Survey Report on Financial Support to Biodiversity

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Abstract: Financial development and biodiversity are mutually dependent. Biodiversity loss brings physical and transition risks to the financial industry, while an optimal allocation of resources through financial means contributes to biodiversity conservation. Through a survey of the representative regions for biodiversity in China—Yunnan, Qinghai, Tianjin, and Hunan—we found that encouraging progress in biodiversity conservation has been made through a wide array of bank loan products, bank-insurance collaboration, issuance of special bonds, and "Fund + X" programs. At the same time, financing gap remains sizeable and the transition risks are surfacing, calling for financial institutions to manage risks more effectively. The report makes the following recommendations: promoting the more efficient conversion of ecological benefits into economic benefits; encouraging new financing models for biodiversity conservation; requiring financial institutions to better evaluate and manage biodiversity-related risks; and improving the supporting measures and safeguards.

Keywords: biodiversity; financial risks; financial support

The ecosystem is the foundation of the global economy and financial system. Today, biodiversity is declining at an unprecedented rate, with one-quarter of the world's species under threat and around one million species facing extinction (NGFS, 2021). In contrast to climate change, biodiversity conservation has been mostly overlooked and underfunded. To address this, we conducted a survey in Yunnan, Qinghai, Tianjin, and Hunan—representative regions for biodiversity in China—to understand the existing financial support for biodiversity and the challenges facing us. On this basis, we offer our policy recommendations on the subject.

I. Interdependency between Biodiversity and Finance

(I) Financial risks arising from biodiversity loss

Similar to climate-related financial risks, the financial risks associated with biodiversity loss can also be classified into physical risks and transition risks (NGFS, 2021). Biodiversity loss can lessen the benefits we receive from nature and ecosystem services and adversely affect both the industries that depend on those services and their business activities, creating physical risks to businesses, such as financial losses, bankruptcy, and impairment of financial assets. In addition, biodiversity creates economic value through the food supply, carbon

sequestration, and water and air purification; its loss may impact agriculture, manufacturing, and other sectors of the economy, as well as all geographical regions and global trade. It is estimated that, globally, USD44 trillion of economic value generation is highly dependent on nature and services of its ecosystem (WEF, 2020), and biodiversity loss could result in economic losses of USD10 trillion per year (NGFS, 2021). As a result, financial institutions with exposure to these economic activities or assets are also at risk.

Meanwhile, transition risks may be triggered by adjustment of governmental measures—new or stricter biodiversity policies and regulations, higher standards, or phase-out of subsidies for harmful activities, for example—changes in consumer preferences such as diets, and technological advances, which may all affect corporate activities, increase operational costs, and devalue financial assets or even turn them to bad debt (Salin, 2021; Platform on Sustainable Finance, 2020). A study by the De Nederlandsche Bank (NGFS, 2021) found that the Dutch financial system is vulnerable to policies aimed at increasing protected areas or reducing nitrogen-emitting activities.

(II) The positive and negative impact of finance on biodiversity

Financial institutions that fund activities harmful to biodiversity will incur heightened physical and transition risks. Conversely, through their resource allocation and risk management functions, financial institutions can also contribute to biodiversity conservation by offering sustainable financial products and services, investing more in biodiversity projects and less in harmful projects, and encouraging greater conservation efforts from businesses.

Traditionally, biodiversity conservation is predominantly funded by government spending and private sector donations, and these limited sources are hard pressed to meet the conservation goals. For instance, one estimate puts the global biodiversity funding gap at USD598-824 billion per year (Deutz et al., 2020). Encouragingly, central banks and financial supervisors have added the study of biodiversity loss and financial stability to their agenda, and financial institutions are also jumping into the action through green credit, bonds, funds and insurance. In October 2021, 36 Chinese banks, 24 foreign banks, and international organizations released the *Joint Declaration of Banking Sector to Support Biodiversity Conservation* to collaborate on providing integrated financial services for biodiversity conservation[2]. As of July 26, 2022, 103 financial institutions from 19 countries have signed the *Finance for Biodiversity Pledge*, committed to protecting and restoring biodiversity through their financing activities and investments[3].

II. Biodiversity Conservation through Banking, Securities, and Insurance Approaches

To better understand the financial support to biodiversity conservation in China as a whole, **we surveyed the local efforts by four of the country's representative regions: Yunnan, Qinghai, Tianjin, and Hunan.**

- **Yunnan Province**: Located in one of the world's 36 most biologically rich—yet threatened—terrestrial regions, Yunnan is the most biodiverse province in China and contains all ecosystem types except ocean and desert. It is home to about half of the species, and half of the key protected species, in China.

- **Qinghai Province**: Owing to its distinct ecological environment, Qinghai has a large wetland ecosystem that is unique among the world's high-altitude regions. Of these regions, it is also the most biologically and genetically diverse. Qinghai is known as a repository of alpine species, and is named by the World Wide Fund for Nature (WWF) as one of the world's 25 key areas for biodiversity conservation.

- **Tianjin**: Tianjin is located at the Haihe estuary, on the west coast of the Pacific Ocean. A large network of rivers draining into the sea has endowed it with three major ecosystems—forests, wetlands, and ocean.

- **Hunan Province**: The region of Zhangjiajie in Hunan is the site of a national forest park and numerous national nature reserves (including one for Chinese giant salamanders and one at Badagongshan). Notably, the Badagongshan nature reserve is selected, by the *China's Biodiversity: A Country Study*, as one of the 17 key biodiversity areas in China with global significance, and has been named one of the "Global 200" ecoregions by the WWF.

(I) The Bank Credit Model

In general, biodiversity conservation is an important objective of green credit. It mainly includes nature conservancy programs, the creation of nature reserves, and ecological restoration projects. As of the end of Q2 2022, conservancy and restoration loans in Qinghai totaled RMB1.761 billion, and green loans for the core ecological areas at Sanjiangyuan (Yushu, Guoluo, and Huangnan) amounted to RMB5.284 billion. As of the end of 2021, the balance of conservancy loans and restoration loans in Yunnan was RMB5.38 billion and RMB42.174 billion, respectively, accounting for about 11.5 percent of the green loans in the province. At the end of Q2 2022, Zhangjiajie had RMB18.93 billion of outstanding green loans, including RMB1.757 billion for restoration projects

and RMB6.142 billion for the conservation-oriented operation of national parks, world heritage sites, national scenic spots, national forest parks, national geological parks, and national wetland parks.

Banks have increased their support for biodiversity conservation through traditional syndicated loans and working capital loans. In April 2021, nine banks including the China Development Bank (CDB), Industrial and Commercial Bank of China (ICBC), and Bank of Tianjin originated a syndicated loan of RMB24 billion to fund the ecological project in the northern mountainous region of Tianjin. With a term of 25 years, the loan represents four-fifths of the total investment, helping the project meet its financing needs. In December 2020, CITIC Bank granted a comprehensive credit facility of RMB160 million, in the forms of working capital loans and banker's acceptances, to an ecological agritech company in Tianjin to support the erection of ecological barriers. The facility was jointly and severally guaranteed by the Tianjin Infrastructure Investment Group.

Banks have made credit more accessible to biodiversity businesses and organizations by widening the scope of collaterals and optimizing the loan process. For biodiversity conservation projects with stable cash flows such as ticket revenue or revenue from specified assets (such as expressways and public utilities), banks often support them once security in the form of pledge of future income, guarantee, or surety is in place. As an example, ICBC Yunnan Branch and PSBC Yunnan Branch have jointly made a loan backed by ticket revenue from the Xishuangbanna Wild Elephant Valley. From 2018 to 2021, a total of RMB189 million was disbursed to meet the working capital needs of this tourist attraction. In 2021, financial institutions including the Yingjiang Rural Commercial Bank and Yingjiang Branch of the Agricultural Development Bank of China (ADBC) originated entrepreneurship loans of RMB2.3 million to local villagers for planting cash crops. The loans were secured by forestry rights and funded by the central bank lending for poverty alleviation projects.

(II) The Insurance Model

Boosting biodiversity conservation through new insurance products. In 2010, Yunnan was the first in China to introduce, on a pilot basis, public liability insurance for personal or property damage caused by wildlife. Province-wide coverage was achieved in 2014. Since 2011, an annual average of RMB14 million has been insured against potential damage from Asian elephants. These policies, jointly underwritten by CPIC Property Insurance and PICC P&C, have paid RMB140 million in claims. Similarly, to ease the potential conflict between humans and wildlife and streamline insurance compensation, in May 2022 Qinghai released the *Pilot Program of Insurance Compensation for Personal and Property Damage Caused by Terrestrial Wildlife in Qinghai Province*,

approving RMB3 million for the first year of the pilot program for purchasing insurance, to be borne by the provincial government[4]. This has propelled Qinghai ahead of the other provinces in China, by both geographical coverage (i.e., province-wide) and scope of compensation, in terms of government-funded liability insurance for wildlife damage.

Sharing the financing risks of wildlife protection projects through bank-insurance collaboration. For instance, after the Zhangjiajie Branch of PICC P&C pioneered an insurance product on Chinese giant salamanders, banks followed up with a corresponding loan product to promote the protection and breeding of the species. A total of RMB200 million has been disbursed to borrowers to date.

(III) The Bond Model

Financial institutions directly issuing green financial bonds to raise funds for biodiversity conservation projects. In 2018, Fudian Bank issued RMB3.5 billion green financial bond in the interbank market at a coupon rate of 4.48 percent and a maturity of 3 years, of which RMB889 million was used for the rehabilitation of Yilong Lake and the dredging of Dianchi Lake. In 2021, Bank of China issued a biodiversity-themed green bond of RMB1.8 billion, becoming the world's first financial institution to do so. The proceeds were funneled into a number of biodiversity conservation benefit projects ranging from ecological demonstration zones, ecological restoration in mountainous areas, ecological water networks, and national forest reserves to forest quality and efficiency upgrades.

Financial institutions investing in special local-government bonds to fund biodiversity conservation projects. By purchasing RMB127 million in special local-government bond, Fudian Bank supported the construction of tourist attraction projects in Lincang, Yunnan, for Mengku large-leaf tea trees. The project involves the relocation of residents and renovation of housing, the protection of the ancient tea trees at Bingdao, and the improvement of tea tourism services. It is expected to generate RMB579 million between 2023 and 2031 from tea production, tea tourism, and rental housing to achieve financial balance after the project completed.

Local governments issuing special bonds to support biodiversity conservation projects. In 2018, the Tianjin Municipal Government issued its first ecological bond, with a term of 7 years and a coupon rate of 4.02 percent. The RMB1.5 billion raised was invested in the protection and restoration of the Qilihai wetlands natural reserve in Ninghe District, Tianjin. Repayment can be mainly funded by the revenue from carbon trading and the land transfer proceeds from restored farmlands and resettlement projects. By the end of

September 2021, the government of Tianjin had issued 23 ecological bonds, including 13 in 2020 which raised RMB49.678 billion. Among the underwriters for them were domestic commercial banks, policy banks, and securities companies[5].

(IV) The "Fund + X" Model

Qinghai took a **"public foundation + trust"** approach to raise funds for the Sanjiangyuan National Park. In October 2012, the Qinghai Provincial Government and the Qinghai State-Owned Assets Investment and Management Company jointly established the Public Foundation for Sanjiangyuan Ecological Conversancy. In 2017, the Foundation and Minmetals International Trust jointly launched a 10-year "Minmetals Trust - Sanjiangyuan Charitable Trust" with an initial size of RMB500,000. More than RMB2 million raised in the first four rounds is used toward the collection of basic water data, the building of ecological conservancy stations, and the promotion of local culture in the Sanjiangyuan area. In 2019, the Foundation provided RMB3.55 million to the national project series for ecological protection at Sanjiangyuan to better safeguard the local ecosystem and put it to productive use, and RMB700,000 to the ecological demonstration village in Madoi County to reduce white pollution and increase vegetation cover. In 2021, the Foundation raised more than RMB60 million, a record high, to further protect the Sanjiangyuan area, help build Qinghai into a model province for national parks, support general scientific surveys in the Qinghai Lake basin, and carry out biodiversity conservation campaigns such as the Tibetan antelopes in Hoh Xil. The proceeds are also used toward restoring degraded grasslands, rebuilding ecosystems in urban and rural areas, and training programs for professionals.

The city of Zhangjiajie in Hunan province leveraged **"private equity fund + banking"** to raise funds supporting local ecological tourism projects. In 2017, Zhangjiajie pioneered a tourism-oriented "contractual private equity" fund for poverty alleviation with a target size of RMB2 billion. RMB1.5 billion has been raised thus far, consisting of RMB1,065 million from China Construction Bank and an RMB435 million commitment from Zhangjiajie Economic Development Investment Group. In exchange for either equity or debt, the fund supported the development of premier outdoor tourism routes, allowing the ecologically rich but underdeveloped regions to protect biodiversity while strengthening the local economy.

Yunnan has adopted **"special construction fund + bank"** to fund biodiversity and other key projects. Established by the CDB and ADBC through the targeted issuances of special-purpose bonds in the interbank market, the fund offers a low interest rate (1.2 percent or 2.8 percent) and long repayment period and primarily makes equity investments and shareholder loans. From 2015 to 2016,

the fund disbursed RMB610 million to three water treatment projects in Dali. These projects aim to re-engineer the inlets to, and cut off the draining of household and agricultural wastewater into, the Erhai Lake and Jianhu Lake, thereby reducing pollutants into lakes and improving water quality and protecting their biodiversity.

III. Challenges

(I) Financing constraints

First, biodiversity projects are mostly public interest or quasi-public interest undertakings with long lifecycles, limited investment returns, and little short-term economic benefits. As an example, the Badagongshan Reserve in Sangzhi, Hunan, consists of 23,468 hectares of key non-commercial forests with a forest coverage of 93.4 percent. It is the largest and most well preserved broad-leaved evergreen forest in the subtropical region and has a unique subtropical mountain forest ecosystem. But despite its significant ecological value, the Reserve lacks appeal to social capital due to the absence of steady cash flows and prospects for short-term return on investment.

Second, some projects have no suitable borrower and few sources of loan repayment. Because animal and plant species tend to spread out over a large geographical area with characteristics of small aggregate, low concentration and fragmented distribution, project launch and funding has been the most salient challenge in conservation efforts. For example, the Chinese Academy of Sciences' Jingdong Subtropical Botanical Garden, with a planned construction period of 10 years, has only received RMB60 million of funding raised by special government bonds. No bank has stepped in to this day as the project lacks a suitable borrowing entity. In addition, studies in Yunnan show that many nature reserves do not have the conditions for joint development and integrated operations. The reduced tourist number, and therefore income, following the pandemic has also deterred financial institutions.

Third, more diversified financial products and services are needed. As biodiversity-rich areas are often underdeveloped and financially underserved, they depend largely on government funding. Other issues to be addressed include (i) over-reliance on green credit and syndicated loans, which respectively exposes the lack of diversified financing products and services and poor engagement by smaller banks, and (ii) absence of insurance policies for species protection and commercial unsustainability of existing insurance products. To illustrate with Yunnan, only 15% of its green credit has been directed toward the eco-environmental sector (including ecological agriculture, protection, and restoration). The limited scale and coverage is falling short of what is needed for biodiversity conservation. In general, species, particularly

rare species, require continuous, long-term funding, and in the event of an earthquake or forest fire, insurance coverage especially. But because the claim resulting from such events would exceed any potential revenue from premiums, currently no insurance company is willing to underwrite those policies.

(II) Financial risk management capacity to be improved

China's rising awareness for biodiversity conservation has resulted in increasingly stringent conservation policies, potentially exposing financial institutions to growing environmental and social risks in large financing projects. For example, in the "Yunnan Green Peacock Case," the first preventive public interest action in China for the protection of endangered wildlife, a hydropower project along the Gasajiang River has been put on halt on account of its threat to the habitats of two endangered species, even though the project had followed the proper procedures and already incurred billions of yuan in investment. This case shows that large-scale projects come with a long project period and high environmental risks, and present substantial uncertainty to financial institutions as they cannot prevent or control the risks at the late stage of projects with sole dependence on environmental impact assessment (EIA) and related permits.

Financial institutions are not well prepared to effectively manage biodiversity risks. Without a deep understanding of these risks, banks have not fully incorporated them into their risk management process. Surveys show that some banks haven't taken the environmental factors into their credit models, allowing businesses to obtain credit despite past or ongoing environmental penalties.

(III) Insufficient supporting mechanisms

Underdeveloped risk compensation mechanisms. Biodiversity projects generally involve large investment, long project cycle, and low investment returns. Underdeveloped supporting policies—security against risks, compensation mechanisms, tax relief, and interest subsidy—have also to some extent restricted financial support for biodiversity projects.

Inadequate information-sharing mechanisms. Because financial institutions are unable to understand customer behaviors' impact on biodiversity, in making credit decisions they mostly rely on EIAs, without separately or especially accounting for biodiversity risks. The lack of coordination between government agencies as well as the absence of a central platform for managing and publishing information on biodiversity conservation hinders financial institutions from promptly and effectively gauging the financing needs and true circumstances of a borrower engaged in biodiversity conservation, which makes it hard for them to connect with suitable projects.

IV. Policy Recommendations

(I) Facilitating the transformation of ecological benefits into economic benefits to widen financing channels

First, in view of the unique biodiversity endowment of each region, we should more effectively pool these ecological resources and increase the value of investing in biodiversity projects through concession agreement, ecological tourism and cultural products, and ecological agriculture. **Second**, we should employ market-based means to integrate public interest projects with for-profit projects, to turn them into a commercially viable whole that would make financing easier for biodiversity efforts. **Third**, we should tap into technology and innovation to turn household and agricultural wastes into resources and better protect and restore the environment. **Fourth**, we should create a more sophisticated system for assessing the value of ecological products. This would address the difficulties faced by these products in valuation, collateralization, trading, and realization, giving them a market value. **Fifth**, on the basis of an accurate valuation of ecological projects, we should develop the corresponding financial instruments and markets.

(II) Developing new financing models and products for biodiversity conservation

First, we should mobilize private investment in biodiversity. For instance, we can provide low-cost funding to biodiversity projects through government subsidies, government guarantees, investment funds, and loans from international organizations to attract more private investors. **Second**, we should develop financing tools based on water rights, wastewater discharge rights, carbon allowance, and other resource- or environment-related rights and interests; add the creation of innovative compensation mechanisms and models for ecological conservation to the list of key tasks in the pilot zones for green finance reform and innovation; and promote ecological industry-specific financial models by encouraging banking financial institutions to provide qualified green credit and other sustainable financial products. **Third**, we should encourage eligible non-financial enterprises and institutions to issue green bonds; encourage insurers to develop innovative green insurance products to involve them in ecological compensation; and support major biodiversity projects and green infrastructures through such means as bonds, insurance investment schemes, and equity investment.

(III) Enhancing financial institutions' assessment and management of biodiversity-related risks

First, biodiversity considerations should be incorporated into the ESG-related

investment and financing activities and targets of financial institutions, along with the creation of the governance mechanisms and risk monitoring and reporting systems for biodiversity and related risks. Disclosure of environmental risks should cover impact on biodiversity, to encourage the transition to an eco-friendlier industry structure. **Second**, we should evaluate the incremental risk exposure of financial institutions arising from biodiversity loss, and conduct scenario analysis and stress testing in relation to biodiversity-related risks. Third-party organizations may supply the much-needed expertise to help financial institutions and investment firms identify risks and make the right decisions. **Third**, financial institutions should more effectively manage environmental risks by making the mitigation of biodiversity impact a component of project screening and due diligence (including a hierarchical mitigation scheme to prevent, minimize, reverse, and compensate for those impacts). Projects involving ecologically important areas, habitats of endangered species, or irreversible impacts on biodiversity should be excluded. Financial institutions should also strengthen the management and monitoring of green projects before, during, and after loan disbursement and address and resolve risks in a timely manner. **Moreover**, financial institutions should better familiarize themselves with the policies on biodiversity conservation and environmental risks and build a team of professionals who are knowledgeable about green finance.

(IV) Improving supporting safeguard measures

First, the government should play a leading role in providing risk compensation in ecological projects and enforcing accountability in ecological objectives, actively engage all stakeholders, and promote a wider range of market-based compensation practices. The goal is to establish a compensation mechanism that is under the stewardship of the government, with orderly participation of the private sector, and responding effectively to market forces. Eco-environmental taxes (such as resource tax and environmental tax) and policies governing revenue from land, mineral, ocean, and other natural resources should be utilized as tools for industry regulation. S**econd**, we should establish information-sharing mechanisms. This entails publishing the list of projects and enterprises engaged in biodiversity conservation and their financing needs, which will reduce information asymmetry; make it easier to analyze costs, returns, and risks for informed credit and investment decisions. **Third**, there should be improved disclosure of biodiversity impact. Enterprises' environmental disclosures and EIA data should play a greater role, such that customers with superior "ecological creditworthiness" are given priority treatment in credit decisions and loan disbursements.