

# CCICED 2017 ISSUES PAPER<sup>1</sup>

## Ecological Civilization Shaping China's New Era

### Abstract

It is now two years since nations started a renewed great global race to end poverty, to achieve a green economic and social transition, and to hold global warming in check. China and other nations see the need to press forward on global concerns while they continue to address green transitions domestically. There is a high level of resolve in China to do more globally and to take comprehensive environmental action in order to live as an Ecological Civilization. Time frames from now to 2030-2035 and to 2050 are of particular significance to China for a New Era whose success will be shaped by green development. The China Council for International Cooperation on Environment and Development (CCICED) holds an Annual General Meeting that formulates and submits policy recommendations to the State Council on a wide range of high priority eco-environmental concerns. This year CCICED is examining how China can shift to a green transition approach that can be implemented now (2018 to 2020 and into the 14<sup>th</sup> Five Year Plan) in order to improve future green prospects within China and globally over the long-term. Ten issues are identified for sustained attention and policy development.

### Introduction

We are all in the Great Race of the 21<sup>st</sup> Century—to create a better life for people while keeping the planet healthy. It is a time of mighty challenges but with almost unchecked opportunities, with many based in part on the innovations associated with the new digital economy. The call is for integrated, comprehensive development strategies of a transformative nature; international cooperation at unprecedented levels; strong leadership; and, above all, inclusive approaches that ensure no one is left out—locally, nationally and globally.

Since 2015 there have been a number of remarkable shifts that demonstrate a great appetite for sustainable development in all parts of the world, but also disappointments. Now, and for the foreseeable future, the need will be to push for accelerated progress on all fronts, with a focus on successful action mechanisms. Also, we must shift greater attention to the mid-and longer-term of 2030 and 2050 (and beyond), even as we struggle with short-term inertia, capacity development and many other problems.

China has made considerable policy progress on building a robust environment and development relationship. Yet most of the action still lies in the future. In line with

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<sup>1</sup> Every year since 2002 CCICED has commissioned an Issues Paper for Presentation to the CCICED Annual General Meeting (AGM) Plenary meeting. The 2017 AGM will take place from 9-11 December. The meeting theme is *Ecological Civilization in Action: A Common Green Future for a New Era*. This Paper's contents and preparation are the responsibility of the CCICED International and Chinese Chief Advisors, currently Dr. Arthur J. HANSON and Prof. LIU Shijin.

international trends for environmental protection and sustainable development, China seeks green development and environmental protection, but with the added dimension of building an Ecological Civilization<sup>2</sup>. This transformative change—to take place between now and 2050—was affirmed during the 19<sup>th</sup> Communist Party of China Congress (19<sup>th</sup> CPC Congress) held in October 2017, an important event since it set out a long-term development path along with political arrangements for the coming five years.

It is opportune that CCICED starts its Sixth Phase (2017-2021) just as the renewed global green race gets fully underway, and in the year of China's comprehensive review of its national political priorities. As a platform for international cooperation, and with the experience and trust based upon 25 years of activities, CCICED is well placed both to provide advice to China on policies related to environment and development, and to foster greater commitment and involvement of China for the solution of such problems at regional and global levels. It is very clear that China's enhanced action will benefit others throughout the world, but especially for South-South Cooperation and other efforts involving developing countries, for green global governance, for green investment, and for cooperation on advanced green tech and other innovations.

### **CPC 19<sup>th</sup> Party Congress**

CCICED Phase VI is underway in the same year as China's 19<sup>th</sup> CPC Congress, where the CPC leaders have been selected for a five-year term. The Congress starts a "New Era" of Chinese development thinking with important milestones between now and 2050, the time frame to achieve "the Chinese Dream of national rejuvenation". There will be three pivot points: **2020** when poverty is to be basically eliminated within China and a moderately well-off society created; **2035** when basic modernization is to be achieved; and **2050** when China aspires to become a strong and prosperous nation, a "Beautiful China" where today's environmental problems will be mitigated, and the country can fully take its place on the world stage with other leading nations.

**China has set out its environment and development path to be the construction of an Ecological Civilization.** Some commentators describe this term simply as China's sustainable development approach. However it is more than this. Ecological Civilization implies important political links and solutions for specific ecological concerns. The term also is philosophical in nature, intended to focus on ways of life that are "harmonious" and respectful of nature. As noted by Xi Jinping in his lengthy Report to the 19<sup>th</sup> CPC Congress: *Any harm we inflict on nature will eventually return to haunt us.*

Chapter 9 of the Report provides guidance for both the immediate and longer-term future of Ecological Civilization and for environmental protection.<sup>3</sup>

*The modernization that we pursue is one characterized by harmonious coexistence between man and nature. In addition to creating more material and cultural wealth to meet people's ever-increasing needs for a better life, we need also to provide more quality ecological goods to meet people's ever-growing demands for a*

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<sup>2</sup> Ecological Civilization helps to fill in the environmental links with other societal activities and provides an "overarching design" for eco-environmental reform and protection. (The Diplomat. 2016. *China's New Blueprint for an 'Ecological Civilization'*.)

<sup>3</sup> Chapter 9 in the Report by Xi Jinping to the 19<sup>th</sup> CPC Congress. *Speeding up Reform of the System for Developing an Ecological Civilization and Building a Beautiful China.*

*beautiful environment. We should, acting on the principles of prioritizing resource conservation and environmental protection and letting nature restore itself, develop spatial layouts, industrial structures, and ways of work and life that help conserve resources and protect the environment. With this, we can restore the serenity, harmony, and beauty of nature.*

Four priority areas are mentioned in Chapter 9 of the Report: **promoting green development; solving prominent environmental problems; intensifying the protection of ecosystems; and reforming the environmental regulation system.**

In other parts of the Report, **attention is given to expanding China's international contributions**, for example, the following statements:

*...It will be an era that sees China moving closer to center stage and making greater contributions to mankind...*

*...play our part in ensuring global ecological security.*

*...Taking the driving seat in international cooperation to respond to climate change, China has become an important participant, contributor, and torchbearer in the global endeavor for ecological civilization...*

### **CCICED Initiatives and Future Directions**

CCICED will need to reset its own efforts so that the Council works on the leading edge of new policy needs, assesses the effectiveness of proposed actions on the basis of best practices and innovation needs; identifies ways to accelerate progress on achieving environment and ecological civilization goals; and balances its efforts between those focused on Chinese domestic needs and those related to regional and global concerns.

In the limited work program undertaken during 2017, CCICED has paused long enough to address its own reform needs, to prepare for a demanding future covering topics that will require more extended study periods, and to understand topics that are relatively new to the Council but of major concern. The Task Force on China's Green Economic Transition 2020-2050 will present an important discussion paper to this year's AGM; and a new initiative on Global Ocean Governance has initiated its study on how Blue Economy ocean plans in China<sup>4</sup> and elsewhere can be made more sustainable, as promoted in Chapter 14 of the UN SDG2030 initiative<sup>5</sup>. In September 2017 CCICED conducted an International Roundtable on Green Urbanization. The Roundtable and other related activities have served as a scoping effort for 2018 Task Force activities on this complex topic.

Many coherent plans are already in place within China's 13<sup>th</sup> Five Year Plan (2016-2021) and globally (Paris Climate Agreement, UN SDG2030). There is an understanding of the value of important ideas such as Planetary Boundaries, Green Finance, Green Trade and Investment, Clean Tech, and how citizen participation in environmental decision-making can be used. **But will the various and overlapping plans be implemented well enough and quickly enough to keep up the momentum for green transitions and transformations?**

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<sup>4</sup> See *China Supports Marine-Friendly Blue Economy*.

[http://www.chinadaily.com.cn/world/2017-06/08/content\\_29665712.htm](http://www.chinadaily.com.cn/world/2017-06/08/content_29665712.htm);

<sup>5</sup> A major global conference was convened in June 2017 at UN Headquarters on the need for accelerated action for ocean sustainability as called for in the SDG2030 Chapter 14.

[http://www.un.org/ga/search/view\\_doc.asp?symbol=A/CONF.230/14&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/CONF.230/14&Lang=E)

This central question has been asked in many ways and for many sectors, including energy, food security, environmental protection, urban design, and countryside sustainable development, and for the key issues of biodiversity conservation, enhancement of ecological services, and sustainable production and consumption.

For the first time, this Issues Paper will address time frames extending to 2050 and beyond. This has required background examination of global scenarios that reflect widely varying outcome possibilities. Also, national areas of progress for China, such as on climate change including the proposed national carbon trading system, stricter regulation and enforcement, and reaching turning points for some issues, especially the War on Pollution. Environmental risk planning and management still appears to be lagging. In general, green taxation and some other key concerns for environmental governance remain works in progress. **How can meeting the longer-term national needs of China be speeded up in a coordinated and efficient way including short-term actions in the remaining time of the 13<sup>th</sup> FYP and during the 14<sup>th</sup> FYP?**

China's Belt and Road Initiative (BRI), the subject of a major international gathering<sup>6</sup> by the Government of China in May 2017, is among the most significant long-term international undertakings by China in terms of its potential environmental role. However investment and trade issues have other important Ecological Civilization and sustainable development implications. **How can China ensure that its ambition to create new partnership approaches with developing nations will help to meet global sustainability objectives in an optimal fashion?**

These questions and others directly related to key international initiatives such as the SDG2030 goals and the post-Paris Climate Change action drive the selection of ten specific issues discussed in the main body of the paper. A brief review of the current international and Chinese environment and development situation is provided as background for the issues discussion. The Issues Paper concludes with consideration of how China's focus on a New Era for the decades to come can be used to further enhance environment and development policy at the national, regional and global level. Ten Issues are highlighted.

**Four key elements provide a focus for the analysis: (1) green governance, including law and institutional strengthening, (2) green finance, investment and trade; (3) scientific development and technical innovation; and (4) inclusive and participatory decision-making with full commitment of enterprises, communities of interest and various stakeholders.**

## **2017 - China's Very Busy Year on Environmental Protection**

This past year has been perhaps the busiest ever in China in terms of policy and implementation action on environment and development.<sup>7</sup> Partly this is the result of having better administrative tools at hand, notably the 2015 revised Environmental Act,

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<sup>6</sup> [https://en.wikipedia.org/wiki/Belt\\_and\\_Road\\_Forum](https://en.wikipedia.org/wiki/Belt_and_Road_Forum)

<sup>7</sup> Each year CCICED prepares a review of *China's Policy Progress on Environment and Development* that is tabled at the CCICED AGM. This year a special five-year review (2013 to 2017) will be provided.

and the full suite of three **War on Pollution Action Plans**. There have been many more sectoral actions for the environment. Internationally, China has taken an active and very successful role on promoting green finance in the follow-up to the 2016 G20 Meeting held in Hangzhou. Many activities this past year relate to the innovation agenda with gathering strengths and breakthroughs in a number of fields. China's domestic situation is discussed in the subsections below. Those matters pertaining mainly to China and the World are described in the next main section.

### **Enforcement Supervision**

Domestic environment and development actions within China reached unprecedented levels during 2017. The highest profile effort has been supervisory missions by thousands of inspectors examining enterprises and local government adherence to laws and regulations, mostly related to the War on Pollution. Thousands of charges relating to corrupt practices and performance failure have resulted. Also, public shaming of cities and provincial offices that failed to meet their targets for pollution control or other environmental management objectives has become an important part of the compliance strategy. Cases of wrongdoing have become commonplace before the courts, with very substantial fines and other punishments.

The intent is to alter the behavior of enterprises, local government agencies, and of individual decision-makers so that environmental inaction or cover-up schemes will be seen as socially, politically and economically unacceptable, and with severe consequences. To ensure the message is clear, direct participation in field visits to provincial and local offices and enterprises by senior central government officials, including the MEP Minister and various vice-ministers have taken place.

At the same time, the massive investments during the 12<sup>th</sup> FYP in green technology; monitoring using independent real-time means such as drones, satellites and direct reporting from potential pollution sites; plus expanded use of some market mechanisms, are starting to show their value. For example, national statistics concerning average PM<sub>2.5</sub> levels in urban environments show a steady downward trend in recent years. However, PM<sub>2.5</sub> values reported during the first six months of 2017 show a worrying rise. More generally, there is a worry that the War on Pollution may not meet all its objectives set for 2017.

During the 19<sup>th</sup> CPC Congress, it was once again noted that achieving full progress on difficult issues such as air pollution may take a longer period than might be hoped for—likely to 2035. Even with an aging population, environmental and health issues deserve more attention, for the influence will be profound.

### **War on Pollution**

China is now preparing for a new phase of the national air pollution control effort to start in 2018, and continuing to unveil new efforts for water and soil pollution control. During the first half of 2017, China started 8,000 water cleanup projects worth some 667 billion yuan (about USD \$100 billion).<sup>8</sup> These cover hundreds of contaminated

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<sup>8</sup> <https://www.reuters.com/article/us-china-pollution-water/china-launches-8000-water-clean-up-projects-worth-100-billion-in-first-half-of-2017-idUSKCN1B4090>

groundwater sites, one of China's most severe challenges. This effort has been complemented with implementation of ecological redlining that will make some areas off-limits for intensive animal husbandry or other polluting activities. Over 200,000 livestock and poultry operations were shut down during the first half of the year. Most interesting has been the appointment of more than 200,000 "river chiefs" who will be accountable for quality improvement in sections of rivers flowing through their local area.<sup>9</sup> However, as former MEP Minister Chen Jining noted in his annual report to the NPC Standing Committee in early 2017, agricultural land quality *does not allow for optimism and the problem of soil pollution for industry, companies and nearby land is prominent*.<sup>10</sup>

## Green Urbanization

At quite another level, the April 2017 announcement of a new city (Xiong'an New Area) to be constructed within the Jing-Jin-Ji region has some environmental implications.<sup>11</sup> Notable among them is the condition of the nearby very large Baiyang Lake and its surrounding wetlands (the largest in northern China).<sup>12</sup> Their ecological functions are to some extent affected by local industries and past construction of dams, thus limiting their sustainability prospects. The construction of a medium-large (2.5 to 6 million eventual population) city could have some negative or positive regional environmental impact. It could become an example of transformative change towards an ecological civilization approach, or it could place additional burdens on a sensitive ecosystem. As well, the city will require additional water resources, perhaps drawing Yangtze River water via the South to North canal.

## Signals: Tipping Points and Turning Points

These few examples demonstrate some of the challenges being tackled by China as it implements its Ecological Civilization action. The examples need to be understood not only as challenges, but also as potential opportunities on a large scale. **They raise the question of whether China is indeed moving from *tipping points* of rapid environmental degradation to *turning points* showing gradual improvement through ecological restoration and better environmental protection.** For the important period to the end of the 13<sup>th</sup> FYP and the 2020 goal of a moderately well off (*Xiaokang*) Society, there should be sufficient momentum and credible evidence in place to satisfy the Chinese population that signals are moving in the right direction on environment and development. Even if the goals of 'blue skies and clean waters' are not yet fully realized.

On matters regarding energy and environment, China has continued to undertake shifts and innovations of national and global significance. Domestic coal peak use perhaps is now part of history, and further declines will take place in the decade ahead. China

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<sup>9</sup> <http://www.scmp.com/news/china/society/article/2111824/how-cleaning-chinas-polluted-rivers-got-personal>

<sup>10</sup> <http://www.reuters.com/article/us-china-pollution/chinas-environment-ministry-finds-patchy-progress-on-water-and-soil-pollution-idUSKBN17R02V>

<sup>11</sup> See Adam Minter. 11 May 2017. *China's Hidden Pollution. As cities expand, industrial waste is getting harder to ignore.*

<https://www.bloomberg.com/view/articles/2017-05-10/china-s-hidden-pollution>

<sup>12</sup> <http://www.scmp.com/news/china/policies-politics/article/2088150/polluted-lake-heart-xi-jinpings-new-city-dream>

continues to lead the world in the installed capacity from solar and wind powered sources, while also driving global prices downward. As noted in a 2017 IEA report<sup>13</sup>, solar energy is now the fastest growing source of new energy globally. China is the largest driver at present.

The shift towards electric vehicles (including cars, buses and trucks) is proceeding at a pace that is not as fast as the transformation of power generation facilities, but the ramping up is impressive within China. In 2016 about a half million EVs were produced. However, this is still a small fraction of the 28 million automobiles produced in the past year. A systematic rise in EV numbers will occur during the coming decade, for both domestic and international markets. There are major incentive programs, and the main cities are making good progress on increasing the number of recharging stations. At least 15 new licenses were issued in the first part of 2017 to permit new entrants into the manufacturing of electric cars. However further expansion is now being curtailed due to worries that overcapacity may develop.

Despite this progress, and China's continued success in driving down GHG intensity per unit of GDP, it has been recently noted that, after two years of global flat levels, global carbon emissions likely will increase by 2% during 2017. Whether a blip on the journey to future global reductions, or a disturbing trend, the information is a reminder of difficult the road ahead will be for China, as well as for other large countries such as India.

## **Innovation**

China's success with energy and environment innovation and other key topics such as Circular Economy, has been the result of clear-sighted priority setting under the country's medium- to long-term plan for science and technology (2006-2020).<sup>14</sup> Many of the 20 goals in the plan directly address environmental sustainability. There have been many practical action follow-ups, for example, in China's ability to cope with both industrial and domestic household wastes.<sup>15</sup> An example is the advanced incineration waste facility in Laogang near Shanghai.<sup>16</sup>

However there have been bumps along the road such as the case of developing a rational and efficient Circular Economy for China, including the country's efforts to generate new supply chains for raw materials from a combination of imported wastes as well as wastes from within China. The collecting, sorting and deconstruction problems frequently are severe, leading to new waste streams (e.g., from poorly sorted plastics and household mixed paper), toxic substances affecting both human and ecosystem health (e.g., recycling of electronics), and the poor handling of commodity wastes (e.g., auto tires, food and delivery containers, and plastics used on agricultural lands for controlling weeds), and non-point sources of some chemicals and other substances and wastes (e.g., oil and rubber residues on roads washing into streams and rivers; plastic tossed into rivers and lakes, ending up contaminating marine waters).

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<sup>13</sup> <https://www.iea.org/publications/renewables2017/>

<sup>14</sup> Cong Cao, R Suttmeier, D.F. Simon. 2006. *China's 15-year Science and Technology Plan*. <http://china-us.uoregon.edu/pdf/final%20print%20version.pdf>

<sup>15</sup> [www.nature.com/news/circular-economy-lessons-from-china-1.19593](http://www.nature.com/news/circular-economy-lessons-from-china-1.19593)

<sup>16</sup> <https://www.economist.com/news/china/21649540-waste-incinerators-rile-public-are-much-better-landfill-keep-fires-burning>

With increasing wealth of people, mass migration into cities, and lax oversight of manufacturing facilities, the problems of waste have become much greater in the past 5 to 10 years. A March 2017 initiative led by MEP, but with cooperation of other agencies including the State Oceanographic Administration (SOA), is the *Offshore Area Pollution Prevention Program*<sup>17</sup> under the water component of the War on Pollution. The program will address many of the waste concerns that make rivers and coastal areas major sources of marine pollution.

A second example of how waste problems are being tackled is the July 2017 central government edict to ban many imports of waste materials into China from other countries.<sup>18</sup> Some 24 categories of imports are involved, including many types of plastics, unsorted scrap paper and some metal scrap, to be banned by December 2017. There have been many instances of garbage smuggled into China from other parts of the world. The import of electronic device waste such as televisions and computers have been controlled through a series of recent programs. A further stop to waste material imports will be in place by 2019 through replacement of imports by substitution with domestic sources of raw and recycled sources. This refinement of China's Circular Economy is important, but has created great anxiety on the part of exporters located in countries such as the USA. Very likely this necessary adjustment to China's Circular Economy may see further optimization, as new concerns arise, for example, the complex issue of lithium battery reuse, disposal and dismantling.<sup>19</sup>

### **Protection of Ecosystems, Biodiversity and Ecological Services**

In China biodiversity conservation is inextricably linked to rural livelihoods and poverty reduction through eco-compensation for the protection of forests, grasslands and wetlands, and for various other types of ecological restoration. The idea of constructed ecosystems is now well celebrated in parts of the country for addressing desertification, coastal zone protection, and for specific needs such as migratory bird habitat. Substantial funding is available.

On a grander scale is the effort that China continues to place on water management. This has worked both for and against the environment. In 2016 Yunnan Province and the Nu Jiang Prefecture-level government determined that a good course of action linking poverty reduction and ecological protection would be to designate two national parks in the Nu River Basin. Tourism will provide local income. Since 2016 development on the Yangtze River has focused greater attention on environmental

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<sup>17</sup> <http://www.cciced.net/cciceden/NEWSCENTER/LatestEnvironmentalandDevelopmentNews/201706/P020170602627691045594.pdf>

<sup>18</sup> [https://www.wto.org/english/news\\_e/news17\\_e/impl\\_03oct17\\_e.htm](https://www.wto.org/english/news_e/news17_e/impl_03oct17_e.htm) ;

<https://www.economist.com/blogs/economist-explains/2017/08/economist-explains-8>

<sup>19</sup> The Economist. 12 August 2017. *After electric cars, what more will it take for batteries to change the face of energy?* <https://www.economist.com/news/briefing/21726069-no-need-subsidies-higher-volumes-and-better-chemistry-are-causing-costs-plummet-after>

restoration rather than large project.<sup>20</sup> The fundamental issues are water stress and water quality arising from many demands for water; yet infrastructure remains an issue.<sup>21</sup>

In September 2017, plans were proposed to build two large sluice gates to divert water into very large flood plain lakes (Poyang in Jiangxi, and Dongting in Hunan Province) that have endured serious low water situations since the construction of the upstream Three Gorges Dam. It is feared that the critically endangered (about 1,000 remain) Yangtze finless dolphins will be affected and eventually all may die.<sup>22</sup> However, the water is badly needed to maintain habitat needed by migratory waterfowl in the internationally renowned lake areas.

This type of dilemma has become very important in this “mother basin” of China. Ongoing action for saving China’s precious biodiversity, including iconic species such as the Giant Panda and the Baiji dolphin (*Lipotes vexillifer*) of the Yangtze River, continues to be a high priority, but with mixed results. The Panda, removed from the IUCN Endangered Species list in September 2016, still faces an uphill struggle since its habitat in Western China has become fragmented into some 30 plots. In the Yangtze River the Baiji dolphin is generally considered to be extinct, although there was excitement in late 2016 when an amateur expedition believed they had spotted the animal swimming near Wuhu City.

There are many other species of animals and plants in China that teeter on the edge of extinction. While less known to the public such species are still important in their ecosystems. With a strong resurgence in Chinese traditional medicine, there are added pressures on many forms of life found either in China or in other countries. Other biodiversity losses arise through overexploitation or habitat loss in marine and coastal areas. For example in 2017, the annual closure to fishing of marine waters in the East China Sea was extended by a number of months since stock levels have plunged.<sup>23</sup> In the South China Sea, large-scale destruction of coral reefs has occurred during the illegal harvest of giant *Tridacna* clams for sale to foreign and Chinese collectors in Hainan resorts and elsewhere.<sup>24</sup>

There is recognition that a strong emphasis on ecological redlining is needed on land, in the oceans and in fragile freshwater habitats throughout China. These redlined areas, whether in time (e.g., closed during migratory or breeding times) or in space such as parks and natural areas, or in urban, farm or other areas, can protect species and valuable ecosystems that enhance ecological services. The idea is not new within China, but in February 2017 it took on new life with the

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<sup>20</sup> The development of China’s Yangtze River Economic Belt: how to make it in a green way?

[https://ac.els-cdn.com/S2095927317301901/1-s2.0-S2095927317301901-main.pdf?\\_tid=fal139ce-bdf4-11e7-993a-00000aacb360&acdnat=1509424732\\_2a8be355107aa2c745b3f9dcec831370](https://ac.els-cdn.com/S2095927317301901/1-s2.0-S2095927317301901-main.pdf?_tid=fal139ce-bdf4-11e7-993a-00000aacb360&acdnat=1509424732_2a8be355107aa2c745b3f9dcec831370)

<sup>21</sup> <http://chinawaterrisk.org/research-reports/water-nomics-of-the-yangtze-river-economic-belt-strategies-recommendations-for-green-development-along-the-river/>

<sup>22</sup> <http://www.scmp.com/print/news/china/society/article/2112556/water-scheme-threatens-yangtze-river-porpoises-extinction>

<sup>23</sup> <http://chinaseafoodexpo.com/china-begins-annual-summer-fishing-ban-areas/>

<sup>24</sup> <http://www.christina-larson.com/in-southern-china-endangered-giant-clams-carved-up-as-jade-of-the-sea/> ; <https://news.nationalgeographic.com/2016/08/wildlife-giant-clam-poaching-south-china-sea-destruction/>

release of an Opinion Paper<sup>25</sup> by the State Council and the Party Central Committee on *Defining and Protecting Ecological Redlines*. The document sets specific deadlines: by the end of 2017 the lines will be defined for Beijing-Tianjin-Hebei and for the Yangtze Economic Belt (e.g., for aquatic habitats for spawning fish, and for locating chemical industries away from the river edge); by 2020 for all parts of the country. By 2030, through management experience with these areas, *national ecological safety should be guaranteed*.

## **Sharing Economy**

China has become one of the most active countries in the world in terms of embracing various elements of the Sharing Economy. Advances in use of mobile phones as the key tool for daily financial transactions is one of the key reasons. The rise of readily available bicycles for rent is dramatic. Beijing has more than 2 million such bicycles (and some e-scooters), all put in place in less than 2 years. Similarly, taxis are readily hailed by mobile. China's Didi Chuxing with some 450 million users across over 400 Chinese cities is a well-financed Chinese and global ride service that likely will become important in the introduction of various smart transportation initiatives, use of big data, and self-driving vehicles.

The new trends of massive dependence on rapid delivery of food and other courier services have created a variety of issues, including environmental problems such as waste disposal of excessive packaging and excessive consumption. However, the internet services that backstop these new sales strategies have led to massive data collection efforts for example by Alibaba. These online services have a very advanced understanding of consumer preferences, including those related to environmental health, and choices of sustainable products.

Perhaps one of the most significant elements of sharing economy is the ability to transmit information via social media, so that individuals can communicate their concerns and preferences to family, friends and colleagues quickly and definitively. China has by far the largest connectivity to the Internet of any country.<sup>26</sup> More than 50% of its citizens are connected, more than 700 million. People can become citizen scientists and provided data on environmental problems. They can become aware of local, national and global environment and development concerns.

Certainly the Sharing Economy is still at its early stages within China, and between China and other countries. Some of the millionaires and billionaires associated with new companies have interests about environmental subjects, and also embrace the China Dream and Beautiful China. They will become philanthropists and investors supporting new green ideas and cutting edge initiatives that will help to move China through its green transition during the coming decades.

## **China's Seventh National Conference on Environmental Protection**

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<sup>25</sup> [http://news.xinhuanet.com/english/2017-02/07/c\\_136038742.htm](http://news.xinhuanet.com/english/2017-02/07/c_136038742.htm)

<sup>26</sup> <http://www.internetworldstats.com/top20.htm>

This National Conference is an event that occurs only every several years, with the first held in August 1973 after the Stockholm Environmental Conference.<sup>27</sup> China's Seventh National Conference on Environmental Protection was held in December 2011. The Eighth Conference will be held in December 2017. Over the intervening years many key changes and progress in the global environmental agenda have taken place, and the ways in which China has aligned itself to the international agenda have altered very significantly. It is an important opportunity to take into account the reality that almost no environmental problems today can be fully solved through local action only; and that global environmental problem solving depends on the resolve of all nations and peoples. The meeting to be held this December will be an interesting blend of the domestic and global goals that now define the field of environmental protection.

## **Shaping A Green Future: China and the World 2017 to 2050**

Throughout the world over the past five years environment and development topics have entered the mainstream of decision-making in an unprecedented fashion. **Concerted effort on the part of the community of nations has reached a point where there can be no turning back, and yet there cannot be any single solution to any of the global environmental problems.** Pathways are needed to move both richer and poorer nations towards a green and sustainable common future. Certainly it is essential not to export environmentally damaging activities from one country to another. And international cooperation must be strengthened to address the comprehensive body of concerns identified by the UN SDG2030 effort globally, regionally and nationally.

When the SDG2030 initiative was agreed upon at the United Nations, President Xi Jinping joined other world leaders on 28 September 2015 to endorse the new goals. He noted the need to:

*...take the post-2015 development agenda as a new starting point, and together to seek an equitable, open, comprehensive and innovation-driven development path in an effort to achieve common development of all countries. China will shoulder the responsibility of implementing the post-2015 development agenda, and seek solidarity and cooperation to constantly push the cause of global development.*

This statement and various follow-up financial commitments and other actions have signalled China's interest in playing a larger international role and sharing its growing experience and capacity on environment and development.

### **Global Time Frames (to 2100)**

The new global environment and development agenda provides for three time frames. **First and most immediate is the period 2015 to 2030 which should lead to turning points and solutions for many major issues. By 2030 major environmental declines should be halted, or slowed.** While hugely challenging, if action is not accelerated on many fronts, future generations will suffer greatly throughout the world. Significant progress is needed towards green finance to blend public and private sector contributions; Low Carbon Economy; Circular Economy; air soil and water pollution in

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<sup>27</sup> Zhen Zhong. 2015. *The Dynamic Evolution of China's Environment Policy*.

[http://ap.fftc.agnet.org/ap\\_db.php?id=506&print=1](http://ap.fftc.agnet.org/ap_db.php?id=506&print=1)

cities; addressing global biodiversity loss; global sustainable ocean use, and poverty reduction especially in rural areas. Green development standards should be observed throughout the world. Chinese experience is highly relevant.

**The second period from 2030 to mid-century will see tremendous changes in energy and environment relationships, sustainable consumption and new production approaches that we can hardly comprehend today.** However, aging populations may be more susceptible to environmental risks such as air and water pollution. Global prosperity will be defined in terms similar to what China now describes as Ecological Civilization, and by whatever the United Nations follows up after successful completion of the SDG2030 initiative.

**It is very important to recognize and act now on planning needs to address the third period—post-2050 to at least 2100.** Many of the environmental risks seen today may well continue to grow in severity, for example, sea level rise; impacts on urban and rural infrastructure as local and regional climate shifts occur. Importantly, however there will be opportunities provided by environmental technology innovation.

**Accelerating global progress on implementation policies and action today could make a tremendous difference to future outcomes during all three periods noted above. Indeed, we should recognize that the greatest opportunity of the 21<sup>st</sup> Century is the transition to green development, sustainable development and Ecological Civilization.**

### **Chinese Global and Regional Roles**

As China's economy and technical capacities continues to expand, and with its success in poverty reduction, the international community now expects China to play a greater role in securing sustainable development and protection of the global environment for future generations. Certainly the signals are strong that China intends to do so through its domestic initiatives, through innovative efforts with other countries, and globally via cooperation and leadership in a number of ways.

China often reminds the world that it is still a developing country. While the nation is justly proud of its scientific development approach and other initiatives, it is also deeply concerned about achieving full success in the War on Pollution, biodiversity conservation, sustainable resource management, creating livable cities and sustainable prosperity, green economic growth, climate change adaptation, and meeting a host of other domestic environmental protection needs as noted in the previous section of this paper.

**Global Pivot Points 2017-2030 (definition: “the pivot on/around which something turns/revolves”)**

At the July 2017 Meeting of the High-Level Political Forum on Sustainable Development, UN General Assembly (UNGA) President Peter Thomson noted that *the SDG2030 goals provide the pathway that will guide humankind to a sustainable way of life.*<sup>28</sup> Other panelists highlighted the need to focus on “investments in green technology;

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<sup>28</sup> <http://www.un.org/pga/71/2017/07/17/opening-of-the-ministerial-segment-of-hlpf/>

human capital development; management of natural resources; domestic resource mobilization; horizontal and vertical coordination across policy areas and government levels; and multi-stakeholder partnerships”<sup>29</sup>.

In the years ahead we might expect to find both leaders and laggards among countries and international bodies, and perhaps some dropouts from the global consensus. Success therefore is not guaranteed; and—ambitious as the goals are—they are insufficient to fully address necessary changes in lifestyle, green governance and other needs for both the near and long-term sustainable future. The dialogue about the ‘Future We Want’<sup>30</sup> therefore must continue throughout the decade ahead.

But most important is the successful application of the knowledge and experience we already have at hand. We can accelerate progress, and wherever possible, exceed targets. This approach is necessary globally as well as nationally and locally. Even if reaching fully satisfactory environment protection still remains somewhat of an aspirational goal globally by 2030-2035, trends towards a cleaner and healthier situation, improvements in ecological services and cessation of biodiversity losses, new patterns of sustainable consumption, and massive reduction in poverty will be good indicators of positive, transformative change.

### **Climate Change and SDGs: The Need for Accelerated Action**

In June 2015 the G7 nations pledged to “decarbonize the global economy in the course of this century”.<sup>31</sup> This remarkable goal could help restrain global temperature rise to 2 °C or less. In June 2016 the G7 countries further amplified the pledge by agreeing to an end to fossil fuel subsidies by 2025 and several other major actions, including support for HFC phase-down; carbon neutral aviation growth from 2020, and annual climate finance of USD100 billion by 2020.

China is better placed than many other countries to meet its commitments under the Paris Agreement and for its own SDG2030 Action Plan. First, the 13<sup>th</sup> FYP (2016-2020) is essentially a national green plan, with rigorous, mandatory environmental and development goals. Achievement of the Chinese ‘all-round prosperous society’ will occur by 2020, with some environmental goals included. In reporting to the UN on the Chinese SDG2030 national action plan, China’s national government has noted that many important elements from the international agreements were incorporated directly into the 13<sup>th</sup> FYP.<sup>32</sup>

Second point is the potential for substantial economic and institutional reform in the years immediately ahead, and after 2020. The reforms can provide for accelerated achievement of the SDG2030 goals within China, and also via the Belt and Road Initiative plus other partnerships specifically related to GHG reductions, biodiversity conservation, etc. If action can be accelerated so that Chinese goals (e.g., for energy transitions) set for 2030 are achieved by 2025 or sooner, benefits will accrue not only to

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<sup>29</sup> from Earth Negotiations Bulletin (ENB) Volume 33 Number 36 Saturday, 22 July 2017

<sup>30</sup> Outcome document from the Rio+20 Conference in 2012

<https://sustainabledevelopment.un.org/futurewewant.html>

<sup>31</sup> <http://www.g8.utoronto.ca/summit/2015elmau/2015-G7-declaration-en.pdf>

<sup>32</sup> [http://www.fmprc.gov.cn/mfa\\_eng/zxxx\\_662805/t1405596.shtml](http://www.fmprc.gov.cn/mfa_eng/zxxx_662805/t1405596.shtml)

China but also to other countries, and for global issues such as low Carbon Economy.<sup>33</sup> Already China appears to have peaked in its use of coal, perhaps as early as 2014.<sup>34</sup>

China's enormous demand for natural resources has upped its ecological footprint<sup>35</sup> in recent years but there also are some encouraging signs. Even with significant eco-efficiency increases in many industrial sectors and other enterprises, there is still considerable room for efficiency gains in energy and material use throughout the economy, in further development of the service sector, and in the emerging Sharing Economy.

The third key point is that China can help other nations meet their goals. China's proactive stance including new funding for developing countries to address urgent matters under the banners of South-South Cooperation, the China Development Bank, new green initiatives through the AIIB and the New Development Bank (BRICS Bank) plus other sources. New sources of environmental funding throughout the world were given a boost by the effort led by China to highlight Green Financing at the 2016 Hangzhou G20 Meeting.<sup>36</sup>

A shortlist of items for China and the World for accelerated progress on goal achievement during 2020 to 2030 or 2035 might include the following:

- Low Carbon Economy: peaking petroleum use before 2025; national carbon trading system fully functional by 2020; stringent low carbon goals achieved for all cities above 5 million by 2022 and for all cities by 2025; projected 2030 goals for renewable electrical power sources doubled.
- All three *War on Pollution* turning points achieved by 2022. By 2030-2035 all major cities should meet the air, water and soil standards established by WHO and/or other international bodies. Major reductions in water and chemical use in the agricultural sector, especially nitrogen reduction by 2025.
- Circular Economy: by 2030-2035 China should be the world leader in most or all sectors regarding reuse, recycling and other aspects of Circular Economy; with advances through economic incentives, technology innovation, improved green governance, etc.
- Green market supply chains, green procurement and sustainable consumption fully in place along with relevant standards and green/sustainability certification systems for buildings, agricultural and other natural resource products, transportation vehicles (public and private trucks, cars, buses, and trains, non-road vehicles including ships and airplanes) by 2025-2030
- Biodiversity and ecosystem protection and specific improvements in ecological services by 2025-2030 based on an updated *Chinese National Conservation Strategy*

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<sup>33</sup> <http://www.lse.ac.uk/GranthamInstitute/news/new-study-finds-chinas-emissions-likely-to-peak-by-2025/>

<sup>34</sup> <http://ieefa.org/ieefa-update-china-now-three-years-past-peak-coal/>

<sup>35</sup> [http://www.footprintnetwork.org/content/documents/ecological\\_footprint\\_nations/ecological.html](http://www.footprintnetwork.org/content/documents/ecological_footprint_nations/ecological.html)

<sup>36</sup> [http://unepinquiry.org/wpcontent/uploads/2017/07/2017\\_GFSG\\_Synthesis\\_Report\\_EN.pdf](http://unepinquiry.org/wpcontent/uploads/2017/07/2017_GFSG_Synthesis_Report_EN.pdf) ; <https://germanwatch.org/de/download/16330.pdf>

*and Action Plan (2011-2030)*<sup>37</sup>.

Action plans for accelerated progress under the 13<sup>th</sup> FYP from 2018 to 2020 are needed, plus early green transition planning for the 14<sup>th</sup> and 15<sup>th</sup> FYP revised goals. China's gain from accelerated action will be stimulation of its future green economy. At some point, hopefully sooner rather than later, **China should serve as a green beacon to the world community** with new benefits for trade and investment, and buying time for key problems such as reducing global greenhouse gas emissions (with co-benefits in the form of reduced air and water pollution).

There will be further merging of domestic and international goals over the coming decades. Assuming the world community continues to be receptive to free trade and other elements of globalization this will be essential. Of course this merging of goals will also be essential to address climate change and other matters covered under global environment and development agreements. Yet in the two years since the world signed on to the strengthened path for sustainable development, many old ways remain sheltered from change. In particular, the need for integrated approaches to planning and management remains largely unfulfilled at both national and international levels. Decision-making on priorities and on implementation action is still largely in the hands of sectors and often favors status quo relationships and actions.

### **Innovation For 2050 Success**

By mid-century the planet hopefully will be on a path of ecological conservation and environmental protection including climate change mitigation well beyond what we can imagine today, and under certain circumstances with full success in the elimination of poverty and other inequalities. This status would be the result of decisions and action taken by our current and also the next generation of politicians, administrators, business and community leaders, planners, scientists, and ordinary citizens. China aims to be a very prosperous green nation adhering to the principles of Ecological Civilization by the 100<sup>th</sup> Anniversary of New China in 2049.

Given the vast outflow of scientific findings and crystal ball efforts at looking into the future, including serious concerns about overshooting capacity of Planet Earth to support biodiversity, ecological services, and to meet the needs of perhaps 10 billion people, how can we organize now to improve the global and national situations by 2050 and beyond? There are several recurrent themes that we must understand thoroughly and act upon in the coming years and decades.

- **Developing the means for 'Living Within Planetary Boundaries'**.<sup>38</sup> This concept is aligned with ecological footprints of individuals, countries, and, ultimately, global demands affecting nine types of biogeochemical cycles and other functions governing life on our planet. Included within these planetary boundaries are matters pertaining to ecological services and biodiversity conservation, sustainability of the oceans, and global climate change limits. Also, working towards using the full potential of demographic shifts and consumption reduction.

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<sup>37</sup> <https://www.cbd.int/doc/world/cn/cn-nbsap-v2-en.pdf>

<sup>38</sup> <http://www.stockholmresilience.org/research/planetary-boundaries.html> ;

- **Preparing for and shaping the ‘Fourth Industrial Revolution’<sup>39</sup> and the Anthropocene Epoch.<sup>40</sup>** The combination of ‘business as usual’ inertia, and political, social or other factors that inhibit sustainability innovation must be overcome. Further drastic decoupling of economic and social improvements from intensity of resource and environmental uses is necessary. The much more complex applications of IT, artificial intelligence, new approaches to manufacturing, biotech and nanotech, and more broadly, the ‘Internet of Things’, use of ‘Big Data’ in problem-solving and other advanced technical knowledge will be disruptive, but also a source of new opportunities for sustainable development. These are decadal challenges as we have seen in the rapid emergence of impacts of the Internet and IT on development of social media, and almost all aspects of daily living. The decade ahead promises even more disruptive changes but many new opportunities for sustainable development innovation.
- **Shifting globalization paradigms towards Sustainable Development and Ecological Civilization.** No longer can it be acceptable for trade and investment practices to be socially or environmentally harmful, nor can great inequalities be acceptable as an outcome of development strategies. South-South Cooperation is an essential delivery mechanism for these new paradigms. Broadly, international cooperation needs to be codified in ways that support innovation for rapid problem solving on environment and development including green finance, legal frameworks and knowledge sharing—all elements for green governance.
- **Placing environmentally and people friendly infrastructure development as the central mechanism for green urbanization and rural development.** The greatest physical transformation the world is likely to see for human settlements, transportation, and connectivity will take place over the coming 3 decades. These changes will affect productivity, quality of life, health and social aspects in both rich and poor nations. Certainly the outcomes for Low Carbon and Circular Economy are at stake; also food security and the expansion of ecological services. The financing needs for sustainable infrastructure represent the largest portion of projected global expenditure for environmental protection improvements for the foreseeable future. Mostly they will have to be met through a combination of public and private sector sources and using innovative models. Very likely China and India, comprising about 40% of the world’s population will be at the top end of the demand side, and Asia the continent with the greatest potential for innovation towards rapidly implemented and cost-effective green infrastructure development.

## Ten Issues

The selection of the ten issues discussed below has been influenced by three important considerations. First, each Issue has immediate as well as longer-term policy dimensions that are in line with needs arising from the 19<sup>th</sup> CPC Congress and/or global demands of universal concern. Second, that the Issue will require an integrated or comprehensive approach that requires cross-sectoral collaboration in order to be

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<sup>39</sup> <https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab>

<sup>40</sup> <https://www.theguardian.com/environment/2016/jan/07/human-impact-has-pushed-earth-into-the-anthropocene-scientists-say>

adequately addressed. And third, each selected Issue requires transformative change that involves a high level of policy, management and technology innovation.

It is not surprising that within each of the selected Issues there are both domestic and international elements. This reality underlines the need for a strong international cooperation approach for solutions. What is becoming more important is China's capacity to share its environment and development experiences with others, especially via channels such as South-South Cooperation, and, of course, through the Belt and Road Initiative.

Finally, the need to give greater emphasis to social considerations stands out for attention. This is in line with Chinese government concern for keeping development focused on meeting needs of people, and for making it possible for people to supervise development. Matters such as gender equality, environmental health, and improvements to sustainability education are prime examples that should thread through issues that impact the outcome of both rural and urban development.

### **1. Create a 10 to 15 Year Strategy for War on Pollution Action Plans**

The second phase Air Pollution Action Plan will start in 2018, and presumably the next phase of the Water Pollution and Soil Pollution Plans will need to be put in place by 2020 to 2021. However it was clearly acknowledged at the 19<sup>th</sup> Party Congress that environmental efforts must be carried out over a long time frame to achieve optimal results. In this case to 2030 or 2035, and when taking into account matters such as environmental health, perhaps even another decade beyond that. The current first phase action plans, by necessity had to be short-term, in order to demonstrate early successes. For the 10 to 15 years ahead there should be a longer-term and integrated effort focused on cost-effectiveness, synergies, and ways to build public confidence about eventual results. The War on Pollution requires long-term risk reduction and management. Also, it is essential to avoid lock-in of technologies and infrastructure that may become outdated. Thus adaptive planning should be part of the strategy.

Having a longer-term strategy should be helpful in a number of ways. It will provide a greater degree of predictability regarding targets, investment costs, and possibilities for shifting from end-of-pipeline solutions to zero pollution solutions in various sectors and for stimulating clean tech development. Longer-term pollution strategy will be helpful in sorting out co-benefits with other initiatives, notably for addressing climate change, agricultural and other types of natural resource development. It is also a means of ensuring that consistent attention and adequate priority will be given to advanced pollution management in urban and rural settings at a time when both will be undergoing dramatic transformations within China.

A longer-term strategy is essential to build credibility with people who may otherwise be skeptical that genuine progress is being made. The strategy should create the kind of positive effort on the part of citizens, local leaders and enterprises that will be required for the War on Pollution to become a transformative element for Ecological Civilization.

### **2. Ensure that by 2020 Every City and Town in China Creates and Manages Their Own Green Development and Ecological Civilization Goals for Implementation During 2020-2035**

Celebration of achieving a moderately prosperous society by 2020 will challenge communities and citizens to look ahead for a better life and improved lifestyle. Inevitably, this will include demands for better environmental conditions, access to green transportation, comfortable and efficient living space, improved safety and environmental health, green space such as parks and other amenities. Cities are on the leading edge of such demands already; but many towns and peri-urban areas also will be seeking their own style of further growth. There already is tremendous diversity in design and construction of communities in China. However relatively few might be considered exemplars for a future driven by green development, or as community ideals for an Ecological Civilization.

The inspired social and economic achievements of the last 15 years now need to be followed up with approaches that improve urban quality of life and/or eco-environmental concerns, while being highly feasible to implement. Even four years ago, for example, it was not feasible to once again consider bicycles as a fully viable urban transport option. That has changed as a consequence of the sharing economy and information technology. Chinese cities already are, or are destined to become, hotbeds for sustainable development technology introductions.

Now is the time to ensure each urban community creates its own green development destiny, with full public participation, and with the encouragement of central and provincial governments. These plans can be based in part on the large number of experiments underway, including efforts for Low Carbon Cities, Ecological Civilization pilot initiatives, and many other efforts. It is also possible for China to draw more extensively on international experience of eco-cities, green cities, green urban renewal, and many urban planning successes elsewhere. The time horizon suggested for implementation is 15 years so that it is possible to act on dreams as well as on very specific short-term needs.

Climate change must be an important element considered in all community green development plans. There should be clear approaches and goals set for both mitigation and adaptation efforts. Also, better biodiversity conservation actions are needed so that there is respect for the role others in the countryside play on maintaining land and water in good condition, supplying ecological services and the food and natural resources that cities require. Eco-compensation by cities to these other areas is often a neglected topic that really should be part of urban green plans.

Of course it is, essential to spatially plan new communities, large and small, to be extremely resource-efficient and environmentally friendly. Easy access to green development clearinghouse sources such as the *APEC Green Supply Chain Cooperation Network* and an associated center established in Tianjin to highlight availability of suitable building and other products.<sup>41</sup> All communities should have active participation in Circular Economy initiatives as part of their core functions.

In a sense what is needed is a National Green Urbanization Dream that can be shared among communities large and small, old and new. This Dream would be to create highly livable neighborhoods and urban ecosystems with continuous improvement of

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<sup>41</sup> [http://mddb.apec.org/Documents/2016/MM/MRT/16\\_mrt\\_005.pdf](http://mddb.apec.org/Documents/2016/MM/MRT/16_mrt_005.pdf)

environmental, social and economic conditions. The suggested period to 2035 would coincide with the time of mass migration from countryside to cities that will lead the transition of China's people into 70% or more living as permanent urban residents.

### **3. Make Ecological Services the Prime Value of Rural Landscapes and Waters by 2040 to 2050**

The face of China's landscape continues to change—sometimes dramatically so. China is under constant threat from severe earthquakes, typhoons and flooding, drought and other natural drivers. To these must be added climate change, plus inappropriate and overdevelopment circumstances. It is possible now to move mountains, to dissect natural habitats into small pieces that lose their ecological value, to drastically change water flow, and to form new land in coastal zones. Indeed, China has seen many such transformations over its long history of civilization. As it enters a New Era characterized in part by its effort to become an Ecological Civilization, the countryside will take on new roles.

Particularly, the countryside must provide China its ecological security; enhance the capacity to cleanse the air, water and soil; conserve and protect plant, animal and genetic diversity; and become the basis for many new service sectors and other occupations, for example through eco-tourism in national parks and scenic areas. In addition, the land and waters must provide even more food and fiber as population increases and climate change impacts occur. Farming, forestry and animal husbandry will see many changes, while towns and cities will grow and be connected by roads and other infrastructure. The Chinese countryside is dramatically different today compared with a generation ago, and further transformation will certainly occur by 2035 and 2050. The danger is that food, fiber, and other material needs may continue to expand at the expense of the other functions.

China still has large expanses of lands considered marginal for standard agricultural or even forest and grassland use. Indeed it has been a tremendous feat to feed and to provide other natural products to more than a billion people on such a small fraction of arable land with very limited per capita water resources. However much of the success in recent decades has been via methods that threaten Planetary Boundaries such as those for biodiversity, geochemical cycles, and climate change.

The services people receive from air, land and water fall into four categories: *provisioning* (food and fiber, natural medicines), *regulating* (climate, water quality and runoff, disease control), *supporting* (nutrient cycles, pollination), and *cultural wellbeing* (spiritual and recreational benefits).<sup>42</sup> Value of provisioning is generally the easiest to monetize and therefore quantify, while the value of the others generally are underestimated. In actions for Ecological Civilization, there must be a clearer recognition of all types of ecological services so that they can indeed be assessed and monitored. China will need to continuously build these services and develop a stronger eco-compensation system and other mechanisms to ensure that the services double or perhaps triple from today's level. Also, it is important to fully integrate ecological services in some measurable ways within the service economy component that is so important for China's future economic growth.

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<sup>42</sup> [www.teebweb.org/resources/ecosystem-services/](http://www.teebweb.org/resources/ecosystem-services/)

Fortunately in China the tide has already started to turn through massive reforestation, successful programs to halt desertification, wetland restoration, etc. The current efforts on ecological redlining, the building of a national parks system and activities under China's 2011-2030 *Biodiversity Strategy and Action Plan*<sup>43</sup> should be considered part of the effort. But there is no overall picture at the moment. Efforts to build an appropriate national ecological accounts system are not complete by any means. Reconstructed forests are not fully productive in terms of biomass and carbon storage, biodiversity conservation, and ecological safety systems on upper watersheds. Grasslands continue to be fraught with difficulties in terms of sustainable management. Rivers are losing rather than protecting their biodiversity. Marine and coastal areas have become highly vulnerable. These are long-term issues that affect rural employment potential, future green agriculture opportunities, and the safety of urban communities, and protection of China's rich biodiversity.

Needed is a quite major shift in how China views the countryside's ecological-economic potential and the relationship between rural conservation and urban areas. Included in the assessment must be a better sense of demand expectations on the part of both urban and rural populations and their consumption patterns. These requirements will require a better balance among the four types of ecosystem services, and the recognition that each type is important for creating future sustainable livelihoods. Also, that fostering and protecting ecosystem services should be of major concern in the spatial planning of infrastructure of all types, and for industrial site locations of industry in rural areas. It is extremely important that the national effort on ecological redlining is carefully conducted for maximum value.

The Yangtze River Economic Belt should be a prime candidate for implementing an Ecological Services approach to development.

#### **4. Create a High Profile National Campaign on Sustainable Production and Consumption Innovation for China's Ecological Civilization**

Modern sustainable production and consumption efforts have been underway in China since the 1990s, for example through the introduction of *Cleaner Production* initiatives<sup>44</sup> from UNEP, Circular Economy in the early 2000s, and more recently the greening of market supply chains, and programs for energy efficiency and low carbon. The move towards green industrial parks is another example. Citizens have become more aware of their need to be environmentally friendly through their consumer choices; and there has been widespread concern about environmental health.

Yet many of the change signals have been going in the wrong direction. China's ecological footprint has been on the rise in recent years. The eagerness of some people to buy large-sized vehicles, addiction to consumer electronics, multiple and oversized houses and apartments, and the shift to much higher consumption of animal protein is placing greater strain on the environment within China and elsewhere. There must be a considerable shift in both production and consumption approaches if China is to avoid

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<sup>43</sup> <https://www.cbd.int/doc/world/cn/cn-nbsap-v2-en.pdf>

<sup>44</sup> [http://www.chinacsrm.org/Org\\_Show\\_EN.asp?ID=446](http://www.chinacsrm.org/Org_Show_EN.asp?ID=446)

the state of overconsumption and unsustainable production processes that have plagued western nations for the last two generations.

Some Chinese policies work against each other. On the one hand, for economic reasons, there are policies for promoting increased domestic consumption. On the other hand, there are suites of policies trying to reduce the externalities and to improve eco-efficiency of production methods. However, when either production or consumption is stimulated, sometimes through subsidies or other incentives, they prove to be very difficult to control. Even desired initiatives such as shared bicycles, and certainly the side effects from the vast numbers of autos now on the road, are examples where outcomes leave much to be desired. Urban construction rates have outpaced China's capacity to build sustainably and to uniformly put in place enforceable high environmental standards. In the countryside, agricultural water use and other inputs will have to be drastically scaled back; and the many raw materials supplied through mining and other extractive sources are still not fully addressed within the framework of Ecological Civilization.

We are entering a decade where it is possible to achieve levels of eco-efficiency and environmentally friendly production and consumption that could only be dreamed of 30 years ago when *Our Common Future* set out an agenda for sustainable development. This pioneering report of the World Commission on Environment and Development<sup>45</sup> called for equitable distribution of benefits rather than unchecked consumption for the wealthier few. The SDG2030 goals recognize that this is now an imperative.

We must turn to radical thinking for the future of sustainable production. The basics for a 'Fourth Industrial Revolution' provide a starting point for China and other countries that have invested heavily in S&T capacity. Green technologies will be the basis for sustainable production, and therefore offer a broader range of consumer sustainable choices. Consider the world of 2025-2035 when the following technologies are widespread: wind and solar power; smart electrical power grids; electric automobiles, lithium battery production; robotization; innovation in land management including remote sensing and detailed mapping for ecosystems and sensitive landscapes; organic agriculture based on environmentally friendly, water-efficient biotechnologies; traceable supply chains for foods, most other goods and materials. It should be much easier for consumers, enterprises and institutions of all types anywhere in the world to make environmentally sound choices in their purchases. The actual ability will depend on continued advances and applications of IT across a wide range of sectors.

Technological innovation is an important part of the green transition for both production and consumption. Very important is the need to speed up widespread understanding and acceptance of new approaches, and to make these approaches more attractive than existing, or possibly other new but unsustainable production and consumption. Innovation in management approaches within enterprises, governmental agencies and communities is essential to create the enabling circumstances whereby it becomes acceptable and even essential behavior to change established production and consumption patterns.

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<sup>45</sup> <http://www.un-documents.net/wced-ocf.htm>

Three important means are: (1) green financing, tax and fiscal reform to ensure a level playing field for green products; (2) even more rigorous enforcement (and independent oversight) of environmental laws, regulations and standards; and (3) greater access to credible information about environmental sustainability and safety of products. This latter concern is not met well enough in today's marketplace within China. Indeed, the situation is generally very confusing and with scattered information sources. Furthermore, better education and training is needed for both producers and consumers.

For matters such as how individual consumption affects China's ecological footprint, national and/or international environmental certification, and for how choices can affect the direction and success of Ecological Civilization, national guidance is needed for people to understand how they can make a difference. By the time of the 14<sup>th</sup> FYP, there should be a well-coordinated effort in place nationally to provide good education along these lines. The effort should take into account major needs and desires, including actions that will improve happiness, well-being and lower consumption lifestyles; comfort and convenience at home and in the workplace; new livelihood possibilities; and provide possibilities of better health.<sup>46</sup> In schools, students should understand how a green transition will provide them a better future. For the whole society it is necessary to bolster mechanisms for providing solid information, and the means to be personally involved in building the "Chinese Dream" through their own consumption actions.

Scenarios of the future are sketchy on just how much we can expect from the innovations implemented during the coming decade. What can be said with a degree of certainty is that sustainable possibilities in later decades (2030 to 2050) will likely be of even greater significance, since many of the new technologies will be mature, and new ideas will be emerging constantly. However if the innovation opportunities now emerging to shape China's green production and consumption are lost through business as usual attitudes, fear of change, or for other reasons, the environmental consequences will affect future social and economic progress significantly.

## **5. Fully Incorporate Demographic, Cultural, Social and Public Participation Aspects into China's Ecological Civilization Action Plans**

Considerable attention has been given to environment-economy relationships in China, as in many other nations. While it is very necessary to continue refining ways to improve on this complex relationship, social aspects also require greater attention. In the longer-term, social-environmental linkages may be among the most significant. This is the case for NIMBY ('Not in My Back Yard'), management of nature reserves, ecological redlining, project social impact assessments, climate adaptation, environment and security, urban migration, and relationships of poverty reduction and the environment. Demographic changes such as aging population will influence environmental health impacts, and also the availability of rural people for ecological restoration efforts. Specific cultures bring forward their particular approaches to local resource management and stewardship. And, despite some improvements in recent times, full public participation in environmental decision-making is still lagging. This is

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<sup>46</sup> See Chinese and other examples in *The Oxford Handbook of Well-Being and Public Policy* (2016); and specific studies such as *Valuing Air Quality Using Happiness Data the Case of China*. Ecological Economics. July 2017.

a complex set of issues, of course. There are many social and cultural components that deserve greater immediate and prolonged attention.

Each of these components may be influenced by gender considerations, both positive and negative. For example, often families have been split, with one spouse migrating to the city for work while the other stays behind, often providing childcare. Disparities in education access will affect job potential. Rural water and soil pollution can be a significant concern, as is indoor air pollution. On the positive side, in the future, as rural service economies, including tourism, protection of ecological services, and preservation of traditional culture will offer new opportunities in villages and towns.

Gender-related aspects of climate change, whether through risk of natural disasters such as floods, droughts and landslides, or through climate adaptation possibilities require much more attention to define issues more carefully, and to provide environmentally safe conditions for all, including poor and elderly citizens.

Women and children have been differentially exposed to toxic situations in many smaller cities, towns and countryside situations through poor pollution control around local industries and mines. Fortunately it appears that progress is being made on removing some of these situations, for example by stopping the import of e-wastes, and closing down egregious examples of mining and industrial pollution. However many of the problems remain at serious levels. And there also are circumstances where males have faced particular risks, for example in small-scale coal mining, and rare earth mining and smelting.

Some of China's minority groups are located in areas rich in biodiversity, with a large portion of lands now designated for restricted use by ecological redlining, nature reserves or other conservation measures. In addition, culture and gender differences in perception about resource use and environmental protection may require specific arrangements including co-management. The protection and enhancement of ecological services may be an excellent way to ensure that no one is left out in the effort to eliminate poverty in these and other regions.

The intersection of eco-environmental protection with improved health, education, and access to rural and urban opportunities has many relatively unexplored possibilities. Over time, and with balanced economic and social reform, new sustainable livelihoods and improved living conditions will be created. Four components require improvement.

First is greater attention to environmental health. Globally there is a growing realization of the role environmental pollution and other environmental concerns play in premature mortality. Much of the attention is focused on emerging economies, and cover both indoor and outdoor pollution. The War on Pollution in future phases should give greater attention to identifying and acting on environmental health issues related to air, water and soil pollution sources. In the public eye issues related to food safety are often considered as environmental concerns. Environmental risk assessments need to be made part of standard procedures for both workplace safety and for encouraging green transitions in many industrial processes. Also, transparency in environmental knowledge sharing can be used as a tool for avoiding local overreaction to some environmental incidents and planning decisions regarding industrial and infrastructure siting.

Second is the need to give greater attention to long-term livelihoods for ecological construction (and reconstruction), especially for people in more remote parts of the countryside, and for restoration of damaged lands and waterways. While there have been excellent efforts, for example in restoring China's forest areas, the permanent nature of such employment needs to be guaranteed. Many such jobs might be filled by laid off coal or other miners, farmers, etc. The implication is for a strengthened eco-compensation approach, and for new types of positions. The *River Chiefs* program is one enlightened initiative. However, there are other possibilities. For example, a corps capable of addressing the many issues of contaminated soils. Also for accelerating the pace to turn areas of desertification into productive lands and scaling up development of dedicated forest and grassland carbon sinks.

Third is to build Ecological Civilization co-management systems to improve ecological and other services in nature reserves, parks, ecological redline areas, and in other public lands that sometimes are considered to be of low value at present. Zone 4 and 5 rivers and some contaminated lakes and coastal areas are important candidates for this type of management. Initiatives, when located in Autonomous Regions populated by minority cultures, should draw upon the skills and knowledge of local people who might be best placed, along with local governments, to co-manage ecologically sensitive areas. The possibility of creating an Ecological Conservation Corps might be considered either at national and local levels.

Fourth is to provide many more opportunities for public participation in assessment of projects, for wildlife conservation and for voluntary efforts to improve ecological services in the countryside and cities, etc. As Chinese green transitions take hold, such approaches will be valuable in both urban and rural settings. There will be innumerable opportunities for local service, whether to monitor environmental and maintain good conditions, safeguard local ecological redline spaces, or to participate in local environmental planning, etc. The need for local environmental and conservation organizations will increase, and, as landscapes are turned from brown to green, they will become richer in biodiversity and will become magnets for recreation, requiring trail-maintenance and many other initiatives suited to public responsibility.

There should be Ecological Civilization public action plans and initiatives put in place throughout the country. They need to be backstopped by technical skills and some funding, and involve both female and male rural and urban citizens of China. As income levels rise, the greater the need for public participation so that the development of Ecological Civilization genuinely builds people's well-being. Undoubtedly there will be tensions during this journey. It is important to fully protect citizens who chose to be whistle-blowers against illegal activities, and to give them full access to the court system.

## **6. Build a New National Strategy for Green Development of China's Blue Economy**

The perilous situation of the world's oceans is receiving more attention as fish stocks continued their decline in many part of the world, as coral reef die-off becomes a major issue, along with the loss of coastal wetlands and other sensitive marine habitats, and as ocean acidification, new estimates of rapid loss of polar ice, global sea level rise, plastics in the ocean, shipping and port pollution, etc., demonstrate a need for

sustainable ocean use. This is all taking place at a time when more national wealth generation is expected from the Blue Economy—whether in China and other countries, other regions or globally. By some estimates the desired future economic development of oceans should rise to 20% of global GDP. However at present levels of ocean ecosystem degradation and unsustainable resource use, additional economic burdens might well lead to devastating local and regional tipping points, or other worse situations from climate change impacts.

For its own ocean space, China has strong vested interests in clean ocean conditions, sustainable biological resources, and stable conditions that will permit recreational and tourism uses, energy development in coastal and offshore areas (including the first offshore nuclear power plant and the possibilities of frozen methane exploitation from areas such as the South China Sea), and coastal infrastructure and cities. With climate change impacts looming, ocean conditions may dramatically worsen.

China depends greatly on access to the world's oceans, including those in polar and tropical regions, where shipping access, port development, and distant water fishing are important. China also now looks to the deep ocean for both scientific reasons and for economic and security reasons. The deep oceans are a source of great genetic biodiversity since the organisms (large and small) live under very stressed conditions. China is expected to become a leader in deep-sea mining, with an interest in a number of minerals including cobalt, which have a role in the anticipated rush towards widespread use of green technologies such as lithium batteries. Some deep-sea mining for copper and other minerals is set to start in 2019 using a Chinese constructed vessel. The International Seabed Mining Authority has issued several licenses to China for such activities.

China also is taking a leading role in compiling scientific information on all the world's ocean space, from the Arctic/Antarctic waters to the tropical zones. Its newest supercomputers are among the most powerful in the world, capable of absorbing remotely transmitted real time information at a scale almost beyond belief. Some of the analysis resulting from this capacity will be very important to understanding the ocean's role in climate change. Also for monitoring China's own offshore interests, such as activities of its international fishing fleets, found throughout the world.

Governance of ocean use is complex, involving a number of international agreements and agencies, in addition to the overarching framework provided by the 1982 Law of the Sea. Environmental and sustainable development matters are not fully covered by the existing agreements. For example, the difficult matter of ocean contamination by the large volume of macro- and micro-plastics material is not covered well. Plastics are mainly from land-based sources, and China is also one of the key stakeholders regarding this problem.

China has a Blue Economy strategy laid out in the 13<sup>th</sup> FYP. The strategy is likely to become a long-term plan with goals that will substantially increase in terms of anticipated growth in the ocean contribution to GDP, currently about 10% of the total. In recent times more attention is being paid to environmental matters, not only within China's ocean space, but also in global terms, for example by COSCO, the major shipping company.

Much more needs to be done by China and by other countries to make ocean use sustainable. A major UN meeting was held in July 2017 to examine ways to meet national and global goals for Chapter 14 of the SDG2030 goals (*Life Under Water* including oceans.) The meeting underlined the urgency of substantially enhancing sustainability actions.

For China there is a need to create a new strategy that will more clearly provide for green development of its Blue Economy. This strategy will need to focus attention not only to uses within China's own ocean space, including its EEZ, but also for those uses that extend into international waters, and areas where there are agreements with other countries. Full implementation of this strategy is likely to be a decade-long endeavour, especially since many new technologies may be covered. China can play an important role in the modernization of global ocean governance, since its own Blue Economy is indeed global in scope.

### **7. Let China's Green Development Approach, the UN SDG2030 Goals, the Paris Climate Agreement, and Ecological Civilization Serve as Central Features in the Belt and Road Initiative (BRI) and in China's South-South Cooperation**

China has signaled to the world that it will share its wealth of development experience and expand its efforts to create new and sustainable patterns of development throughout the developing world, and specifically within the broad swath of countries forming the BRI regions. There has been a significant increase in South-South Cooperation through funds set up to address Climate Change (RMB 20 billion), and for development in fields such as agriculture, health and education (initially USD 2 billion). Other funding will come from longstanding Chinese lending institutions such as the very large China Development Bank and the Import-Export Bank of China. There are good indications and recent action to suggest that all of these sources will strive to incorporate environment and development principles and action in their grants and loans. Also, the August 2016 Green Finance Mechanism guidance document signed by seven Chinese agencies, provides solid directions both domestically and internationally.

Much of the effort undertaken by China over the coming two decades will address important infrastructure needs in Asian, African and some other parts of the world. China is well equipped to deal with the supply side of BRI, but it is not as clear how well the demand side of the partner countries will be articulated or understood. Environmental impacts will be significant; however there are opportunities for environmental improvements as well. Development needs are urgent in most of the areas where China is concentrating its effort. Certainly China's capabilities to build well and quickly can be put to good use. However action should not be at the expense of sustainability, and good environmental practices. This point is well understood, by Chinese leaders. There are, however, various instances where there have been difficult situations often at local levels.

At present there is not a comprehensive or over-arching policy approach on how to address the social, ecological and environmental aspects of BRI, China's South-South Cooperation, and other international development activities. There is not a concerted effort to make these activities an integral part of China's Ecological Civilization and the country's green development strategy. It should not be very difficult to take such an approach. The advantages of doing so would include: the greater certainty of achieving

SDG2030 and climate change goals of partner countries; satisfying China's goal of spreading understanding and acceptance of Ecological Civilization regionally and globally; and building international confidence that China indeed will be able to address environmental impacts and other concerns associated with its projects abroad.

China has the opportunity to help on climate change, green urbanization, biodiversity conservation, desertification, sustainable agriculture, and on meeting critical infrastructure needs. Generally China seeks to do so in a fashion that also enhances trade and long-term investment opportunities. Thus this issue blends directly into the next one.

## **8. Develop an Ecological Civilization Approach to China's Investment and Trade (Inbound and Outbound)**

While sustainable development and environmental protection have been fundamental goals of the World Trade Organization (WTO) since its inception, progress on overall WTO implementation has been slow. Doha Round WTO negotiations started in 2001 are still not completed. As recently as 2015 some DOHA negotiations continued in Nairobi. The main objective of the DOHA negotiations was to improve opportunities for developing nations to access markets abroad. A signed agreement would have benefitted both poor and rich countries. Environmental goods and services were intended to be part of the overall package since these would improve the availability of these global goods.

According to the WTO, three areas were proposed in the initial DOHA negotiations on environment: the relationship between WTO rules and those within multilateral environmental agreements (MEAs); improved collaboration between WTO and MEA secretariats; and the elimination of tariffs and non-tariff barriers on environmental goods and services. Despite negotiations on these points up to 2014, and with considerable interest and will to find common ground, there is still no final consensus. Environmental goods negotiations (which included China) started in 2014 and continued at sessions in 2015 and December 2016. The areas identified for yet more discussion have included generating clean and renewable energy; improving energy and resource efficiency; reducing air, water and soil pollution; managing solid and hazardous waste; noise abatement; and monitoring environmental quality.

Failure to complete the DOHA Round has left unresolved important points such as the role of subsidies on goods such as solar panels, wind turbines and other green technologies, and international access for environmental companies. China brought a complaint to the WTO in 2012 that countervailing import duties imposed by the USA on Chinese solar panels were not proper under relevant WTO rules and agreements. The USA actions were based on concern over subsidies. The WTO Panel ruled in favour of China, but the case has dragged on, with final resolution expected by the end of 2017. Other cases have come forward either through the WTO mechanism and other channels.<sup>47</sup>

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<sup>47</sup> See Joanna Lewis. *The Rise of Renewable Energy Protectionism: Emerging Trade Conflicts and Implications for Low Carbon Development*. Global Environmental Politics. 14(4) November 2014.

From about 2005, greater emphasis began to be placed on regional trade agreements (RTAs) and various other plurilateral and bilateral efforts to open trade and investment opportunities. According to OECD monitoring, some 260 RTAs were in place globally by 2013. However the attention given to environmental matters varies greatly. A number of the richer countries apparently are more likely to have environmental considerations built in, according to the OECD. China did not press for inclusion of environmental matters in early agreements, although that situation appears to be changing in recent years. China has more than three-dozen free trade agreements (mostly bilateral) either signed, in negotiation, or under consideration. IISD has produced several important documents on greening China's trade and investment strategy and policies, notably a 2010 document *Elements of a Sustainable Trade Strategy for China*<sup>48</sup> produced in cooperation with the Development Research Center of the State Council.

Green investment banks, green bonds and other ways to complement public investment on environment and development still form only a small portion of the overall international investment flow. To meet the substantial financial needs of the SDG2030 goals, plus investments for climate change initiatives will require much more money than has ever been invested in the past on environmental matters. China is already taking a leading role, especially on green bonds. This experience is already proving useful for the pioneering approaches China is taking on green energy and other sustainable development initiatives through the BRI, AIIB and other investment channels.

For the future, it would be helpful to have improved protocols for both investment and trade that would be more universally applicable and standardized for bilateral, plurilateral, and multilateral agreements. To have such protocols in place would reduce the constant threat of imposed duties and other trade barriers and disputes that may hinder easy access to green technologies, and accelerate the pace of change to renewable energy sources, improved water and sewage, etc. It would also reduce the potential for problems such as the creation of havens for toxic wastes or other types of undesirable international transfers. China could play a very useful role since it is one of the countries currently playing a leading role in setting up new trade and investment agreements with other nations, and within the international community.

## **9. Strengthen Governance for Green Development and Ecological Civilization: How to Recognize Interlinkages among Issues in order to Build a Comprehensive Eco-reform Process**

Internationally and nationally it is apparent that solutions may founder if there is insufficient understanding of interlinkages, or a lack of comprehensive policy processes. This has been a persistent problem within China where there are complex but often incomplete or inadequate governance arrangements. Environment and development is particularly difficult since impacts generally cross sectors, and various environment and development impacts express themselves over different time frames. Also spatial differences are very important. Poor families living near contaminated sites, or exposed to flooding may have very different risk factors than the economically better-off living

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<sup>48</sup> <http://www.iisd.org/library/elements-sustainable-trade-strategy-china>

in other areas of a city. While most of these observations may be well understood, finding adequate solutions has been difficult.

The latest effort has been to set out more flexible mechanisms to address problems. For example, environment has found a good place at the table of the *Leading Group for Financial and Economic Affairs*. The Yangtze River Economic Belt is a mechanism that broadly addresses a range of concerns within the nation's most significant river basin, including, at the moment, the need to give the whole system a reprieve and rethinking regarding new large-scale developments. In essence, Nature needs a rest and recovery time for this river basin that generates about 40% of China's GDP.<sup>49</sup> Such top-level governance approaches require strong and dedicated leadership.

The *five in one* approach that has accompanied the rise of Ecological Civilization links environment, economy, social, cultural and political elements into integrated approaches. It has been helpful in various ways, for example bringing together various elements of the financial sector to build a common set of guidelines for banks, insurance, stock market, environmental trading, and other lending mechanisms. This guidance will be helpful in attracting necessary financial support for the massive funding needs to address environmental and climate change needs from the private sector. And it will help to improve the quality of initiatives carried out within China and other countries where China is involved. China already has the largest green bond market in the world.

The fragmentation of decision-making remains a serious problem. There is no equivalent in China of the US Department of the Interior, which has broad authority over all uses of public lands. The long-standing problems of disconnect in authority of national bodies such as the Ministry of Environmental Protection over their local counterparts is being solved. Yet differences in strengths and capacity of the various sectoral ministries remain as serious concerns.

It is possible that sectors will become more cooperative on matters such as water resource use, or in energy reform, green urbanization, etc., as a consequence of quite rigorous performance assessments and inspections that now require local officials to meet environmental goals—with severe consequences to those who fail to do so.

For the future much work remains on the best Chinese solutions to the integration problem that is inherent in environment and development domestically not only in China but also in most other countries. The same types of concern plague international problem-solving as well. And to the extent that these problems occur elsewhere but inhibit China from meeting its own objectives, there is ample reason for China to press for international reform. The effort to achieve SDG2030 goals is a prime approach for stimulating reforms, as are important elements related to Climate Change.

## **10. Setting Long-term Pathways and Targets for 2050-2100 for China's Ecological Civilization with a National 'Zero Carbon Economy' and for 'Living within Planetary Boundaries'**

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<sup>49</sup> The decision is from Xi Jinping in a January 2016 Symposium to discuss the future of major economic projects in the Yangtze Economic Belt Region. President Xi indicated *The Yangtze River has a unique ecological system. It is an important ecological treasure.*

Definitive steps now and in the coming three decades are needed to reach initial goals for an Ecological Civilization in China and in the world. However clearly not all problems can be solved over this time frame. Maintaining biodiversity, managing climate change mitigation and adaptation will continue to be matters of great difficulty, and enhancing ecological services on land, freshwaters and the ocean will be central to our own species existence. Despite best efforts, environment and security concerns may be significant, whether from conflicts related to mass migrations, nuclear war damage, or the consequences of worsening water or food security problems. A world divided into the very poor and the very rich will have dire consequences for civilization.

Globally, the deep-seated need for adaptive planning and management is evident enough, but too rarely applied well. There is still a tendency for decision-making to be reactive at both the national and international level. Fortunately China has followed an approach that is highly rational with both short-term (5 year) and longer-term (15 to 30 year) time perspectives. Efforts beyond this time frame will continue to rely heavily on scenarios and other methods to look into the future.

The knowledge required to understand very long-term pathways and targets to sustainability, and the necessary steps for green development is emerging, much of it experiential, and from countries like China. But for big shifts such as the aspirational goals of Zero Carbon Economy in the G7 and elsewhere, and living within the Nine Planetary Boundaries much more thought and modeling is required. Ecological Civilization, by its very definition has to be long-term. Civilizations are not created overnight. Or even in a few centuries. It is not too soon to be creating a longer-term, serious dialogue about the post-2050 world and this particular country's place in it. After all, China is a nation with a history of more than 5000 years of civilization.

## **Conclusion**

This year's Issues Paper is special, for its longer-term time frame perspective, and for its outlook concerning China's turning outwards regarding its place on the world, even as it refines a unique pathway for comprehensively solving its domestic environment and development issues. There is a high degree of confidence on the part of the CPC that 2020, 2035, and 2050 goals can be met. It is encouraging that China continues to invest politically and financially in addressing domestic environment and development challenges and opportunities.

The War on Pollution is likely to have positive outcomes during the coming half decade, even if it takes decades more to fully meet environmental quality needs. The commitment to green development is unprecedented in scale and future opportunity. What is particularly significant is how programs can be tailored to fit varying circumstances within the country. China appears to be setting out principles and operating procedures for environmental protection, eco-compensation and green finance, but with the flexibility needed to adapt to local circumstances and needs. Ecological Civilization demonstration zones such as those in Jiangxi and Guizhou Provinces are good examples. The roll out of pilot initiatives on carbon trading is providing the experience for careful design of a national program—one of the most globally significant such efforts.

Globally, always hanging over the future are grim longer-term scenarios, such as a Fortress World with closed borders and enclaves of wealth and poverty, the prospect of out of control global warming, and of drastic decline in ecological services. If China can contribute substantially to making global governance more effective in tackling poverty, ecological and environmental matters, especially climate change, biodiversity and ecological services, and the need for clean technologies, the world is likely to recognize Ecological Civilization as a very significant contribution to a sustainable future for the 21<sup>st</sup> Century and beyond.

The Belt and Road Initiative is remarkable in scale, and for its potential to define improvements on how infrastructure might be used to improve environmental conditions, whether for industrial operations, transportation or other aspects of urban and rural development. The potential danger is that, while supply side organization is strong and can be fast-moving the same cannot be said always for the demand side. Thus China's impacts on environment and development in BRI partner countries need to be fully understood and acted upon. This is recognized, but much of the actual effort remains to be done, for example in the Greater Mekong region and elsewhere, such as in parts of Africa. Similarly, as China's ocean economy expands, its contributions to global ocean sustainable development and governance will be critically examined.

Overall, the SDG2030 objectives, whether applied within China's own borders, or elsewhere, can be a good compass to guide Chinese initiatives and approach. These objectives call for integrated development approaches, full societal participation especially on matters of gender, youth, minority groups; and major improvements in green finance and removal of unsustainable subsidies, rule of law, and cooperation among sectors—including government, civil society institutions, communities, and business. New models of sustainable development governance must be developed, as an urgent means to accelerate progress.

One of China's great advantages is the central government's commitment to eco-environmental improvement. By placing this subject matter directly into the Deepening Reform process and mechanisms, there can be no doubt that it is in the mainstream of decision-making. There is recognition that it is impossible to have full success in meeting economic and social goals unless there are concurrent environmental gains. The New Era desired by China between now and 2050 therefore will have to be a Green Era.

CCICED has from its 1992 start taken an approach that emphasizes partnerships, openness of information sharing, and a view that no one nation on its own can fully address the complex issues posed by sustainable development. China has little choice to do otherwise. **The hope is that China, in its path to economic prosperity, social harmony, and environmental sustainability, will indeed become a green beacon for the world community.**