China Council for International Cooperation on Environment and Development (CCICED)

Institutional Innovation for Environmental Protection in the Context of Ecological Civilization

CCICED Task Force Report

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Glossary of Key Concepts

In order to help readers understand this report, key words are defined below:

National environmental governance system refers to the overall body of national and local environmental laws and regulations, environmental management entities and policies and operational measures. It provides the basis for action, defines enabling systems and establishes the modes of environmental governance.

Internationally, the term 'governance' addresses all the processes used to set and achieve goals and includes roles played by government, industry and society. Environmental governance is defined to include the cooperation among these multiple stakeholders, in environmental management. Institutions provide the foundation for close cooperation among stakeholders and effective environmental management and influence overall governance capacity.

National environmental governance is discussed in this report in the context of ecological civilization and as a theoretical basis for understanding required system innovations. This report focuses primarily on recommendations for reforms related to pollution prevention and control and ecological environmental protection including social governance related matters.

Environmental protection institutions (or measures) refer to the laws, policies and regulations found in the national environmental governance system, including pollution control, environmental quality management, biodiversity and ecological system conservation, and the preservation and development of various natural resources (water, land, forest, grassland, wetland and mineral resources).

Ecological and environmental protection management systems refer to the administrative arrangements supporting environmental governance, including the structure of various entities and the allocation of governmental responsibilities for environmental protection among agencies and levels of government.

Environmental management in this report refers to the management activities (including law enforcement) of environmental protection departments at both the central and local government levels.

Key Words: Ecological Civilization, Environmental Protection, Institutions, Innovation, Reform

Summary of Key Findings

- **Serious environmental problems expose gaps in environmental governance.**

The 18th National Congress of the Chinese People's Congress (CPC) identified that increasing resource constraints, severe pollution and a deteriorating ecosystem make it critical that China establish an ecological civilization awareness that respects, accommodates and protects nature and the need for comprehensive institutional reform. While there have been some promising improvements, the current institutional arrangements are not sufficient to achieve the ambitious environmental targets and integrated reforms that are being announced by the Premier as part of the 'war on pollution' and maintain a commitment to economic growth that is balanced, coordinated and harmonized with environmental and cultural considerations.

Governance at both the national and local levels in China is deeply influenced by a traditional management model and the planned economy. Decision makers often are very powerful and fail to strictly enforce the implementation of environmental laws. Enterprises pursue economic benefits, sometimes lack social responsibility, and often ignore environmental laws and regulations resulting in damage to the environment. Civil society has little consciousness of its environmental rights and has limited capacity to participate in environmental governance or pursue legal redress.

Change to the environmental governance system needs to focus on both institutional and capacity related issues. Modernization of the national environmental governance system and strengthening of governance capacity require continuous improvements and streamlining of institutional arrangements, management systems and operational mechanisms and reallocation of responsibilities and resources to better align with the objectives of ecological civilization and respond to changes in policies and priorities. Government needs to lead and also model the desired changes. The communist party and governments at all levels should set examples, complying with the environmental laws in their own operations and enforcing them. This is crucial for the environmental improvements necessary to achieve ecological civilization.

- **Problems in the existing environmental protection institutions:**

(i) The environment was sacrificed in efforts to achieve high-speed economic development resulting in high environmental costs; (ii) environmental protection departments have lacked influence, capacity, resources and authority and have been hindered by local governments that have prioritized and been rewarded for the pursuit of GDP growth; central government lacks the mechanisms to effectively supervise local governments on environmental protection; the allocation of environmental management functions among various departments is dispersed, overlapping, uncoordinated and in some cases inappropriate and the departments often fail to fulfill their environmental protection functions without real consequences; (iii) environmental performance evaluations of party and government leaders has not been given adequate attention; some environmental regulations are poorly designed and difficult and costly to enforce; penalties for violations are too low; local environmental departments lack mechanisms for enforcement, supporting effective public participation and protecting environmental rights, and supervision of governmental and enterprise compliance.

- **The modernization of environmental governance requires a redefinition of key relationships, roles and accountabilities. Priority areas are:**

(i) Relationships between government, market and society; (ii) relationships between regulatory/supervisory and economic/resource use departments; and, (iii) roles and responsibilities of central and local governments. Reform should give priority to the following: establishment of institutional measures to ensure that environmental considerations are incorporated in strategic decision making; ensuring compliance with environmental laws; strengthening the oversight and supervision of economic/resource use departments based upon a more powerful and authoritative environmental ministry and environmental departments; clarifying the environmental responsibility of central and local governments, especially economic departments; adopting subsidiarity based approaches that are guided and supervised by the national government but consider regional variations and promote innovative solutions; establishing accountability mechanisms that include environmental quality as a key performance measure; improving inter-jurisdictional coordination and mechanisms for the central government's supervision and regulation of local governmental behavior; strengthening the independence, compliance monitoring and effectiveness of ecological environmental supervision; and creating the appropriate pre-conditions and incentives to improve environmental performance of enterprises and active engagement of third parties in environmental improvement initiatives.

- **Reform requires strategic transformations, including adjustments to and changes in environmental management objectives, methods and priorities.**

Significant reform in the environment started under the 12th Five Year Plan. During the 13th Five Year Plan, environmental management activities should focus on environmental quality improvements. This will require a rebalancing of priorities and mechanisms to maximize environmental, economic and social outcomes in all key policy matters and resolve disputes between government entities. It needs to be guided by strong research and science that can provide options to more effectively link land and resource use activities to carrying capacity. It needs to create the necessary mechanisms to facilitate the active engagement of enterprises and the community in environmental improvement and move beyond the strong reliance on command and control measures. It needs to be supported with high quality, timely, respected and integrated data to monitor and publicly progress and help build and maintain consensus. To further enhance transformative changes, a strengthening of theoretical policy research, the establishment of an economic system that supports environmental quality improvements, and the promotion of institutional innovations in environmental management should be further progressed.

- **Social governance is the weakest link and needs to be strengthened.**

International experience has demonstrated the potential benefits of increasing public participation and engagement in environmental policy, planning and implementation in building awareness, consensus and public confidence and improving environmental performance. Institutional measures are needed to establish a multi-stakeholder joint governance system for environmental protection, which fosters multiple stakeholder participation and multiple governance methods and channels.

- **The general direction of environmental management institutional reform.**

The new environmental law is a key institutional innovation. Government at all levels must lead by example in complying with environmental laws, and must make urgent institutional changes to ensure that government entities and decision-making processes reflect and actively promote the objectives of an ecological civilization. Successful further reform will be dependent on raising the strategic position of ecological civilization through a range of institutional measures and incorporating ecological civilization into all aspects of economics, politics, culture and society. Institutional changes will certainly face some opposition and take time. Reform efforts need to be focused on areas of greatest risk, public concern and potential gains and be guided by the comprehensive gap-analysis of existing arrangements undertaken by this task force.

The general direction of environmental management institutional reform should be to: follow the rule of law and set clear laws and prescriptions to protect the environment; encourage and mobilize all stakeholders to engage in environmental protection in order to form a multi-stakeholder governance system involving the government, the market and society; and increasingly use an environmental management approach under which the ‘State provides macro guidance and supervision, while localities focus on independent innovation.’

Summary of Main Policy Recommendations

Recommendation 1:

Mobilize governmental, social and economic resources and forces to build an ecological civilization. Clearly define responsibilities, establish coordination mechanisms and policies, develop integrated goals, and form synergies. According to the requirements of the 18th National Congress of the Communist Party of China (CPC), ecological civilization is not the task of a single environmental protection department. All State Council departments must act together to incorporate ecological civilization into all activities promoting economic, political, cultural and social progress. Priority actions are as follows:

(i) The State Council should develop plans which clarify the ecological civilization responsibilities and functions of all governmental departments (especially central government and economic departments). This should mandate the consideration of environmental factors. Local government should be required to make improvements to the quality of the environment. Third party independent evaluation of the performance of ministries under the State Council and local governments should be organized periodically, and the results should be publicly disclosed.

(ii) A State Council Environmental Protection Committee (or State Council Sustainable Development Committee), with a relevant State Council leader acting as chairman, should be established. The Committee should be responsible for coordinating the environmental management activities of various departments, coordinating regional and river-basin ecological protection and pollution prevention and control, and incentivizing and penalizing ministries under the State Council and local governments according to their environmental performance.

(iii) Pollution prevention and control functions and ecological protection functions which are currently scattered across departments should be integrated into a more unified structure that provides independent supervision and enhanced enforcement power.

Recommendation 2:

Establish incentive mechanisms to promote environmental protection. Move beyond the reliance on command and control mechanisms and adopt a balanced use of 'carrots and sticks' including the following:

(i) National fiscal, taxation, pricing and financial policies that encourage environmental protection should be expeditiously implemented. This needs to be reflected in general revenue and transfer payments. The central government should take the leading role in ensuring that the growth rate of the central fiscal budget for environmental protection is not lower than the growth rate in revenue. Special environmental pollution remediation funds should be set up (e.g., a soil contamination remediation fund) to raise funds for pollution control. For the construction and operation of environmental infrastructure, models of public-private partnerships (PPP) should be used to leverage social capital

and technology, make full use of market mechanisms, reduce the cost of investment and improve operational performance.

(ii) Establish an enterprise environmental credit evaluation system to reward enterprises that comply with environmental protection laws. Strengthen the capability of small and medium sized enterprises (SMEs), through provision of a platform with information about pollution treatment services.

(iii) Actively promote industries and enterprises' voluntary pursuit of good environmental performance, through programs like those found internationally—the Green Supply Program and the Top Runner Program.

(iv) Strongly adhere to the principles of 'he who pollutes pays, he who damages compensates, he who protects benefits,' speed up the promotion of and improvements in the eco-compensation system, and mobilize the enthusiasm of local governments for protecting the environment, especially in areas experiencing fiscal difficulties.

Recommendation 3:

Strengthen social governance of environmental protection and develop a multi-stakeholder governance model. A multi-stakeholder governance model led by government is fundamental to solving environmental problems in China. Priority should be given to the following:

(i) Developing and implementing systems for public participation, information disclosure and environmental litigation as required by the new Environmental Protection Law. Implement open and transparent environmental information reporting and disclosure of pollution discharges, pollution treatment and potential environmental risks and ensure effective enforcement.

(ii) Encourage environmental protection social organizations to play a role and create a social environment and the legal conditions to facilitate their development.

(iii) Encourage grassroots organizations to focus on environmental management issues, embrace the public's environmental demands, develop community by-laws for environmental protection, and advocate green lifestyles.

Recommendation 4:

Match environmental protection departments' authority, capacity, and resources to their supervision and management functions and tasks. Strengthening supervisory authority and enforcement capacity of environmental departments is one of the main priorities of environmental institutional innovation. Priorities should focus on the implementation of the new environmental law as following:

(i) The State Council should formulate relevant administrative rules and regulations specifying the responsibilities, authorities and work procedures of environmental protection departments to supervise the environmental management activities of other departments at corresponding and lower levels of government.

(ii) Establish a unified environmental information platform to achieve timely and accurate data sharing. Set up a national environmental quality monitoring network under the management of the Ministry of Environmental Protection.

(iii) Increase fiscal investments in environmental scientific research, monitoring and information gathering, and supervision and enforcement capacities. Encourage provision of environmental services through market mechanisms.

(iv) Increase the overall number and capability of civil servants in environmental protection departments to match their workload and statutory responsibilities. Expedite work to prescribe the duties of environmental law enforcement staff supported by appropriate training.

Recommendation 5:

Integrate environmental management institutions to improve efficiency and effectiveness. The existing institutional arrangements need to be modified to reduce uncertainties, delays, communication and access difficulties surrounding key data. Regulatory measures need to be better integrated to facilitate implementation, monitoring and compliance improvements. There is a need to strengthen the scientific basis of decisions and develop integrated information systems across government agencies. Enforcement efficiency needs to be strengthened by better integrating implementation mechanisms and revising environmental protection laws and policies based on the most recent developments in scientific research and in response to environmental management needs. Several policies should be considered:

(i) Study and develop a comprehensive total emission control system for primary pollutants and CO_2 emissions from the consumption of fossil fuels. Explore and implement regional, river-basin and sectoral total emission control systems that are based on each region's environmental carrying capacity.

(ii) Develop relevant laws, regulations and implementation methods for an emission permit system that covers all pollution discharging entities. Reform the environmental impact assessment (EIA) system to achieve more effective integration with the pollution permitting system. Apply the EIA system on strategies, plans and policies, as well as cross-regional and river basin projects that may have significant ecological impacts.

(iii) Improve environment and health related institutions, the environmental public interest litigation system and the ecological environment damage compensation and accountability systems. Strengthen investigative efforts and penalties for environmental matters involving criminal liability to ensure sanctions reflect the seriousness of the offense.

Recommendation 6:

Recommendations for further CCICED studies:

(i) Study on promoting the environmental governance system and strengthening governance capacity, especially social governance;

(ii) Study on third party evaluation of the environmental performance of government, and the institutions of environmental credit rating of enterprises;

(iii) Study on top-level design and construction of environmental protection institutions;

(iv) Study on incentive policies and mechanisms to promote environmental protection;

(v) Study evaluating the reform and implementation of the pollution control institutions;

(vi) Study on the Aarhus Convention and international experiences on public participation of environmental protection and multi-stakeholder governance.

Background and Approach of the Project

The 18th CPC National Congress established ecological civilization as one of the five pillars of socialist modernization and called for integration of its core principles into the economy, politics, culture and society. The 'Decision on Some Major Issues Concerning Comprehensively Deepening the Reform' (hereinafter referred to as the 'Decision'), stated that the overall goal of deepened, comprehensive reform is 'to improve and develop socialism with Chinese characteristics and to promote the modernization of the national governance system and capacity.' In the area of ecological civilization, the Decision points out: 'We must establish a complete and integrated ecological civilization institutional system...and use rules to protect the environment.' These provisions are of great importance for improving the national environmental governance system and promoting environmental governance capacity.

For over 30 years since China's reform and opening up and rapid industrialization, resource and environmental problems have become increasingly prominent. The seriousness of environmental pollution has caused strong reactions from the public; society is united in calling for improving environment quality. There are many flaws and gaps in the current environmental governance system and relevant institutional structures. They are not able to deal effectively with the new environmental pollution control and ecological and environmental protection challenges.

In 2014, the CCICED established a Task Force with both Chinese and international members to conduct a study on 'Institutional Innovation for Environmental Protection in the Context of Ecological Civilization'. The Task Force analyzed existing research on environmental protection institutional reform and conducted field visits to both eastern and western China to solicit feedback from local environmental authorities and enterprises. The Task Force conducted a study tour to Europe to study European experiences in environmental institutional reform. Meetings were held with governmental and non-governmental environmental organizations and experts in the European Union. The Task Force also established a Chinese expert advisory group which provided comments during the report's preparation.

The Task Force identified the prerequisites of ecological civilization and undertook a comprehensive analysis of the existing environmental governance system, the institutional structures that currently support it and the nature of the current environmental problems being experienced in China. They compared institutional structures with best practices both domestically and internationally having regard for China's key needs and culture. Drawing on both domestic and international experiences and lessons, some specific recommendations related to the modernization of China's environmental governance system and the reform and innovation of its environmental protection institutions are made. Chinese and international case studies provide practical guidance relevant to the transformation of China's environmental governance system, improving governance capacity, and developing an over-arching and strategic design for environmental management.

The Task Force aims to provide recommendations on: (1) promoting the reform of the national environmental governance system and enhancing national environmental governance capacity; (2) institutional and management regime innovation for environmental protection, which is necessary for a real improvement in environmental

quality; (3) a top-level design for the strategic transformation of the environmental management system.

The Task Force research included six subtopic reports: (1) Theoretical Framework and Modernization of the Environmental Governance System; (2) Improving Social Governance Capacity for Environmental Protection; (3) Reform of the Ecological Environmental Protection Management System; (4) General Thoughts for Institutional Innovation for Environmental Protection; (5) Transformation of Environmental Management; (6) International Experiences and Cases.

Key International Lessons Regarding Institutional Innovation

(i) Science driven policy making that drives a strong environmental governance system that is flexible, dynamic, evidence driven and outcome oriented is best placed to deal with the problems that more traditional systems have not been able to address.

(ii) Data availability and transparency are key elements of effective environmental governance. Data needs to be reliable, accessible and ideally in an integrated form to properly assess problems and monitor progress, effectively monitor and enforce compliance, drive innovation and assist in promoting social governance by empowering society to become involved in social supervision

(iii) Nationally systemized methods and standards for environmental performance assessments and independent arbitration bodies help to fairly ensure the interests, authority and objectives of each implementing entity. An example is the U.S. Toxic Release Inventory identified as one of the single most important changes to clean up toxic pollutants.

(iv) Monitoring, assessing, and evaluating policy implementation and progress and adjusting institutional measures where appropriate are central to continuous performance improvements. These mechanisms have been critical in achieving Germany's ambitious energy reforms through its *Energiewende*.

(v) Enhancing awareness of environmental protection needs enhances the potential for constructive public involvement. A central contribution of the U.S. National Environmental Protection Policy Act (NEPA) 1969 was its role in enhancing awareness of environmental protection throughout the federal government and ensuring that environmental values were taken into account in the decision making of agencies and departments This required federal agencies to prepare environmental impact assessments (EISs) for all 'major federal actions significantly affecting the quality of the human environment' bringing transparency and public engagement and analysis of environmental impacts and evaluations of alternatives for federal actions with large scale effects on land use, energy production, transportation and management of ecosystems and critical habitat.

(vi) Strengthening incentive structures has successfully changed behaviors as demonstrated in the Top Runner Program in Japan that has reduced energy use.

(vii) Policies and institutions for governing regional transport of pollutants are important to achieving improved environmental quality. Under the U.S Clean Air Act, the EPA successfully led air quality improvements that relied both on in-state emission reductions and regional scale controls for pollution transported across state boundaries. This involved regulations imposing emissions controls on nitrogen oxide, sulfur dioxide the main precursor to ozone and PM.

(viii) Policy coordination within federal systems is critical. Both Australia and the United States have successfully introduced statutory measures to address regional and catchment based environmental challenges through the Australian National Water Act, 2007 and the U.S Clean Air Cooperative federalism Framework.

Contents

1. ECOLOGICAL CIVILIZATION AND THE NATIONAL ENVIRONMENTAL GOVERNANCE SYSTEM: THE CONTEXT

1.1. Ecological Civilization and Implications for Environmental Protection

The 18th CPC National Congress established ecological civilization as one of the five pillars of socialist modernization together with the economy, politics, culture and society, stating: 'Promoting ecological civilization is a long-term task of vital importance to the people's wellbeing and China's future. Faced with increasing resource constraints, severe environmental pollution and a deteriorating ecosystem, we must establish an ecological civilization awareness that respects, accommodates and protects nature. We must give high priority to ecological civilization progress and incorporate it into all aspects and the whole process of advancing economic, political, cultural and social progress, to achieve the objective of building a beautiful China and sustainable development of the Chinese people.'

The objectives of ecological civilization are not only to realize modernization, attain the level of a moderately developed country and allow all people to enjoy a high quality material and cultural life, but also to build a beautiful China, achieve harmony between humans and nature, and secure sustainable development for the people.

The call for ecological civilization puts environmental protection into an increasingly important position and provides broad and strong support for environmental protection. Progress towards an ecological civilization is reliant on effectively addressing China's serious environmental problems and resource constraints and making economic development harmonious with environmental protection. The main tasks in the short-term must continue the focus on: optimizing national land development plans, conserving and efficiently using and recycling resources, strengthening ecological environmental protection and enhancing ecological civilization institution building.

The third plenary session of the 18th CPC National Congress laid out a strategic plan for advancing ecological civilization: 'In order to promote ecological civilization, we must establish a complete and integrated institutional system, implement the strictest resource protection, damage compensation and accountability system, and improve the environmental governance and ecological restoration system, and use institutions to protect the ecological systems and the environment.' This indicates that the most pressing task in ecological civilization is institutional improvement. Ecological civilization construction will effectively promote innovations in environmental protection institutions. Comprehensive and strictly implemented environmental laws and programs would not only help address severe environmental problems, but also safeguard the progress of ecological civilization.

The Standing Committee of the 12th National People's Congress adopted the amended 'Environmental Protection Law of the People's Republic of China' on April 24, 2014, the most important institutional innovation progress made to date in the area of environmental protection. It opens a new era for institutional innovation linked to concept of ecological civilization and the modernization of China's environmental governance system and capacity.

1.2. Environmental Problems Highlight Gaps in the National Environmental Governance System

Since the process of reform and opening up began, China has experienced rapid economic growth. In 2010, China's GDP exceeded Japan's for the first time, becoming the second largest in the world. Blemishing this impressive achievement are increasingly serious environmental problems: (1) Emissions remain high. Since 2005, China tops the world in the total discharge of many key pollutants, such as SO_2, and in the seriousness of water pollution (as measured by Chemical Oxygen Demand or COD). Pollutant discharges in many regions are beyond the carrying capacity of the local environment; (2) Environmental quality is not good. Only 3 of 74 cities that were monitored in 2013 achieved the new air quality standards (with a non-attainment rate of over 95.9%). Water quality in the 10 major river basins is generally categorized by light pollution, but 8.9% of 704 monitored river sections are worse than Class V national standards. 59.6% of monitored groundwater sampling point areas had poor or very poor water quality. 16.1% of soil quality monitoring points did not meet standards, and 19.4% farmlands are considered polluted. Heavy metals (such as Hg) and persistent organic pollutants are becoming serious environmental problems that are drawing high levels of public attention. (3) Social problems caused by environmental degradation are worsening. Major unexpected environmental accidents such as the pollution of the Songhua River are occurring. The frequency of environment-related mass protests (such as against the PX Project in Xiamen) is increasing. Environmental pollution damages people's health, has caused strong reactions from the public, and has significant impacts on social and economic wellbeing.

The severity of environmental conditions exposes flaws in China's environmental governance system. Environmental governance institutions are inadequate. The environmental management system is un-coordinated and insufficiently integrated and governance mechanisms are incomplete. There is lack of mutual support and there are not enough incentives and checks-and-balances among and between institutions, the management system and implementation mechanisms. This has resulted in an inability to address existing environmental challenges and to take preventative measures. Opportunities to capture co-benefits of an integrated pollution control approach are not being captured.

The current environmental governance system lacks the capacity to support sustainable development. The true environmental and social costs of growth are not adequately accounted for. Mechanisms to provide government leaders with the best available evidence to balance economic, environmental and social costs to maximize outcomes are often lacking. Modernization of the environmental governance system is urgently needed.

1.3. Promote the Modernization of the National Environmental Governance System and the Strengthening of Governance Capacity

The third plenary session of 18th CPC National Congress defined the overall goal of comprehensive reform in the short-term as improving and developing socialism with Chinese characteristics and promoting the modernization and strengthening the capacity of the national governance system.

1.3.1. National Environmental Governance System

The national environmental governance system incorporates the overall body of national environmental laws and regulations, environmental management systems, and operational mechanisms. It provides the basis for action, defines enabling systems and establishes the modes of environmental governance. It is an important component of the broader national governance system.

Environmental protection institutions are the package of laws, regulations, policies and guidelines formulated by the state in order to meet environmental protection objectives and establish requirements and procedures. Environmental protection institutions provide the foundation, guidelines and directions for the overall environmental governance system.

The environmental protection system refers to the organizational, functional and authoritative arrangements found among governmental departments, enterprises and social organizations in the area of environmental protection.

Environmental protection mechanisms are the processes and operations by which various actors involved in environmental governance interact for the purpose of achieving environmental protection objectives and requirements. They are key to effectively implementing environmental protection policies and laws.

Combined, environmental protection institutions, the environmental protection management system, and governance mechanisms must form an integrated and harmonized environmental governance system. The objective of building and promoting a national environmental governance system is to: protect ecosystems and the environment, safeguard environmental security, provide environment-related public services, improve environment quality and bring benefits to the people.

The theoretical basis of environmental governance is found in the theories of sustainable development, ecological system valuation, natural ecosystem balance and evolution, and public governance, among other theories. It lays a theoretical foundation for the progress of civilization and the harmonious development of human society and nature. Environmental governance actors include governments, enterprises, social organizations and the general public. The government includes the Communist Party of China, legislatures, judiciaries, other political parties, and central and local governments. Enterprises include state-owned, privately-owned, and foreign-invested enterprises, joint ventures and individually-owned businesses. Social organizations include trade unions, industrial associations, educational institutions, scientific research institutions, social groups and the media. The general public includes individual citizens and their self-governing organizations.

1.3.2. National Environmental Governance Capacity

National environmental governance capacity is the ability to bring the functions and roles of actors in the national environmental governance system into full play to effectively protect ecological systems and assure environmental quality. National environmental governance capacity is not simply the sum of all governmental environmental protection management capacities, but the overall capacities of all actors involved in governance processes.

National environmental governance capacity is the comprehensive capacity to address and govern all public environmental matters closely related to the interests of the whole country and all citizens. This includes the capacity for producing and supplying environmental services and products, allocating and coordinating environmental resources, formulating and implementing environmental policies, safeguarding national environmental security, and addressing international environment issues. It includes distribution of environment-related public services, social education, the degree of social organizational development, the public's ability to participate and its degree of social awareness and cohesion.

With the growing demand for environmental service, rapid economic growth and societal progress, and increasingly complicated environmental problems, the environmental governance system has to deal with interrelated problems that the traditional government management system cannot address. It must be able to forecast and control new emerging environmental problems. Environmental governance institutions and capacity should correspond to the environmental problems that must be addressed and thus require periodic changes.

Environmental governance capacity must also be suited to national conditions and the scale of environmental problems that need to be solved. Drawing on other countries' experiences can serve China's environmental management and sustainable development needs.

1.3.3. Modernization of the National Environmental Governance System and Capacity Enhancement

Firstly it is necessary to consider what is meant by the term modernization in this context. Put simply, the aim is to ensure that there are the necessary institutional tools, structures and capacity available to effectively address key problems facing China while at the same time maximizing longer term outcomes including sustainability.

These goals can only be achieved through continuous improvements to environmental protection institutions, better coordination, communication and information exchange and a strengthening of operational mechanisms. Industry partners consistently seek certainty from government decision-making processes and a clear articulation of rules. This may require the introduction of statutorily based provisions and processes to increase transparency and public confidence.

To evaluate the modernization of environmental governance capacity, the presence, extent, or effectiveness of the following indicators can be used for reference (based on Chinese and international experiences):

(i) Harmony in relationships within and among various actors of environmental governance and public trust in key decisions;

Key Property: Roles and responsibilities are clearly allocated.

(ii) Checks and balances among institutions and actors, within the management system and its implementation mechanisms, including supervision and enforcement efforts. Striking a balance in relation to the extent of reliance on command and control versus market or other incentive measures.

Key Property 1: Integration, to ensure the balanced consideration of environmental, economic and social factors, to capture co-benefits and align various functions and services to ensure accountable delivery of programs that both protect the environment and provide for economic and social wellbeing.

Key Property 2: National Interests and Subsidiarity. National interest considerations so that where appropriate a national approach is adopted in preference to diversity across jurisdictions, and at the same time, subsidiarity where responsibility lies with the lowest level of government possible allowing flexible approaches to improving problems.

(iii) Stability in the implementation of environmental governance objectives to respond to changing scientific knowledge and circumstances;

Key Property: Adaptability, in responding to changing scientific knowledge and circumstances.

(iv) Fairness between actors of environmental governance and between current and future generations;

Key Property: Inclusiveness, through mechanisms and structures to enable the participation and engagement of enterprises and community in environmental improvement efforts

(v) Efficiency through the simultaneous realization of improved environmental conditions and economic, social and administrative performance.

Key Property 1: Fiscal sustainability at the national, regional and local levels of government

Key Property 2: Integrated and accessible information systems to improve reliability, accuracy and exchange between departments, industry and the community and drive evidence based decision making and assist in consensus building.

The ideology guiding environmental governance has changed over the course of history from a focus on the management of public hazards in the first half of the twentieth century, to a greater attention to pollution prevention and control in the second half of the twentieth century, to sustainable development since 1992, and green development and public participation at the start of this century. There is also now more emphasis on the voluntary cooperation of enterprises, third party supervision and public participation.

Greater emphasis needs to be given to incentivizing good environmental behavior and promoting innovation both in government and the broader community. Environmental protection institutions should also be improved. It is necessary to improve China's current environmental governance institutional system, to build social responsibility and awareness of the rule of law, and on this basis, to promote cooperation, institute appropriate checks and balances and drive innovation.

Strategic environmental impact assessments should be employed to provide political leaders with scientifically based and independent advice about the impact of new and existing policies on the environmental, economic and social objectives underpinning eco-civilization and to shift the historical weighting given to economic considerations.

2. CURRENT SITUATION AND CAUSES OF ENVIRONMENTAL PROBLEMS

2.1. Achievements

The environmental protection institutions discussed in this chapter refer to the mandates and guidance of environmental protection laws and regulations. Due to time constraints the scope of this report is limited to pollution prevention and control and ecological environmental protection.

Environmental reform commenced through the 'Environmental Protection Law (trial)' of 1979, which established the first environmental protection institutions, including environmental impact assessments for construction projects, pollutant-discharge fees and the 'Three Simultaneities'. Along with the promotion of environmental legislation, environmental legal institutions have been strengthened, a series of new environmental protection institutions has been developed and old institutions have been improved. The revised 'Environmental Protection Law' adopted in 2014 establishes new systems, such as the environmental protection target performance evaluation and eco-redline systems, and promotes the development of environmental protection instruments. By the end of 2013, the National People's Congress had issued 10 environmental protection laws and 20 environmental resource protection laws. The State Council had promulgated more than 20 administrative rules and regulations on environmental protection. Local people's congresses have also developed hundreds of local environmental protection laws and regulations. There are already about 30 environmental protection laws and regulations: 5 are linked to governmental environmental responsibilities, 19 to pollution prevention and control, and 9 to biodiversity and eco-system protection. See Table 2-1.

Over the past 30 years, China's environmental protection institutions have gradually become more comprehensive as part of the strong commitment by government to achieve pollution prevention and control and eco-system protection and environment quality improvements. They have played an indispensable role in supporting and ensuring environmental protection but many problems remain.

Both the 11th and 12th Five-Year Plans expanded the coverage and impact of pollution prevention and control related measures and defined mandatory total pollutant discharge levels and increased the types of key pollutants to be controlled. As a result, the discharge of primary pollutants did not increase but dropped even while the economy has grown. The State Council formulated a stricter 'Plan of Action for Prevention and Control of Atmospheric Pollution' and initially established a jointly controlled coordination mechanism to address growing concerns about health impacts related to pollution, which prescribed legal steps to be taken. For example, in key cities which fail to reach air quality standards, 'plans should be developed for attaining the standards within the time limit...and even more strict measures should be applied to meet such standards within the time limit.' For the purpose of ensuring effective implementation of environmental protection institutions, efforts have been made to reform the environmental management system and improve the capacity and authority of environmental protection departments. At the beginning of this century, the state environmental protection department has also set up regional offices to strengthen supervision and inspection of local governments and enterprises in relation to the implementation of environmental protection laws and regulations, plans and standards.

In 2008, the State Council established the Ministry of Environmental Protection (MEP) and gave it responsibility to provide environmental input into decision-making related to national economic and social development.

Table 2-1: Major Environmental Protection Measures

Scope	Name of Law or Regulation
Governmental responsibility	1. Environmental liability scheme targeting information disclosure* 2. Environmental protection performance evaluation* 3. Cross-regional pollution coordination system 4. State of Environment
Pollution prevention and control	1. EIA 2. Pollution phase-out system 3. Pollution fees 4. Total emission control 5. Three Simultaneities 6. Extended producer environmental responsibility system 7. Environmental pollution investigation, monitoring and remediation* 8. Restricted transfer of pollution-intensive equipment 9. Pollution discharge registration 10. Environmental liability regime* 11. Pollution permit 12. Environmental and health monitoring and risk assessment* 13. Time-bound pollution treatment 14. Compensation for pollution damage* 15. Polluter implementation of hazardous waste treatment
Biodiversity and ecological environment protection	1. Wildlife ownership vested to state 2. Nature reserves classification 3. Catalogue of Protected Wild Plants and Animals 4. Nature reserve management 5. Special hunting permit 6. Eco-redline* 7. Special harvest permit 8. Eco-compensation* 9. Water conservation and soil erosion control plans

* Institutions established or improved by the revised 'Environmental Protection Law' adopted in April 2014

These institutional measures have improved environment quality. In the first decade of this century, the SO_2, NO_2 and inhalable particles (PM_{10}) in the environment of cities at the prefectural level decreased by various degrees even while there was rapid economic growth. The pollution levels of the Huaihe and Liaohe rivers noticeably decreased and water quality improved. The proportion of worse-than-grade-five water quality monitoring sections of the seven major water systems dropped by 15%. But environmental pollution is still serious in China. The discharge of some pollutants is increasing, with increasing environmental risks. Health problems are frequently reported in the press. The need for institutional reforms to improve environmental quality remains an urgent priority.

2.2. Major Problems in China's Environmental Protection Institutions

2.2.1. Effectiveness of Environmental Protection Institutions and Principles

To be effective in achieving the goal of ecological civilization, institutional measures must be able to improve environmental outcomes in an efficient and effective manner. This must be part of a broader framework that seeks to optimize economic, social as

well as environmental outcomes. Effectiveness depends on many factors, including scientific design, reasonableness, suitability to the national situation, and implementation capacity and will. It needs to have regard to the economic and social context, be risk focused, equitable, flexible and provide for the necessary checks and balances. If measured by these broad principles, China's environmental protection institutions still have significant and urgent problems warranting reform

2.2.2. Defects in Existing Environmental Protection Institutions

2.2.2.1. Gaps in governmental responsibility institutions

Mismatch between Governmental Authority, Responsibility and Resourcing. Environmental protection laws give government entities at both the national and local levels extensive statutory responsibilities to protect the ecological environment. However, there is a mismatch between authority and the provision of resources to manage these reserves. For example, Article 11 of the *Regulations on Nature Reserves* specifies that 'nature reserves are divided into national nature reserves and local nature reserves,' indicating that nature reserves are managed at different levels. Article 23 of the Regulations specifies that 'the expenses needed for the management of the nature reserves shall be arranged by the people's government at or above the county level of the region where the nature reserves are located. The state shall subsidize the management of national nature reserves appropriately.' The mismatch between the government's environmental authority and responsibility can also be seen in Article 11, which specifies that nature reserves are divided into national nature reserves and local nature reserves, and states that the expenses needed for the construction and management of nature reserves should be provided by the governments at each respective level and in accordance with legal principles. This means that for nature reserves at both the national and local levels, the governments of the region where the nature reserves are located are expected to cover necessary expenses. Many of these areas have less developed economies and are facing financial difficulties. Such an arrangement gives the central government the authority over national level nature reserves, but fails to provide the necessary financial support to the host region to manage the reserves; this is neither legally rational nor consistent with ecological civilization goals.

Lack of Binding Governmental Commitments to the Environmental Improvement Measures. The previous 'Environmental Protection Law' and various specialized laws have specified that local governments shall be responsible for the environmental quality within areas under their jurisdictions and take measures to improve environmental quality. There is, however, no clear mandatory provision concerning what measures should be taken by the government to improve environmental quality. There are also no provisions defining the government's responsibility for the deterioration of environmental quality and how a government can be held accountable. Although the revised 'Environmental Protection Law' further clarifies the environmental responsibilities of governments, problems still exist. For example, in relation to the governmental environmental responsibility institution, the General Provisions only state that governments: 'shall be responsible for the environment quality within areas under their jurisdiction,' 'shall increase their fiscal input in environmental protection,' 'when developing economic and technical policies, …shall take into full account their environmental impacts,' and 'shall make plans to meet the standards within the time limit.' There are no substantially binding

commitments for government to meet these environmental responsibilities nor liability if they do not do so. This diminishes the potential effectiveness and credibility of the new environmental laws.

Governmental environmental responsibility is closely related to social public service and public health, as well as ecological civilization progress and sustainable development. If governments do not accept any liability for their own actions or inactions, the core environmental responsibility system will be effectively hollow.

2.2.2.2. Inadequate pollution control institutions

Even though the institutional system for pollution control has produced some encouraging results, there remain substantial gaps, such as with EIAs. When the Environmental Impact Assessment Law was drafted in 2001, there was a proposal to expand EIA coverage to include not only construction projects but also important potentially environment-impacting plans and policies. It was clear that policies developed by governments and relevant departments may have more persistent and broad impacts on environmental conditions than specific construction projects. Proposals to implement strategic environmental assessments were however not adopted due to the conflicting views and interests of some departments and local governments. .

Pollution control measures currently lack a clear scientific basis, and detailed procedural rules, significantly undermine their effectiveness. For example, there are no detailed legal provisions for the pollution permit system, and thus it has not been effectively implemented; the 'Three Simultaneities' system was not well-designed. Penalties are set too low, enforcement is difficult and permits are sometimes viewed as irrelevant.

Box 2-1 US EIA System for Policy and Major Projects

The United States National Environmental Policy Act (NEPA) was enacted in 1969. Its goal was to enhance awareness of environmental protection throughout the federal government and to assure that environmental values were taken into account in the decision-making of all agencies and departments. NEPA achieves this goal by requiring federal agencies to prepare an environmental impact statement (EIS) for all 'major federal actions significantly affecting the quality of the human environment.' Because of the broad scope of this requirement, it has become practice to develop a short 'environmental assessment' (or EA) to assess whether the impacts of a proposed action are sufficiently severe to warrant a more comprehensive EIS. As a result, production of EISs has been limited to manageable numbers, in the range of 400-600 per year.

It took several years for federal agencies to develop the political will, expertise and infrastructure to comply with NEPA. The courts initially played a critical role in enforcing NEPA requirements against recalcitrant agencies in response to suits by citizens concerned about the harmful environmental effects of large federal projects. NEPA's signal accomplishment has been to bring transparency and public engagement to the analysis of environmental impacts and evaluation of alternatives for federal actions with large-scale effects on land use, energy production, transportation and management of ecosystems and critical habitat.

2.2.2.3. Gaps in ecological protection institutions

There are gaps and defects in the field of ecological protection institutions:

a) There is no special or specific law concerning ecological protection, i.e. a direct legal basis for ecological protection institutions is lacking;

b) Although the institutions that are urgently needed for ecological protection, such as an eco-redline system and ecological compensation system, have addressed by the revised Environmental Protection Law, they lack specific content and procedures. Specific regulations are still needed for implementation.

c) Existing ecological protection institutions are few in number and have narrow coverage, making it difficult to achieve broad ecological protection.

Box 2-2 'Functional extinction' of Yangtze River dolphins

The Yangtze River dolphin is listed in the first rank of wildlife placed under special state protection. Special hunting and catching licenses are required. Despite this, the Yangtze River dolphins and other rare aquatic mammals are threatened with 'extinction.'

Research shows that about 300 Yangtze River dolphins lived in the Yangtze River in the 1980s, but only a few dozen were left in the mid- to late- 1990s. In 2006, relevant research institutions conducted a joint investigation of the Yangtze River dolphin. They found no Yangtze River dolphins in the water bodies from Yichang to the Shanghai Estuary. In 2007, the government announced the 'functional extinction' of Yangtze River dolphins.

In order to protect species, China formulated the Law on the Protection of Wildlife in 1988 and revised it in 2004. The law protects 'the species of terrestrial and aquatic wildlife which are rare or near extinction and the species of terrestrial and aquatic wildlife which are beneficial or of important economic or scientific value.' This Law has established lists of wildlife owned by the state that are under special state protection, or require special hunting and catching licenses. The government is prioritizing the protection of rare, endangered and high-value animals; yet, the institutions to implement these goals are too weak and narrowly focused.

Measures focusing on the protection of endangered species such as hunting and poaching controls are useful, however, they fail to give adequate consideration to habitat protection despite this constituting the major risk to species survival in many instances. More comprehensive approaches to ecological protection focusing on the retention of key habit and ecosystems both within and outside of the formal reserve system are crucial.

2.2.3. Defects of the Environmental Protection Institutional System

In accordance with the 18th CPC Decision, various environmental protection measures have been established, but they still require a clearer scope, statement of goals and main principles, and balance of authority and responsibility between executive and implementing agencies. The overall design should be stable, but flexible, so that it can be improved and amended as situations change.

Many environmental protection measures were established prior to the ecological civilization concept, and therefore, the ideologies guiding institutional designs were not oriented by it. They fail to fully reflect the core ideas of respecting, obeying and protecting nature.

As previously noted the coverage of pollution prevention and control institutions is relatively comprehensive adopting an end-to-end approach. However, there are obvious institutional gaps in terms of natural ecological protection, governmental environmental responsibility, as well as social environmental governance. Many badly needed institutions for ecological protection, such as an ecological compensation system, have yet to be implemented. A comprehensive and integrated set of institutional measures for ecological protection is urgently needed.

Too often, pollution prevention and ecological measures are vague in terms of procedures and regulations and do not find an effective balance between the responsibility and authority of regulators and those being regulated. These defects restrict overall performance.

2.3. The Root Causes of the Problems with Environmental Protection Institutions

2.3.1. Phases in Economics, Social Development, and Environmental Management

At the beginning of the process of opening up and reform, China's national economic foundation was weak and overall social development lagged behind the global average. China accounted for only 2% of the global economy with 25% of the world's population. The Chinese people have strongly desired reform and economic development. China thus followed a course 'centering on economic construction,' which not only satisfied the requirement for a stable social order, but also conformed to the people's call for a better life.

In the early stage of development, China's technological level was low and the country engaged in simple processing and manufacturing. The demands for labor and environmental resources were relatively great. After a long period of economic stagnation, China still had resources and relatively good environmental conditions. Large amounts of environmental resources were used as inputs for economic production. The result was an obvious marginal output, which contributed to social dependence on environmental resources and to the idea that environmental resources are inputs for economic development.

Due to the tolerance and self-purification ability of ecosystems, the characteristics of environmental pollution are cumulative and delayed. Great economic benefits can be obtained through the inputs of environmental resources, but such activities often have insufficient regard to ecosystem thresholds. The consequences of environmental damage often do not emerge immediately. Therefore, the benefits of economic development and the costs of environmental damage are asynchronous. In the early stages of high-speed economic development, this asynchronous development provided greater economic benefits than environmental costs, thus a huge environmental dividend was obtained. This environmental dividend is also known as the capacity environmental dividend, as shown in Figure 2-1. Weak environment protection institutions provided huge institutional environmental dividends, known as a capacity environmental dividend, as shown in Figure 2-2.

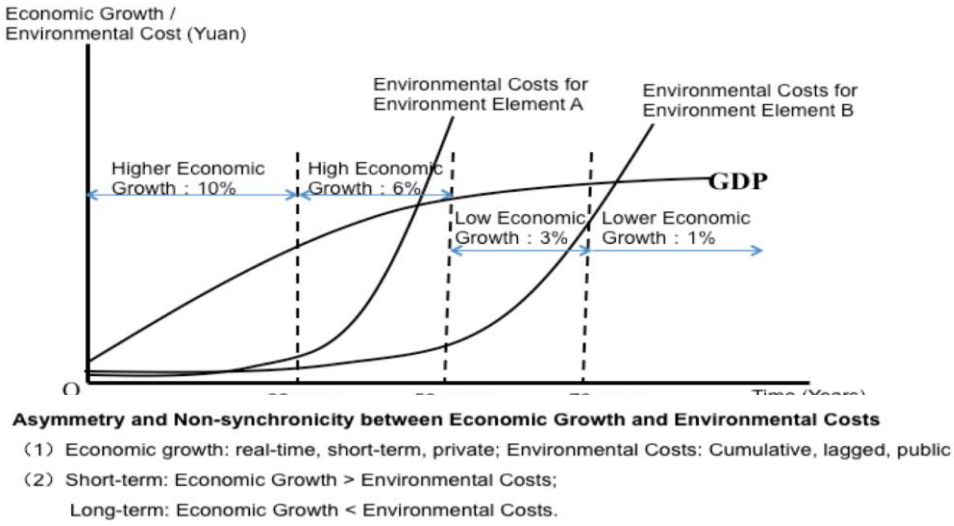

Figure 2-1 Environmental Dividends, Economic Growth and Environmental Cost

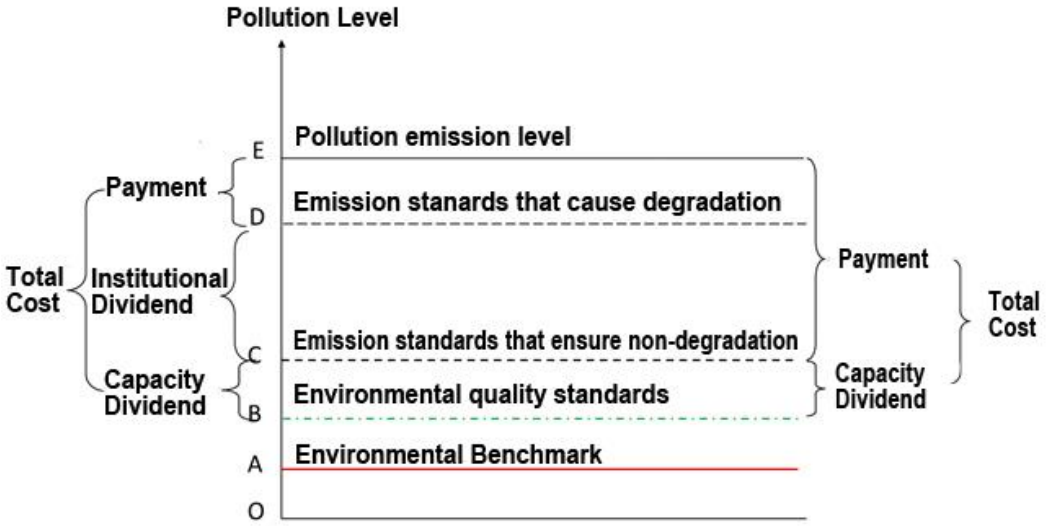

Figure 2-2 Institutional Environmental and Capacity Environmental Dividends

Environmental resources are a public good; their utilization and consumption are not exclusive, so any economic organization or individual may obtain environmental dividends by utilizing the environment. During the early period of high-speed economic development, public demand for environmental resources was mainly for the purpose of ensuring survival. This has made it very difficult to shake society's belief in 'GDP-oriented' development despite the degradation in environmental quality.

On the whole, there is a close causal relationship between China's historical stage of development and the fact that environmental governance has developed slowly since the reform and opening-up process began. However, as environmental carrying capacity is approaching its limits, the marginal economic benefits of the environmental dividend are falling sharply. The effects of environmental damage have gradually become more prominent and the view that 'environmental protection's role is that of an

escort for economic development' which formed in the early stage of high-speed economic development is now facing great challenges.

Entering the new century, China has adopted a series of measures to strengthen environmental protection and promote pollution control yet many problems remain. International experience attests to the difficulties in establishing and maintaining effective environmental governance systems. No jurisdiction can rightfully claim that the task is complete. Reform cannot occur in one campaign as circumstances change, requiring ongoing betterments to meet new challenges. From the start, the development of environmental protection in China has been affected by the global context and compared to the situation when developed countries were at similar levels of economic development, the challenges facing China are great. Given China's high development goals, strict environmental targets, and high public demands for improved living and environmental quality, reforming China's environmental protection institutions will be a major task.

2.3.2. Root Causes of Problems

2.3.2.1. A governmental system which has its main responsibility as boosting growth means environmental protection often gives way to economic growth

It is very important for a developing country to promote rapid economic growth for substantial periods of time in order to maintain national stability and improve people's living standards, as well as achieve social development and progress. There must be a clear definition of the government's functions and responsibilities. Due to the needs for economic growth, local governments have gradually evolved into important investment and business operation targets. For long periods of time, trade and investment promotion and the acceleration of GDP growth have been the main areas of focus of local governments and the main indicators used in the performance assessment and promotion appraisal system.

The authority and ability of environmental protection departments have been limited by their institutional arrangements. In the functional allocation of various government departments, the environmental protection departments have been put into an inferior position; it is difficult for them to form systems and mechanisms for independent regulation. They are not able to implement the management duties prescribed to them by the law. And, although economic departments in charge of comprehensive economic management have important decision-making power, their environmental protection responsibilities are not clear even though they have functional responsibilities for environmental protection. They have ignored these responsibilities internally and failed to effectively conduct comprehensive decision-making and coordination of environment and development.

2.3.2.2. The allocation of functions relating to ecological and environmental protection across governments is fragmented, duplicative and fails to clarify rights and responsibilities

A rational functional allocation would have each department undertake the function that most closely matches its management objectives, but not undertake functions that are directly in contradiction to those management objectives. At present, however, the horizontal allocation of functions for ecological and environmental protection is not

rational. Despite the basic legal principle calling for a 'unified supervision combined with management by multiple departments,' this kind of management system has not actually been established.

In terms of unified supervision, the environmental protection departments are lacking in authority and means. In the process of governmental reform in 1998, the Environmental Protection Committee under the State Council was shut down. Its functions were transferred to the State Environmental Protection Administration (SEPA). SEPA was made responsible for the coordination of all regions and departments and for solving major cross-regional and inter-basin environmental issues. But, as SEPA is not part of the State Council, it is difficult for SEPA to coordinate major environmental and development issues involving many departments and regions. With its limited authority, it is difficult for SEPA to influence national economic and social development policies in relation to environmental protection or promote the incorporation of environmental elements into the performance assessment or policy directions of other departments. For example, it has no right to decide to introduce policies that promote good environmental outcomes nor give inputs on key decisions regarding state-investment projects. Its supervision of government departments at the same and lower levels exists in name only.

Box 2-3 Shanghai Environmental Protection and Construction Coordination Committee

In 2013, Shanghai established the first Environmental Protection and Construction Coordination Committee in China. This inter-departmental body integrates administrative, legal and policy resources, and is responsible for coordination, communication, inspection and evaluation of environmental protection works. It provides a platform to promote a series of actions, including the 'Three-year Environmental Protection Plan', the national and local 'Clean Air Action Plan' and the still to be issued 'Clean Water Action Plan' and 'Clean Soil Action Plan', urban environmental function zoning, and establishment of an eco-redline system.

Some supervisory and management functions tied to ecological and environmental protection have been granted to various sectoral departments. This leads to three problems. First, the competent departments responsible for resource management tend to be responsible for managing assets. They prefer to consider the economic interests of their own departments, and as a result environmental benefits tend to be relegated to a secondary position. Second, it is difficult for various departments to form joint regulatory efforts due to the decentralized functions of ecological and environmental protection among various departments. According to a report of the Chinese Research Academy of Environmental Sciences, the central government has 53 ecological and environmental protection functions, the environmental protection department takes responsibility for 40%, and the other nine departments have responsibility for 60%. Among the 21 functions undertaken by the environmental protection department, 52% are independently undertaken by the environmental protection department, and 48% are functions shared with other departments. Third, there is a departmentalization and fragmentation of relevant legal institutions for ecology and the environment. For example, there is an arbitrary division of institutions for the protection of water resources and water pollution prevention and control that have the same function or are connected to each other: there is a water function zones classification system and a similar water environment functional zoning system; there are indicators of water

carrying capacity and also indicators of water environmental capacity and indicators of total water environmental capacity, etc. Similar problems also exist in the environmental monitoring system, which is to act as a supporting system for environmental management.

2.3.2.3. The division of powers between the central and local governments is unclear, and supervisory capacities are weak

Legally, China is a unified state with a single governance system. Local governments have relatively great powers while central government departments basically offer operational guidance to local governments and relevant department. These are the characteristics of a 'strong horizontal administration and weak vertical administration'.

Box 2-4 Federal Policy Coordination

Water shortage is an important issue in Australia. The Millennium drought in 2007 bought scarcity and resource degradation to the forefront and was a catalyst for changes in policy and institutional arrangements. Governments were collectively unable to address key questions about water resources, creating a growing perception of failure of joint governance. The National Water Act introduced in 2007 established the Murray Basin Plan framework. This Act had bipartisan support. It was a response to drought and the potential impact of climate change, and also aimed to fulfill Australia's international environmental obligations. For the first time a single independent expert national government body assumed responsibility for holistically planning the management of water resources of the Basin in a way that best meets the social, economic and environmental needs of the basin and its communities. Water accountability was based in the national environment portfolio rather than in a resource use portfolio potentially captured by water use interests. This was a significant change in ministerial accountabilities and critical to the advancement of reforms. Many states also established dedicated Offices of Water with responsibility for developing water-sharing plans under state legislative requirements as water owner.

The separate and shared powers of the central and local governments are not clearly demarcated. In the past several years, the central ministries and commissions have taken several measures in order to urge local governments to implement the environmental policies formulated and promulgated by the State Council. These include establishing regional supervision institutions, strengthening the functions of basin water resources protection agencies, as well as implementing dual leadership for the leading cadres of local environmental protection departments at all levels (relying mainly on the management of local CPC Committees); at the same time, the target responsibility system has been implemented to strengthen central guidance and supervision over local environmental protection works. But for various reasons, these institutions have not really played their expected role. As an example, due to the lack of an independent monitoring, statistical and assessment system, the central government has had trouble getting real environmental protection data, compromising the target responsibility system.

2.3.2.4. Personnel, equipment and financial allocations for environmental protection are very weak

Due to the low priority accorded to environmental protection, both in the central and local governments, the environmental protection departments' personnel, equipment and financial allocations are inadequate to satisfy either the existing statutory responsibilities or meet the new demands required under the new environmental

legislation. The State Ministry of Environmental Protection has just 311 administrative staff. Even taking into consideration the staffing of government affiliated institutions in the National Environment Monitoring Station and the regional supervision centers, the staff number is still less than 1,000. In comparison, the staff number of the United States Environmental Protection Agency is almost 16,000. The same disparity applies to relative budget levels as shown in Box 2-5.

Box 2-5 Environmental Agency Staffing and Budgets in Several Developed Countries

The German Federal Ministry for the Environment, Nature Conservation,Building and Nuclear Safety (BMUB) is charged with the environmental portfolio. The ministry has a staff size of about 1,200. In 2014 it had an allocated budget volume of 3.6 Billion Euros. The German Federal Environment Agency (UBA) has a staff of about 1,400. The German Federal Agency for Nature Conservation has a staff of about 290. The German Federal Office for Radiation Protection has a staff of 708. The German Federal Office for Building and Regional Planning and the integrated Federal Institute for Research on Building, Urban Affairs and Spatial Development have together a staff of approximately 1,250.

The United States Environmental Protection Agency (EPA) is the highest level agency in the United States charged with an environmental portfolio. The agency had a workforce of 15,913 and a budget of about 7.9 billion US Dollars in fiscal year 2013. The Agency has 12 offices, with each supervising multiple sub-offices. In addition, it has 10 regional offices, which are tasked with relevant policies in their areas. Apart from conducting environmental assessments, research, and education, the EPA has the responsibility for maintaining and enforcing national standards under a variety of environmental laws.

The Ministry of the Environment in Japan employed a staff of 2010 in 2012. It includes a Waste Management and Recycling Department, Environmental Policy Bureau, Environmental Health Administration, Environmental Management Bureau, Nature Conservation Bureau and Nuclear Regulation Authority.

The staffing shortages are even more apparent among lower levels of government which require more technically skilled staff and capacity but have limited budgets, staff, and management capabilities. In recent years, the governments at all levels have strengthened the capacity of their technical teams and introduced more monitoring. However, in the central and western regions which are areas of significant biodiversity value the local management and law enforcement abilities are still very weak, and in many cases, officials are reluctant to or unable to manage their environmental responsibilities.

2.3.3. Root Causes of Problems Relating to Institutional Arrangements

2.3.3.1. Inadequate supervision and environmental performance evaluation of party and government policymakers

The GDP-oriented government performance evaluation system continues to be the dominant performance assessment system. Resource consumption, environmental damage and ecological effects have not yet been fully incorporated into economic and social development assessment systems. The weight given to environmental protection in the performance evaluation system for party committees and governments at all levels is too low. Local governments thus lack an adequate sense of their ecological protection responsibilities; environmental inaction and administrative interference in

environmental law enforcement have long been problems. Protectionism, which is very prominent at the local level, makes it difficult for environmental protection departments to enforce the law.

2.3.3.2. Existing laws and policies are unable to adapt to current environmental management and regulatory requirements

Pollution fees are too low and fail to reflect regional differences and the pollution permit system is not effective. Some standards for pollutants discharge are outdated, and there are few industrial and ambient pollutant discharge standards. The environmental impact assessment (EIA) of projects and the system of 'Three Simultaneities' have not been effectively implemented, and there is a serious problem of unauthorized construction taking place before EIA approval. The high costs of law enforcement, the low costs of breaking the law, weak regulatory and supervisory mechanisms and other problems are prevalent and hamper effective implementation of statutory measures. Despite compulsory administrative measures and environmental protection department responsibilities even before the 'Environmental Protection Law' was amended, there were many implementation problems at the local level. The laws and regulations did not serve as effective deterrents to illegal enterprise activities. Currently, in environmental cases, the plaintiff has to apply to the people's court for enforcement; however, enforcement of court decisions is at times compromised because of local protectionism. In addition, there may be limited judicial attention to pollution cases, relatively long enforcement times, and limited ability to enforce decisions. As a result, violations are not being promptly corrected.

2.3.3.3. There is no mechanism for determining a role division and relations among the government, market and general public

There is growing recognition of the important role of market mechanisms and broader fiscal measures in environmental protection. But there has not been sufficient use of market mechanisms and institutions that can accurately reflect the values of ecosystem services and natural resources and support good environmental performance. Natural resources remain undervalued despite commitments to introduce market mechanisms to send appropriate price signals. As a result, the cost of enterprises' resource utilization and environmental pollution costs are 'socialized' or 'externalized'. Resource and energy intensive production is encouraged, and enterprises are lacking in motivation and fiscal incentives to nurture the environment and save resources.

Achievement of ecological civilization is dependent on successful engagement with industry and community. Citizens' rights to the environment have not been fully embodied in the law, and there are barriers to effective participation and a lack of effective institutional safeguards. Additional institutional arrangements are needed to promote and aid societal participation in environmental governance. Relevant laws and regulations must exist that give third parties the ability to carry out environmental services and participate in the monitoring of enterprise and government environment performance while also protecting their legitimate rights and interest.

2.3.4. The need for policy changes to redefine the relationship between economic development and environmental protection

2.3.4.1. Economic development takes precedence over environmental protection

Economic development has taken precedence over environmental protection in China's resource and environment protection laws and regulations, plans and policies. For example, the 'Water Pollution Prevention Law' specifies that the government 'shall, in line with the national standards for water environment quality and the country's economic and technological conditions, establish the national standards for discharge of water pollutants.' As a developing country, water pollution emission standards are currently limited by technological and economic considerations. In many regions in northern China, there is no annual surface runoff, and thus extremely limited water self-purification capacity. Meanwhile, due to the pressure brought about by local competition for development, localities almost never automatically establish more stringent standards to control the discharge of pollutants. With the increase in the number of enterprises in these areas, there is often deterioration of environmental quality even though enterprises meet pollution emission standards. Under the Regulation on Pollution Fee Collection and Use, pollution fees are set taking into consideration the economic and technological conditions as well as the capacity of enterprises. Thus, pollution fees are **set at levels lower than the cost of pollution treatment**. As a result, many enterprises have preferred to pay pollution fees rather than invest in pollution treatment because it is cheaper to do so.

2.3.4.2. The benefits from economic development are greater than the cost of environmental damage

For poor areas with less developed economies and substantial environmental carrying capacity, economic development leads to incomes from economic development far exceeding the short term costs of environmental damages. This short-term phenomenon strengthens society's recognition of the rationality of 'pollution first, treatment later.' However, this approach to development threatens the potential for long-term and sustainable development due to diminishing marginal returns and increasing marginal costs from environmental damages. China has entered a peak period of environmental pollution damage. The degradation of environmental quality is causing damage to public health and the ecological environment and huge social and remediation costs. At present, some institutional measures that emphasize the priority of environmental protection have been introduced, but they are still limited in their approach. They often do not adopt a more systemic approach rebalancing and integrating environmental values with economic and social decision making.

2.3.4.3. Current economic benefits outweigh future environmental costs

When future environmental costs give way to current economic benefits, an environmental dividend is created which is instant, short-term and privately beneficial, while the damage is delayed, long-term and of a public nature. Due to intense social competition and the desire for growth, many local governments, enterprises and the public are eager to acquire quick success and benefits even when doing so has negative environmental implications. Due to the short-term and private nature of benefits and the delayed and public nature of damages, most members of society are not willing to give

up the pursuit of current environmental dividends because of damages to be felt by future generations.

Weak environmental laws and policies can result in significant environmental dividends while covering up the low efficiency of economic growth, undermining the incentives for technological progress, and even reducing overall competitiveness. In the future, a very high economic price will have to be paid for these environmental debts unless remedial action is urgently taken. International experience in Europe, the USA, Canada and Australia have utilized stringent EIA processes to assess relative risks and benefits relating to development to make these considerations more transparent to government, industry and the community.

3. POLICIES AND PRINCIPLES FOR THE REFORM OF THE ENVIRONMENTAL PROTECTION INSTITUTIONAL SYSTEM

3.1. Guiding Ideology and Basic Principles for the Reform of Environmental Protection Institutions

Environmental protection institutional innovation will require a systematic focus and the courage to break down institutional barriers and establish environmental protection institutions that promote integration and harmony between environmental quality improvements and economic development and social progress. Some priority areas are:

3.1.1. Guiding Ideology and Goals of Reform

The reform of environmental protection institutions should be guided by the spirit of the 18th CPC National Congress and the third plenary's 'Decisions' and with the goal of improving environment quality and constructing an ecological civilization. It will be necessary to create new awareness regarding environmental protection; change behaviors; improve the scientific basis, applicability and effectiveness of institutions; and focus on the integration and coordination of institutions at the policy, planning and operational levels. By 2020, significant achievements will need to be made in key environmental protection areas and in the construction of new institutions that can optimize environmental. Sound, standardized and effective environmental protection institutions should be formed, which can provide institutional support for achieving good environmental quality in harmony with a well-off society.

3.1.2. Basic Principles of Reform

The reform of environmental protection institutions should follow these guiding ideologies and insist on the following basic principles:

Harmony between human and nature. The innovation of environmental protection institutions should adhere to the basic idea of 'harmony between humans and nature,' establish awareness and move forward implementation of 'eco-redline' protection; adhere to the basic principles of respecting, complying with and protecting nature; abandon the problematic idea of 'conquering nature'; and promote the construction of a resource-saving and environment friendly society.

Expand coverage and enhance effectiveness. Innovation should seek to supplement, improve and develop existing institutions, eliminating institutional gaps and forming a

robust 'institutional chain' across the fields of ecological and environmental protection, the government's environmental responsibility system, and the social governance of the environment. Priority also should be made to strengthen existing pollution control institutions and enhance their efficiency and effectiveness with supportive regulations. This needs to be supported by strong scientific research on complex interactions that can be used to make timely policy and regulatory revisions to adapt to new pollution prevention needs.

System integration and synergies. A system wide redesign of environmental protection systems should occur. There needs to be better alignment and coordination between the responsibilities, policies, procedures and laws and mechanisms developed to enable the integration of economic, social and environmental considerations and resolution of any potential disputes.

Synergies should be developed to promote coordination and cooperation. Importance should be attached to coordination and synergies between various environmental protection institutions and other institutions. This will be a difficult but essential part of the reform.

Clear functions and integration of responsibilities and authority. Effective institutional structures require clear lines of authority and responsibility and sufficient financial and human capacity to meet expectations. Equity and fairness principles should apply.

3.2. Classification and Construction of Environmental Protection Institutions

Studies have reaffirmed the need to adopt a systematic approach to environmental protection to provide greater leverage and alignment. According to the objectives and principles discussed above, future environmental protection institutions can be classified into three categories based on their objectives, content and coverage: pollution prevention and control; ecological protection and restoration; common and basic institutions.

3.2.1. Pollution Prevention and Control

Pollution prevention and control institutions should address source prevention, process management and end-of-pipe treatment. Some of the following institutions may apply to more than one stage.

• Environmental Impact Assessment	• Cleaner production
• Registration of pollutant discharge	• Pollution auditing system
• Pollution permit management system	• Time-bound pollution treatment
• Total emission control	• Pollution fee/environment tax
• Phase-out of pollution facility, processes and products	• Pollution damage compensation
• Regional approval suspension	• Penalty for non-compliance with emission standards/administrative punishment system

3.2.2. Ecological Protection and Restoration

• Eco-redline	• Main Functional Zoning system
• Prohibit development in eco-redline regions	• List of key protected wildlife
• Performance evaluation system to protect eco-redline regions	• Special hunting license system for key protected wild animals

• Accountability system for destruction in eco-redline regions • Nature reserve and national park system • Ecological compensation system*	• Special harvesting license system for key protected wild plants • Ecological restoration institution • Natural recovery institution

3.2.3. Common and Basic Environmental Protection Institutions

• Environmental target responsibility system • Environmental protection performance evaluation • Environmental audit and life-time accountability • Emergency responses for environmental accidents • Environmental monitoring • Environmental standards • Environmental enforcement and fiscal support system • Corporate environmental information reporting and disclosure • Compensation of environmental damage	• Life-time accountability system for environmental damage (administrative, civil and criminal) • Enterprise environmental credit system • Environmental information disclosure • Tip-off system of public, legal persons and other organizations • Environmental public interest litigation • Public participation and supervision system • Social organization's right protection system • Social organization management system

* Institutions established or improved by the revised 'Environment Protection Law' adopted in April 2014.

These environmental laws, systems, and measures are part of the more comprehensive environmental protection institutional system. Further study is required to address key implementation challenges.

3.3. Reform of the Ecological Environment Protection Management System

3.3.1. The reform of the ecological environment protection management system should deal with three relationships

The reform of the ecological environment protection management system will involve an extremely complex set of objectives and tasks. In order to speed up reform and promote the establishment of an ecological environment protection management regime suitable for dealing with complex social and economic transformations and changing natural and social conditions, it will be necessary to seriously study and properly handle the relationships described below:

3.3.1.1. Relationships between government, market and society

There should be a clear articulation of the responsibilities of the government, enterprises and society, especially how enterprises and society can support the government's functions. This is a precondition for promoting ecological and environment protection management system reform as well as for the effective functioning of markets, which rely on governments to reduce uncertainties by establishing rules and procedures and providing information. Governments can reduce risk by defining authority, structures, responsibilities, rights and procedures.

In a market economy, one of the important responsibilities of the government is to provide public goods or quasi-public goods that are not provided by the traditional market economy, such as environmental quality, ecosystem services and natural

resource conservation, and help enterprises to internalize their external behaviors, bear the costs of their externalities, and take on their social responsibilities. This is necessary to achieve a reasonable allocation of resources.

In China, the government's responsibilities and commitment to environmental protection are clear. But, because the government has multiple functions and goals in many fields, the government still needs to balance the relationship between environmental protection and other functions. What is most crucial in this situation is to properly handle the relationship between environment and development. Due to long-term environmental debts, the government needs to rebalance environmental protection and economic development, greatly increasing the weight of environmental protection, as well as seeking an optimal path to achieve multiple objectives. Another key problem is determining how to cultivate and strengthen the environmental protection powers of market actors, social organizations and individuals so as to give full play to the role that people can play and find a reasonable allocation of environmental protection functions across actors.

3.3.1.2. Relationship between unified management and separate specialized management

Agency structures historically draw boundaries based on various resource use categories such as water, mining and forests. This approach acknowledges the unique challenges involved in their management but fails to sufficiently regard obvious biophysical and spatial connections and broader ecosystem considerations tied to their use. It is very important that institutional mechanisms enable the adoption of comprehensive ecological and environmental protection management approaches that have the ability to address the characteristics of each ecosystem. There is pressing need to better articulate boundaries between environmental regulatory/supervisory entities and natural resource use agencies. The clear allocation of functions is important so that an integration of elements, functions and measures can be achieved. Many models have been pursued in other countries wherein environmental agencies are part of broader organizational clusters or remain as separate stand-alone agencies. Arrangements differ internationally regarding the co-location or separation of ecological environmental responsibilities from pollution control related functions. According to international experience, there are success stories with both management modes. Whether a comprehensive 'super ministry' or various professional independent regulatory agencies should be established is not clear. As countries increasingly realize the importance of eco-system integrity and the systematic nature of problems concerning resources, ecology, and the environment, there is a trend to restructure governmental departments into broader fields or related clusters of resources, the ecology, and environment. Many patterns of restructuring can be seen.

The placement of ecosystem management functions should reflect the fact that natural resources have multiple attributes. For example, forests have both economic and ecological attributes. Many resource agencies have areas of significant conservation significance under their control. International experience favors the co-location of related functions to remove administrative inefficiencies, reduce duplication, improve coordination, minimize poacher game keeper issues, improve monitoring and compliance and facilitate cooperation, communication and information exchange between key entities. Direct support from national government leaders is usually necessary to successfully implement ambitious environmental protection targets

especially when they require the engagement of other levels of government, markets and the community. Whether ecosystem management functions, should be integrated with the regulation of natural resources or the function of environmental protection, is a theoretical question that can have broad implications. In China's present reality, the protection of natural resources and ecosystems is most urgent. This Report has highlighted the urgent need to strengthen regulatory oversight and effectively monitor and enforce compliance. This should be a guiding principle. The preferred choice may be to unify responsibility for the functions of protecting natural resources, controlling environment pollution and managing ecosystems, which are currently scattered across various departments.

3.3.1.3. Division of powers between the central and local governments

In most of the major developed countries in the world, the division of powers between the central government and local governments is relatively clear. National governments have retained or introduced powers in relation to some water, air quality and climate change issues as well as to inter-regional issues in response to various crises or as issues gain in priority while most environmental issues tend to be managed by local governments. Central governments have specific administrative and financial control measures as well as directives and action plans to regulate implementation at the local level. There are also some corresponding institutions, such as regional and basin commissions, or regulatory agencies, which coordinate and supervise the behavior of state/local governments to better align national objectives. One of the problems of China's environmental protection management system is that there is insufficient coordination between the central and local governments, and no system or mechanisms to effectively guide and supervise local environmental behavior.

China is a very large country, so ecological and environmental problems have obvious regional and trans-regional characteristics. Thus, the system of environmental protection found in federal states can be used as a reference, i.e. while retaining jurisdiction of major national and trans-regional and inter-basin issues, other ecological and environmental problems should be delegated for local management. At the same time, a system and mechanisms of administrative supervision and fiscal restraint to guide and supervise local governments in the effective implementation of laws, plans, and planning processes and to prompt local governments to really shoulder the responsibilities of ecological protection is critical.

3.3.2. Key Direction for the Reform of the Environmental Protection Management System

Reform of China's environmental protection management system should be in accordance with the framework set by ecological civilization institutional reforms and follow the basic rules of nature and ecological systems as well as the laws of management science. In addition, a stronger ministry of environmental protection and stronger environmental protection departments are needed so that both unified and specialized management arrangements can be further improved. Priority needs to be given to defining relevant environmental protection responsibilities of the central environmental protection and other departments, especially the department for comprehensive economic and social development, and establishing a mechanism for assigning them responsibilities and auditing their environmental performance. The mechanisms for coordinating across administrative/biophysical regions and for central

government supervision of local governments should be improved, noting that internationally, jurisdictions have moved from administrative to legislative entities to strengthen accountability. This will restrict the ability of local governments at various levels and their relevant departments to interfere with the effective implementation of environmental protection laws and regulations or national environmental targets.

Reforms should establish appropriately authorized monitoring and oversight mechanisms at the leadership level with the authority to resolve any disputes between government entities. They should require regular reports to leaders and the broad community on implementation, monitoring, and supervision.

Box 3-1 Independent Monitoring and Policy Evaluation

High level oversight and evaluation mechanisms to review and monitor policy implementation and progress and adjust institutional measures where appropriate are now viewed as critical to achieving Germany's *Energiewende*. In Germany, the scale of changes demanded by the *Energiewende* have led to calls for new governance instruments. Greater attention is starting to be paid to the development of low-carbon energy plans, to coordination between the federal and the *Länder* (state) governments, and to the views of the public. Information exchange, dialogue, critique, support, and monitoring are viewed as essential to a smooth transition towards a low-carbon energy system. It is recognized that coordination of goals, plans, and instruments will be necessary to minimize redundancies and costs. This requires coordination both vertically—from the national to the state and communal level, as well as horizontally, among and between towns and cities and the *Länder*. It also means a need for systematic monitoring of the *Energiewende*, a task now being carried out by an independent body that is commissioned by the government. Their report, *Energie der Zukunft* (Energy of the Future) assesses progress and challenges with meeting *Energiewende* targets and makes recommendations for improvements.

3.4. Reform of Environmental Management Institutions

Strategic transformations in environmental management are needed as discussed below.

3.4.1. Key Directions for the Strategic Transformation of Environmental Management

3.4.1.1. Necessity and key directions

The strategic transformation of environmental management needs to build on the legal, policy and institutional foundations that have been introduced over the past decade but supplement these with innovative new ideas and approaches to environmental management taking into account current and emerging economic, social and environmental problems that China could face in the future while at the same time showing progress on key environmental targets announced by the government. The objectives, methods and focus of environmental management will require adjustments to deal with different environmental problems than those of earlier phases of social and economic development.

Environmental management should be shifted from a focus on improving environmental quality while continuing to control total emissions. The main areas to consider are:

(i) Overall environmental conditions. There are many pollutants that can affect environmental quality. Only focusing on a few major pollutants will not adequately address environmental quality problems; an integrated approach has the potential to capture greater co-benefits for the environment at lower overall costs.

(ii) Environmental quality improvement as the ultimate objective. Different regions will have different natural environmental conditions, industries, and major pollutants. Using environmental quality as an indicator will provide pressure on local governments, and also leave them enough flexibility to reduce administrative costs; drive market innovations and emerging technology.

(iii) Focus on monitoring and reporting progress and changes. Environmental conditions are relatively simple to grasp by monitoring changes in environmental quality. With this information, it will be easy to reward and punish in a fair manner based on local governments' environmental assessments. At the same time, improved environmental quality will speak to the people's demands.

(iv) Total emission control is only one of many means that need to be explored to achieve the objective of improved environmental quality.

It is worth noting that total emission control is still an important starting point for pollution control. The total emission control system should be improved by aligning it with broader environmental quality improvement objectives. These ideas can be a guide for environmental management reforms in the 13th Five Year Plan and beyond.

3.4.1.2. General ideas underpinning the strategic transformation of the environmental management system

Before the 12th Five-Year Plan, China's environmental management orientation gradually shifted from a general pollution prevention focus to the total emission control of key pollutants. Improvements in environmental conditions occurred. At the end of the 11th Five-Year Plan and early in the 12th Five-Year Plan, China started to pay attention to issues such as heavy metals and PM2.5 and focused more on risk control based on environmental quality, public health and environmental issues.

During the 12th Five-Year Plan, there was also a stronger focus placed on environmental quality improvements and risk prevention. In the 13th Five-Year Plan and beyond, China should incorporate environmental quality management into all fields. Clear improvements in environmental quality and overall achievements in obtaining the target of a well-off society can be expected. Pollution control, environmental quality management and risk prevention will need to be increasingly integrated within each region with a growing focus on environmental quality protection and risk prevention.

3.4.2. Enabling Institutions

3.4.2.1. Further defining and enhancing the strategic position of environmental management transformation

Environmental departments at various levels should make clear the importance of the strategic transformation of their environmental management systems for

eco-civilization construction. They should continuously innovate their management concepts and transform their management ideas. Efforts should be made to further enhance research. By defining the importance of the strategic transformation of environmental management for environmental protection and eco-civilization, there will be a shift in emphasis towards management for environmental quality improvements, a target which could be taken up in the 13th 'Five-Year Plan'.

3.4.2.2. Speeding up the establishment of an economic system favorable to improving environmental quality

First, environmental quality improvement should be a goal incorporated into all relevant economic and social development policies. During the development and implementation of strategies for the environment, planning, and industrial policies, the ability to meet state, regional, and river basin environmental quality improvement requirements should be taken into full consideration in order to reduce stress on and radically improve environmental quality. It needs to be guided by strong research and science that can provide options to more effectively link land and resource use activities to carrying capacity. Second, in combination with the objective of improving environmental quality of the air, water, and soil and taking into consideration the industrial structural characteristics of river basins and regions, traditional industrial

Box 3-2 Eco-compensation in Basin

From 2009, Hebei province implemented the policy of 'Responsibility for water quality in river sections and eco-compensation fund', which set the following regulations for overproof fine: When inflow water quality reach the standard, 100,000￥ for 0.5 times excess of COD in outflow, increase by excess degree, 1500,000￥ for 2.0 times excess of COD in outflow. When inflow water quality exceed the standard, 200,000￥ for 0.5 times excess of COD in outflow, increase by excess degree, 3000,000￥ for 2.0 times excess of COD in outflow. In 2013, 170 million eco-compensation fine was collected to reward the waterhead areas and upstream areas which protected the water environment. This policy effectively improved the basin water environment.

structures and development modes should be adjusted. Third, investment should be promoted so as to support the transition towards newly emerging green strategic industries and to develop a green economy. Technologies for environmental protection and cleaner production favorable to the environment should be transformed into productivity. Fiscal, financial, and pricing incentive structures as well as ecological compensation and other economic policies should be used to promote environmental protection and resource saving.

3.4.2.3. Promoting Strategic Transformations and Institutional Innovations in All Fields of Environmental Management

Reform and improve environmental protection with environmental quality management as a guiding vision. First, the 13th Five-Year Plan should emphasize the principles of regional management and propose indicators for regional environmental quality. Second, research should be carried out in the fields of environmental science and technology and environmental monitoring to improve relevant standards, monitoring methods and measures. It needs to be supported with high quality, timely, respected and integrated data to monitor and publicly progress and help build and

maintain consensus. When implementing various pollution control institutions, such as the EIA system and the total emission control system, environmental quality improvements and environmental risk control should be regarded as the starting point and the ultimate goal of institutional implementation. Finally, it is important for governments at all levels to use environmental quality as a basis for environmental performance assessments.

3.5. Reform of Social Governance Institutions

During China's gradual shift from a planned to a market economy, social organizations lacked vitality and autonomy and citizens had little understanding of self-governance. As a result, the environmental governance system has been dominated by administrative directives. Administrative mechanisms have been stronger than market mechanisms, and both mechanisms have been far stronger than social mechanisms, resulting in a very unbalanced state. This has resulted in weak supervision of enterprises and repeated instances of illegal construction and illegal discharges. There is insufficient public understanding and involvement, Environmental problems have also been behind many cases of public protests. There is urgent need to enhance the weak sectors in the environmental governance triangle, and improve social governance for environmental protection.

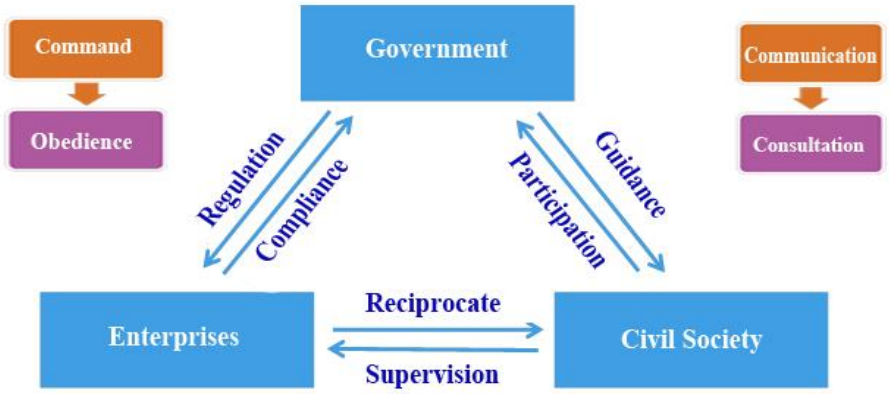

Figure 3-1 Multi-stakeholder Environmental Governance

Currently, the reform of environmental protection institutions focuses on restructuring towards an **environmental governance model led by the government but with joint governance by multiple stakeholders.** The government still plays the leading role in environmental protection as it is obliged to provide environmental public services. Beyond this, government-enterprise-public dialogue and cooperation can be strengthened so as to bring into full play the capabilities and roles of different actors, thereby promoting effective environmental governance.

The three features of 'joint governance' are: **1) There are multiple governance actors**. Government should provide institutional guarantees and platforms so that enterprises, social organizations and the public will have wider, more direct and effective access to environmental governance. In particular, the government should create a favorable external environment for all kinds of civil environmental protection organizations. **2)**

There are multiple forms of governance. Apart from traditional administrative regulation, the role of market mechanisms should be enhanced. Extensive dialogue and consultation with all social sectors will become an important means of advancing environmental governance. Committees of villagers, urban resident committees and home owner associations should be encouraged to pay attention to and participate in environmental protection in order to fully achieve self-governance of the community environment. **3) There are multiple channels of governance**. Beyond disclosing environmental information according to the law, opportunities and channels for the public to participate in social governance of the environment should be established. The government should also establish a regular and long-term mechanism for dialogue and consultation with social sectors, encouraging them to be actively involved in the process of setting up, advancing and implementing environmental policies, plans and projects. Other measures like purchasing services from society and promoting third-party pollution treatment can also be used to support and offer an activity space to enterprises and social organizations so that they too can be involved.

Environmental protection responsibilities should be borne by government and society (including all levels of party organizations, legislative and judicial agencies, various social organizations, enterprises of all types, etc.). Institutional innovation is dependent on moving away from a model that relies largely on one minister or agency in government acting as the sole guardian or advocate for environmental protection and management to one that embeds accountability across all agencies and levels of governments in partnership with industry and community.

3.6. General Ideas Supporting Environmental Protection Institutional Reform

In summary, innovations in environmental protection institutions should aim to make adjustments and improvements in line with the overall requirements of ecological civilization construction and promote the establishment of a new relationship between man and nature. Two important questions must be answered: What are the overall requirements of ecological civilization construction? How should the system be adapted to the new requirements and which innovations in environmental protection institutions should be promoted?

3.6.1. Overall Requirements of Ecological Civilization

According to the 18th CPC National Congress, there are three main requirements for ecological civilization construction:

(i) Raise the strategic position of ecological civilization and a beautiful China by deepening reforms, promoting a new pattern of modernization, and realizing a national strategy of development that secures a harmonious balance between man and nature. To do this, China will have to pursue economic development under stricter resource and environmental constraints and moving away from the looser resource and environmental constraints of the past. Important changes must be carried out. Weak institutions should be strengthened in order to reduce the large gap between execution capacities and responsibilities.

(ii) Incorporate ecological civilization construction into the four major constructions. Ecological civilization construction should be incorporated into all aspects and processes tied to advancing economic, political, cultural and social

progress and society should contribute to building a beautiful China. Achieving a new relationship between man and nature will require inputs beyond environmental and resource conservation departments. The power of the entire society must be mobilized. The government cannot achieve this alone; a new structure of social governance should be built.

(iii) Strengthen the system to protect the ecological environment. The third plenary session of the 18th CPC National Congress stated that 'in order to promote ecological civilization, we must establish comprehensive and integrated institutions and implement the strictest possible resource protection institutions, damage compensation institutions and accountability institutions. We will also improve environmental governance and ecological restoration institutions, and use institutions to protect the ecological environment.' This statement highlights the importance of institutions in ecological civilization construction. Institutions take precedence over funds and technologies, as well as morality and self-discipline. Ecological civilization construction will alter economic and social development approaches, touching upon people's vested interests, and as a result it will encounter challenges. Institutions are an effective way to overcome conflicts of interest and resistance. Ecological civilization construction will take a long time, so it is necessary to establish a long-term mechanism and stable institutions to safeguard progress.

3.6.2. General Thoughts Related to the Innovation of Environmental Protection Institutions

Institutional reform of environmental protection institutions shall be based on the following:

First, use legal and regulatory institutions to protect the environment. Research must be conducted and a scientific basis must underpin environmental laws, regulations and standards to ensure their feasibility and effective implementation. Existing laws, regulations and standards need to be revised and amended to adapt to environmental protection needs.

Second, encourage and mobilize all stakeholders to engage in environmental protection in order to form a multiple stakeholder (government, market and society) governance system. Improve implementation mechanisms for stakeholder cooperation and for a system of checks and balances to achieve overall improvements in the effectiveness of environmental protection institutions.

Third, increasingly make use of an environmental management approach where the 'state provides macro guidance, while localities focus on independent innovation.' Given the different natural environment and economic development levels of regions, it is important to encourage all areas to explore solutions tailored to their situation. National environmental protection departments should strengthen macro-level guidance, provide fundamental laws, regulations and standards, and minimize the prescription of unified approaches that are applied to all regions. The creativity and initiatives of local environmental departments should be encouraged so that they can fulfill their responsibility to protect and improve local environmental quality. The development of important environmental policies should be based on pilot projects conducted in different places.

4. POLICIES AND RECOMMENDATIONS FOR ENVIRONMENTAL PROTECTION INSTITUTIONAL REFORM

The previous sections of this report have analyzed the present status and problems of environmental protection institutions in China, discussed the principles behind an ecological civilization, introduced key principles (including international experiences), and proposed general directions for reform. This section will propose specific policies and recommendations for much needed reform. Environmental protection institutions are the foundation of environmental protection. A variety of reforms in environmental protection institutions and policies will be needed. The Task Force has focused on reforms relating to pollution prevention and control and ecological and environmental protection. The Task Force suggests policy recommendations related to 5 key areas for institutional reform and further specifies 17 more specific suggestions. In the Task Force's opinion, there has not been sufficient attention paid to several of these key points. These points should now be urgently emphasized. Other points are raised as innovative examples of institutional reforms coming from international experiences; they can serve as practical and feasible ideas and reference points. Other important ideas related to institutional reform covered by special studies of CCICED will not be included here.

4.1. Mobilize All Stakeholders to Engage in Ecological Civilization, Clarify Responsibilities, Coordinate Policies and Integrate Objectives

According to the requirements proposed by the 18th National Congress of CPC, ecological civilization is by no means simply the task of environmental protection departments. All departments of the State Council must act to incorporate ecological civilization into their activities tied to advancing economic, political, cultural and social progress. Considering the problems tied to the lack of clarity in the delineation of departmental responsibilities, the fragmented approach to achieving ecological civilization objectives, lack of coordination on river basin and regional environmental issues, and inefficiencies in existing policies, institutional reforms should focus on the following:

(i) The State Council should further clarify responsibilities linked to an ecological civilization for all governmental departments (especially the economic departments) by developing new responsibilities and functional plans, which define responsibilities, organizational structure and staff size. This would push the responsible authorities to more effectively implement their functions in a resources-saving and environmental-friendly manner. Improvement of environmental quality shall be defined as a hard requirement for local governments. Third party independent evaluation of the performance of relevant ministries under the State Council and local governments should be organized periodically, and the results should be publicly disclosed.

(ii) Establish a State Council Environmental Protection Committee (or State Council Sustainable Development Committee), with a relevant State Council leader acting as chairman. The Committee shall be responsible for guiding and coordinating environmental protection responsibilities, objectives and tasks of departments; coordinating regional and river-basin ecological protection and pollution prevention/control; assessing environmental impacts of major national decisions; and providing incentives for, or assessing punishments on ministries under the State

Council and local governments based on their environmental performance.

(iii) In the State Council's next round of government reforms, pollution prevention responsibilities should be integrated bringing together the functions of water pollution control and conservation and biodiversity protection. Environmental protection functions should be separated from resource development management functions. Nature reserve management and other cross-cutting functions should be unified under an independent regulatory and enforcement power.

4.2. Establish Incentive Mechanisms to Encourage Environmental Protection

China has developed many laws, regulations, polices and standards on environmental protection; however, there are enforcement gaps. Considering the externalities caused by pollution to public property and the environment, it is necessary to maintain pressure on polluters. It is also very important to consider how to motivate companies, industries and local governments to protect the environment. A sound balance between regulation and punishment and guidance and incentives shall be achieved; that is, both carrots and sticks will be needed. In terms of institutional reform, special attention should be paid to the following:

(i) Various fiscal and taxation measures and pricing and financial policies that encourage environmental protection should be promoted. Fiscal investments for environmental protection at various levels of governments have long been relatively low. The central government should take the leading role in ensuring that the growth rate of the central fiscal budget for environmental protection is no lower than the growth rate in revenue. Under the 'polluter pays' principle, special environmental pollution funds should be set up (e.g., a soil contamination remediation fund) to raise funds for pollution control. For the construction and operation of environmental infrastructure, models of public-private partnerships (PPP) should be used more often to leverage social capital and technology, make full use of market mechanisms, reduce the cost of investment and improve operational performance.

(ii) An enterprise environmental credit system according to the principle of 'incentivize credit and penalize dishonesty' should be established. This can be jointly implemented by the Ministry of Environmental Protection in cooperation with the People's Bank of China and the China Banking Regulatory Commission (CBRC). Third-party social non-profit agencies and organizations are encouraged to participate in the evaluation. Enterprises should be categorized by their performance. Those enterprises that comply with environmental protection laws should be encouraged; those that deliberately discharge pollution illegally should be cracked down on and publicly disclosed. For small and medium sized enterprises (SMEs), a pollution treatment service platform should be provided.

(iii) Voluntary action by industries and enterprises — examples being the Green Supply Chain Program and the Top Runner Program, environmental labeling of products, and green procurement — should be promoted. The best performers can be rewarded with incentives provided by the government.

(iv) Following the principle of 'he who pollutes pays, he who damages compensates, he who protects benefits,' speed up the promotion and improvement of an ecological compensation system and mobilize the enthusiasm of local governments for protecting

the environment, especially in areas experiencing fiscal difficulties. In the short-term, great efforts should be made to disseminate Shandong and Hebei provinces' experiences with river-basin ecological compensation pilots.

4.3. Strengthen Social Governance of Environmental Protection by Engaging Multiple Stakeholders

Social governance is the weak link in the environmental governance triangle connecting the government, enterprises and society, and should be strengthened in order to modernize the environmental governance system. Currently, environmental demonstrations in reaction to environmental problems are on the rise. The government is losing credibility, and the public has limited ability to control polluting enterprises. All of these points indicate that social environmental governance is a weak link in environmental protection. In order to solve China's environmental problems, a governance structure led by the government but with the active participation of multiple stakeholders should be developed. To this end, special attention should be paid to the following:

(i) Public participation, information disclosure and environmental litigation should be promoted as stipulated by the new Environmental Protection Law. In terms of environmental information reporting and disclosure, a key focus should be enterprises' self-reporting of their pollution discharges, pollution treatment and the environmental risks of the pollutants being used. Enterprises should report to the government and release information to society as prescribed by regulations. Social organizations and the public should have the right under the law to require environmental protection departments and enterprises to provide environmental information. Punishments should be developed for those enterprises that fail to provide information in a timely manner as required by law.

(ii) Environmental protection social organizations should be encouraged to play a role in environmental governance. A supportive environment that facilitates their involvement should be developed. Laws and regulations that protect their legitimate rights and interests as well as regulate their behavior are needed. Mechanisms that encourage public and private funding of social organizations, including government procurement of their services and a tax exemption policy for public welfare projects, should be developed.

(iii) Encourage grassroots organizations (including committees of villagers, urban neighborhood committees, property owner committees, etc.) to focus on environmental management issues and embrace the public's environmental demands. Develop community by-laws for environmental protection, advocate green lifestyles, solve the problems of noise pollution and garbage separation via self-governance, and cooperate with the government to collect sewage treatment fees and refuse disposal fees in accordance with established rules. The government should provide environmental information, give guidance and training, as well as establish a mechanism for regular communication and consultation.

(iv) The CCICED or relevant departments should conduct special research on the Aarhus Convention, so as to draw lessons from international experiences related to public participation in environmental protection and multi-stakeholder governance.

4.4. Match the Environmental Protection Department's Authority, Capacity and Resources to its Supervision and Management Functions and Tasks

As a large developing country that has experienced rapid economic development, China is experiencing extremely complex environmental problems. China has formulated many laws, regulations, policies and standards, and has decided upon a grand vision of building a 'Beautiful China'. To achieve this goal there must be an organization with sufficient authority and a strong team to steer environmental protection work. The national environmental protection agency only became a department of the State Council in 2008. The environmental protection department has long been a weak division and as a result has struggled to fulfill its mandated tasks. Substantially strengthening the environmental protection department's supervision and management functions and enforcement ability should be top priorities. Special attention should be given to the following:

(i) The provision in the Environmental Protection Law which specifies that the competent department of environmental protection 'conduct a unified supervision and management of the environmental protection work throughout the country' should be enforced. The State Council should formulate relevant administrative rules and regulations that clearly specify the responsibilities, authority and work procedures for environmental protection departments to be able to supervise the environmental protection work carried out by government departments at the same and lower levels. Such supervision is to be carried out by environmental protection departments in collaboration with supervisory departments, and the results should be publicly disclosed to effectively enhance the supervision and enforcement authority of environmental protection departments.

(ii) Establish a unified environmental information platform to achieve timely and accurate data sharing. Develop relevant plans, standards and procedures to guide various departments and local governments to collect and disclose environmental information. Set up a national environmental quality monitoring network under the unified management of the Ministry of Environmental Protection. Reform the environment statistical system. Gradually establish a statistical data collection system based on surveys made at sampling sites and use the material balance and pollution discharge coefficient method to improve data quality and reduce the potential for external manipulation of data. Improve the quality of the China Environment Bulletin providing more details on environmental protection activities, especially the evaluation results of local government environmental performance, so as to increase the transparency and influence of the Bulletin.

(iii) Increase fiscal investments in environmental science research, monitoring and information capacity, and supervision and enforcement capacity, and improve the efficiency of the use of funds. Reform public institutions for environmental protection, adjust and optimize their organizational structure, and reduce the staff size that is supported by public funds. Encourage provision of environmental services through market mechanisms. Increase the number of civil servants in environmental protection departments to match their workload. Meanwhile, improve the management competency and public communication ability of environmental management staff, speed up the development of legal interpretations of the duties of environmental law enforcement staff, and require them to strictly adhere to implementation procedures prescribed by environmental protection laws and regulations.

4.5. Reform Environmental Management Institutions to Improve the Efficiency and Effectiveness of Implementation

Currently, there are multiple systems regulating emissions of industrial pollutants, including total emission controls, environmental impact assessments, the 'Three Simultaneities' system, pollution permits, pollution discharge fees, etc. In addition, there are emission standards for various pollutants and environmental quality standards which are used as quantitative requirements and pollution control targets. However, environmental pollution remains severe and quite a number of enterprises are not in compliance with emission standards. Institutional arrangements have contributed to enforcement problems. There is a need to review the scientific basis and rationality of these systems, increase enforcement efficiency by improving and integrating implementation mechanisms, and revise environmental protection laws and policies based on scientific research and environmental management needs. The following reforms should be pursued:

(i) Based on scientific assessments, reform the total emission control system to improve environmental quality and bring regions into compliance with environmental quality standards. Develop a comprehensive total emission control system that covers primary pollutants, and CO_2 emissions from the consumption of fossil fuels. Put in place regional, river-basin and sectoral total emission control systems that are based on each region's environmental carrying capacity. Incorporate total emission controls for enterprises and other institutions into pollution permit systems. Strengthen permitting standards for high energy consuming and emission producing as well as resource-intensive industries. Define specific requirements for resource and energy savings and pollution discharges. Finally, reform the requirements for environmental permits so as to take into consideration regional resource endowments, environmental capacity and ecological conditions.

(ii) Speed up the formulation of relevant laws and regulations and implementation methods for an emission permit system at the national level. Provide a legal basis for the establishment of a nationwide emission permitting system which is unified, fair, feasible and embraces all kinds of pollutants. Total pollution discharge limits should be defined according to emission standards, cleaner production levels and the total emission control indicators for local environmental quality. All pollutant discharging entities should register their emissions with environmental protection departments which should be the issuing agents of pollution permits under a unified regulatory system.

(iii) Reform the environmental impact assessment (EIA) system to achieve coordination with the pollution permitting system. A pilot can be tried that integrates EIA and pollution permit approval with the aim of developing less-environmentally impacting industrial projects, a more simplified and unified permit system, and a more efficient environmental approval process. The EIA system should be applied on strategies, plans and policies, as well as cross-regional and river basin projects that may have significant ecological impacts.

(iv) Strengthen the link between environment and health institutions and the ecological environmental damage compensation and accountability system. Increase the cost for enterprises and individuals of violating the law causing ecological damage. Despite the efforts made by environmental protection departments, it is also important to strengthen

the responsibility and capacity of the judicial system to investigate environmental violations. There should be proper and timely handling of disputes tied to environmental damage compensation and fair expectations regarding burden of proof requirements in environmental damage cases. Establish mechanisms for appraising the scope and costs and assessing the responsibilities for environmental damages. Improve the public interest litigation system, and accept public interest environmental cases filed by governmental and social organizations according to laws and regulations in a timely fashion. Strengthen the intensity of investigations into environmental criminal liability to ensure offenders are sanctioned accordingly.

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