Chapter 9
Green Finance

9.1 Introduction

In recent years, international practices in the field of ecological conservation finance have developed rapidly, and innovative models for mobilizing resources from the public and private sectors have continuously emerged. However, it also faces many challenges, such as a large funding gap and insufficient attention to ecological and biodiversity protection by financial institutions and institutional investors. The Tenth Conference of the Parties to the Convention on Biological Diversity (CBD COP 10), held in Aichi Prefecture, Japan, in 2010, adopted a global Biodiversity Strategic Plan for 2011–2020, and set 20 outline goals for ecological conservation during this decade, known as the Aichi Goals. But as things stand, most of Aichi's goals will be lost. The enormous challenges of COVID-19 show that improving resilience in areas such as health, climate, biodiversity, air pollution, and food is fundamental to achieving sustainable development. While some regions have made tackling climate change part of their recovery plans, there is still little focus on biodiversity conservation and nature-based solutions. At the same time, since the outbreak of COVID-19, the world, especially developing countries, has faced economic recession and worsening public debt, which is likely to lead to deforestation in poor areas. Local governments may also pay less attention to—and reduce investment in—biodiversity protection, resulting in damage to biodiversity. In this context, maximizing the mobilization of financial resources—through the development of ecological protection finance to support ecological protection and biodiversity protection—is crucial.

On the basis of the first phase of work in the first half of 2019–2020, the Green Finance Task Group has conducted the second phase of research work since the second half of 2020. The research results include five topics: "Promoting the Positive Principle of Nature," "Financial Practice of Ecological Protection of Chinese Institutional Investors," "Innovation of Financial Instruments for Ecological Protection," "Impact of Agricultural Subsidies on the Behavior of Financial Institutions," "Debt and Biodiversity," and an annex, "Fintech and Biodiversity," as well as a

China Council for International Cooperation on Environment and Development (CCICED) Secretariat, *Green Recovery with Resilience and High Quality Development*, https://doi.org/10.1007/978-981-19-9470-8_9

research report entitled "The Important Role of Green Finance in the Rehabilitation of Abandoned Mines Is Urgently Needed—Taking Agriculture in Huifeng, Sishui, Shandong Province as an Example." Based on the above research, the Green Finance task force has put forward policy recommendations for the development of ecological conservation finance for the 15th Conference of the Parties to the United Nations Convention on Biological Diversity (COP 15) to be held in Yunnan, China.

These studies are a joint effort by Chinese and international research teams in the Green Finance Research team, with the support of the China Council for International Cooperation on Environment and Development. The Chinese team carried out several investigations in Beijing and Shanghai on sovereign wealth funds, public and private equity funds, securities brokers, social security funds, bank finance subsidiaries, etc., and went to Shandong province to carry out a special investigation on mine restoration projects. In addition, due to travel restrictions caused by the pandemic, members of the Green finance expert group at home and abroad were unable to meet offline for the second phase of the study. For productive discussions and working sessions, GIZ organized three webinars—online study tours—on behalf of the BMU. Experts from leading international institutions and the private sector were invited to present their findings, including Simon Zadek and Ashley Gorst (F4B), Sejal Patel and Paul Steele (IIED), Rebecca Ray (Boston University), Guillaume Gruere and Silvia Sorescu (OECD), Terrence Townshend (Paulson Institute), Jeen Nijboer (Rabobank), Marianne Haahr (Green Digital Finance Alliance), Sebastian Bekker (Natural Capital Finance Union/United Nations Environment Programme WMCM) and Colette Grosscurt (ACTIAM). The results of these meetings are reflected in the reports in each section.

In addition, the report pays special attention to the role and impact of gender issues in green finance. The fifth of the UN Sustainable Development Goals—achieving gender equality and empowering all women and girls—is a cross-cutting theme that covers all the 2030 Sustainable Development Goals and is seen as an important driver of biodiversity conservation. According to the 2015–2020 Gender Action Plan under the UN CBD, considering the link between gender issues and biodiversity, it is necessary to clarify the impact and relevance of gender roles on the use, management and conservation of biodiversity. Gender roles include gender-based division of labour and responsibilities, priorities, decision-making rights, and knowledge and skills that affect how men and women use and manage ecological resources. At the same time, the formulation and implementation of various ecological protection policies and measures will also have a crucial impact on different gender roles, thus determining the realization of gender equality goals. Centring on the topic of biodiversity finance, this study integrates the gender mainstreaming perspective into various parts of the research and tries to discover and elaborate the internal connection and mutual promotion between the two, while considering how to take into account the integration in policy recommendations as appropriate.

9.2 Develop Ecological Protection Finance and Advancing the Nature-Positive Principle

9.2.1 Development of Finance and Nature-Positive Principle

The finance system sits at the apex of—and serves and influences—the whole economy. Some argue that the application of a guiding principle within finance in relation to nature is necessary, as finance plays such a crucial role [1]. Internationally, in respect of climate change, the role of finance has become accepted as core to the Net-Zero Transition, with policies to advance this goal infusing fiscal design, public spending, supervision and private financial institutions [2]. If it were adopted, an equivalent nature principle could have similar far-reaching effects, affecting decision making and operations throughout the financial system: through private finance in the form of pensions, insurance, asset management and banking; and, through public finance in the form of public banks, sovereign wealth funds, sovereign debt issuance, central bank market operations, and overseas development finance.

The Dasgupta Review 2021 compiled evidence that a redirection of finance and new capital flows is needed to avoid large future economic losses from the degradation of nature and to avoid the loss of nature inheritance by future generations [3]. The climate and biodiversity agendas are front and centre in national and international agendas in 2021, with the Conferences of the Parties for UNFCC and the CBD. Whereas, in finance, a transition of the system to net-zero carbon has begun, a debate has begun over whether a parallel transition should follow close behind for nature and biodiversity [4]. An international search has started within the environment advocacy community for an overarching principle to describe and for coordinating this transition, and "nature positive" has emerged as a leading option, backed by NGOs particularly in North America and Europe [5]. This chapter describes the range of issues that would favour the complete application of the principle to the finance sector, were the principle to be adopted internationally.

Going beyond "Do No Harm," the nature-positive principle is both proactive and ambitious. The CCICED has already examined the principle of "Do No Harm," making recommendations covering SDG 15, ecological redlining, mainstream biodiversity screening, mitigation hierarchies and SEAs, and governance and financing structures for implementation [6]. The "Do No Harm" principle, together with the principle of "No Net Loss," embody ideas of protection and avoidance of loss, but the question is whether they address the large-scale restoration and recovery of depleted natural systems which would secure a thriving planet: whether they are sufficiently aspirational. A range of views has joined in an international debate, between the more inclusive language of "nature" and the narrower language of "biodiversity," the role of offsetting, and the dimensions of metrics for measuring performance [7]. These international views, in the NGO community in particular, have coalesced around the nature-positive principle, and this principle is beginning to attract broader political

interest. This paper considers the application of this language to finance in a Chinese context.

Growing citizen awareness internationally of the state of nature has lifted this issue up the political agenda. With the G7 meeting in June expected to lay out the political framework for the climate and Biodiversity Conferences of the Parties later in 2021, there might be strong international interest in landing a guiding policy principle for nature and biodiversity. The existing institutional networks, culture, and capabilities within finance that have been built up to tackle climate change, are now at the very early stages of addressing themselves to nature. For example, the Dutch central bank has reported on macro-prudential risks arising from the depletion of nature [8]. This system, which has been built to address climate change, could be extended to address nature. The early stages of this institutional and market program are evidenced by a large number of papers published on the subject internationally over the last 18 months [9].

The application of the nature-positive principle in finance creates market opportunities. When China introduced the Green Finance Principles and the Net-Zero principle, they supported a huge growth in green finance [10]. China made a bold commitment to a low-carbon economy, achieving an emissions peak before 2030 and achieving carbon neutrality before 2060 [11]. Internationally, the CBD has suggested a milestone in 2030 and a long-term goal in 2050 to stop and reverse the loss of biodiversity [12]. This raises a question for the international community and for China: could a nature-positive transition lend itself to a similar medium-term milestone and long-term goal? Countries around the world, including China, have already developed strategic frameworks for net-zero, consisting of milestones, targets, target allocations and road maps, transition pathways, policy instruments, and supporting institutions [13]. A possible next step for China and countries internationally would be to take a similar approach to a transition in nature. Quite often, one sees countries develop independent pieces of policy in an area and then, when sufficient pieces are in place and political momentum has built up, the country brings them together into a unifying strategy. The signs that this may happen soon internationally include the publication of papers, articles, and political statements; the movement forward of new policies on agricultural subsidies (such as the UK Environmental Land Management Scheme); the commencement of initiatives on financial risk and nature (such as the Task Force on Nature-Related Disclosure); activities on financial product classification (the EU taxonomy); work on trade rules and nature (EU, UK); and, preparations underway in some countries for the publication of nature strategies (e.g., UK, end 2021). These might, in due time, all be brought together in overarching nature transition policies, with a coordinating statement of mission.

The early focus of a nature transition would be likely to be on standards, data and accountability. The machinery that would allow states and markets to govern and operate a nature transition is now beginning to be developed, though still at an early stage. They involve standards (e.g., IUCN's work on standards for nature-based solutions); definitions; monitoring; data collection and access; indicators; and

accountability. Fintech has a critical role to play in wiring these data flows into the financial system [14].

The transition could create opportunities for investment in nature—where previously there was disinvestment—and in new financial products. Internationally, the financial institutions already pursue growth in new asset classes (such as renewable energy) and new products (such as Environment Social and Governance-focused portfolios) to meet the demands of consumers [15]. Similarly, the nature-positive transition might offer new strategic opportunities in new asset classes (such as nature-based solutions) and new products (nature-positive portfolios) as well as a host of ancillary services in fintech, which are elaborated below and in an annexe. There is a great deal of interest internationally in those aspects nearest to market (nature-based solutions and natural-climate solutions) and investment has been starting to flow into fintech in this area, particularly over the last 12 months [16]. To date, it remains a voluntary activity, but if it becomes compliance-driven, then a very rapid market expansion could follow. Internationally, governments are working out how to channel overseas development funds at scale into this channel.

When advocating and applying the nature-positive principle, financial institutions and other key players should understand and take into account the roles, needs, and capacities of men and women, and use this understanding to inform the design, implementation, and monitoring of gender-equitable finance initiatives. The integration of gender considerations into decision making and operations not only advances gender equality (SDG 5), but can also unlock the potential of genders that might not otherwise be given opportunity, enhancing the social and environmental benefits of conservation finance projects.

Internationally, early stage discussions have recognized that a full transition to a nature-positive financial system would involve new policies of economics and finance ministries. In its fullest version, central banks and financial services regulators could write policies equivalent to the nature-positive principle. This would mirror actions in jurisdictions such as the City of London to tackle climate change, where finance ministries and supervisors have applied the levers of governance—data analysis, disclosure and risk management machinery, investment policies and the customer engagement of the financial sector—in pursuit of a net-zero carbon outcome [17]. The most ambitious emerging thinking internationally on nature, for example from the Finance for Biodiversity Initiative and from the Paulson Institute, is that the financial system could be harnessed for the purpose of a nature-positive transition, or a similar overarching goal [1].

All of the above relate both to countries' domestic activities and their international activities. Internationally, some countries are now at an early stage of thinking about the links between nature, biodiversity, and finance in their international activities such as supply chain finance, overseas investments, sovereign debt purchasing and overseas development aid [18]. This shows lessons learned from earlier debt-for-nature swaps [19].

This section describes, using international examples:

- The definition of nature positive
- The role of a nature-positive finance system
- Opportunities that will be created for China in green finance, in greening mainstream assets and in new classes of natural assets
- The role of a nature-positive approach to finance in the greening of supply chains
- The role of fintech
- Application to the Belt and Road Initiative (BRI)
- The relationship between a nature-positive approach to finance and ecological redlining.

9.2.2 Definition and Attributes of the Nature-Positive Principle

The nature-positive principle is outcome focused—those outcomes being the ecosystem services provided by nature and the assets underlying them. The principle embodies biodiversity and does not substitute its unique ecosystem services for other forms of nature. Since it is ecosystem services-based, it engages with the discipline of natural capital accounting and allows a balance sheet of assets and liabilities to be developed to manage change and to link with financial data [20].

It is scalable and adaptable. It allows all forms of institutions to adopt and to coordinate around a defined, policy-equivalent mission, which could be set at international, regional, national, or local level and for institutions themselves. Thus, it can mesh with the jurisdictions of existing policy, legal, market, and institutional structures.

The nature-positive principle can be implemented consistently with other principles. The precautionary principle, the polluter-pays principle, the mitigation hierarchy and other rules which help to achieve just, efficient outcomes, all complement the nature-positive principle, because it describes only what should be achieved, not how it should be done. It can complement the rights and duties of Indigenous peoples and of consumers. Also, because it is purpose-focused, it complements more descriptive, categorical systems such as the EU taxonomy (classification and labelling) of real economy and financial assets [21]. Although the principle would be consistent with the practice of offsetting, which some international civil society organizations have opposed, it is also consistent with legal protection of natural assets, conservation of high-value assets and emerging legal concepts such as "ecocide."

Recommendation for China
Develop a proposal for the adoption of a nature-positive standard by banks, insurers (underwriters), asset owners, and asset managers.

Set out how the nature-positive target relates to reduction in losses, net addition, recovery, and metrics.

9.2.3 Framework for a Nature-Positive Transition of the Financial System

Finance is a system, through which a guiding principle such as "nature positive" could be applied on some or, in its fullest extent, on all elements. The Finance for Biodiversity Initiative has kick-started a debate by putting forward its ambitious view on how the fullest application of a nature-positive principle would apply to six elements. Internationally, some governments and countries have taken the first tentative steps in some of these areas, and there is now a debate about which areas to pursue first and how far and fast to take them forward. Here are the initiative's recommendations.

9.2.3.1 Advance Citizens' Nature Choices: Financial Institutions Take Account of Citizens' Individual and Collective Nature-Related Rights and Preferences in Their Financing Decisions

(i) Financial institutions inform and empower citizens to make biodiversity-related choices, as savers, lenders, insurers, consumers, voters, and taxpayers.
(ii) Regulators require financial institutions to adopt compliance processes to respect the heritage rights of indigenous communities to biodiversity stewardship and use, and to respect their traditional livelihoods.

This would mean giving citizens the rights to choose financial products with specific nature objectives, such as "nature-positive alignment." This would be a specific extension of ESG-aligned reporting and portfolios, which have been growing rapidly internationally on a voluntary basis and have become much more popular with consumers in recent years. A question for governments is whether to intervene at all in the way the market is developing by itself.

In order to enable citizens' nature choices, financial institutions would take account of the nature-related rights and preferences of groups, including women, in investment and financing decision making and project implementation. Across many communities, women as caretakers, natural resource managers, and users occupy roles that are vital to their families, communities, and society. Nonetheless, evidence shows that women have limited rights and access to, benefits from, and control over resources. The principle of gender mainstreaming complements the nature-positive principle and can be implemented in accordance with the CBD Gender Action Plan.

Recommendation for China
Ensure, by 2023, that pension and other investment and savings funds offer customers a choice of products which includes nature-positive-aligned funds.

9.2.3.2 Disclose Impacts on Nature: Financial Institutions Publicly Disclose Actual and Expected Nature Impacts and Associated Risks

(i) Financial institutions make the data and assumptions underlying reported impacts and risks publicly available, to enable effective citizen and shareholder action, and to facilitate the setting of effective standards, policies and regulations.
(ii) Regulators require financial institutions regularly and publicly to report the nature impact of their entire balance sheets, and to stress-test expected nature risk.

One of the likely early areas of action is data. Data availability brings many public benefits, so governments internationally have taken an interest in this area, supporting new initiatives in standard setting, platform development, and data R&D. In particular within finance, there is already government interest and funding for institutions to develop quantitative reporting of impact and risk relating to nature in the future. The arrangements for private finance institutions are in the most advanced stage of discussion, through the Taskforce on Nature-Related Financial Disclosure (TNFD), whose mandate is to prepare some of the standardized practices that would be needed to implement this element [22]. Stress testing methods could be adapted from climate change stress testing which are now in place in a number of international financial jurisdictions worldwide. The French government has introduced the "Loi de Vigilance" in France, which introduces new corporate duties, obliging companies to govern and report on the activities of their overseas activities in relation to human rights, fundamental freedoms, human rights, and the environment [23]. This approach offers an example that can be used to embody the protection of nature.

Recommendations for China
Chinese and international banks should develop a quantitative approach to the use of standards, risk and impact assessment, and reporting in relation to nature and collaborate with other international institutions to work toward a convergent and harmonized set of standards as these develop worldwide.

Chinese financial institutions should support, track closely, and participate in the Task Force on Nature-Related Financial Disclosure.

9.2.3.3 Create Liability for Nature: Legal Systems Make Financial Institutions Liable for Biodiversity Impacts

(i) Legislators extend liability for nature damage caused by companies to their banks and other financing institutions.
(ii) Regulators require financial institutions and corporations to establish nature protection as a public fiduciary responsibility of company directors in their corporate governance.

Incentives are material to causing the current situation of nature depletion. Although it is true in many jurisdictions that financial incentives to avoid harm to nature are weak or absent, it might also be one of the most difficult situations to reverse politically. Internationally, the debate has focused on soft commodity supply chains, in particular timber, with the European Union introducing legislation and the UK with a draft bill progressing through its legislative chambers. So far, there have not been exclusions within investment management, in the same way that tobacco and arms are screened out of ethical investment portfolios, to remove activities that damage high-value protected areas and threaten species, though this could develop. In addition, there have been discussions among legal reform experts, which have not yet crystallized into legislation in any countries, to create a new crime of "ecocide" associated with the loss of species or significant damage to ecosystems.

Recommendations for China

China should debate and identify ways to address the role and responsibility of financiers and to extend legal liability to those who contribute to damaging nature.

China should consider the introduction of extra-territorial law to stem the use of Chinese capital and financial institutions to finance activities that damage nature beyond its frontiers.

China should articulate the concept of "ecocide" in law, to enable the courts to pursue the most serious cases of damage. It should also support and contribute to the movement seeking to develop the concept of "ecocide" in international law.

9.2.3.4 Align Public Finance with Nature: Governments and Public Agencies Transparently Align All Public Finance to Biodiversity-Related Policies, Goals and Commitments

(i) Governments eliminate or reform all nature-negative subsidies and taxes and develop and scale up incentives for biodiversity restoration.
(ii) This process should address public procurement, investments and financial instrument design, sovereign debt arrangements and monetary practices.

Public finance is a rich area of action for government. Fiscal reform covers agriculture and fishing subsidies, and the procurement of biodiversity restoration. The first of these is the subject of another CCICED paper [24]. The reform of subsidies and public spending has been discussed for many years, but now the discussion is reaching wider into non-fiscal components. The non-fiscal components include governments' role as owner and funder (and policy-manager) of state-owned financial institutions (such as national banks and international development banks), and its role as lender or donor to development finance institutions. As direct owner, it can make corporate policy equivalent to its national policies on nature positive, and as a lender or donor it can make the investment and grant mandates equivalent in the same way. A government can also use its operation in sovereign debt markets to constrain the use of proceeds from its sovereign bond holdings, for example, through the arrangements becoming known as "Nature Performance Bonds," a concept now being developed internationally and which may be housed in a new international facility at the World Bank [19].

Recommendations for China
China should map out a nature-positive transition for public finance and subsidy practice, including overseas investment mandates and the investment mandates of its policy banks and development finance institutions.

China supports the international Global Platform on Debt, Climate and Nature currently being designed by the World Bank.

9.2.3.5 Align Private Finance with Public Policy: Financial Institutions Ensure that Their Activities Are Consistent with Nature-Related Public Policies, Goals, and Commitments

(i) Financial institutions align their financing with biodiversity-related public policies and international commitments—for example, through assurance of net gain of biodiversity and ecosystem services.
(ii) Regulators require financial institutions to align their financial practices, including the design of financial instruments, offers, and services, with the

nature-related public policies and nature-related international public policy commitments in jurisdictions where they operate.

Research shows that very few financial institutions internationally have policies relating to nature and biodiversity; in contrast, many more have adopted policies on climate change, including net-zero targets [25]. Some have signed up to the Finance for Biodiversity Pledge, but all are at an early stage of understanding the meaning of a nature-positive or similar transition for finance [26]. It seems possible, internationally, that the pattern of behaviour seen in financial institutions in the last couple of years in relation to climate, where more and more ambitious policies have been adopted, could be followed in relation to nature and biodiversity over the next 5 years. Internationally, financial supervisors and regulators have been willing to require their sectors to manage long-term risk but have not been willing to direct them in their investment policies. Those regulators have hardly begun to look at nature and biodiversity, and there is a debate whether they and the sectors they oversee have sufficient capacity to deal with nature on top of climate change. However, if and when they do decide to address nature, an overarching principle such as nature positive would provide them with a clear direction of travel.

Recommendations for China on Financial Corporate Policy and Fiscal Instruments
China should define the role and expected behaviour standards of its financial institutions—along with their rights and responsibilities—and incorporate these in a plan for a nature-positive transition.

9.2.3.6 Integrate Nature into Financial Governance

(i) Governance arrangements, including mandates, instruments, and the basis on which governing bodies are held to account, should be demonstrably responsible, capable, and effective in stewarding the impacts of finance on biodiversity.
(ii) Financial governance institutions, including financial regulators and monetary authorities, standards setters, and those with fiduciary responsibilities for financial assets, should publicly explain the past and likely future impacts of their decisions and actions on biodiversity.

Prior to 2014, not one central bank considered climate change to be its business. By 2020, there was not one major central bank worldwide that did not speak of its forward-looking approach to climate change. This shift was brought about in large part by exemplary leadership. Such leadership acted within their authority in addressing the risk climate change poses to financial stability. But in truth, they were as much driven by a conviction that central banks and financial regulators needed

to play their part in addressing a global, existential challenge. Indeed, these leaders ensured that their progress would not be impeded by incumbent governance norms by inventing a new platform: the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). The NGFS is now starting to look at nature and biodiversity. The Dutch central bank has been an early mover, with the publication of estimates of nature dependency which makes the case for management of risk.

Those governing global finance will wish to consider the materiality of biodiversity in financing decisions. Central banks and financial regulators can advance this only by acting within their authority. Yet precedent shows that their mandates can and often are broadly interpreted. Indeed, the Group of Thirty, an international body of leading financiers, in a landmark report following the Great Financial Crisis, concluded that central banks should align with long-term public policy goals (while avoiding being responsive to shorter-term public policy measures) [27]. As financial regulators, then, there is a debate to be had about what alignment would mean. It could mean ensuring that licensed financial institutions align their behaviour and impacts with such long-term policy goals and not only with the needs of robust risk pricing and financial stability.

Recommendations for China on Financial Regulation

The People's Bank of China and the three leading supervisory authorities (CBRC, CIRC and CSRC) should agree on how to address biodiversity risk and impact within their respective sectors and develop policies to ensure a rapid transition to alignment with the nature-positive principle.

China's banks should then adopt policies that align with Chinese government principles, policy milestones, and targets for a nature-positive transition.

9.2.4 Enabler: The Role of Fintech

Strategies are needed to align the financial system with the broader goal of Eco-Civilization, where the flows of finance restore damaged ecosystems and favour overall balance between the natural environment and human endeavours. The implementation of a nature-positive standard would today be greatly facilitated by the judicious application of digital financial technology, i.e., fintech.

One of the common sources of resistance to greater accountability by financial sector actors for their impact on nature is that the full range of tools, namely regulations, standards, data, accounting practices, and reporting guidelines, are not in place. Under normal circumstances, the process to put this arsenal of measures in place would be long and arduous. Today, however, fintech can greatly accelerate and facilitate the uptake of new standards and practices.

While the applications of fintech to nature and ecosystems are still comparatively underdeveloped compared with other applications, for example to climate change, the gap is rapidly being filled. Developments in China and abroad suggest that there is a wide range of ways in which fintech can help speed the alignment of finance with the requirements of nature. Key among these are the following.

Big Data: The increasing availability of and access to data relating to nature and natural resources, and the changes to them over time, is both speeding up the time between research and results and generating a base foundation of information to inform financial decisions, whether assessing risk or measuring impact. Open, accessible databases such as the Global Biodiversity Information Facility further increase availability and comparability of data, greatly reducing the obstacles to sound financial decision making [28].

Artificial Intelligence: The application of artificial intelligence and machine learning has accelerated enormously over the past decade, and it can now handle much of what previously required time-consuming and tedious research. By combining data sets, AI can both pinpoint the problems with more accuracy and sharpen the focus of interventions to solve these problems. Now well developed in fields like agricultural production, there remains a gap to be filled in applying AI to natural resources and the impact of human activity on them. It is a gap that must be filled urgently.

Blockchain: Distributed ledger technology, often referred to as Blockchain, can greatly improve the security and reliability of both data and the legal infrastructure that underlies accountability for damage to nature. Blockchain land registers, contracts, and other basic documentation can greatly reduce conflict and corruption around access to and use of natural resources and clarify property and access rights. Blockchain also greatly enhances the traceability and certification of products deriving from exploitation of nature, including financial instruments such as green bonds. Similarly, they can correct the power imbalances that too often lead to private over-exploitation of nature. However, the application of Blockchain technology to reduce the impact of human activity on nature remains in its infancy [29].

The Internet of Things (IoT): Connecting technology, instruments, and communications to the Internet and harvesting the information that is automatically generated, both vastly improves the availability of data and relieves the sometimes massive burden of sifting through and combining data sets to generate the information needed. The nature-positive standard requires a strong foundation of data, hence IoT might be an important and automated provider of much of the data needed to underpin its implementation.

The above base factors deriving from new fintech applications can, if properly applied, overcome many of the obstacles that lie in the way of the rapid adoption and application of a nature-positive standard and greatly improve the accountability of financial actors in respect of agreed standards. The application of the full range of fintech approaches would facilitate the **Digitization of Natural Assets**.

Fintech can assist by building models of economic development that respect nature by **"digitizing" natural assets** such as trees or water courses so as to enable trade,

investment, and valuation. The construction of an open, digitized platform on the basis of these assets would assist in boosting the transparency and traceability and might provide the foundation, for example, for a green credit system. It might also overcome the problem of data compartmentalization, enabling combination of data across enterprises and financial actors.

Disclosure of Risk and Impact: The assessment of the nature-based risks inherent in any financial transaction and the measurement of the impact on nature of these transactions, is a central challenge. Fintech applications favour and facilitate transparency and enable streamlined disclosure of risks and impacts such as these, making it possible to greatly increase the recognition of nature in governance systems and policies. It enables financial institutions to engage responsibly in the implementation of the nature-positive principle, and to apply it to those to whom they lend or in whom they invest.

Public Engagement: The implementation of the nature-positive standard is both a supply and demand challenge. Fintech facilitates both. The contribution of Fintech to the supply challenge has been outlined above. Moreover, by facilitating transparency and the accuracy of information, it can greatly support the growing demand from consumers and the public for greater responsibility toward nature. Crowd-sourced science, using mobile phone applications, is already boosting accountability as people check and communicate to public authorities and private funders what is being done with their money, correcting misinformation and building a community around a vocal demand for better outcomes. The potential of fintech to create and reinforce the demand for nature-responsible finance is only beginning to be understood.

Since the beginning of the twenty-first century, China has become a global frontrunner in fintech. In addition, China has demonstrated to the world its firm determination to establish a "national ecological civilization" and participate in "global climate governance." This sets the most favourable policy environment for the green application of China's fintech. However, as is the case in the Netherlands, Germany, and Spain, etc., the policy integration between fintech and green finance is still very limited, and the policy guidelines in both fields underestimate the nature-positive principle. Currently, the main challenges faced by fintech in supporting the development of biodiversity protection include:

1. **How to design and promote biodiversity conservation from the perspective of commercial feasibility**: Because technology companies generally have a low awareness of the importance and relevance of biodiversity protection with their businesses, the operability of incorporating biodiversity protection into the company's business strategy and utilizing financial technology to measure, certify, and translate it into business profit is still in a very early stage of exploration. There is still a lack of nature-positive business models, like Ant Forest, in the market for firms to learn and to borrow form.
2. **How to promote citizens' engagement in biodiversity protection**: While it has been well accepted that fintech has a great potential to arouse citizens' green awareness and encourage engagement in personal natural positive behaviours, in

the practice such importance and value have not been fully understood. Neither national nor local governments have introduced incentive mechanisms directly linked to consumers' individual green behaviours.

3. **How to promote the participation of SMEs**: At present, large companies are still the main players in ecological protection projects, and the participation of SMEs is still very limited. "Native" green fintechs are very rare.
4. **How to promote data quality and data sharing**: For the cross-border data platforms and transaction platforms, cross-border information transmission, mutual recognition and sharing face complex national and international legal issues. Moreover, the defining, pricing, and trading (i.e., liquidity) issues of data-driven biodiversity projects and assets directly affect the value of data.

Recommendations for China on Fintech

China should explicitly develop and adopt strategic guidelines to encourage fintech for biodiversity, releasing a strong policy signal to the market. It should promote the inclusion of nature-positive application of fintech into the 14th Five-Year Plan and actively seek a leading position in the field to contribute to global ecological progress.

China should identify and map out the many ways in which fintech can be enlisted in support of a nature-positive standard, pinpoint gaps in present practice and establish a program to minimize these gaps.

China should strengthen ecological protection responsibilities of the fintech industry and companies. It should establish knowledge exchanges and seminars along with regional green education centres for fintech companies, promote information sharing and green capacity building, and improve publicity and stimulate companies to innovate on nature-based sustainable business models. It might consider establishing "fintech + biodiversity protection" pilot/demonstration zones.

China should focus especially on fintech applications that enable transparency, disclosure and the accurate assessment of risk and impact related to finance and biodiversity. These should be designed with a view to their widespread use both within China and abroad, starting in key areas for biodiversity.

China should favour fintech applications that widen the opportunities for stakeholder participation in exercising accountability around a nature-positive standard.

China should favour the development of green/biodiversity infrastructure, in particular green data/biodiversity platforms, and continually support the monitoring and research of green/biodiversity data.

9.3 "Throttling": Ensuring that Funds Flow to Support Conservation

9.3.1 Practices of Chinese Institutional Investors in Conservation Finance

9.3.1.1 Background

In this chapter, the term "institutional investor" refers to a legal entity that is qualified to invest in financial markets, and includes sovereign wealth funds, public or private equity funds, qualified foreign investor (QFII), brokerages, insurance, social security funds, wealth management subsidiary companies of commercial banks and asset management companies etc. Most of these companies hold financial licences, but some institutions (such as private equity funds, small asset management companies, private investment companies, government investment and financing platforms) have not been included as financial institutions. In recent years, institutional investors' activities and quota in China's financial market are increasing gradually. The quota increased from 136.6 to 4718.1 billion RMB at a 30% average annual growth rate. Along with the establishment and improvement of China's green financial policy, institutional investors, especially large institutional investors, have made great efforts in the practice of sustainable investment, and environmental, social, and corporate governance (ESG) investment. The research finds that there is rising attention and enthusiasm for green finance and ESG investment from China's institutional investors, with the number of financial products growing. However, their practices in conservation finance are still in the initial stages, with a lot of room for improvement in the future. Large institutional investors, such as sovereign wealth funds, asset management companies, and commercial insurance companies, have not yet incorporated ecological and biodiversity conservation into their investment strategies and decision-making systems.

9.3.1.2 Practices of Chinese Institutional Investors in Developing Conservation Finance

Investment Funds, Securities Companies and Banks Have Launched More Ecological Protection Financial Practices

In practice, Chinese investment funds, securities brokerages, and bank wealth management companies pay more attention to ecological protection finance. Some institutions have incorporated ecological protection into their development framework from a strategic level, and actively explored products related to ecological protection in the development of green finance and ESG investment.

(1) Funds

Funds are participating in conservation finance through ESG investments. In the past few years, more and more foundations of China have braced the concept of green development and ESG into their investment strategies. The tendency has become even more distinct since June 2018, when MSCI introduced Class-A Shares in China into two of its ESG indexes, namely the MSCI Emerging Markets Index and the MSCI ACWI Index. In this mechanism, listed companies that do not meet the ESG standards will be removed. The research finds that there are a large number of publicly offered funds striving to improve their ESG frameworks by building internal ESG rating teams and cooperating with third-party rating companies or databases. According to the "China Responsible Investment Annual Report 2020" jointly released by Shandao Ronggreen and China Responsible Investment Forum (China SIF), by the end of October 2020, there were 127 pan-ESG public fund products in China, with a total scale of more than 120 billion yuan.

(2) Securities Companies

At present, many securities companies in China (including asset management companies) have begun to conduct studies on ecological protection investment. The securities companies no longer see the concept of green finance as a brand strategy like 10 years ago, but also as an innovative product that possesses both economic and social benefits. China is now developing a multi-win–win market for participants, including institutional investors, private investors, and project managers. An example is that Industrial Securities implements the concept of green development in terms of green financial evaluation criteria, business assessment criteria, and organizational structure reform and has formed a comprehensive planning of "four-in-one" system including green investment, green financing, green research, and environmental equity, and aims at being an exemplary and leading role in China's security industry.

(3) Bank Finance Companies

Commercial banks are the core of China's financial system, and ecological protection finance is an important embodiment of commercial banks' development of green finance and practice of sustainable development. In recent years, ESG and other ecological protection concepts have been applied to bank finance, and "bank department" ESG-themed finance products have become increasingly mature. In April 2019, Huaxia Bank launched the first ESG-themed financial products in China. As of December 10, 2020, there are 49 ESG and environmental protection-themed products in the market of bank financial products, and the investment targets include green bonds, green ABS, and debt assets of enterprises with good ESG performance. It covers key areas such as energy conservation, environmental protection, ecological protection, high-quality development, clean energy, rural vitalization, and people's livelihoods.

The Financial Progress of Sovereign Wealth Funds, Asset Management, Insurance, Investment Companies, Government Investment and Financing Platforms for Ecological Protection Is Relatively Slow

At present, China's sovereign wealth funds, asset management companies and insurance companies have made relatively slow progress in ecological protection finance. Despite the increased emphasis in recent years, no specific financial planning for ecological conservation or biodiversity has been developed at the strategic level.

The main reason is that the asset owners do not pay enough attention to ecological protection. As the performance assessment of managers by owners is still based on the return on investment, institutional investors put the return on investment in the first place when making investment choices, take the preservation and appreciation of assets as the core business objective, and give little consideration to ecological protection. In contrast, investment managers who have been entrusted by conservation-focused funders (such as those from Europe) have been faster to form ESG evaluation teams and introducing ESG criteria into their investment decisions.

9.3.1.3 The Policy Environment for China's Large-Scale Institutional Investors in Conservation Finance

Although at present the Chinese government has not issued policies specifically aimed at ecological protection, it has issued many policies in green finance that relate to ecological conservation, which has laid a good foundation for the start and promotion of conservation finance.

Financial Policy

There are two kinds of policies encouraging financial institutional investors to participate in developing conservation finance. One type is the policies published in 2015 and 2016 related to energy conservation and emission reduction, ecological protection, and the overall planning for green finance systems. The other one involves the measures of serving the economic entities, promoting high-quality economic development, revitalize rural areas and improve the green and low-carbon system. These policies are mainly macro-level advice and guidance, and are connected with the concepts of financial innovation, low-carbon economics, and ecological restoration under the framework of green finance (see the attachment).

Fiscal Policy

The fiscal policies encouraging institutional investors to participate in conservation finance are mainly embodied in China's energy conservation and environmental protection planning in the 13th Five-Year Plan period. These policies focus more

on increasing government's funds for energy conservation and emission reduction projects, compensation for ecological protection, and implementing preferential tax policies on environmental protection and pollution prevention and control etc.

Environmental Policy (Industrial Policy)

China is encouraging institutional investors to develop conservation finance via improving various systems of ecological conservation in top-level policies, such as the Ecological Civilization Reform Plan, the Green Industry Guidance Catalogue, and the 14th Five-Year Plan.

9.3.1.4 Challenges and Obstacles of China's Large-Scale Institutional Investors in Developing Conservation Finance

Although China has made significant progress in green finance recently, the development of conservation finance under the framework of green finance is still in its infancy. In general, institutional investors lack incentives to invest in conservation finance. They should build the concept of conservation finance into their investment strategy, take the lead in the practice, and have the courage to explore and develop the corresponding financial investment products.

The Less Knowledge and Attention to Conservation Finance

At present, with the support of the Chinese government, green finance has made great progress both in theory and in practice. However, regarding ecological protection finance, although there is some overlap with green finance, there are also some differences. As pointed out in Chap. 2, the nature-positive principle goes beyond the "no-harm" principle and "no-net-loss" principle in the past, and is more proactive and more effective in ecological and environmental protection. China's green economy focuses more on economic sustainability and does less to support environmental remediation and biodiversity conservation. As a result, the concept of ecological protection finance has not been widely promoted and recognized in China. Many market entities only know about green finance and ESG concepts, and do not regard ecological protection finance or even biodiversity finance as an important business goal. The research and innovation of ecological protection finance are relatively insufficient, and there is no special strategy put forward or ecological protection investment with distinct theme.

The Economic Returns of Conservation Projects Are Not Clear

First, China's green finance mainly focuses on (1) green upgrading of traditional industries, (2) energy conservation and emission reduction, (3) important ecological resource restoration led by government financial funds, (4) construction of green towns and industrial parks, (5) new energy represented by photovoltaic and automotive lithium batteries, and (6) emerging industries represented by new materials and energy-saving equipment. Ecological protection projects have low returns, long cycles and high risks, and most of them cannot gain direct benefits in the short term or even in the long term, so there are still few conservation investment projects that can realize the economic and social benefits together. With the uncertainties of economic and investment returns combined with the absence of successful cases of conservation investment, institutional investors have fewer incentives to pilot conservation finance, and the motivation to promote conservation finance and innovate new products and services is low.

Second, the institutional investors cannot find proper matching of investment targets. There are strict rules on the amount of assets, such as net assets required by the authorities. In the secondary market, there is a lack of listed company stocks directly related to ecological protection. Furthermore, the selection strategy is profit oriented. The environmental performance is only an auxiliary means of identifying the potential risk of enterprises, rather than the major consideration.

Infrastructure for Conservation Finance Is Imperfect

The major challenges of conservation finance are the long investment cycle and the uncertain investment returns without a unified evaluation system. On the one hand, the mechanisms of information disclosure are not perfect. Except for a few highly polluting industries, there is no mandatory requirement for conservation protection disclosure. It is difficult for investment institutions to accurately judge the risk and return of ecological protection investment. On the other hand, the standard for ecological protection is not clear. It is hard to price ecological assets, which makes it difficult for investment institutions to carry out post-investment management.

Relatively Lack of Policy Incentives

From the perspective of projects, the anticipated cash flow for the project is uncertain. There are two types of benefits from conservation projects that have no positive incentive for investors, namely incomes from tourism projects and the carbon sink benefits from the protected areas (e.g., forests, wetlands). As for tourism projects with conservation goals, they are more like the spillover effect brought by environmental improvement after the remediation. It cannot be directly distributed to the investors as the income of restoration project. As for the carbon sink benefits, due to the relatively loose quota allocation in China's pilot carbon market, the carbon price was

too low to generate enough benefits of the carbon sink for conservation projects. Therefore, it is necessary to stimulate ecological protection finance from the policy level. However, the research found that the current policy incentives are relatively insufficient, making it difficult for institutional investors to develop and promote related products.

From the perspective of management, as the entrusting and supervising parties of large state-owned institutional investors, the government bodies have not yet incorporated ecological and biodiversity conservation into the performance evaluation system. Under the condition that the current evaluation system focuses on financial returns and has clear assessment criteria for financial returns, the motivation of state-owned institutional investors to invest in natural ecological assets is obviously insufficient.

9.3.2 The Impact of Agricultural Subsidy Policy on Financial Institutions

9.3.2.1 The Main Forms of Agricultural Subsidies in China and Their Impact on the Financial System

For a long time, China has built a complete agricultural support policy system oriented to increasing production and income. This system has played an important role in ensuring China's grain supply and promoting the increase of farmers' income, but it has also caused serious damage to the agricultural ecological environment. China has gradually changed the policy orientation of one-sided pursuit of increasing production and started to implement a new agricultural subsidy policy system that combines the dual objectives of increasing production with ecological protection.

The Main Form of Agricultural Subsidies in China

China's agricultural subsidies are mainly for grain production. In 2016, based on the experience gained from pilot projects, China rolled out the reform of the agricultural subsidies, combining "subsidies for superior crop varieties," "direct subsidies for grain," and "general subsidies for agricultural means of production" into "subsidies for agricultural support and protection." The policy objectives were to protect the fertility of cultivated land and appropriately scale grain operations. At the same time, China also has carried on the reserve policy reform, establishing the "soybean target price subsidies" and "corn producer subsidies." After the 2016 reform, China's main agricultural subsidies can be divided into four categories: Direct Subsidies, Producer Subsidies, the Policy of Minimum Grain Purchase Prices (MGPP) and Agricultural Insurance Premium Subsidies (AIPS) (Table 9.1).

Table 9.1 China's main agricultural subsidy policies

Types of agricultural subsidies	WTO policy attributes	Amount of subsidy (billion CNY)
1. Direct subsidies		
(1) Agricultural support and protection subsidies (ASPS)		163.35
Land fertility protection subsidies (LFPS)	Green box policy	141.66
Moderate-scale operation of grain subsidies (MSOGS)	Amber box policy	21.69
(2) Purchase subsidies for agricultural machinery (PSAM)	Amber box policy	25.66
2. Producer subsidies		
(1) Corn producer subsidy (CPS)	Blue box policy	39.03
(2) Soybean producer subsidy (SPS)	Blue box policy	7.34
3. The policy of minimum grain purchase prices (MGPP)		
(1) The policy of minimum rice purchase prices (MRPP)	Amber box policy	/
(2) The policy of minimum wheat purchase prices (MWPP)	Amber box policy	/
4. Agricultural insurance premium subsidies (AIPS)	Green box policy	28.8

Data source WTO domestic support notification documents

The Influence of China's Agricultural Subsidy Policy on the Behaviour of Financial Institutions

The main purpose of agricultural subsidy policy is to adjust the behaviour of agricultural producers. However, different forms of subsidies will have different effects on the behaviour of financial institutions, but generally speaking, financial institutions' responses to agricultural subsidy policies are mainly divided into two categories: adjustment of lending scale and adjustment of premium prices.

(1) Green Box Policy

Green box policy refers to the policy that has only a slight distorting effect on agricultural trade and agricultural production. China's green box policy mainly consists of LFPS and AIPS.

LFPS is provided to the actual cultivators according to the area of the land, but in practice, the subsidies are often directly issued to the farmers who have the right to contract the land. Therefore, LFPS does not easily affect the production behaviour of farmers, but is more like a transfer payment to improve their income. In the process of subsidies, farmers' incomes are raised, and financial constraints are eased, and

demand for credit is reduced, which may lead financial institutions to scale back lending.

AIPS makes the government bear part of the insurance cost for farmers, so it will promote farmers' demand for agricultural insurance. AIPS have greatly increased the number of farmers purchasing insurance and significantly expanded the scale of the agricultural insurance market, which will inevitably prompt major financial institutions to increase the supply of agricultural insurance products and increase the premium prices.

(2) Amber Box Policy

Amber box policies are direct price interventions and subsidies for agricultural products that distort agricultural trade. China's amber box policy mainly includes MSOGS, PSAM, and MGPP.

MSOGS is a subsidy given to farmers who grow grain to a certain extent, which can effectively promote farmers' moderate-scale operation. Stimulated by subsidies, farmers' enthusiasm for food production will increase, and the transferring of land to expand the scale of operation will increase. The scale expansion will lead to an increase in the demand for agricultural machinery, which is generally manifested as a substantial increase in the demand for credit. In China's institutional context, where rural land rights can be mortgaged, financial institutions are likely to expand lending accordingly.

PSAM can reduce the capital cost of farmers' purchasing agricultural machinery and effectively stimulate farmers' demand for agricultural machinery. However, even with subsidies, most farmers cannot afford to buy farm machinery at full cost, so a rise in the demand for farm machinery will inevitably lead to an increase in the demand for credit. In addition, improved agricultural machinery will encourage farmers to expand production, which in turn will lead to higher levels of credit demand growth. Under such circumstances, financial institutions will lend more.

MGPP is to guarantee the income of rice and wheat farmers and help them avoid being excessively affected by the fluctuation of agricultural prices, which will undoubtedly increase the enthusiasm of farmers to plant rice and wheat. Such an increase in enthusiasm will, on the one hand, put more land into agricultural production; on the other hand, it will also increase the use of pesticides and fertilizers by farmers. All these behaviours will increase farmers' demand for funds. Under such circumstances, financial institutions will raise the threshold of lending and moderately expand the scale of lending. In addition, since MGPP has a certain degree of substitution relationship with AIPS, the subsidy will also reduce the insurance demand of farmers and make financial institutions lower the price of insurance products.

(3) Blue Box Policy

The blue box policy is the special amber box policy of direct payment in connection with the production restriction program. China's blue box policy is mainly producer subsidies for corn and soybeans.

Table 9.2 Behavioural responses of farmers and financial institutions under the stimulus of agricultural subsidy policy

Type	Agricultural subsidy policy	Behavioural responses of agricultural producers	Behavioural responses of financial institutions
Green box policy	LFPS	Falling demand for credit	Scale back lending
	AIPS	Increased demand for insurance	Increase the price of insurance premiums
Amber box policy	MSOGS	Enlarge the scale of agriculture; increased demand for credit	Expand lending
	PSAM	Demand for agricultural machinery increased; increased demand for credit	Expand lending
	MGPP	The enthusiasm for agricultural production was increased; increased demand for credit; falling demand for insurance	Raise the loan threshold; expand lending; reduce insurance premium prices
Blue box policy	Producer subsidies	The proportion of corn and soybean increased	Raise the premium prices of corn and soybeans

Producer subsidies are aimed at farmers who plant corn and soybeans. This subsidy is an adjustment of agricultural structure and will encourage farmers to plant more corn and soybeans. China's soybean and corn production areas are mainly in the north, and increasing the planting area of corn and soybean will mainly reduce the size of the area growing wheat. However, since the production cost of wheat differs little from that of corn and soybeans, it will not have a big impact on farmers' demand for credit. On the other hand, due to the adjustment of varieties, the demand for corn and soybean insurance products will increase, financial institutions will launch more corn and soybean insurance products and increase the insurance premium price (Table 9.2).

9.3.2.2 The Impacts of China's Agricultural Subsidies on the Environment and Ecosystem

The Possible Impacts of China's Traditional Agricultural Subsidies on Nature and Ecosystems

Most of subsidies mentioned above were not designed with an eye to environmental protection, causing some negative environmental externalities.

(1) **The income effect of the general subsidies for purchasing agricultural supplies may lead to excessive use of chemical fertilizers, pesticides, and mulching film by farmers, which may cause agricultural non-point source pollution.**

The widespread use of chemical fertilizers and pesticides has played a vital role in promoting grain production and ensuring China's food security. At the same time, planting is also a dominant source of water and soil pollution. Subsidy policies for specific fertilizers and pesticides help encourage farmers to choose high-yielding crop varieties, but they have long-term adverse effects on soil and water resources. According to China's national pollution survey data, the total nitrogen loss from the planting industry in 2007 was 1.5978 million tons, and total phosphorus loss of 108,700 tons, accounting for 33.8% and 25.7% of the country's total nitrogen and total phosphorus emissions respectively. Residual pesticides and fertilizers have also directly destroyed the agricultural ecosystem and biodiversity in some areas, posing a greater threat to the survival of fish, amphibians, waterfowl, and beasts. Mulch film has been largely used and lightly recycled, and the problem of residual pollution and land erosion of mulch in some areas has become increasingly serious.

(2) **Multiple subsidy policies have led to more land that is unsuitable for farming being put into agricultural production, which may disrupt the ecological balance.**

In order to obtain a number of agricultural subsidies, there may be a phenomenon of excessive land reclamation and land wasting. Excessive development has caused vegetation destruction and soil erosion to increase, some rivers have reduced or even cut off flow during dry seasons, rivers have increased sand content, and pollution of drinking water sources still occurs from time to time, which were influenced by long-distance transportation of inland pollutants and unfavourable meteorological conditions such as local pollution source emissions.

(3) **The direct subsidies to grain growers encourage farmers to grow the same grain crops annually, resulting in a single planting structure and a decline in soil fertility.**

The traditional model of diversified planting is extremely important to maintain the balance of the farmland ecosystem, while the specialized single crop production model guided by subsidies breaks the original farmland ecological balance. At the same time, with an increasing number of migrant workers, farmers are more inclined to plant food crops with high-yield, low-input, easy management, and relatively stable prices in the agricultural production of main grain production areas. This reduces the buffering performance of the farmland ecosystem. Farming techniques of ridge and plowing may aggravate the decomposition of soil organic matter and structural damage, and also aggravate the threat of disease and insect pests to food production, becoming a potential factor that seriously affects the country's food security.

(4) **The economic incentives of agricultural insurance may lead to the separation of planting and breeding industries, and the discharge of livestock and poultry wastes has become an important source of water pollution.**

Traditionally, farmers operated diversified planting and breeding, and used human and animal manure as fertilizer to fertilize crops. At the same time, the waste generated in the process of crop production can also be used to feed animals, which is green and environment friendly. The ecological circular development model can minimize the adverse effects of external materials on the rural environment.

The emergence of agricultural insurance has formed an alternative to the traditional agricultural risk dispersion model of diversified planting; that is, farmers can also provide risk protection for their agricultural production by purchasing agricultural insurance services. If farmers choose to engage in specialized planting or breeding under the economic incentives of agricultural insurance, the original circular economy development model will be challenged. To increase the output of agricultural products, farmers must continue to increase the input of pesticides and fertilizers, causing soil structure to suffer. Environmental destruction and the untreated discharge of livestock manure caused by large-scale breeding will also become a serious environmental problem.

Characteristics of the Transformation of Agricultural Subsidies in China in Recent Years

(1) **The orientation of general subsidies for purchasing agricultural supplies is transferred to green and sustainable objects.**

In response to the high price of chemical fertilizers at the beginning of this century—and the widespread fertilization in rural areas combined with the serious problem of excessive fertilization in some areas—the central government established and implemented a soil testing and formula fertilization subsidy program in 2005. As of 2019, China has invested 10.4 billion yuan in subsidies for soil testing and formula fertilization. During the 13th Five-Year Plan period, with the adjustment of agricultural policies and green development policies, the use of chemical fertilizers nationwide has experienced decline for four consecutive years from 2016 to 2019, and the intensity of fertilizer use has also maintained a downward trend. In the planting industry, the main driving force for emission reduction comes from the decline in the total amount of fertilizer application, the continuous optimization of the fertilizer input structure and the further improvement of fertilizer utilization.

(2) **General subsidies for purchasing agricultural supplies have mainly shifted from the promotion and use to the end of recycling.**

In 2017, the Ministry of Agriculture issued the "Agricultural Film Recycling Action Plan." The plan encourages 100 counties in Gansu, Xinjiang, and Inner Mongolia to promote the transformation of subsidy funds from supplementary use to supplementary recovery while farming corn, cotton, and potato. Vigorously promote the mechanical picking of mulch film, open subsidies for mulch film recycling machines, and make up for them. In 2019, the central government will continue to support local

governments in recycling waste mulch film to promote the construction of agricultural film recycling demonstration counties.

(3) **An ecological compensation mechanism should be established to promote the balance between nature and the ecosystem.**

For example, in view of the serious soil erosion in the middle reaches of the Yellow River, the central government has increased its subsidies. In 2019, the National Development and Reform Commission issued the Pilot Plan for Comprehensive Ecological Compensation, taking the lead in pilot projects for comprehensive ecological compensation in five counties (county-level cities and districts) in each of 10 provinces.

9.4 "Broaden Sources": Increasing Green Funding Sources

9.4.1 The Innovation of Conservation Financial Instruments

9.4.1.1 Developing REITs of Ecological Environment Infrastructure in China

China's Ecological Environmental Infrastructure Urgently Needs to Broaden Financing Channels

(1) The Investment Demand of Ecological Environment Infrastructure Is Very High

The traditional ecological environment infrastructure is mainly about all kinds of pollution control, involving air pollution control, solid waste pollution control, noise pollution control, and other aspects. The specific projects include domestic sewage treatment plants, sewage treatment pipe networks, industrial solid waste disposal facilities, etc. In March 2020, China proposed to speed up the construction of new infrastructure. The new infrastructure of ecological environment includes the green transformation of traditional infrastructure (such as charging stations (piles) of new energy vehicles), intelligent and digital transformation (such as domestic waste transfer system based on Internet of Things), etc. Both traditional and new eco-environmental infrastructures need huge capital investment. Taking the upgrading of urban sewage in China as an example, according to the calculation of China Merchants Securities, the investment scale of this project alone is more than 800 billion yuan.

(2) The Sources of Funds for Eco-environmental Infrastructure Are Insufficient

Due to the characteristics of strong public welfare and low commercial return rate, the sources of investment funds for eco-environmental infrastructure mainly focus on two ways. One is government financial funds or bank credit funds relying on government credit, including financing through PPP projects supported by the government.

The COVID-19 pandemic has brought about slower economic growth and increased government investment since 2020, which has led to a more tense fiscal situation in China. At the same time, defusing the hidden debt of local government led to decreasing financial support of this channel. Second, enterprises raise funds from the financial market. Affected by the economic environment, China's power, water, gas and heat, garbage, and hazardous waste industries have a high level of asset liability ratio and their financing ability is limited. Many enterprises engaged in ecological environment infrastructure investment are private small and medium-sized enterprises, so it is difficult to obtain green bond issuing qualifications in the bond market or green credit funds from banks. Moreover, their own operations are facing difficulties, and the investment of free cash flow in ecological environment infrastructure is declining.

China has begun to introduce REITs in the infrastructure sector. In June 2021, China's first batch of nine infrastructure REITS was listed, of which two were ecological and environmental infrastructure projects.

Problems in REITs of Ecological Environment Infrastructure

(1) Lack of Tax Incentives

China's environmental protection projects involve many taxes from construction, transfer, and disposal, such as land value-added tax, transfer income tax, business tax, deed tax, and stamp tax; in the operation stage, they face double taxation of enterprise income tax and individual income tax which directly affect the enthusiasm of all parties involved in Chinese REITs. The international mature REITs usually enjoy various preferential tax policies. For example, the American REITs stipulate that if the company meets certain requirements, it can be exempted from corporate income tax and only levy individual income tax on investors. Tax policy has a direct impact on the enthusiasm of China's REIT participants.

(2) Lack of Liquidity and Low Yield

The real estate ownership and franchise of eco-environmental infrastructure have a fixed term, which affects the valuation and pricing of assets. Compared with real estate REITs, the valuation of environmental protection facilities REITs under the income method has decreased year by year, and, due to the relatively poor liquidity, the return rate of environmental protection facilities REITs has been further reduced.

(3) Franchise and Ownership Transfer Channels Are Not Smooth

Infrastructure funds should penetrate through vehicles such as asset-backed securities and project companies to acquire full ownership or concession rights of projects. However, some projects currently have problems with restrictions on land or equity transfer and the need to obtain the consent of the competent authorities for the transfer of concessions. In the transfer of state capital, there is also a need to fulfill the procedure of state capital entry transaction, but the relevant supporting policies are not

perfect. These original institutional regulations are contradictory to the characteristics of REITs, and supporting policies to solve the above problems are not yet in place.

9.4.1.2 Practice of Government Guidance Funds Based on Ecological Protection

Recently, in order to promote ecological protection and support sustainable economic development, the central and local governments and state-owned enterprises have launched certain explorations and practices in setting up government guidance funds based on green development. However, compared with other fields, the scale is relatively limited, and there is still a lot of room for development in the future.[1]

Development Status

Government guidance funds based on green development mainly include the National Green Development Fund, the Yangtze River Green Development Fund, and the green industry investment funds initiated and established by local governments. The National Green Development Fund was initiated and established by the Ministry of Finance, the Ministry of Ecological Resources, and the Shanghai Municipal Government in July 2020. The operating entity is the National Green Development Fund Co., Ltd. (located in Shanghai), and the initial scale is 88.5 billion yuan. The Yangtze River Green Development Fund was established in November 2019. It is jointly funded by Three Gorges Group, Three Gorges Capital Holdings Co., Ltd. under Beijing Enterprises Water Group, and Beijing Enterprises Financial Services (Beijing) Investment Holdings Co., Ltd. The initial scale is 20 billion yuan.

In recent years, the local government level has also begun to establish guidance funds related to green industries and sustainable development. More than 10 provinces have set up nearly 20 green development guidance funds at the provincial level, with a target scale of nearly 500 billion yuan (Table 9.3).

Problems and Obstacles

(1) Little Input into Green Projects

Because the establishment of the Green Development Fund has been relatively short, it is still in the stage of organizational structure establishment, preliminary market research, and expansion of strategic cooperation. There is a lack of specific ecological protection investment projects. From the local government level, the fund establishment time that can be found in public information is after 2016, and about half of

[1] The government guidance fund in this article is a broad concept, including not only the guidance fund established by government finances, but also the guidance fund established at the level of central enterprises and state-owned enterprises.

Table 9.3 Guiding funds related to ecological protection in recent years

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
1	Shandong Province	Green Development Fund, 2017	10 billion yuan	Comprehensive use of sovereign loan funds from Asian Development Bank, French Development Agency and other countries to attract social capital to participate together. It is the first green fund set up at the provincial level with loans from international financial organizations. Focus on energy conservation and emission reduction, environmental protection and governance, clean energy, circular economy, green manufacturing, climate change, etc.
2	Shandong Province	Three Gorges Green Industry (Shandong) Equity Investment Fund, 2020	5 billion yuan	It is jointly invested and established by Three Gorges Capital Holdings, Qingdao West Coast New Area Ocean Holding Group and provincial, municipal and district-level guiding funds. Focus on clean energy, eco-environmental protection and other green industrial chain areas, and boost the conversion strategy of new and old kinetic energy in Shandong Province

(continued)

Table 9.3 (continued)

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
3	Hebei Province	Green Economy Development Fund, 2019	2 billion yuan for the first phase	Hebei Xintou Group and International Green Economy Association invested and established, focusing on supporting a number of energy-saving and environmental protection enterprises to build a green manufacturing industry with Hebei characteristics
4	Shanxi Province	SDIC Green Energy Development Fund, 2018	1 billion yuan	Shanxi State Investment Corporation, Shanxi Securities, Zhangze Power and other provincial state-owned enterprises jointly launched, focusing on green power generation projects
5	Liaoning Province	Low-Carbon Green Industry Investment Fund, 2020	3 billion yuan, 500 million yuan for the first phase	Invest in the equity of outstanding enterprises in the field of environmental protection industry, key projects in the field of environmental protection, advanced environmental protection equipment manufacturing, smart environmental protection, and carbon sink trading
6	Liaoning Province	New Energy and Low-Carbon Industry Investment Fund, 2011	5 billion yuan	Liaoning Energy Investment (Group) Co., Ltd. was jointly established with Haitong Securities Co., Ltd., focusing on new energy and low-carbon industries

(continued)

Table 9.3 (continued)

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
7	Jiangsu Province	Ecological Environment Development Fund, 2017	80 billion yuan, 6 billion yuan for the first phase	Huarong Tianze Investment Co., Ltd., a subsidiary of China Huarong, was jointly established with the Jiangsu Provincial Government Investment Fund, with Jiangsu Eco-environmental Protection Investment Fund and Jiangsu Eco-environmental Protection Facility Upgrading Fund, etc., focusing on the projects in the library of "263" special action project
8	Zhejiang Province	"Two Mountains" Rural Revitalization Green Development Investment Fund, 2020	1 billion yuan	Anji County People's Government, Zhejiang Jinkong and China Land Reclamation Industry Development Fund jointly set up 9 investment projects, covering many industries such as ecological agriculture and tourism in Anji County

(continued)

Table 9.3 (continued)

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
9	Henan Province	Green Development Fund, 2019	16 billion yuan, 3.5 billion yuan in the first phase	The provincial finance, Henan Agricultural Comprehensive Development Corporation and relevant provincial cities jointly funded projects in areas such as clean energy, ecological environment protection and restoration, garbage and sewage treatment, soil remediation and treatment, and green forestry in Henan Province
10	Guangdong Province	Green Industry Investment Fund, 2016	5 billion yuan	It is composed of 50 million yuan of government guidance funds and 4.95 billion yuan of social funds. The early investment direction is to promote the urban green lighting demonstration city project and promote the development of green lighting industry
11	Sichuan Province	Urban and Rural Green Development Industry Guidance Fund, 2016	40 billion yuan	Sichuan Provincial Department of Housing and Urban–Rural Development, Provincial Development and Reform Commission, Provincial Key Office and related enterprises participated in the establishment, and focused on supporting innovative enterprises in the initial stage

(continued)

Table 9.3 (continued)

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
12	Guangxi Province	Green Emerging Industry Fund, 2020	5 billion yuan, 1 billion yuan for the first phase	CICC Capital Operation Co., Ltd., Guangxi Forestry Group Co., Ltd. and Nanning Industrial Investment Group Co., Ltd. are jointly established, which will focus on serving the development of green emerging industries, building the development pattern of high-end green home industry chain, and supporting the transformation and upgrading of high-end manufacturing, electronic information and big health industries
13	Ningxia Province	Green Industry Development Fund, 2017	2 billion yuan	Rundongfang is jointly established with Ningxia Agricultural Investment Group, which mainly invests in green industry projects
14	Ningxia Province	Environmental Protection Industry Fund, 2017	1 billion yuan, 500 million yuan for the first phase	The government's guiding fund is 100 million yuan, and 900 million yuan is raised from social investors and financial institutions
15	Guizhou Province	Industrial and Provincial State-Owned Enterprise Green Development Fund, 2019	30 billion yuan	It consists of three parts: Guizhou provincial financial industry special funds, provincial state-owned enterprise funds integrated investment and social capital directional collection, and invests in high-quality industries and state-owned enterprises with good development prospects and good growth

(continued)

Table 9.3 (continued)

	Provinces and cities of the fund	Fund name and year of establishment	Fund size (100 million yuan)	Establishment and main investment direction
16	Guizhou Province	Green Industry Poverty Alleviation Investment Fund, 2017	90 billion yuan in 2020	Focus on providing financial support around the rural industrial revolution and twelve major agricultural characteristic industries

Note The author organizes based on public information

the funds were established after 2019. Many of them are still in the fundraising stage and have not yet been actually operated.

(2) Unclear Positioning and Development Goals

First, some provinces equate ecological protection guidance funds with emerging industry investment funds and agricultural funds. Although marked "green" in the name, these funds did not invest strictly in ecological protection projects. Most of the investments flow to high-tech enterprises or other agricultural enterprises.

Second, some local governments have a strong arbitrariness in determining the amount of funds and the target amount. Some provinces did not consider the local economy, financial environment and green industry project conditions; therefore, the determination of the number of funds and the target amount was relatively arbitrary. Under this circumstance, the scale of the fund is too large, and the proportion of amplifying social capital through fiscal funds is too high. Not only may it cause greater difficulties in social fundraising, but it will also make the government have a weaker voice in the follow-up fund investment, which is not conducive to the long-term development of the fund.

(3) Imperfect Management Mechanism

First, there are too many institutional constraints and lengthy decision-making procedures. Some local governments still stick to the traditional financial special fund management thinking for fund management. They use administrative means to intervene or replace supervision, resulting in low fund efficiency. In addition, relatively few projects receiving investment from green funds have been disclosed.

Second, supervision and performance evaluation of government guide funds are imperfect. In terms of supervision, it is supervised jointly by the Ministry of Finance, the National Development and Reform Commission, and the industrial sector. In terms of performance evaluation, a nationwide system has not yet been established, and some documents have only a principled discussion. As a result, the evaluation systems of local governments also mainly focus on the investment, progress, and withdrawal of capital, which is unable to comprehensively and effectively supervise and evaluate the daily management and operation of the fund.

In addition, most of the guidance funds have strict regulations on investment income and periods and are subject to strict restrictions on the preservation and appreciation of state-owned assets. However, ecological protection-related projects generally have a long investment period, and the annual cash flow cannot be guaranteed. This does not match the investment preferences of the guidance fund, which easily leads to the difficulty of landing the ecological protection guidance fund.

(4) Lack of Investment Standards

At present, the environmental information disclosure mechanism, especially the information disclosure of non-listed companies, is incomplete. The standards for ecological projects and green projects have not yet been fully established. As a result, the ecological protection guidance fund, like other ecological protection finance, lacks investment instruments, and advances relatively slowly.

9.4.2 Debt and Biodiversity Conservation

China is increasingly prioritizing nature as a central component of its policy making. The target to reach net-zero emissions by 2060 and the hosting of the 15th Convention on Biological Diversity this year on a post-2020 Global Biodiversity Framework underline China's global leadership on the environment.

Across emerging markets there is a growing debt and nature crisis. Half of low-income countries are either at high risk of or in debt distress, creating the need for immediate fiscal space and resources to drive economic growth. Many of these nations are dependent on nature to drive productivity and service debt payments, fuelling international discussions about potential solutions to address debt and nature issues together. The G20 is advancing discussions on the range of solutions to address both crises, with China's role as a creditor putting it in a position to engage in discussions on how to support debtors through the crisis.

Sustainable debt issuance has grown rapidly across international and Chinese financial markets. Global sustainability-aligned debt now exceeds USD 1.5 trillion and is expected to make up 10% of global issuance in 2021. China is a global leader in green bonds, with the domestic bond market worth USD 120 billion, the second largest market in the world. The sophisticated architecture and implementation capacity that China has developed to rapidly advance this market puts it at the forefront of emerging developments in global debt markets.

A new generation of sovereign debt instruments captures the financial risks and opportunities posed by nature and climate. Nature performance bonds are instruments that link debt terms to nature outcomes, providing ways for issuers and investors to build green considerations into financial markets. These range from sustainability-linked instruments that link debt terms with performance outcomes to more established green bonds focused on financing nature-positive investments. The growth of these products in sovereign and corporate bond markets offers China global opportunities to deploy these instruments in the current crisis and to integrate nature more broadly into financial markets.

China is uniquely positioned to seize the opportunity to rapidly develop a program to support the uptake of sovereign and domestic nature performance bonds. To advance this, China can undertake practical steps to consolidate emerging international best practice and build on its strong domestic experience in green bond markets. The following paper sets out three key recommendations that China could carry out to advance this agenda:

1. A technical analysis of international experience of instruments and their short- and longer-term potential for improving biodiversity outcomes.
2. Engagement with international processes and discussions about instruments and architecture around greening sovereign debt markets.

3. Launching a nature-linked set of sovereign, sub-sovereign or domestic debt deals using nature performance bonds.

9.4.2.1 China's Opportunity for Global Leadership on Nature and Biodiversity

China has put nature at the forefront of its domestic and international policy making. Ever since China embedded a policy of *shentai wenming* ("ecological civilization") into its constitution in 2018, the concept of prioritizing the environment has taken greater hold, particularly under President Xi Jinping. This has been one of the ways China has demonstrated its ambition to ensure nature is not simply consumed, but that its environmental and social dimensions in economic activity are placed at the centre of decision making.

China's leadership in 2021 is likely to shape international commitments to climate and biodiversity. China's strong domestic commitments on climate include reaching net-zero emissions by 2060. The hosting of the Convention on Biological Diversity (COP 15) in Kunming this year will set global post-2020 ambition for maintaining biodiversity for the coming decades. In the run up to this event, China has elevated the importance of the creating strong implementation and enabling conditions to ensure greater support for developing countries in terms of resource mobilization, technology and capacity building.

That principle of ecological civilization is aligned with a growing global consensus that nature plays a critical role in economic growth and resilience. Nature, and the biodiversity that supports it, determines the quality of the air, the availability of fresh water and soils, pollination and pest control, and mitigates the impact of natural hazards. The World Economic Forum (WEF) estimates that 40% of global GDP depends on nature, with this share higher in many developing countries [30]. The recent Dasgupta Review in the UK on the economics of biodiversity highlights the increasing importance of nature's role in supporting resilience and economic productivity [3]. Research by WWF, the Global Trade Analysis Project (GTAP) and the Natural Capital Project has shown that there is a clear correlation between the decline in services nature is able to provide and GDP growth [31].

The link between nature and the drivers of economic growth is increasingly understood and measurable, and of immediate relevance to policy-makers and investors. Nature is central to mitigating climate and other physical risks, and creates a growing number of economic opportunities, including carbon credits and sustainable tourism. For instance, the United Nations Food and Agriculture Organization estimates that 95% of agriculture relies on the productivity of soils [32], while nature-based tourism contributes between 10 and 20% of GDP to Kenya and Namibia [33]. The Food and Land Use Coalition estimates a global commercial opportunity of USD 200 billion from protecting and restoring nature by increased conservation and the restoration of 300 million hectares of tropical forests by 2030 [34].

However, nature conservation efforts have to date fallen far short of what is needed to sustain its vital contribution to economies and broader well-being. Nature's health and the impacts of climate change pose both immediate and long-term risks to investors, particularly those in sovereign debt markets that depend on "natural capital" to drive economic productivity and resilience of national economies. While there is growing recognition that nature and biodiversity have a critical role to play in the health of economies, sovereign debt markets lag behind in allowing investors ways to integrate nature into the attractiveness and risk of a country's sovereign debt. Currently, 80% of financial resources available for conservation are from public sources, illustrating the large gap and opportunity to align private finance with nature [35].

9.4.2.2 The Growing Pressure on Global Sovereign Debt Markets

These considerations have great relevance at a time when many developing countries are saddled with large accumulated debt. The COVID-19 pandemic has reduced the growth prospects of most emerging market countries, while global recession and containment measures to stop the spread of coronavirus have led the International Monetary Fund (IMF) to estimate that economic growth in emerging markets will contract by 5.7% in 2020 [36].

The combined effect of increased public spending and reduced government income has put a large fiscal strain on many economies, leading to an urgent need to secure liquidity. The fiscal impacts of COVID-19 have increased already large debt burdens, pushing many countries toward the risk of default. The cost of debt service in 2020 and 2021 will be over USD 3 trillion across emerging economies, raising concerns in financial markets about debt sustainability in some of the poorest countries. In 19 sub-Saharan African countries, the debt-to-GDP ratio reached 71% in 2020 compared with 26% in 2012 [37]. Debt restructurings in Ecuador, Argentina, Belize, Suriname, Zambia, and Angola are examples of the pressure on developing and emerging markets, with the IMF warning that over half of low-income countries are either at high risk of or in debt distress [38].

The global debt crisis has been particularly severe in countries with greater economic dependence on nature, and high levels of biodiversity. Work by the International Institute for Environment and Development highlights the countries where a deterioration in debt terms intersects with areas of critical global biodiversity and climate vulnerability [39]. These include low-income sub-Saharan African countries such as Kenya, Madagascar, Mozambique, Uganda, Angola, and Cameroon and middle-income Asian countries such as Vietnam, Laos, and Bhutan. To date, the response to the twin crises of sovereign debt and climate and natural change has been insufficient to restore strong economic growth, while deteriorating natural capital raises longer-term risks to growth and resilience.

9.4.2.3 Addressing Debt and Biodiversity Through New Financial Tools

Sovereign debt instruments today offer little or no opportunity for borrowers to capitalize on improvements in their natural capital or for investors to seek better nature performance. There are growing calls to facilitate a transition toward incorporating nature and climate into emerging and global debt markets, providing issuers and investors with the tools to respond to better aligning the cost of capital with natural capital. The recent growth of sustainability-aligned debt now exceeds USD 1.5 trillion, and is expected to make up 10% of global issuance in 2021, illustrating growing global demand for these investments [40]. Initiatives such as the Task Force on Nature-related Financial Disclosures (TNFD) and related policy and regulatory developments have exemplified and accelerated greater investor awareness and accountability [22].

Investments in nature can also provide greater assurance of debt sustainability and management of nature-related risks. According to the IMF, better management of natural capital can reduce expected productivity and resilience to future risks, hence improving the credit conditions of the debt issuing country even as it issues greater volumes of debt [41, 42]. Investments in nature also offer an economically efficient way to achieve countries' commitments to increase biodiversity and meet other environmental goals, especially emissions reductions. Achieving these goals will become increasingly expensive if countries delay action [43].

There is both a short- and long-term imperative to better integrate nature into sovereign debt markets. In the short term, there is the opportunity to use a new set of debt instruments to repurpose existing unsustainable debt or issue new debt in ways that drive a nature-positive economic recovery. In the long-term, there is hope to begin a transition toward embedding nature risks and opportunities into sovereign debt arrangements. As noted by Hank Paulson in September 2020, "As governments rebuild … policymakers must learn to value nature, providing the right conditions and incentives to drive change. One important step would be to create a new asset class comprised of things such as productive soils, crop pollination, and watersheds." [4].

There are now mature policy and market initiatives to green sovereign debt markets. Several national governments, including members of the G20, are discussing green sovereign debt options for emerging markets. The World Bank and other international organizations—including the IMF, the OCED and the UN—are working to develop a facility to catalyze a set of new debt instruments that respond to short-term emerging market needs, as well as facilitating a transition to integrating nature more broadly into sovereign debt markets [19]. These developments are backed up by proposals from international organizations, including the United Nations Economic Commission on Africa, which aims to provide African nations with the tools to meet immediate liquidity needs and develop medium-term green stimulus investments supported by nature and climate financing instruments [44].

9.4.2.4 Nature Performance Bonds

An emerging set of debt instruments, nature performance bonds (NPBs), offers a solution for linking debt payments with nature and climate outcomes. These instruments possess the potential to fund immediate liquidity needs and form a structural solution that enables better long-term and sustainable growth [45]. NPBs would be structured in various ways to provide sovereign and corporate issuers and their investors with options to build nature into their financing decisions. These instruments range from:

- **KPI-linked or sustainability-linked bonds**, which allow a general use of proceeds but incentivize performance toward nature outcomes by providing a deduction on the principal of the bond value or a reduction in the interest in exchange for meeting nature-based outcomes.
- **Use of proceeds bonds**, such as green bonds, that link the funds raised through bond issuance to specific nature-based projects.

These instruments could build on existing green bond models and support a range of nature-based outcomes, such as restoring wetlands, protecting forests from encroachment, and reducing threats to wildlife and plant species. The central features of these instruments are:

a. **Provision of liquidity to direct resources to economic recovery measures**.

   - In the case of a sustainability-linked bond, this would generate funds for general purpose use to fund immediate economic and social priorities. On issuance of the bond, the debtors would receive the full amount of funds released, which could be used by debtors to fund immediate fiscal needs or capital spending. The debtor's performance against the agreed performance indicators would then determine how much debt is repaid to creditors annually and at maturity of the bond. Pakistan is amongst the first sovereign issuers to pledge to use this instrument to fund a recovery package [46].
   - In the case of a use of proceeds bond, this would generate funds to support strategic investments in nature-based investments, which could be linked to short- and long-term economic productivity drivers. Up to November 2020, 22 governments have issued use of proceeds bonds in the last four years [47], including in the developed countries of France, Germany, and South Korea, as well as in middle-income countries including Indonesia, Nigeria, and the Seychelles [48].

b. **NPBs can be structured around a set of standardized nature outcomes that can be regularly and consistently monitored and used across the market**.

   - Reporting and verification of performance outcomes would be designed to be transparent and robust, and linked to emerging natural capital, biodiversity, and climate standards and protocols to allow sovereigns and investors to benchmark performance indicators against internationally recognized metrics.

- Central to building a scalable asset class is a structure that aligns with emerging nature and climate performance measurement standards. This would enable the bonds to have the potential to be used across countries with different biodiversity and climate opportunities, allowing for maximum investor potential.

c. **NPBs provide the debt issuer with flexibility over how most effectively to achieve nature and biodiversity outcomes suited to their circumstances**.

- In contrast to use of proceeds models, sustainability-linked bonds would provide issuers the incentive to meet performance outcomes at least cost, which would give creditors the added incentive to fund nature and biodiversity outcomes that represent better value for money.
  An overview of the structure of a sustainability-linked bond is summarized in Fig. 9.1.

d. **NPBs can be supported by blended public–private finance in some circumstances**:

- Public creditors may wish to use the instruments to repurpose unsustainable debt to generate immediate liquidity for debtors, or may be willing to forgo some financial returns in exchange for assured nature performance.
- Initial involvement of private sector investors could be supported by blended or concessional finance, where the public investor is willing to pay for a nature performance outcome.
- The involvement of the private sector in the market for NPBs will evolve as the bonds become increasingly standardized and liquid. Private creditors would

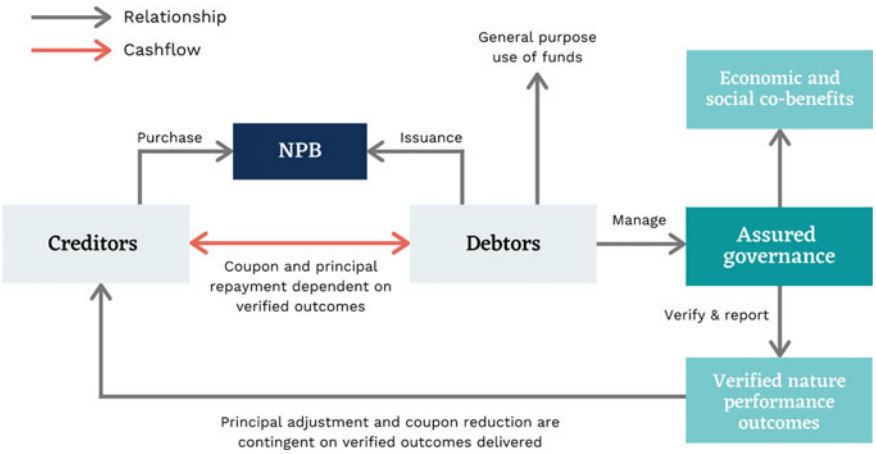

Fig. 9.1 How sustainability-linked bonds connect nature and climate outcomes to sovereign debt repayment terms

be increasingly interested in these assets if they are convinced that nature performance outcomes materially affect solvency risks.

Box 9.1 The Parallel Development of Sustainability-Linked Bonds in Corporate Debt Markets

A number of similar instruments are emerging in parallel with the opportunity to develop NPBs, which helps demonstrate the feasibility of NPBs and potential range of applications. These are chiefly sustainability-linked bonds, which have been issued by a range of international corporate firms:

- A recent survey by Environmental Finance shows that since 2019, 49 "sustainability-linked bonds" have been issued worldwide, worth USD 27 billion. These feature a range of green, sustainability, and social outcomes (as well as payment structures, should performance outcomes be achieved).
- In January 2021, Hong Kong property developer New World Development Co issued the first sustainability-linked bond in Asia, worth USD 200 m over 10 years.
- In 2019, the Italian energy group Enel issued a USD 1.5 billion 5-year, sustainability-linked bond. The bond rate is subject to it having achieved a target of at least 55% of its installed capacity in renewable energy by 2021. If the 55% goal is not reached by end 2021, the coupon will be increased by 25 bps until the bond matures.
- This initial activity has been followed by other firms issuing these bonds, including LafargeHolcim (November 2020), Suzano (September 2020), and Novartis (September 2020).

9.4.2.5 China's Unique Role and Potential to Develop a New Asset Class of Nature Performance Bonds

China now has an opportunity to consolidate emerging international best practice and build on existing green financial market experience. Specifically, China can use expertise from developing green debt markets, coupled with its global environmental leadership to explore the potential of this new asset class, with the potential to become the standard in sovereign debt markets.

China can do this spearheading the design and application of new financial instruments, nature performance bonds. There are at least four reasons why China is in a unique position to lead a shift to nature-positive sovereign debt markets in this way, thus driving a positive shift out of the current debt and nature crises.

a. **China is already leading global ambitions for biodiversity conservation**. China's domestic policies have demonstrated how quickly a country can move toward building back nature, and its hosting of the Convention on Biological

Diversity (COP 15) in Kunming this year could set global ambition for maintaining biodiversity for the coming decades. This is further reinforced by China's strong recent commitments on climate change, including reaching net-zero emissions by 2060 as set out in the 14th Five-Year Plan.

b. **China plays a central role in the sovereign debt markets**. It is by far the largest single official creditor to emerging economies. Since the beginning of this year, China has actively participated in and implemented the G20 Debt Service Suspension Initiative (DSSI) to suspend debt repayments of the poorest countries and has announced a moratorium on debt repayments for 77 developing countries and regions.
c. **China has already demonstrated its ability to accelerate the development of green sovereign debt instruments, starting with large green bond issuances in 2015**. It is now a global leader, with Chinese domestic bond market currently worth USD 120 billion, making it the second largest in the world, according to the Climate Policy Initiative report *The State and Effectiveness of the Green Bond Market in China* [49]. China also has a unique scheme of green finance pilot zones, incorporating six provinces and nine regions. The program is being used to test green finance options locally prior to being used nationally.
d. **China has established the capacity and institutional infrastructure to design, rate and structure green debt instruments through a regulatory framework and supporting institutional infrastructure that allow markets to rapidly scale**. Key institutions include the People's Bank of China (PBOC), the Green Finance Committee, and the National Association of Financial Market Institutional Investors. These bodies play a central role in setting standards on the design, structure and certification of green bonds, opening the way for these institutions to play a central role in leveraging existing capacity to develop similar architecture for nature performance bonds.

9.5 Policy Recommendations

9.5.1 Recommendations for China's Institutional Investors in Conservation Finance

9.5.1.1 Highlighting the Importance of Conservation Finance in Green Finance at the Policy Level

(1) From the strategic height of top-level design, highlight the important position of conservation finance, and regard ecological protection finance as an important field of sustainable development investment.
(2) Even if we cannot implement special policy or measures aimed at conservation finance in the short term, it is suggested to revise the original green finance policy by adding conservation finance content.

(3) In the green finance system, the assessment of the ecological and biodiversity conservation effects of institutional investors should be further highlighted. In terms of supporting policies, it is also more about "outcomes" than "processes."

9.5.1.2 Improving the Infrastructure Needed for the Institutional Investors in Conservation Finance

(1) We should establish and improve the conservation disclosure framework of enterprises. Compulsively require enterprises to disclose relative information by different stages and levels, which could provide information for the investors when making decisions.
(2) We should regard ecological protection finance as a subdivision of green finance and establish an indicator evaluation system and evaluation standard system to provide authoritative and unified theoretical support and indicator system standard support for the next innovation of financial products and services.
(3) We can advocate and gradually require large institutional investors to issue social responsibility reports, responsible investment reports, and conservation investment reports. Preferential policies and investment promotions could be given to institutions that actively carry out conservation investment and information disclosure.
(4) Accelerate the establishment of a natural resource asset accounting system to provide a fair evaluation system for the asset accounting of ecological protection-related enterprises. In terms of securities market access, special listing standards (such as profit standards) for ecological protection-related enterprises, which are different from traditional for-profit enterprises, should be formulated to increase financing channels for ecological protection-related projects.

9.5.1.3 Highlight the Ecological Protection Responsibility of Asset Owners

(1) For sovereign wealth funds, government industrial investment funds, and large state-owned investment institutions, it will be important to add ecological protection requirements in addition to assessment of investment returns. In the supervision of products, it is necessary to check whether the content of the products is consistent with its name. For example, if the theme fund is named after ecology, its portfolio should be targeted at enterprises related to ecological protection industry as defined in the existing Green Industry catalog.
(2) For institutional investors, regular unified training should be conducted for personnel related to the development of ecological protection investment products and risk management, so as to improve their professional knowledge of ecological protection industry needed in the investment process.

9.5.1.4 Encouraging Institutional Investors to Participate in International Cooperation in Specific Sectors

Under the framework of ecological protection finance, research and practice in subdivided fields should be further strengthened, especially in some international frontier fields. China's ecological protection finance practice can be accelerated by strengthening international cooperation. For example, in the marine sector, the EU issued the "Sustainable Blue Economy Financing Principles Initiative" in 2018. In 2021, the United Nations Environment Programme Finance Initiative (UNEP FI) released "The Tide is On: Drawing a Blueprint for Marine Finance in the New Decade" and "Turning the Tide: How to Finance sustainable Marine Recovery—A Guide for Financial Institutions" and a companion list of Recommended Exclusions. At present, three small and medium-sized Chinese banks have joined UNEP FI. It is suggested that government departments set up special task forces to construct financing principles, standards, and guidelines for the blue economy in line with China's national conditions. We will encourage institutional investors to participate in international cooperation and strengthen exchanges and communication with international organizations.

9.5.1.5 Encouraging Institutional Investors to Focus on Women's Rights When Developing Eco-protective Finance

Gender mainstreaming is critical to institutional investors in two ways. First, ESG concepts, in which the social responsibility issues represented by the "S" (i.e., "social") include many factors and scenarios of gender equality (e.g., gender inclusion in internal operations and corporate governance, gender risk identification and management mechanisms of investment and financing projects, etc.), which is itself an important embodiment of the implementation of ESG strategies; second, the development of gender equality principles based on Secondly, stakeholder communication and exchange based on the principle of gender equality can help institutional investors to better examine and understand the needs, interests, roles and impacts of different genders (with particular attention to the impact of biodiversity loss), thus making financial solutions more compatible with social and environmental aspirations and contributing to the achievement of multiple sustainable development goals.

Currently, large domestic financial institutions focus more on internal operations and corporate governance, such as the protection of women's rights and interests (see CSR report) and the proportion of female board members or executives. Institutional investors need to consider and implement whether investment and financing projects can bring more employment opportunities, economic income, and economic autonomy to women. More attention should be paid to how to avoid harming women and girls in investment and financing activities, and how to encourage women and representatives of women's groups to participate in discussions and decisions on biodiversity investment and financing, and to develop corresponding policy mechanisms and action plans.

9.5.2 Suggestions for Financial Institutions in the Agricultural Subsidy Chain Based on the Nature-Positive Principle

Agricultural subsidy policies based on the principle of nature positive are conducive to encouraging multi-sectoral cooperation including agricultural authorities, financial regulators, financial institutions, and local governments to promote financial services to pay more attention to the protection of ecological environment and biodiversity. In the future, efforts should be focused on the following aspects.

9.5.2.1 Adjust the Structure of Agricultural Subsidies

The current design of agricultural subsidies in China has already taken into account the objective of ecological protection, and not all subsidies will cause damage to biodiversity. The arable land fertility protection subsidy and agricultural insurance premium subsidy are inclusive subsidies, which will not change farmers' production behaviour and will not affect biodiversity. Subsidies for the appropriately scaled grain operations and the purchase of agricultural machinery and tools have promoted large-scale and specialized agriculture, improved the utilization efficiency of chemicals, and helped protect the ecological environment. In the future, the reform of agricultural subsidies should have clear objectives and focus on adjusting the minimum purchase price policy and producer subsidy policy to change farmers' production behaviour. Such policies, which encourage farmers to plant a single crop in large tracts, risk upsetting the ecological balance by creating an area with too little species diversity.

To be specific, we should appropriately reduce subsidies to corn and soybean producers, lower the minimum purchase price standards for rice and wheat, and increase subsidies of a universal nature so as to reduce the damage of subsidies to biodiversity while ensuring that farmers' income and agricultural output do not decline. In addition, China can set an upper limit on producer subsidies in a certain region, so that only the most efficient corn and soybean producers can receive subsidies. In this way, on the one hand, agricultural production efficiency can be improved, and on the other hand, biodiversity can be prevented from being affected by single crop planting in the region.

9.5.2.2 Strengthen Supervision on the Implementation of Policies

Although many of China's current subsidy policies are designed with environmental factors in mind, they are distorted in the implementation process and fail to achieve the expected policy objectives, such as LFPS. In principle, this subsidy only subsidizes the landowners who have made great achievements in protecting the cultivated land. However, in the actual operation process, the grassroots government, in order to reduce the cost of policy implementation, turns it into a kind of universal subsidy,

which only increases the income of farmers, but fails to achieve the goal of protecting cultivated land. Therefore, China should strengthen the supervision of policy implementation in the future, formulate convenient and quantifiable eligibility criteria for subsidies according to regional characteristics, and strictly urge the grassroots levels of government to implement policies according to the standards and requirements, so as to strengthen the pertinence of subsidy policies and reduce the damage of agricultural subsidies to the environment.

9.5.2.3 Shift from Direct Subsidies to Indirect Subsidies

In order to achieve biodiversity goals, China should reduce direct subsidies to agriculture and convert them into indirect subsidies. That will reduce the amount of subsidies directly distributed to agricultural producers. It will also increase the input in agricultural science, technology innovation, and technology promotion, in order to reduce the price of technology, improve the modernization level of agricultural production, and change the current situation that agricultural subsidies harm biodiversity.

9.5.2.4 Take Environmental Targets into the Criteria for Determining Subsidies

China should include environmental targets in the criteria for the recipients of subsidies; that is, only agricultural producers who take ecological protection into account in their production can receive agricultural subsidies. At present, the design of agricultural subsidies in China has shown a tendency to develop in this direction. For example, LFPS requires farmers to pay attention to the protection of land in the production process, but the expected goal has not been achieved in the implementation process. In the future, environmental targets should be included in the identification criteria of more subsidy policies, and stricter identification criteria should be formulated for the recipients. More requirements on ecological protection should be put forward for the recipients, such as testing water quality, air, soil, etc., and the inspection results should be taken as a standard to determine whether farmers can get agricultural subsidies.

9.5.2.5 Focus on Supporting Women Farmers

In view of the current situation that women account for the majority of the rural labour force, special knowledge popularization and ability training should be provided for female farmers.

Due to the low level of education among the rural population and the poorer rights and opportunities for women (including women and children) to access educational resources than men, the habits, needs and capabilities of rural women should be fully taken into account in carrying out knowledge and skills training on biodiversity and

ecological conservation. International studies have shown that, women show more friendly behaviours toward the environment than men, in line with the UN Convention on Biological Diversity's emphasis on gender mainstreaming and its gender action plan. Reasonable agricultural subsidy policies would not only promote ecological protection but also provide support to improve the economic situation of rural women, thus contributing to the realization of the goal of gender equality in the economic empowerment of women.

9.5.3 Suggestions on the Innovation of Conservation Financial Instruments

9.5.3.1 Further Promoting REITs of Ecological Environment Infrastructure

Introduce REITs Tax Incentives and Other Supporting Policies

Based on the characteristics and complex architecture design of infrastructure REITs products, it is essential to clarify the tax policy of each link and give appropriate preferential treatment. It is suggested that the tax burden should be reduced in the process of establishment in combination with international tax experience, such as the exemption of deed tax that the project company needs to pay when the issuer transfers the target assets to the project company. In order to avoid double taxation, it is suggested that the income used for dividends in REITs should be subject to enterprise income tax or individual income tax only once at the level of the project company or investor, and the stamp tax should be reduced or exempted at the holding and establishment stage.

Relax Restrictions on Franchise and Ownership Transfer

IT is suggested to clarify the approval process of franchise transfer in REITs and deregulate the process. Relevant supporting policies should be issued to lay the foundation for the long-term development of REIT products.

Expand the Source of Underlying Assets

Since 2014, the mainstream operation mode of eco-environmental projects is the PPP mode, but the proportion of this mode in the total amount of franchise projects is not high, and the proportion of PPP projects that can meet the requirements of pilot projects with an operation period of not less than 3 years is lower. In addition, there are still conflicts between the PPP mode and REITs. It is suggested that a transition

period should be set for the selection of REITs projects, and it is allowable to select from the existing BOT projects before 2014.

Strengthen Information Disclosure and Investor Education

Regulatory authorities and financial institutions should help public investors understand the product characteristics and risks of REITs in a rich and easy-to-understand way so as to match the risk preference of investors. Regulatory authorities should strengthen the supervision of information disclosure, ensure the healthy and orderly development of the market with strict routine supervision, and protect the legitimate rights and interests of investors. As for the information that is clearly stipulated by law and has a significant impact on investors' decision making, REITs issuers should fully disclose all the information that should be disclosed.

9.5.3.2 Government Guidance Funds Based on Ecological Protection

Innovate Mechanisms for Cooperation Between State Capital and Private Capital

The operation mode of the existing industrial investment fund is basically government-initiated, attracting social capital according to a ratio of 1:1 or sometimes higher. The decision-making mechanism is basically in the hands of the government-authorized state-owned investment institutions, which is not very attractive to social capital in terms of decision-making rights and benefit distribution. It can be considered to draw on international experience that government funds do not aim to make profits, but to share risks with social capital and promote ecological protection investment. To this end, it is recommended, first, to limit the right to unequal returns: government capital exits with a zero return rate for successful investment projects during the investment period; government capital shares the losses with social capital for failed investments; Second, to establish a more market-oriented investment decision-making mechanism and decide the investment direction through the scientific formation of an investment decision-making committee.

Perfect the Appraisal System

It is recommended that the state or relevant functional departments issue a special performance evaluation approach for ecological protection guidance funds based on a unified guidance framework for guidance fund performance evaluation, taking into account the policy benefits and green economic benefits of the funds, etc. For state-owned ecological protection investment funds, the investment period of the fund should be appropriately relaxed to focus on the long-term performance of the fund and avoid excessive pursuit of economic returns in the short term.

9.5.4 How China Can Show Global Leadership in Developing Green Sovereign Debt Markets

To address the current debt and nature crisis, and garner the long-term debt and nature sustainability benefits of NPBs, China can act quickly to develop this new asset class. This new market segment could quickly rival the size of its growing green bond market and lead a global movement to fully integrate nature and climate into sovereign debt markets. The key recommendations for capitalizing on this opportunity are:

9.5.4.1 Conduct a Technical Analysis of International Experience of Instruments and Their Short- and Longer-Term Potential for Improving Biodiversity Outcomes

China could commission and oversee work to gather existing and emerging international best practice on the set of nature-linked debt instruments. By doing this, China could quickly assess the short and long-term market size and potential of these instruments by:

(1) **Engaging with key international initiatives and stakeholders involved in the design of the new generation of nature-linked debt instruments**. China could rapidly engage with leading initiatives and networks at the intersection of finance and biodiversity to collate international best practice. To do this effectively, it could link with key knowledge partners, including the Finance for Biodiversity Initiative, who play a role in convening key international stakeholders.

(2) **Conducting a technical analysis of the short- and long-term potential of existing and emerging nature-linked debt instruments**. Following engagement with international initiatives and financial institutions, China could synthesize international best practice and understand the size of the opportunity for developing a market for new nature-linked debt instruments. This would involve a detailed examination of:

   a. The set of instruments that link debt-to-nature and climate performance indicators, including sustainability-linked bonds, nature performance bonds, green, and blue bonds.
   b. International examples and case studies of where instruments have been used, incorporating the experiences of sovereign, sub-sovereign and corporate debt markets.
   c. Types of nature and climate indicators that could be used in a new generation of performance instruments, including the metrics and frameworks to monitor and verify nature performance outcomes and work to align these with corporate sustainability-linked bond issuances worldwide to increase investor appeal.

d. A review of the market infrastructure, regulatory frameworks, and stakeholders likely to be involved in the development of instruments in China and internationally, building on work on the *Guidelines for Establishing the Green Financial System* jointly conducted across seven ministries.

This would enable China to quickly draw together international experience to plan prior to the emergence of these nature-linked debt markets internationally. This could enable China to benefit from its existing experience in green financial markets by assessing the potential for these instruments to play a role in discussions about resource mobilization in post-2020 biodiversity framework discussions at COP 15 and to capitalize on market developments.

9.5.4.2 Engage with International Processes and Discussions About Instruments and Architecture Around Greening Sovereign Debt Markets

(1) **China can engage with the G20 on the design of international policy to address the emerging market sovereign debt crisis**. China can use its leadership position to facilitate discussions about the potential to integrate debt with nature and climate by engaging with other G20 members, debtor countries and financial institutions. China's role as the Co-Chair of the Sustainable Finance Study Group (SFSG), means it could work with like-minded nations to build leadership and share learning. Specifically, it can work with members of the G20 to assess the role that scalable nature-linked debt can play in the development of the Common Framework for Debt Treatments.

(2) **China can play a central role in the design of an initiative by the World Bank to develop a new facility to support the issuance of nature- and climate-linked sovereign bonds**. The facility would establish the conditions and coordinate stakeholders to scale the integration of nature into sovereign debt markets, in both the immediate context of the debt crisis for the longer term. This could catalyze a global market for nature performance bonds in which China could play a central role. China could play a key international leadership role as G20 SFSG Co-Chair by engaging with the World Bank to ensure alignment with G20 policy. It can also ensure that the facility is developed to meet the needs of the post-2020 biodiversity framework by ensuring the facility supports the mobilization of public and private finance for biodiversity outcomes.

(3) **China can also engage with leading nature practitioners to further assess the short- and long-term potential to support these instruments**. Several initiatives bring together leading experts and draw on the combined expertise of international stakeholders about how to design and implement these debt instruments. This includes the Learning Group on Debt and Nature convened by Finance for Biodiversity, which aims to discuss the market and technical barriers and opportunities for deploying nature performance debt instruments across many different contexts worldwide. China could act as an observer in

these groups to understand challenges and opportunities and monitor emerging international best practice.

9.5.4.3 Launch Nature-Linked Set of Sovereign, Sub-sovereign, or Domestic Debt Deals Using NPBs

(1) **China could engage in a one-year program of work to launch a pilot scheme for NPBs internationally**. We could pilot these instruments internationally in the context of debt restructuring or issuance of new debt in which nature and biodiversity outcomes are greatly improved, and countries' ability to sustain their debt is enhanced. China is already engaging with many emerging economies considering the current global debt situation, opening up the opportunity for China to negotiate debt terms that are mutually advantageous. The scheme could also support the issuance of NPBs to finance domestic companies, building on China's developed market infrastructure around green bonds.

(2) **Rapidly identifying countries where China has mutual interests in supporting fiscal and nature outcomes could pave the way for significant discussions about how NPBs could support Chinese debtors**. This could support highly vulnerable debtors in need of liquidity, while driving nature improvements linked to China's existing or planned BRI investments. China has already begun a strategic shift to support sustainable, green growth, recognizing the long-term benefits to those countries. As shown in Box 9.2, several Chinese debtor countries that are at risk of defaulting also have an identified set of biodiversity projects or initiatives in the pipeline that could be undertaken rapidly.

(3) **Green the Belt and Road Initiative (BRI)**. In April 2019, the BRI International Green Development Coalition (BRIGC) was set up. It includes initiatives and partnerships to foster objectives such as: biodiversity and ecosystem management, green finance and investments, and environmental legislation and standards. By identifying countries where China has mutual interests in supporting biodiversity or climate outcomes, China could pave the way for significant discussions about the use of NPBs to support highly vulnerable debtors, while driving nature improvements linked to China's existing or planned BRI investments.

Box 9.2 Countries with High Levels of Chinese Debt that Are High in Biodiversity

A large portion of China's current official debt holdings is relevant for NPBs. According to research by the International Institute for Green Finance, China holds USD 102 billion across 52 BRI countries that also qualify for DSSI support, which means these countries face significant debt burden risks alongside significant nature and biodiversity loss risks.

The five countries with the most outstanding debt owed to China were: Pakistan (USD 20 billion), Angola (USD 15 billion), Kenya (USD 7.5 billion), Ethiopia (USD 6.5 billion) and Laos (USD 5 billion).

Additional work by the Global Development Policy Center has identified 41 countries that have the highest potential for Chinese debt relief linked to biodiversity and climate potential. This work identifies Angola, Cambodia, Laos, Myanmar, Uganda, and the Solomon Islands as having the highest potential for mutually advantageous biodiversity or climate outcomes and high dependency on China for lending.

(4) **Launch domestic nature performance bond pilots**. China's unique Green Finance Pilot Zones Programme, incorporating six provinces and nine regions, creates the opportunity to trial nature performance bonds to support domestic municipalities or firms in achieving nature-based performance objectives. The first municipal green bond issuance by Ganjiang New Area in Jiangxi Province to finance smart utility pipelines was 12 times oversubscribed, highlighting strong investor demand. Widening this pilot program to finance China's nature priorities could further broaden the domestic green debt market.

(5) **Through effort, the first instrument issuance could take place by the end of the year in partnership with key debtor countries or domestic firms**. This would align with broader international discussions about debt relief, highlighting China's commitment to international efforts to addressing debt and biodiversity, and advancing ecological civilization on a global basis. Chinese leadership could be highly catalytic in encouraging other creditor nations to examine the potential for linking improvements on debt terms to biodiversity outcomes.

(6) **Plan new market and regulatory infrastructure that can be applied to support scaling up of new debt markets**. This would encourage companies and investors rapidly to develop and issue nature- and climate-linked performance debt instruments and to quickly become a leading market for these instruments. China can play a significant role in the strengthening of a green and sustainability bond market that delivers on climate and biodiversity outcomes through application of standards aligned with the 1.5 °C ambition of the Paris Agreement on Climate and the targets of the CBD. As the green bond market grows internationally, investors are increasingly interested in credible delivery of outcomes. International standards are improving, and alongside science-based approaches on climate, they will increasingly incorporate science-based targets for other environmental matters. China has a role to play in strengthening those standards and increasing their application.

(7) **Engage and coordinate key domestic regulators to plan and develop capacity to issue these new instruments**. This could include the People's Bank of China, China Banking Regulatory Commission China Securities Regulatory Commission for exchange-traded corporate green bonds, National Development

and Reform Commission for public-sector issuers, and the National Association of Financial Market Institutional Investors, and China Securities Regulatory Commission. By enabling these institutions to quickly develop capacity to issue this new asset class, China could broaden both a domestic and international market for this potentially large RMB-dominated global debt market segment.

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