality and risk control, and energy and resource consumption with serious ecological impact through the most stringent ecological and environmental management measures
		2014	Implement the national ecological redlining system: incorporate the national ecological redlining system and related systems into the legislation; perfect the spatial planning system for land and sea use, clearly define ecological red lines; renew the national coordination mechanism for ecological conservation, monitoring and law enforcement; perfect nature protected area system; perfect ecological compensation system and incentive mechanism based on ecological redlines

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Opinions on Improving the Compensation Mechanism for Ecological Protection	Implement, by 2020, the compensation mechanism for ecological protection to fully cover such key fields as forests, grassland, wetland, deserts, oceans, rivers and farmland and such important regions as exploitation-prohibited areas and key ecological functional areas; practice the principle that the one that benefits provides compensation; clearly define the rights and obligations of the protectors and the beneficiaries; designate and strictly observe ecological red lines and study and roll out ecological compensation policies. Further improve the ecological compensation mechanism for key areas, and build compensation standards on the output capacity of ecological products. Integrate ecological compensation with the main functional zoning, the western development strategy and poverty alleviation of poverty-stricken areas, and gradually improve the basic public service level in major ecological functional areas, to promote green development	2006	Introduce the ecological compensation mechanism to regulate the relationship between environmental interests and economic benefits
		2014	Accelerate and improve the ecological compensation system, with adherence to the principle of "polluter pays, destroyer compensates, and protector benefited", and mobilize the local governments to protect the environment, especially those with financial difficulties
		2014	Establish a long-term mechanism for ecological compensation that considers both landowners and stakeholders, which supports direct payment of ecological compensation to landowners or operators of ecological redlined areas and deployment of major ecological construction projects with focus on ecological redlined areas
		2014	Perfect ecological compensation system and incentive mechanism based on ecological redlining system
		2013	Set up the ecological compensation and pollution damage compensation mechanism on the basis of accounting ecosystem services
		2012	allocate the ecological compensation fund combined with the eco-functional zoning of the eastern and middle-western regions
		2010	Establish financial mechanisms for construction projects and ecological compensation, providing stable financial support for ecological protection and restoration in the central and western regions
		2010	Speed up the legislative process of ecological compensation and establish and improve the public welfare compensation funds for forests, grasslands and wetlands. Under the framework of national ecological compensation, set adequate and reasonable budgets for the national nature reserves; gradually include afforestation into the scope of national ecological compensation; build ecological compensation mechanisms for the protection of marine and water ecosystems

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2009	Establish the ecological compensation system for coal mining and implement the bond system for environmental restoration
		2008	Establish and improve the ecological compensation mechanism, explore the urban and rural integrated model of environmental management to promote the overall advancement of China's environmental protection cause
Plan for the Pilot Reform of the Ecological Environment Damage Compensation System	Stipulate that environmental damage compensation covers decontamination expenses, eco-environmental rehabilitation expenses, loss of service functions during eco-environmental rehabilitation, loss incurred by perpetual damage to eco-environmental functions and eco-environment damage compensation investigation, appraisement and other reasonable expenses. Establish a national unified system of technical specifications for environmental damage evaluation. Encourage social organizations that meet the defined requirements to carry out environmental damage compensation litigation	2009	Study and formulate relevant environmental standards and guidelines, including standards for pollution damage compensation
General Principles of the Civil Law of the People's Republic of China (Draft)	Add rehabilitation and eco-environmental remediation	2014	Improve the environment and health related systems. Incorporate environmental risk assessment into the formulation of environmental policies and standards. Improve the environmental public interest litigation system, strengthen the environmental damage compensation and accountability, and strengthen the responsibility and capability of judicial authorities to investigate environmental violations

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2013	Speed up the reform of environmental protection management system, establish regional linkage mechanisms for terrestrial and marine ecosystem conservation and restoration and pollution prevention and control; accelerate the amendment to the Environmental Protection Law which clearly defines the ownership and use rights of all kinds of natural resources assets and improves the system and mechanism for use control and management. Establish the accountability and compensation systems for resources and environmental damage and the system of compensated use of resources and the environment
		2012	Establish a sound emergency response costs system and define that the accident causer bear the costs incurred in emergency response in the marine environmental damage compensation system
Pilot Plan for Preparing Balance Sheets of Natural Resources	Ascertain the situation of natural resource assets and its variation, to provide information foundation, monitoring, early warning and decision support for carrying forward ecological civilization construction and effectively protecting and sustainably utilizing natural resources	2012	The establishment of a green national economic accounting system is a fundamental reform measure conducive to green transformation of cadre performance evaluation system. The Central Government should continue to promote relevant research and accelerate the process of demonstration and application
		2013	Organize the research on green national economy accounting, and gradually develop a methodology for integrating resource consumption, environmental damage and protection benefits into the national economic evaluation system
		2010	Carry out research on ecosystem service valuation and green accounting, and incorporate into national economic accounting system and performance evaluation system
Wild Animal Protection Law	Specify that "wild animals shall not be ill-treated" and change "wild animal conservation" into "protection over wild animals and their habitats"	2007	Curb activities prohibited under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
		1999	Strengthen biodiversity protection legislation and law enforcement, and take comprehensive measures to strengthen the management of biological resources and prevent the destruction and unreasonable use of wildlife resources

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Energy, Environment and Climate			
Interim Measures for the Administration of Energy Audit for Public Institutions	Improve energy efficiency of public institutions and there by cutfiscal expenditure		
Notice on Promoting the Orderly Development of Coal Power in China	Exercise strict control over the additional increases of coal power in all regions	2011	Incorporate climate change into the legislative agenda, develop and promulgate as soon as possible the *Energy Law* and amend the *Coal Law, Electric Power Law, Energy Conservation Law*, and Renewable Energy Law to further encourage clean and low-carbon energy development and utilization
Energy Technology Revolutionary Innovation Action Plan (2016—2030)	Achieve major breakthroughs in key technologies, covering energy safety, clean energy, and intelligent energy	2000	Strengthen and perfect energy and environmental technology innovation and support system, and give high priority to energy policy
Guiding Opinions on Promoting Electric Energy Substitution	Improve the level of electrification to address the serious fog and haze problem caused by large-scale scattered coal and fuel oil consumption; substitute about 130 million tons of standard coal equivalents of dispersed coal and fuel oil by electric power in final consumption during 2016—2020		
Notice on Effectively Conducting t he Key Work for Launching the National Carbon Emission Permit Trading Market	Give full play to the decisive role of the market mechanism in the allocation of GHG emissions oriented to emissions control and low-carbon development. Require the joint efforts and coordination of central government, local governments and enterprises to promote the emissions trading market so as to ensure emissions trading will be launched nationwide in 2017	2011	Promote the emissions trading scheme, including establishment of trading markets and platforms for conventional pollutants and emissions and launch of carbon tax pilot as soon as possible
		2009	Gradually explore and establish a voluntary emissions trading system

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Work Plan for the Pilot Construction of Climate Resilient Cities	Incorporate climate resilience indexes universally into the urban-rural planning system, construction plans and industrial development plans, make cities apparently more capable of dealing with such problems as waterlogging, drought, water shortage, high temperature, heatwave, strong breeze and freezing disaster and improve cities' capability of adaptation to climate change comprehensively	2014	Pay more attention to urban capacity of climate change adaptation and urban environmental planning and put in place the risk assessment framework and corresponding financial emergency funds for climate change adaptation
		2011	Speed up the development and amendment of laws and regulations in favor of emissions reduction, covering energy production and conversion and energy and resource conservation and utilization, and add climate change into the legislative agenda
Environmental Governance and Rule of Law			
Environmental Protection Supervision Plan (for Trial Implementation)	Central Environmental Protection Inspection Teams promote the implementation of accountability of the party committees and governments, dual responsibilities in one position, and accountability for dereliction of duty	2012	Establish marine environmental administrative inspection system and law enforcement system and strengthen supervision and inspection of EIA system implementation for marine energy development activities
		2013	When implementing the action plan for air pollution prevention and control, the Central Government should focus on monitoring and coordinating the full implementation of measures by local governments and intensify environmental accountability
		2015	Give full consideration to the impact on the ecological environment in the major national policy decisions, and supervise and evaluate the environmental performance of the State Council departments and local governments
Opinions on Establishing Unified and Standard National ecological civilization Pilot Zones and Implementation Plan for National ecological civilization Pilot Zones (in Fujian)	Specify the objective of establishing pilot zones and forming a state-level integrated test platform for ecological civilization system reform. Make, through experiment and exploration, important progress in the key reform tasks as specified in the overall scheme for the ecological civilization system reform and obtain feasible and effective institutional achievements by 2017	2012	Intensify system and policy innovation and implementation to advance the practice for ecological progress in an all-round way
		2013	Create ecological civilization pilot zones. The Central Government should take economic incentives to encourage local development of a wide range of ecological civilization pilot zones

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2014	Promote, based on multi-sectoral collaboration, regional coordinated environmental governance and eco-city pilot. Incorporate the eco-city pilot into the existing national ecological civilization demonstration system, with focus put on the pilot of regional coordinated governance of the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta, and promote demonstration projects of " eco-city model"
		2015	Accelerate the reform for promoting ecological progress, establish a multi-party environmental governance system, create comprehensive experimental zones for green development and transformation, and implement plans and actions for the pilot reform for building green transformation governance capacity
MEP establishes the Department of Water Environmental Management, Department of Air Environmental Management and Department of Soil Environmental Management	Make an institutional reform to strengthen the prevention and control of air, water and soil pollution, by establishing the Department of Water Environmental M anagement, D epartment of Air Environmental Management and Department of Soil Environmental Management	2013	Quicken the reform of environmental protection management system to establish unified management of all pollutants, sources of emissions, environmental media, and ecosystems
		2014	Integrate pollution prevention and control functions scattered in various departments to achieve unified supervision of all sources of pollution, pollutants and environmental media
Guiding Opinions on the Pilot Reform of Vertical Management System for Environme nta l Protection Departments Below the Provincial Level Concerning Environmental Monitoring, Supervision and Law Enforcement	Strengthen the environmental protection responsibilities of local party committees and governments and the relevant departments; adjust the local environmental protection management system; standardize and strengthen the local environmental protection agencies and ranks; establish a sound and efficient operation mechanism	2003	Reduce local protectionism and practice more uniform and consistent environmental regulation and law enforcement in provinces
		2006	Perform vertical management of environmental departments below the provincial level through the adjustment of local environmental management systems

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Measures for Administration of Post Environmental Impact Assessment for Construction Projects (for Trial Implementation) and Measures for Administration of Regional Restricted Approval of Environmental Impact Assessment for Construction Projects (for Trial Implementation)	Improve EIA effectiveness	2012	Improve the policy system of environmental quality compliance management. Practice a normalized system of restricted approval, covering areas with below-standard environmental quality, serious pollution or/and frequent environmental accidents and projects involving major pollution factors.
		2013	Improve the EIA and post-evaluation system of poverty alleviation projects and programs; reform systematically the environmental and social impact assessment mechanisms to carry out "pre-approval" on major projects with environmental and social impacts. Formulate policies to protect public environmental rights and interests
Implementation Plan for the Environmental Impact Assessment Reform during the 13th Five-Year Plan	Take improvement of air quality as the center, comprehensive improvement of the EIA effect as the main line and institutional innovation as the driving force; further streamline administration and delegate power to the lower levels, and intensify the crackdown on unlawful acts, improve the top-level design of strategic and planned EIA to enhance binding force, and build a preliminary EIA warning system; complete the EIA of the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta, and organize the EIA of the Yangtze River Economic Zone and the Belt and Road Initiative; integrate with the discharge permit system to achieve system connection and target and measure consistency; perfect planning EIA consultation mechanism that facilitates cross-administrative consultation of planning organizations on major plans with possible trans-boundary environmental impact, and strengthen the regional joint defense and control	2012	Tighten the EIA system, and monitor and evaluate the performance of enterprises and local governments in system implementation; disclose and inform of, on a regular basis, enterprises and departments that fail to meet the EIA requirements; strictly implement the EIA system and the "three-simultaneous" system; accelerate the revision of laws on environmental protection and EIA and further improve the EIA system
		2013	Make systemic reform of mechanisms for environmental impact assessment and social impact assessment
		2014	Reform the EIA system and the "three-simultaneous" system, and improve the convergence with the discharge permit system. Carry out the pilot project for integrating the EIA system and discharge permit system; incorporate the environmental risk assessment into the formulation of environmental policies and standards. Establish regional EIA consultation mechanism, take joint emergency action to address regional heavy pollution weather and ensure the dissemination of early warning and emergency information to the public in a timely manner

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2015	Complete strategic EIA of the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta and organize the strategic EIA of the Yangtze River Economic Zone and the Belt and Road Initiative
Guiding Opinions on Building the Green Financial System	Mobilize and encourage more social capital into the green industry while effectively suppressing polluting investment	2013	Highlight the safeguard of rule of law and the driving force of green financial innovation; encourage reform and innovation of the green financial system to promote the green industrial transformation and upgrading
		2014	Build a green finance system providing financial support for green transition
G20 Green Finance Synthesis Report	Send out a clear signal of supporting green investment to investors; promote the voluntary principle of green finance; pool more resources to support capacity building; support the support of domestic green bond market; develop environmental risk analysis methods	2015	Create comprehensive experimental areas for green development and transition, implement plans and actions for the pilot integrated reform of green transition governance capacity, practice green financial innovation mechanism, and improve the environmental governance capability; accelerate the development of green finance, green logistics and energy conservation and environmental protection services, and develop productive services through green capacity building; incorporate green finance into the Belt and Road Initiative financing mechanism, urge “going-out” corporate investor to attach importance to ecological and environmental protection and actively fulfill their social and environmental responsibilities; reform and innovate the green finance system and promote green industrial transformation and upgrading

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Guidelines for the Issuance of Green Bonds	Green bonds are corporate bonds that raise funds to support green, circular and low-carbon development projects, covering energy conservation and emission reduction technology transformation, green urbanization, clean and efficient utilization of energy, new energy development and utilization, development of circular economy, conservation of water resources and development and utilization of unconventional water resources, pollution control, ecological agriculture and forestry, energy conservation and environmental protection industry, low-carbon industry, advance demonstration and experiment of ecological civilization, and low-carbon pilot demonstration	2014	Give full play to the leverage of green bonds and benefits of large-scale professional assessment capacity; encourage social capital participation through the issuance of green bonds
		2015	Promote green credit, green bonds and green insurance. Promote green credit by innovative means and vigorously develop the markets of green bonds and green insurance
Guiding Opinions on Strengthening the Construction of the Enterprise Environmental Credit System	Publicize corporate environmental information through government website, "Credit China" website, and other channels familiar to and accessible for the public and include the information into the corporate environmental information system and national unified credit information sharing platform	2012	Create a social atmosphere for enterprises to take a proactive approach to law-abiding development and to establish an environmental credit rating system for enterprises
		2014	Establish as soon as possible the corporate environmental credit rating system and encourage enterprises that comply with emissions standards and constantly improve environmental performance
		2015	Establish corporate environmental credit rating system which requires mandatory environmental information disclosure of listed companies
Notice on Comprehensively Promoting the Resource Tax Reform and Interim Measures for the Pilot Reform of Water Resource Tax	Propose price-based collection of tax on mineral resources and include the mineral resource tax into local fiscal revenue	2012	Improve the green development capacity of local governments through the reform of resource tax system
		2014	Conduct resource tax reform that tax should be collected on a price basis

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2015	Reform the pricing mechanism of important resource products by incorporating environmental costs, starting with fossil energy sources such as coal and petroleum, and develop the green fiscal policy that reflect the environmental costs of production and consumption
Implementation Opinions on Accelerating the Promotion of Lifestyle Greening	By 2020, popularize the value of ecological civilization across the whole society, strengthen evidently the whole people's concept of green lifestyle, and establish preliminarily a system of policies, laws and regulations for lifestyle greening	2011	Strengthen the regulation and guidance to green the traditional service industry
		2012	In the social field, advocate green consumption patterns and guide eco-friendly behavior and change the way of life in the whole society
		2013	Guide active public participation in environmental protection in rich and innovative forms and in a variety of ways, such as through green consumption, green travel and changing lifestyles, and create a good social atmosphere of fulfilling the shared environmental responsibilities and obligations
		2014	Encourage grassroots organizations to cast attention to environmental governance. Reflect the public environmental demands, develop environmental protection social conventions, and promote green lifestyle
		2015	Encourage and ensure the whole society to participate in environmental protection action, promote sustainable consumption and lead a green-oriented change of lifestyle by guiding green diet, promoting green clothing, advocating green living and encouraging green travel
Guiding Opinions on Promoting Green Consumption	Speed up the transition towards green cons umption according to green development concepts and socialist core values	2009	Advocate sustainable consumption patterns, promote low-carbon lifestyle and give full play to the role of the public and non-governmental organizations in green economic development
		2011	Promote sustainable consumption to boost green economic development
	Encourage enterprises to build green supply chain, carry out cleaner production audit, and reduce life-cycle environmental impact of products	2013	Promote the inclusion of green supply chain as an important indicator of statutory procurement criteria
		2015	Promote government green procurement and encourage leading enterprises to implement green supply chain management voluntarily

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Environmental Protection Tax Law (Draft)	Shift sewage charges to enhance mandatory collection and reduce intervention in the collection	2009	Implement an environmental tax system that centers on sound environmental taxation. Study to carry out as soon as possible the environmental tax reform focused on environmental taxation to make up for China's current environmental tax system. Build China's environmental tax framework by introducing environmental tax, restructuring the existing taxes and improving the environment-related tax policies. Include wastewater, waste gas, solid waste and carbon dioxide into the scope of environmental taxation. Reform the environmental taxation system in an approach of easiness and gradualness, study the imposition of independent environmental tax as soon as possible, and perfect other environment-related taxes and tax policies
		2011	Accelerate the resource tax reform, adjust the consumption tax policy in line with implementation of energy conservation and environmental protection policy, and impose environmental taxes (including carbon tax)
		2012	Impose additional consumption taxes on products entailing severe environmental pollution and great resource and energy consumption, and accelerate the introduction of environmental tax. Implement the green tax system (including environmental tax and resource tax) and other market incentives to change the behavior of enterprises and consumers. Accelerate the implementation of environmental tax and introduce the "leader" standards
		2014	Introduce environmental taxes. Environmental taxes are levied on pollutant discharge in accordance with the principle that the polluter pays

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Opinions on Giving Full Play to the Functional Role of Trial to Provide Judicial Services and Safeguard for Ecological Progress and Green Development	Construct the cooperative trial mechanism to handle, according to law, cases involving environmental pollution prevention, ecological protection, development and utilization of natural resources and ecological damage compensation litigation cases. Actively explore the judicial response to climate change and promote the construction of national governance system to address climate change	2007	Establish and improve the environmental justice system to safeguard public and individual environmental benefits and environmental justice
		2013	Promote the construction of local environmental courts and improve the relevant judicial practice
		2014	Strengthen environmental justice practice, promote the coordination between environmental and judicial departments, build up environmental courts and environmental judges; improve the responsibility and capability of the judicial authorities to pursue accountability of environmental violations
Green Industry Development Plan (2016—2020)	Drive the development of upstream parts and components suppliers and downstream recovery and processing enterprises through the implementation of green supply chain standards and producer responsibility extension system, relying on leading enterprises in the industries of automobile, electronic appliance, communication, machinery and large-scale complete sets of equipment. Establish a traceable information system for green raw materials and products	2011	Establish and improve China's green supply chain system and drive the transformation of the whole production system green through green consumption and green market
Green Manufacturing Engineering Guide (2016—2020)	Establish green supply chain management system based on active application of such information technologies as the Internet of things, big data and cloud computing. Improve green supply chain management regulations covering procurement, suppliers and logistics and carry out green supply chain management pilot. By 2020, basically establish green supply chain management system in key industries, and make substantial progress in the producer responsibility extension system	2012	Establish and continuously improve the sustainable green consumption system, and further deepen the government green procurement list and green supply chain practice and innovation

Field	Policy Progress (2015—2016)	Time of Proposal	Content
Pollution Prevention, Control and Mitigation			
Mid-stage assessment of Air Pollution Prevention and Control Action Plan	Assess and confirm the national air quality and the trends and pollution characteristics using a variety of technical methods based on the datasets of MEP, CAS, CMA and relevant scientific research institutes obtained through long-term ground observation, comprehensive observation of typical processes and satellite remote sensing inversion	2014	Establish an air quality improvement based management model and a scientific performance evaluation system for air pollution prevention and control; establish a system of pre-assessment, annual assessment and final assessment of the *Air Pollution Prevention and Control Action Plan*; improve the mechanism for regional joint air pollution prevention and control
Notice on Strengthening Environmental Pollution Prevention, Control and Governance of the Yangtze River Golden Waterway	Put eco-environmental restoration of the Yangtze River in an overwhelming position and propose to carry forward water pollution prevention and control and ecological protection and restoration of the Yangtze River in an all-round way through intensifying spatial control, optimizing indusrial structure, strengthening source treatment and emphasizing risk prevention and control, with the core on the improvement of water environment quality	2015	Conduct environmental risk assessment for such macro-level strategies as the Belt and Road Initiative, Beijing-Tianjin-Hebei Integration, and Yangtze River Economic Belt to form an environmental risk prevention mechanism
Soil Pollution Prevention and Control Action Plan	Form an effective system of soil pollution prevention and control to promote the sustainable use of soil resources	2011	It is important to introduce a package of green programs and policy measures concerning pollution prevention, energy and climate change, resource pricing, ecological compensation and environmental restoration to address soil pollution in traditional industries and mining areas, given the weak legal framework for environmental and pricing reform
		2013	Call on the Chinese Government to make greater efforts to solve the outstanding impact on public health and life problems, including air, water and soil pollution and decline in ecological services, when promoting ecological progress or building a harmonious green relationship between environment and development

Field	Policy Progress (2015—2016)	Time of Proposal	Content
		2014	Include the disclosure and update of information on a regular basis, including the predictive results of air, water and soil pollution posing future health threats to the urban population and climate change impact and adaptation, as an important basis for performance appraisal of government officials
		2015	Amend the *Soil Pollution Prevention and Control Law* included in the legislative planning as the *Soil Environmental Protection Law*
Regional and Global Engagement			
Joint Statement Issued at the Conclusion of the 21st BASIC Ministerial Mee ting on Clima te Change	Promote the outcome of the Paris Agreement, and urge the developed countries to issue commitments		
U.S.-China Joint Presidential Statement on Climate Change	Join the *Paris Agreement* and bring it in force as early as possible; make positive results on relevant multilateral occasions, including the HFC amendment and the ICAO's global market-based measure to address GHG emissions from international aviation; finance and encourage the progressive introduction of low-carbon technologies		
Montreal Protocol on Substances that Deplete the Ozone Layer	Reach a historic consensus on reducing the use of HFCs		
Work Together to Build a Win-Win, Equitable and Balanced Governance Mechanism on Climate Change, the speech given by President Xi Jinping at the Paris Conference on Climate Change	Make efforts to achieve the climate change agreement; create a future of win-win cooperation with each country making its best, rule of law, fairness and justice, and inclusive and common development and mutual learning; engage an active participant in the global response to climate change	2015	Develop and implement China's green action for foreign aid, strengthen South-South Environmental Cooperation, and build green, low-carbon, eco-friendly and developing the Belt and Road Initiative

Chapter 7
CCICED 2016 Issues Paper[1]

In today's world, all countries are interdependent and share a common future. We should…create a community of shared future for mankind…We should build an ecosystem that puts mother nature and green development first…All members of the international community should work together to build a sound global eco-environment. We should respect nature, follow nature's ways and protect nature. We should firmly pursue green, low-carbon, circular, and sustainable development. China will shoulder its share of responsibility and continue to play its part in this common endeavor. We also urge developed countries to fulfill their historical responsibility, honor their emission reduction commitments and help developing countries mitigate and adapt to climate change.

—Xi Jinping, 28 September 2015 UN General Assembly Speech

Source: https://gadebate.un.org/sites/default/files/gastatements/70/70_ZH_en.pdf

7.1 Introduction

In January 2017 CCICED will turn a new page on a story already 25 years in the making. CCICED's new Phase VI (2017 to 2021) will need to consider significant shifts in the storyline. International and national level momentum over the past few years has brought renewed promise of reaching turning points on major environment and development concerns and environmental action is mainstreamed as never before. There is a new green wave of entrepreneurs, and of commitments by enterprises and by elements of the financial sector. The pivotal point for improved green development outcomes is

1 An Issues Paper has been produced by the CCICED Chief Advisors for the CCICED AGM each year since 2002. It is intended to draw together key ideas based on the annual AGM theme and on work produced by the various research teams and other sources. The content reflects the views of the Chief Advisors and not necessarily the opinions of CCICED Members or others associated with this Council. Past Issues Papers are available online at https://www.sfu.ca/china-council/council-documents.html

2030—a middle milestone when many innovations will have taken hold. This is a once in a generation opportunity with many implications for China and other countries. But recent events such as Brexit, the US election, and other matters related to the wave of populist sentiment around the world suggest that turbulent times may lie ahead. It is therefore timely that CCICED is closing its Phase V work with a focus on China's ecological civilization and the World.

We know that even with all the global and regional accords now in place, there is no guarantee yet of adequate ecological security for any country. The national and international green governance frameworks still lag behind the growth in environment and development pressures. Investment and finance continue to be skewed towards unsustainable patterns and legal frameworks are inadequate to meet complex needs. These shortcomings are among the reasons why the 2015 reboot of sustainable development through the UN SD2030 Goals and the 2015 Paris Agreement on Climate Change are so important. It is excellent that China and many other countries have ratified these accords, and taken major initiatives for their implementation.

Globally, however, if the SDG2030 efforts prove inadequate, if the world's oceans are ecologically stressed and resources depleted, and if the worst ravages of climate change are unleashed, then it will be a tough time for all. The main point is that no matter how well China does domestically, unless the rest of the world progresses towards "a sound global eco-environment" as called for by President Xi Jinping, there will be no guarantee of long-term environmental security in China or elsewhere. Indeed, to prevent such a situation, we must promote much more strongly the means to accelerate progress on environment and development efforts — perhaps through even more far-reaching goals and tighter timelines than now exist. And, certainly, we need a better capacity to share innovation ideas, capacity and products so that green development is accessible to all, including nations with limited means.

7.1.1 China's opportunity

The fundamental issue for this AGM is how China can become a leader on environment and development concerns by accelerating progress on its own green transitions, and by partnering with others. Not only for the long-term benefit to its own future prosperity, but also for the planet and all people. In its modernization during this half-century, China is facing three great moments. The year 2020 will bring attainment of a "moderately well-off society" *(Xiaokang Society*) just prior to the 2021 centenary of the Chinese Communist Party. By 2030 China hopes to be among the front-running nations

for innovation — with important implications for goals such as peaking greenhouse gas emissions, and fulfilling its national action plan under the Convention on Biological Diversity and China's SDG2030 Implementation Plan[1]. By 2049, the centenary of New China (the PRC), China wishes to be an all-round leading nation, prosperous and very advanced in its capacities including innovation for environmental matters.

Starting with the new and very green 13th Five-Year Plan (2016 to 2020)[2], China has set out a "green is gold" top-level policy path supporting the country's transition to an ecological civilization.[3] This concept is still new enough that it is not well known around the world. But there is interest certainly on the part of some developing countries and UNEP. With China's recent commitments to enhanced South-South cooperation[4], new financial institutions such as the AIIB and the New Development Bank[5], plus the Belt and Road Initiative (BRI)[6], ecological civilization can become a part of China's strengthened "going out" approach.

7.1.2 A global green turning point by 2030

It is reasonable to believe that China can become a more important player in efforts to achieve a global green turning point by 2030 through:a) good performance in domestic actions, which are significant due to their immense scale, b) making ecological civilization, green growth and green development an essential part of its overseas investments and international aid, and c)greater and more proactive involvement in global green governance issues and initiatives. The time between now and 2030 will see China go through three Five-Year Plan periods. To a time when urbanization and rural development are at a far different stage; when modern transportation networks are in place; and where economic and social reforms have opened new opportunities. Green transitions are a very necessary part. All of this experience may help to shape outcomes elsewhere.

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1 September 2016 release of the Implementation Plan from China's Ministry of Foreign Affairs. http://www.fmprc.gov.cn/mfa_eng/zxxx_662805/W020161014332600482185.pdf

2 See *China's Green Growth Roadmap in the 13th Five-Year Period*. Global Green Growth Institute and PRCEE.76 pp. Also see http://www.chinafile.com/reporting-opinion/environment/how-chinas-13th-five-year-plan-addresses-energy-and-environment

3 Further information on Ecological Civilization is available in: UNEP, PRCEE and CCICED. 2016. *Green is Gold. The Strategy and Actions of China's Ecological Civilization*. UNEP. 43 pp. http://web.unep.org/greeneconomy/sites/unep.org.greeneconomy/files/publications/greenisgold_en_20160519.pdf

4 http://www.ipsnews.net/2015/11/opinion-chinas-new-south-south-funds-a-global-game-changer/

5 http://euweb.aiib.org/html/aboutus/AIIB/?show=0; http://ndb.int/our-purpose.php

6 http://english.gov.cn/beltAndRoad/

7.2 CCICED 2016 studies and analysis

The following CCICED studies have been completed during 2016:

① Task Force on Rule of Law and ecological civilization

② Task Force on South-South cooperation for ecological civilization

③ Special Policy Study on China's Role in Greening Global Value Chains

CCICED has initiated a Task Force on Green Transition Outlook, which will provide a progress report and some recommendations to the 2016 AGM, and continue its work during 2017. CCICED in cooperation with the World Economic Forum (WEF) convened a meeting on Sharing Economy in June 2016 providing some results of interest in the context of environment and development. Some Background Papers will be tabled at the AGM: *Preliminary Ideas on Greening the Belt and Road Initiative; Theory, Methods and Practices of Benefit Cost Analysis in the United States: A Case Study in $PM_{2.5}$ Policy Analysis*, and a *Framework for an Ocean Initiative within CCICED*.

This past year has been an extremely active period for the introduction of new green policies within China plus the major G20 meeting hosted by China in September 2016. The *Policy Progress Report*[1] prepared by the Chief Advisors Group for tabling at the AGM documents the main points, and therefore this information will not be repeated in the Issues Paper.

Also during 2016, considerable effort has occurred on planning for CCICED Phase VI. Much of this effort is relevant to this year's AGM theme, since it is recognized that in future there must be considerable attention to China and the World as part of CCICED's work. This draft Prospectus will become available for the information of members and others.

7.3 Opportunities for "a common shared green future"

The need for accelerated progress on commonly held goals such as the SDG2030 agenda and on climate change is quite obvious. Successfully tackling these and other major issues in as short a time as possible will create a snowball effect. The adopted innovations and reform will open space for additional transformative changes. Another way of putting it is that "success breeds success".

1 *Progress in Environment and Development Policies in China and Impact of CCICED's Policy Recommendations 2015—2016*. Earlier editions of this document are available at https://www.sfu.ca/china-council/council-documents.html

7.3.1 Better results sooner?

Is it possible that important targets for 2030 could actually be achieved by 2025 or even sooner? As CCICED members such as Lord Stern have pointed out, in the case of coal and other fossil fuels in China (and by implication elsewhere in the world) early achievement of their peak use would have major value in the race to slow global climate change.[1] The list of other such efforts could be long. In addition to energy factors, drastically reducing water use in agriculture, greening urban infrastructure, avoiding locked-in effects from over investment in highly polluting sectors, plus accelerating the shift to a green financial system will help immensely. The benefits in quality of life, for example by reducing environment health risks, and for employment gains in the new green economy are likely to be lasting and of large magnitude.

Obviously it is not only China that should ask the question. Indeed, for the developing countries an accelerated pace of change is most urgent. Many look to China for advice and assistance, given the country's rapid economic growth. The accumulated experience of China in addressing the environmental and social impacts of this growth is now highly relevant. The opportunities for richer countries are very diverse but greater levels of international cooperation and partnership are required to maximize benefits. No country on its own can escape the impacts of uncontrolled global warming, loss of ecological services, and effects of pollutants transported in the oceans and atmosphere, or the human dimensions of conflict over natural resource declines. Fortunately, there is much room for advanced science and technology collaboration, global green IT implementation, and for improvement in investment patterns and international green governance. But it will take bold strokes to make it happen, as demonstrated by the 2015 agreement between China and the USA on energy and climate change objectives.

Opportunity-driven initiatives are best because they lead to win-win situations. Let us consider some of these opportunities in the context of enhanced achievement of environment and development goals for a) China, b) South-South cooperation, and c)the Global Community.

7.3.2 Potential opportunities for China from accelerated progress on environment and development goals

The opportunities and benefits for China are spread rather evenly among the various components in ecological civilization, as noted below.

1 Ye Qi, Nicholas Stern, et al. July 2016. *China's Post Coal Growth*. Nature Geoscience.9: 564–566.

7.3.2.1 Environmental

(1) Snowball effect from successful partnerships and increased green investment will accelerate the pace of meeting goals related to *War on Pollution*, climate change and other environmental protection needs.

(2) Accelerated green technology transitions will include products and services developed jointly by China and others to satisfy global needs—and, if meeting international and national standards, become important throughout the world.

(3) Enhanced safeguarding of ecological services and goods in China and in neighbouring regions and countries.

7.3.2.2 Economic

(1) Larger domestic and international markets will exist for Chinese green products, technology and services, along with other early adopter advantages.

(2) Important contribution to green quality standards for manufacturing and other industries as part of *Made in China 2025*.

(3) Accelerating the pace of economic reform through green transitions will hasten growth of new jobs and businesses, including within the service sector.

7.3.2.3 Social and cultural

(1) Reduced environmental health risks.

(2) China's sustainable domestic consumption progress will be hastened, including consumer values and choices.

(3) Social development through education, awareness-raising, and participation.

(4) Value shifts towards ecological civilization ideals.

7.3.2.4 Political

(1) Expanded role for China in global green governance reform and decision-making.

(2) Build China's international reputation as an environmentally responsible country and business partner.

(3) Create an international perception of taking on responsibilities in line with China's economic size and ecological footprint; and benefitting others by sharing capacity to deal with environment and development issues.

7.3.3 For improved South-South cooperation success

Many of the world's poorer countries lack the institutional capacity, finance and technical means to fully address the broad range of needs highlighted by the SD2030 Goals and are likely to be among the most significant beneficiaries from partnerships, development assistance and strengthened trade links with China. The tie-in possibilities via

the Belt and Road Initiative, the South-South cooperation funds from China for Climate Change and for SD Goals, plus support for initiatives through the AIIB and other Chinese influenced funding, are significant since these are intended to be dispersed in quick but effective ways, and there are start-up commitments to make them green. However, it is very worth while to press for priority to green initiatives. Below are some ways in which accelerated green South-South cooperation can be a win-win for both sides (China and partner countries).

(1) China's green experience can influence the green transitions of many other countries, and regional or global development outcomes of various types.

(2) The ability to build cooperative arrangements with neighbouring countries on matters such as river basin management, ocean conservation, or regional air pollution can avoid conflict and extend development benefits.

(3) The Belt and Road Initiatives offer the possibility of having comparative green experience emerge from within the many countries involved and use this experience throughout major regions such as Southeast Asia and Africa.

(4) Successful, accelerated green development via South-South cooperation may help to spread understanding and acceptance of ecological civilization values beyond China.

(5) Selling Chinese green goods and services, and therefore increased trade potential are outcomes that can be expected as a consequence of well-managed South-South cooperation.

(6) An accelerated pace for green transitions should lead to more rapid poverty reduction rates, improved health and other social benefits in both rural and urban settings of poor countries.

(7) More rapid transfer of Chinese experience regarding green infrastructure may help many of the developing countries to avoid undesired lock-in effects of poor urban planning, energy or transportation infrastructure, etc.

7.3.4 For benefits to the global community

A handful of large countries, including China, are absolutely essential participants for progress in securing global environment and development benefits. While these countries will see national advantages in their individual green transitions, their contribution globally should be factored into their decision-making.

(1) Reaching turning points on the control of environmental threats as quickly as possible will create a global willingness to invest in further action to eliminate the problems. The classic example is the success of the Montreal Protocol in reducing the

ozone hole created by CFCs.

(2) Green procurement through global supply chains will be helped if there is progress from the 10% to 30% level of certified green products commonly found in commodity supply chains. Accelerated efforts are needed for commodities such as timber, fish and agricultural products for soy and palm oil. Also for many types of manufactured products.

(3) Per capita ecological footprints[1] of most nations could be substantially reduced while likely improving quality of life and improving ecological services. The faster this happens, the more flexibility there will be to accommodate the expected expansion of global population, and to ensure that the poor in the world have sufficient access to necessities.

(4) As environmentally friendly practices are mainstreamed, they will become the "new normal" and can provide a more advanced baseline for continuous improvement everywhere. Much can be learned from the global impacts of smart phones. This has led to a virtual revolution regarding information exchange, social media and consumer habits. All in a period of only 15 years.

(5) The hope is that the ambitious SDG2030 agenda will become universal—sooner the better. If so the conversation on environment and development in 2025 will be far different than now. In fact we can expect the dialogue to be much closer to China's values-based concept of ecological civilization. Rapid success with SDG2030 will set the world on a much better path for biodiversity conservation, climate change mitigation and poverty elimination. Key to this happening is attention to inclusiveness.

7.3.5 Conclusion

We know that actions of leaders can influence laggards, can help those less able to meet their own ambitions, and above all can bring about burden sharing. There is much talk and scepticism about whether all nations are capable of meeting the goals they have set for themselves in response to global commitments. Also of "free riders" who will draw global benefits, even if they do not contribute as fully as they might, or if they become contrarians on such major issues as climate change mitigation. And, at a practical level, whether those prepared to contribute to the global good may end up facing competitive threats in trade or other economically challenging ways, especially during prolonged and uncertain transition periods. These challenges may actually be diminished through accelerated action on the part of those nations well situated to make contributions. China certainly falls into this category since it has already made it clear that a steady course

1 See http://wwf.panda.org/about_our_earth/all_publications/lpr_2016/

is needed on green development and it has the means to bring about change inside and outside the country.

As suggested in this brief review of the need for an accelerated pace towards "a common shared green future", the expectation is that the resulting benefits for China and other countries will be comprehensive and potentially very widespread throughout the world and of long-term significance. However, there are many challenges.

7.4 Ten Issues

The ten issues noted below are by no means the only ones of concern, and surprises are likely. However these ten points certainly cannot be ignored if China is to fully engage with the world on environment and development issues. Certainly the Government of China is aware of, and is in the process of addressing all of these concerns. Yet much more is needed in order for smooth implementation of green transitions that will support new economies, strengthen social development with better inclusion of all people in decision-making, and lead to a clean environment with healthy ecosystems. There are contributions to be made at all levels from local to global, and there needs to be a strong focus on governance, rule of law and green finance always. The great need is for innovation to take us much more quickly to sustainable solutions that can be swiftly applied and of enduring value.

The short accounts under each cannot do justice to the complex topics. They do provide a window into a number of important discussion points.

7.4.1 Better and faster implementation of China's 13th Five-Year Plan green goals

Through successful 13th Five-Year Plan achievements China will be perceived globally as a leading contributor to environment and development security, especially if the country is seen to be addressing the global agenda adequately through its practices both domestically and internationally.

(1) This most environmentally promising Five-Year Plan should enable turning points for all aspects of the War on Pollution, across the board gains on Green Development, and other progress towards ecological civilization.

(2) The current Five-Year Plan should set the stage for greater gains in the coming 2 plans as well as guarantee the role of environmental contributions to a *Xiaokang Society*.

(3) Stronger implementation policies based on adaptive planning and management are

needed in key sectors, central agencies and environmental agencies including MEP.

7.4.2 Strengthening of integrated green governance and institutional change

For transformative change to occur at the pace and scale demanded over the coming decade or more, cross-sectoral, integrated efforts must be strengthened. The AIIB resolve to be "lean, clean and green" should be echoed across other institutions. Institutional arrangements for sustainable development implementation and the construction of ecological civilization remain uncertain, whether in China or other countries. International organizations are struggling to deal with the complexity of decision processes and are certainly in need of innovation to fully implement global agreements.

(1) Within China and globally environment and development progress continues to be hindered by governance inadequacies, with particular concerns about enforcement and about inadequately focused laws, outmoded institutional arrangements, and financial sector issues.

(2) A governance framework adequate for an ecological civilization in China[1] may be on the horizon but is not operative on the ground. This challenge can be met in 5 to 10 years if the political will remains strong.

(3) Globally, greater Chinese participation and leadership is needed. The example of China-US cooperation on climate change, the AIIB and various other examples exist. However there are gaps and underperformance in many agreements, and new matters emerge every year, for example those involving the sharing economy, and micro-sized plastic particles polluting the oceans.

7.4.3 Using initiatives for climate change and for SDG2030 implementation to accelerate social development improvements

Seek new opportunities within China and in China's activities abroad for improving social equity within green urban and rural communities, enhancing gender equity, creating solidarity among groups facing similar issues such as climate change adaptation, and strengthening capacity to address social and environmental impacts through education and other means. The keyword is inclusion.

(1) Improved public participation along with education and training, plus information sharing remain among the most important elements for improved environmental

1 Pan Jiahua. (2015), *China Environmental Governing and Ecological Civilization*. http://link.springer.com/book/10.1007/978-3-662-47429-7

management and protection, sustainable consumption, and other aspects of creating an ecological civilization.

(2) What is truly remarkable at global level discussions on environment and development is how many social organizations/NGOs from all parts of the world now participate. Their efforts are needed on a much larger scale at local and national levels in order to strengthen and speed up green social development and other environmental matters.

(3) Improved mobilization of funds for social development is an important part of all environment and development efforts. These funds are needed to address health and safety matters, environmental education, intervenor funding to ensure the voices of poor or displaced people are heard, and to provide benefits such as green village technology. Green financing for these and other social matters must have continuity, including post-project availability. China has some good examples of such effort through its eco-compensation programs. Such examples might provide a good basis for green social endeavors abroad.

7.4.4 Building a more consistent and comprehensive green growth strategy

Since 2009 the G20 has highlighted the need for removal of fossil fuel subsidies, desirability of green growth strategies at national levels, firm action for low carbon strategies, and most recently in their Hangzhou meeting this September, urged the scaling up of green finance.[1] In the coming year it will be helpful if China and Germany can work together with leading developed and developing economies at the forthcoming G20 to expand the attention given to green growth and finances, and low carbon economy.

(1) During the 2016 G20, China pressed for greater effort globally to sustain economic growth. The need is evident, even though limits and challenges exist throughout the world, including China. A green transition in economic growth is essential but how to fully revamp the economic system is still challenging, often controversial. China is making progress but still does not adequately link economic and ecological reform.

(2) The critical period for this global green transition is 2020 to 2030, when substantial progress on low carbon economy and achieving SD2030 goals is paramount. If China can outperform on its national green economic transition during this time its future will be more secure perhaps for the balance of the 21st Century. In addition, such progress will put China in a better position to assist other developing nations; and to take its place as the world's largest sustainable economy.

1 http://www.g20.org/English/Dynamic/201609/t20160906_3396.html

(3)Climate change will be a pervasive element crossing many sectoral boundaries in future green economic development. This reality needs to be factored into many more of the most significant economic and investment decisions. There needs to be almost constant monitoring to determine if this is happening in a way that brings about desired changes as rapidly as possible, and with due consideration of how to maintain public sector and private sector support within China, and certainly also with partner countries in overseas endeavors.

7.4.5 Implementing integrated green development and ecological civilization

Ecological civilization is a means to link values, key priorities and cross-sectoral cooperation for decisions that affect development within China or in Chinese undertakings abroad. These are not points only for the Government of China but also for Chinese enterprises and investments, and for the many initiatives involving Chinese organizations, financial organizations and other bodies that together shape outcomes for environment and development. The key concern is to move towards integrated development decision-making within the context of an ecological civilization umbrella.

(1) It is of value to build integrated strategies such as BRI, development in the Yangtze and other major rivers and economic development zones in a way that addresses needs such as regional air and water pollution, climate change adaptation, etc. Integrated approaches need to be applied more effectively in future efforts of rural and urban planning, and river basin, coastal zone and marine planning. While this point is reasonably understood at various levels of government, the implementation policies are not so well developed yet.

(2) China's integrated green development should become a standard approach in its international cooperation, and in its many overseas land and water developments.

(3) Energy decisions need to become more integrated, with adequate attention to climate change agendas including gender impacts, co-benefits and environmental assessment.

(4) Giving greater attention to green planning, ecological redlining and various aspects of urbanization and rural development is necessary in order to avoid option foreclosure and undesirable lock-in effects.

7.4.6 Continuing to expand and accelerate the pace of green South-South cooperation and enhanced South-South-North action

China is "Going Out" to the nations of the South in an unprecedented way via multilateral and bilateral commitments. There is sharing of its own experience, skills and technology, and its own approach to Official Development Assistance, which places emphasis on trade and investment as well as direct financial assistance. China also has signalled its interest in South-South-North joint efforts. Through BRI and new financing, China is making a generation-long effort at an unprecedented scale. Success will change the outlook for growth and quality of life in many partner countries.

(1)The substantial increases in funding by China for developing nations has the potential to be a major game changer during the coming decade and beyond. There are numerous statements that some of the funds will be channelled to environment and development, and certainly to climate change and for SDG2030 initiatives. However it is early days, and there will be competing priorities. The various Official Development Assistance envelopes must be well coordinated and operate within robust green guidelines. Also, there should be long-term commitments in order to address ecological and other concerns.

(2)It is essential that the shift be towards ecological civilization, whether or not this term is embraced universally. The need is for sustainable development adjusted to meet the specific conditions of individual countries. China is strong on assessing the supply side. The demand side is less clear, and needs to be addressed quite urgently. Then, adaptive processes are required to ensure mutual interests are served.

(3)All of China's overseas efforts should be guided by green development goals and standards, and as necessary include green capacity building. Sharing of green technology innovation can and should be part of the package.

7.4.7 Making certain trade and investment, global value chains and other international economic arrangements fully support efforts to build an ecological civilization with full sharing of the resulting benefits

7.4.7.1 Ensure trade and investment agreements fully incorporate green development

New regional and bilateral agreements will boost globalization, even as there are some movements towards "deglobalization" in parts of the world. These agreements have flourished in recent years, with many initiated or supported by China. The proliferation is certainly driven in part by the slow pace of WTO negotiations. However, the more fine-

grained agreements are also a way to bring in concerns more specific to the priorities of specific countries or regions and those of China. They should, however, always promote and take on board best practices regarding green development.

(1) The need is to bring consistency in treatment of environment and sustainable development concerns into all new agreements, with adequate monitoring and enforcement mechanisms for green development and environmental effects.[1]Also, to provide adequate opportunity for green capacity development with partner countries, and, as necessary, avoid any activities that will lead to unsustainable outcomes, or unmitigated environmental impacts, including climate change.

(2) China's long-term green transition outlook could be bolstered by green trade agreements, since the new greener economy will depend upon favourable treatment of green products and services. Access to markets will depend upon meeting green standards abroad. And corporate social responsibility of international firms operating in China, and Chinese enterprises operating in other countries will be improved through environmentally sound trade and investment requirements. The concept of ecological civilization might be embedded in at least some agreements.

7.4.7.2 Embrace green standards and systems for trade and commerce

How can international organizations and countries, including China, work more closely together to address the many downstream issues for standards including matters such as enforcement, traceability and other practical needs?[2,3]Globally, over the past 20 years a very complex web of green standards has emerged, some on a voluntary basis and others linked to trade agreements. These are subject to many constraints, relatively slow acceptance and sometimes lead to trade barriers or disputes. Concerns exist about verification of impacts and of actual compliance to standards. Illegal trade is a major concern.

(1) While China has progressed on many aspects of this issue, it is still highly vulnerable and has a low level of participation in some important commodity areas. Now at a crucial stage of expanding its domestic consumption and implementing domestic Low Carbon Economy, there are emerging issues about standards, credible reporting

1 An example of how to examine this issue is provided by the European Commission DG for Trade sustainability impact analysis of a China-EU Investment Agreement. http://www.trade-sia.com/china/wp-content/uploads/sites/9/2016/05/FIE93555-SIA-EU-China-revised-draft-inception-report-12-May-2016-clean.pdf

2 http://www.oecd-ilibrary.org/governance/international-regulatory-co-operation_9789264244047-en

3 See various reports of WWFChina and of IISD on some concrete needs, for example: http://awsassets.wwfcn.panda.org/downloads/wwf_china_trade_report_en.pdf ; http://www.iisd.org/sites/default/files/publications/sustainability-impacts-chinese-outward-direct-investment-literature-review.pdf

and verification. The public is engaged in many of these issues, including both food and environmental safety assurances in products.

(2) Green trade and commerce is a maturing field that requires much more attention from Chinese authorities and business. Making Chinese and international standards compatible, stamping out illegal trade practices, encouraging sustainable consumption and improved consumer choice, greening *Made in China 2025*, and expanding green procurement are key examples of what must happen.

7.4.8 Addressing planetary boundaries and ecological footprints

Turning China into an extreme conserver society at the same time as the nation becomes wealthy is a tremendous challenge, but one that must be met for both domestic and global reasons. It is also a part of the "green is gold" paradigm.

(1) Of special concern are the several components including key geochemical cycles labelled as Planetary Boundaries.[1]For example, excessive nitrogen in the environment (from agricultural fertilizers, automobile emissions and industrial uses) must be brought under control as soon as possible.

(2) Also of grave concern is the declining state of the oceans including ecological services and climate change impacts. China's Blue Economy[2] is expanding and is certainly not confined only to adjacent ocean space. The Blue Economy, globally and China's, must be reformulated to embrace green development principles and actions in a much more effective way than in the past. Expanded international cooperation is essential, including more effort on the oceans and climate change.

(3) China's rising consumption as wealth increases is slipping into unsustainable levels particularly in cities. World Wildlife Fund (WWF) China's reports on ecological footprints indicate that in various aspects, especially carbon footprint, China now exceeds "one planet" levels.[3] Such trends must be addressed either through more efficient uses, or through shifts in values on the part of both producers and consumers to reduce demand. While both aspects are underway, progress is still below the rate needed.

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1 http://www.greattransition.org/publication/bounding-the-planetary-future-why-we-need-a-great-transition

2 *The blue economy – growth, opportunity and a sustainable ocean economy*. World Ocean Summit 2015. https://www.oceanprosperityroadmap.org/wp-content/uploads/2015/05/2.-State-of-the-Blue-Economy_briefing-paper_WOS2015.pdf and Developing a blue economy in China and in the USA https://cdn.americanprogress.org/wp-content/uploads/2015/05/ChinaBlueEcon-report-final.pdf

3 http://www.zujiwangluo.org/ecological-footprint-results/ and http://www.footprintnetwork.org/images/article_uploads/China_EF_Sustainable_Consumption_2014_English.pdf

7.4.9 Using the power of disruptive innovations of IT hardware and software to hasten green transitions

China has embraced "Internet Plus" "Big Data" approaches and many other leading edge efforts that combine innovative software and technology to provide for environmental, resource efficiency and sustainable development applications. Battery technology, smart grids, and environmental monitoring are among the many examples. Most recently the benefits and costs of Sharing Economy have become a focus.

(1) The future holds even greater potential to use rapidly advancing IT often in conjunction with other technology innovations from nanotechnology, biotech, and green industrial chemistry and software development to help achieve an ecological civilization. This is a prime area for both competition and cooperation, but will require considerable attention to appropriate governance measures applied in a timely and enabling fashion. Also, more attention to social, economic and environmental impacts.

(2) Certainly future changes will not proceed smoothly or linearly in coming years as new technologies, software apps, and other innovations are introduced. We can see into the future, but less accurately predict outcomes, especially after 2040 or 2050. Transportation is a case in point. However, the big picture of moving from fossil fuel economy towards renewable sources of energy, tighter management of water, capacity to monitor more carefully environmental risks, and many other concerns such as consumer preferences is becoming clearer with each passing year, and largely due to computational capacity, big data, and the increasing use of very sophisticated remote sensing of the oceans, atmosphere, land use, etc.

7.4.10 Improving valuation and verification

The basis for decisions and assessment of progress must be highly credible and benchmarked with best practices in China and globally. Indeed the challenge is to move well beyond current best practices, especially via leapfrogging and rapid adoption of new technologies, better means of verification and other tools. Cost benefit based on adequate valuation of ecological services and careful assessment of carbon trading assertions are examples requiring on going attention.

(1) China will need to provide transparent and credible information well beyond what currently exists to satisfy both domestic and international audiences. Greater international cooperation is needed in many cases, for example to reduce illegal, unreported and unregulated (IUU) exploitation of fish stocks, international trade in endangered species,

and, very likely, in any system involving international carbon trading.

(2) Generally environmental benefits and ecological services remain unaccounted for in decision-making, and undervalued in national accounts. China is making progress in this area, but the reality is that much work remains to be done. In China's efforts with other developing countries, the situation is likely to be similar, or sometimes far worse since basic data may not be available. This is a theme that requires steady progress, backstopped by considerable scientific effort.

(3) The idea of individual green performance accountability of officials at various levels of local government is a new concept. It depends on having good information fairly applied in the performance assessment. This is a model that might have more widespread application, but also needs to be optimized for both impact and fairness.

7.5 Conclusion

This Issues Paper has covered some pressing concerns for the future of our planet and people, and proposes an accelerated pace of action. We must remember however, that the green shifts are only part of a larger picture. The World Economic Forum has identified what it considers to be the 10 biggest global challenges.[1]These include climate change, food security, inclusive growth and creating 500 million new jobs globally, gender equality, future of the Internet, and a regulatory framework sufficient for the long-term improvement of trade and investment. Accelerating progress on green transitions must contribute to the solution of these and other challenges such as demographic shifts in various countries and regions.

Layered above all is a set of concerns such as how to achieve sustainable development and environmental security in the aftermath of violent conflict, or of political dysfunctionality and other governance failures. The persistent question of providing an adequate level of financial transfers (and transfers of technology) from richer to poorer countries lies at the heart of all aspects of global green development. This will require solutions well beyond issuing green bonds and other recent financial innovations, important as they may be. And how to ensure that people can have access not only to the essentials for life, but also the fruits of a prosperous way of life? Global population may rise to amid-century UN projection of 9.7 billion people[2] making sustainability challenges much greater. But equally challenging are the rising consumption demands of newly rich and already wealthy

1 https://www.weforum.org/agenda/2016/01/what-are-the-10-biggest-global-challenges/

2 http://www.un.org/en/development/desa/news/population/2015-report.html

countries.

It may be said that a call for accelerated progress on environment and development beyond the levels so painstakingly worked out in the Paris Agreement or other environment and development accords is futile. But there can be no alternative. We know that the various ratified environment and development agreements still do not add up to a whole that is sufficient to safeguard our planet's future. Currently no country can claim to have reached a sustainable state since we are interdependent and vulnerable to global environmental change.

Acting on this interdependence is a task for all. However, now is China's moment in the sun — over this coming decade and probably for much longer. There is no country in the world that is likely to spend more on green transformation in coming years. And it will do so for good social, economic and environmental reasons related to its own secure future. Internationally, China has the opportunity to move to the front of the line, not only on innovative technology development and application, but also to demonstrate how to rapidly implement desirable changes and to encourage such action throughout the world.

Hopefully CCICED through its present and future endeavors will contribute to this effort. Certainly two key approaches stand out. One is to create an Outlook approach consistent with meeting urgent and also longer-term policy needs related to innovative green transitions. The other is to support China's considerable efforts with developing nations through expanded consideration of green development in all of China's overseas endeavors.

China is drawing upon its ancient history and values as it constructs an ecological civilization. All of us, Chinese and non-Chinese, need to seriously reflect on how this integrative approach might lead us into a better global situation. The coming five years within China should help to prove its worth. If so, then it deserves to be an important component in our global quest for sustainability.