

KEY POINTS

- Mainstreaming nature-based solutions (NBS) into policies and financial mechanisms can improve natural capital protection, ecological restoration, and sustainable agricultural practices, simultaneously generating ecological and socioeconomic co-benefits for more resilient, equitable rural economies.
- Applying the gross ecosystem product (GEP), an accounting mechanism for valuing and pricing ecosystem goods and services, can improve ecological and spatial planning and inform decision-making.
- Using governance and financial vehicles as an incentive mechanism, including eco-compensation and water funds, can scale up natural capital investments by generating ecological benefits and economies of scale.
- Enhancing sustainable finance mechanisms by integrating environment, social, and governance (ESG) criteria into lending and investment decisions can increase private sector participation and private capital flows in nature-based projects.

Scaling Natural Capital Investments in the Yellow River Ecological Corridor

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Balancing economic growth and sustainable development in the Yellow River basin is a challenging task. This is underscored by the July 2021 floods that displaced more than 1 million people in Zhengzhou, the capital of Henan. Exacerbated by climate change, such water-related disasters will likely continue threatening livelihoods in the basin over the coming decades. Overexploitation of natural resources, inadequate water supply and sanitation services, soil contamination, water pollution, and climate change impacts are only some of the risks affecting the basin's health and its most vulnerable rural communities. A nature-positive approach can help address both nature and climate emergencies, building back better and greener in the aftermath of the global pandemic. The preservation of nature has emerged as a critical pathway for transitioning to growing the economy in a more resilient and sustainable way. This means ensuring that nature is an integral component of investment and fiscal policy decisions. Such an approach must include actionable targets that recognize the centrality of nature to maintain and restore ecosystem services and biodiversity, and increase societies' resilience. Defining the Yellow River basin as an ecological corridor can promote nature-positive investments and policy reforms while protecting the key ecosystem services that the basin provides. The policy brief proposes four policy recommendations to scale up natural capital investments and contribute to an ecological transition in the Yellow River basin.

BALANCING NATURE AND THE ECONOMY IN THE PEOPLE'S REPUBLIC OF CHINA

The People's Republic of China (PRC) has made remarkable achievements in eradicating extreme poverty.¹ In February 2020, the government announced that the PRC had accomplished its targets of eradicating absolute poverty, set in 2012, for the

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¹ Agence France-Presse. 2021. China Poverty: Beijing Says It's Been Eradicated, But What Exactly Has Been Achieved?. 24 February.

first time in history. Despite the progress made, the PRC still faces severe problems caused by unbalanced, inadequate, and uneven development in the rural provinces of the Yangtze River and the Yellow River basins. Livelihoods are also affected by biodiversity loss, climate change, water insecurity, and land degradation. While 2019 was a significant year for the war on pollution,² several challenges remain. Unsustainable agricultural practices and inadequate management of wastewater and solid waste are among the root causes of environmental degradation in rural areas. These factors are exacerbated by hazards, such as floods and droughts. Natural assets, including forests, grasslands, wetlands, and fertile soils, together with the ecosystem functions and services they provide, are under enormous pressure. To overcome these issues, the PRC government has introduced the national vision of “ecological civilization,”³ whereby humanity relies on a healthy planet for harnessing economic and social progress.⁴

Policy and regulatory reforms have accompanied the transition to promoting more sustainable production and consumption models. The Rural Vitalization Strategy (2018–2022) is the blueprint for realizing the dual goal of ecological restoration and poverty alleviation with a nature-based approach. The strategy aims to realize comprehensive rural development to meet economic, social well-being, and environmental objectives. The strategy comprises four core areas of intervention, in line with the Asian Development Bank (ADB)–PRC country partnership strategy (2021–2025)⁵:

(i) transforming food systems, (ii) enhancing market connectivity and digitalization, (iii) improving the rural environment, and

(iv) strengthening rural economies. This is embedded in the **14th Five-Year Plan, 2021–2025**, which will be crucial to high-quality, green development, investing in the four capitals⁶ (natural, human, social, and physical) with a nature-positive approach (Box 1).⁷ Peak carbon dioxide emissions by 2030⁸ and achieving carbon neutrality is an additional challenge, requiring accelerated policy reforms to enhance local institutional capacities.

YELLOW RIVER BASIN: A COMPLEX, FRAGILE HUMAN–NATURE SYSTEM

Owing its name to the loess (fine-grained sediments) that it carries downstream, the Yellow River (Huang He) originates from the Bayan Har Mountains on the Tibetan Plateau and drains into the sea in the east (Map). With a length of 5,464 kilometers, it is the fifth-longest river in the world. The Yellow River basin is the second-largest river basin in the PRC next to the Yangtze River basin, but it accounts for only 2% of the PRC’s total water resources. The basin covers an area of 752,400 square kilometers, crosses nine provinces, and supplies water to 66 prefectural-level cities and 340 counties. With a population of 420 million (30.3% of the total population), the basin accounts for 26.5% of the national gross domestic product (GDP).⁹ The Yellow River connects the Tibetan Plateau, the Loess Plateau, and the Northern China Plain, and plays an important role for ecological, food, and energy security in the PRC.

Box 1: Nature-Positive Approach

A nature-positive approach means ensuring that nature is an integral component of investment and fiscal policy decisions in the post-pandemic economic recovery. Achieving international targets and solving both nature and climate emergencies can be supported through nature-positive investments. Such an approach must

include actionable targets that capture nature’s complexity and connectivity with biodiversity conservation to maintain and restore promotion of ecosystem services and biodiversity. A successful nature-positive approach increases the resilience of the planet and societies to future challenges.

Source: *World Economic Forum*. 2021. What Is ‘Nature Positive’ and Why Is It the Key to Our Future? 23 June.

² According to the 2019 State of Ecology and Environment report released in 2020, the central government spent CNY53.2 billion (approximately \$7.5 billion) to promote integrated management of air, water, soil, and rural environment, and establish a national green development fund, significantly improving the water quality of rivers and lakes.

³ Ecological civilization implies that the changes required in response to global climate disruption and social injustices are so extensive as to require another form of human civilization, one based on ecological principles. Broadly construed, ecological civilization involves a synthesis of economic, educational, political, agricultural, and other societal reforms toward sustainability. Z. Wang, H. He, and M. Fan. 2014. The Ecological Civilization Debate in China: The Role of Ecological Marxism and Constructive Postmodernism—Beyond the Predicament of Legislation. *Monthly Review*. 1 November.

⁴ A. Hanson. 2019. Ecological Civilization in the People’s Republic of China: Values, Action, and Future Needs. *ADB East Asia Working Paper Series*. No. 21. Manila: Asian Development Bank.

⁵ ADB. 2021. *Country Partnership Strategy: People’s Republic of China, 2021–2025—Toward High-Quality, Green Development*. Manila.

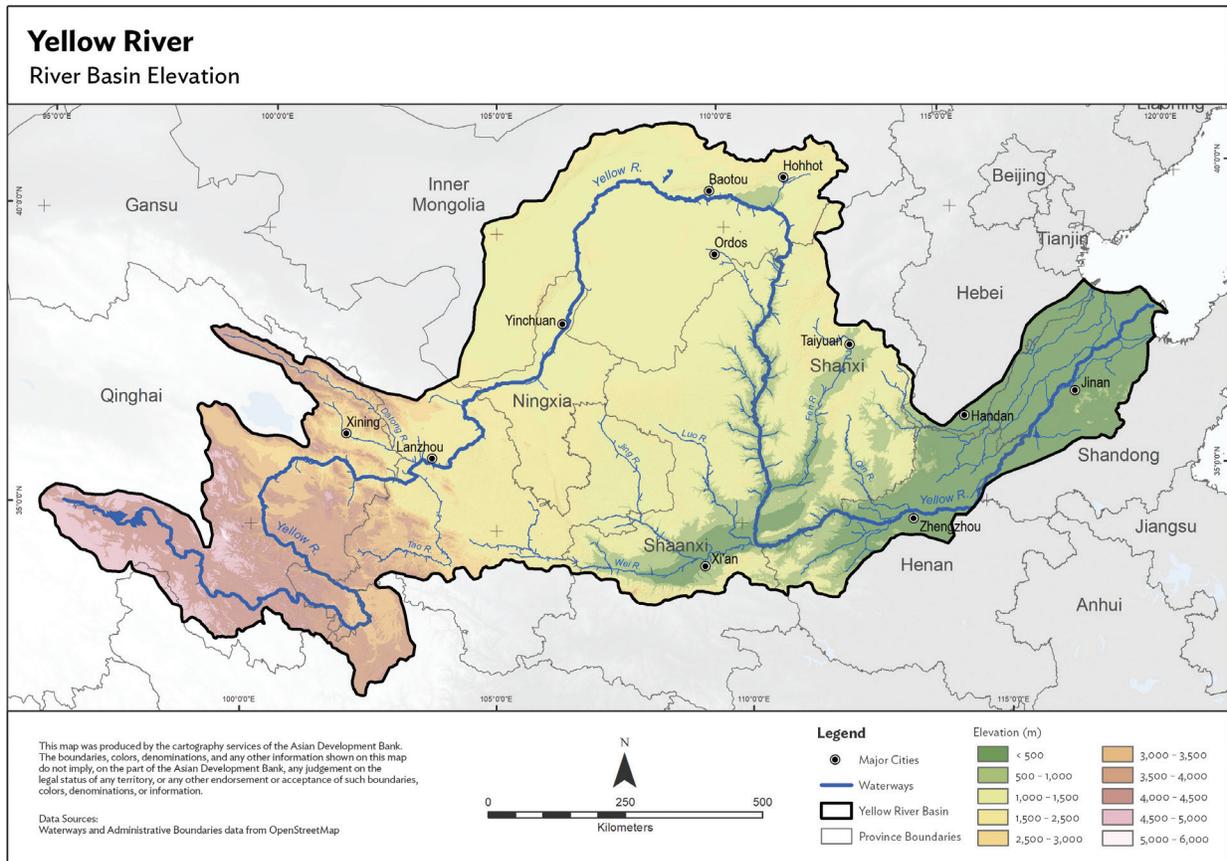
⁶ C. Hepburn and N. Stern. 2019. Driving Investments toward Sustainable Economic Growth in the People’s Republic of China. *ADB East Asia Working Paper Series*. No. 16. Manila: Asian Development Bank.

⁷ S. Cardascia, S. Robertson, and Q. Zhang. 2020. Prioritize Nature in Asia-Pacific’s COVID-19 Recovery. *Asian Development Blog*. 9 December.

⁸ Xinhua. 2021. Action Plan for Carbon Dioxide Peaking before 2030. 27 October.

⁹ Xi Jinping Speech at the Symposium on Ecological Protection and High-Quality Development of the Yellow River Basin. http://news.cnr.cn/native/gd/20191015/t20191015_524816783.shtml.

Map: Yellow River Basin



Source: Asian Development Bank.

Challenges in the Yellow River Basin

Complex physical and development issues, which are unique to the area, remain unaddressed and hamper water security in the Yellow River basin. Four major challenges are outlined below.

(i) Water scarcity. The Yellow River basin is extremely water scarce. Water resources are unevenly distributed and concentrated in the upper reaches of the Yellow River basin. The annual average precipitation in the basin is 446 millimeters (mm) (40% of the Yangtze River basin) with an average water resources quantity of 473 cubic meters (m³) per capita, which equals 23% of the national average (2,029 m³).¹⁰ Agriculture is the largest water user, consuming 69.8% of available water. Water scarcity is exacerbated by a harsh climate. A major drought in 1997 registered the largest number of zero-flow days (226 days). Subject to many pressures, the river’s flow has diminished by 13.4% since the 1990s, affecting the basin’s sustainable economic and social development.

(ii) Sediment load. High sediment loads make the basin one of the most hydrologically complex systems in the world. From 1919 to 1960, the annual average sediment runoff was about 1.6 billion tons under normal conditions. Sedimentation, coupled with continuously strengthened embankments, generated the “hanging river”¹¹ phenomenon. As a result, the riverbed reaches 10 meters above the adjacent plain in the downstream valley. Along with soil erosion, sedimentation has become a major issue during flood events. Historically, the river floods frequently,

Agriculture is the largest water user, consuming 69.8% of available water. Water scarcity is exacerbated by a harsh climate.

¹⁰ ADB. Forthcoming. *Yellow River Basin Water Security Assessment and Policy Recommendations*. Manila.

¹¹ Sediment carried by the Yellow River is deposited in such large amounts on the riverbed that it raises the bed and creates a phenomenon referred to as the “hanging river.”

with 1,092 major floods recorded since 1949. Despite reduced flood severity and sediment load due to the construction of reservoirs, embankments, and other infrastructure, 90 million people who live in the North China Plain are still prone to flood. The July 2021 floods in Zhengzhou, the capital of Henan province, were triggered by a record-breaking 617 mm of rainfall over 24 hours, almost the equivalent of the annual average of 640.8 mm.¹² Exacerbated by climate change, such water-related disasters will likely continue threatening livelihoods in the basin over the coming decades.

(iii) Pollution. Water pollution has led to substantial ecological degradation. The sources are diverse and include agrochemical runoff, coal-mining activities, industrial effluents and atmospheric deposition of industrial emissions, untreated wastewater, and solid waste transported by sediments. Human activities are responsible for soil erosion, environmental degradation, desertification, and biodiversity loss in the upper and middle reaches. To date, due in part to anthropogenic pressures, three-quarters of the basin's area are classified as ecologically fragile; 75% of grasslands and 20% of wetlands are degraded, and groundwater resources are overexploited.

(iv) Balancing economic growth and sustainable development. Balancing economic growth and sustainable development in the basin is becoming an increasingly challenging and complex task. Overexploitation of natural resources, inadequate water supply and sanitation services, contamination of soil, and water pollution put the health of the basin and its most vulnerable rural communities at risk. Fragmented governance and financial shortcomings are some of the barriers that underpin effective mitigation of environmental degradation. These shortcomings include the lack of basin-wide planning; policy incoherence across sectors, partially rooted in poor coordination mechanisms across agencies or administrative levels of governance; financial gaps due to the limited flow of private finance; inadequate economic incentives; and knowledge gaps and inadequate skill development.

YELLOW RIVER ECOLOGICAL CORRIDOR

The Yellow River Ecological Corridor (YREC) program is being shaped by ADB's experience from the Yangtze River Economic Belt development plan and the rural vitalization strategy.¹³ The program focuses on institutional strengthening, policy reforms, ecosystem restoration, water pollution control, natural capital accounting, green finance, rural-urban integration, innovation, and digital platforms. Building on the experience and lessons accumulated with the largest basin-wide program in the PRC, ADB has conceptualized the YREC.¹⁴ Box 2 elaborates the concept of an ecological corridor.

Integrated ecosystem-based planning and management approach. Addressing the development challenges in the Yellow River basin requires an integrated ecosystem-based planning and management approach, which involves multisector and multi-stakeholder interventions across multiple scales. In response, the government has prepared the Yellow River Master Plan, 2021–2035¹⁵ to prioritize ecological protection and promote high-quality green development. The YREC builds on three key principles: (i) protect the basin's fragile ecological environment, (ii) address the severe condition of the water resources (balancing use and preservation), and (iii) promote high-quality green development and sustainable livelihoods across six thematic areas of intervention with a programmatic approach (Figure).

Human activities are responsible for soil erosion, environmental degradation, desertification, and biodiversity loss in the upper and middle reaches.

Box 2: Ecological Corridor

An ecological corridor is “a clearly defined geographical space that is governed and managed over the long term to maintain or restore effective ecological connectivity” among several natural zones, linking groups of species. Healthy ecological corridors generate a

diversity of ecological functions and economic co-benefits such as supporting the hydrological and nutrient cycling; and improving biodiversity while enhancing food security, climate resilience, and disease resistance.

Source: J. Hilty et al. 2020. Guidelines for Conserving Connectivity through Ecological Networks and Corridors. *Best Practice Protected Area Guidelines Series*. No. 30. Gland, Switzerland: International Union for Conservation of Nature (IUCN).

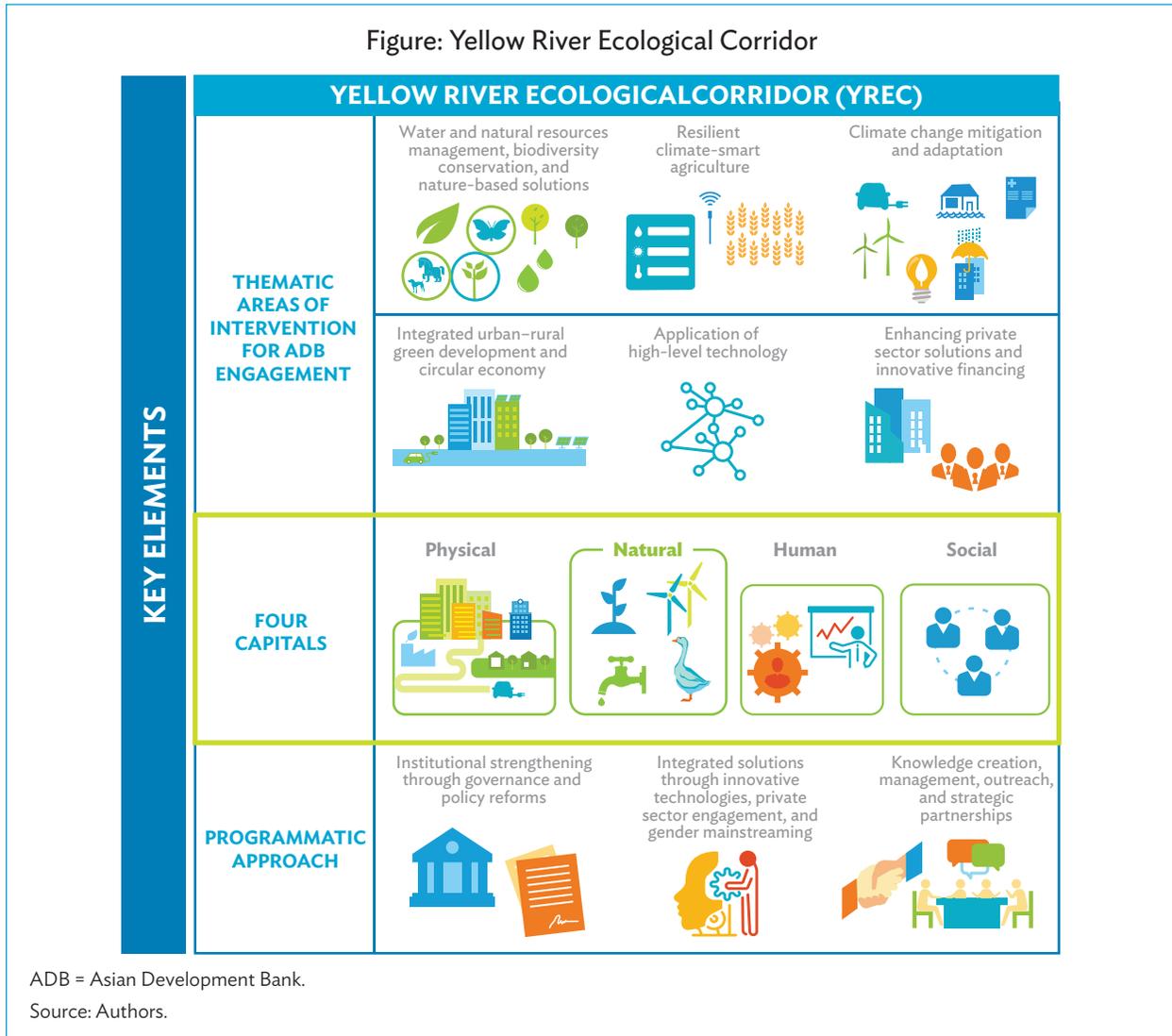
¹² R. Woo and S. Qiu. 2021. At Least 25 Dead as Rains Deluge Central China's Henan Province. *Reuters*. 22 July.

¹³ ADB. 2021. ADB, ADPC Sign MOU to Promote Rural Vitalization in PRC. News release. 26 August.

¹⁴ J. Lynch. 2020. Yellow River Can Lead Way to Greener Recovery. *China Daily*. 9 June.

¹⁵ Government of the People's Republic of China. Yellow River Basin Ecological Protection and High-quality Development Programme. Beijing. Unpublished.

Figure: Yellow River Ecological Corridor



ESTABLISHING THE YELLOW RIVER BASIN AS AN ECOLOGICAL CORRIDOR: POLICY RECOMMENDATIONS

Nature-based solutions to improve natural capital protection, ecological restoration, and sustainable agricultural practices

Globally, the PRC has the highest absolute amount of GDP in nature-dependent sectors, amounting to \$2.7 trillion.¹⁶ Agriculture and food systems rely on direct extraction of resources from land, forests, rivers, and oceans as well as on the provision of ecosystem services such as healthy soils, clean water, fisheries, and agroforestry. Employment and revenue generation from

natural capital are supporting millions of livelihoods. Poverty and biodiversity hot spots are geographically coincident and concentrated in rural areas, where livelihoods depend disproportionately on natural capital (Box 3).¹⁷ Nature-based solutions (NBS) can generate positive impacts for economic growth and social and climate goals in the PRC. NBS is an umbrella concept defined by the International Union for Conservation of Nature (IUCN) as “actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.”¹⁸ The NBS concept is consistent with several ecosystem-based approaches such as green infrastructure, ecological engineering, forest landscape restoration, climate-resilient agriculture, and disaster risk

¹⁶ A. Khatri and C. Zhu. 2020. How China Can Take the Lead on Protecting Nature after COVID-19. *World Economic Forum*. 7 April.

¹⁷ H. Zheng et al. 2019. Realizing the Values of Natural Capital for Inclusive, Sustainable Development: Informing China’s New Ecological Development Strategy. *Proceedings of the National Academy of Sciences of the United States of America*. 116 (17). pp. 8623–8628.

¹⁸ IUCN. 2019. Informing the Global Standard for Nature-Based Solutions. 31 January.

Box 3: Natural Capital

Natural capital, according to the Natural Capital Coalition, refers to “the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.” It includes wetlands, grassland, freshwater and coastal ecosystems, timber, biodiversity, agricultural lands, and mineral and fuel resources. Ecosystem services or “ecological products” (as the People’s Republic of China calls them) flow through natural capital and provide important inputs to human well-being and socioeconomic welfare through their supporting, regulating, provisioning, and cultural functions.

Supporting services include soil formation and retention, biomass production, production of atmospheric oxygen, nutrient and water cycling, provision of habitat, and maintenance of biodiversity. Regulating services include local climate and air quality, carbon sequestration, flood and drought mitigation, water and food system maintenance, and human and ecological health and resiliency. Provisioning services include production of fresh water, food, fuel and fiber, minerals, and medical resources. Cultural services include tourism, recreation, and spiritual and aesthetic values.

Source: Southwest Partnership for Environment & Economic Prosperity (SWEET). What is Natural Capital? <https://sweep.ac.uk/natural-capital/>.

reduction. NBS include nature climate solutions (NCS), which have positive outcomes for climate mitigation and adaptation. NCS for mitigation are measures to decrease carbon emissions from ecosystems (e.g., reducing deforestation and forest degradation), increase sinks (e.g., improving land management and preserving and restoring land cover), and stabilize global temperatures. NCS for adaptation are measures to protect habitat and biodiversity, control soil erosion, reduce fire risk, and manage urban heat and invasive species.

Examples of NBS and NCS practices applicable to the PRC context are (i) provision of watershed services and management of water-related risks through integrated watershed management; (ii) ecosystem restoration, regenerative agriculture, resilient food systems, and food safety through soil regeneration, sustainable land use management, reforestation, water pollution control, climate-resilient agriculture, and agribusiness development; and (iii) biodiversity conservation through protection of natural reserves, natural parks, wetland conservation, and income-generating activities such as ecotourism.

Integrating NBS into policy and financial mechanisms is critical to achieving environmental and economic outcomes for environmental protection and poverty alleviation. Linking poverty and conservation policies is key for improving rural livelihoods in the Yellow River basin’s poverty-stricken counties.

Policy Recommendation 1: Mainstreaming nature-based solutions (NBS) into policies and financial mechanisms can improve natural capital protection, ecological restoration, and sustainable agricultural practices, simultaneously generating ecological and socioeconomic co-benefits for more resilient, equitable rural economies.

GROSS ECOSYSTEM PRODUCT TO IMPROVE THE EFFECTIVENESS OF DECISION-MAKING AND PLANNING

To better align policy reforms with environmental protection targets, the PRC policy makers have developed new policies to promote environmental protection, generate livelihoods, and sustain ecosystem services. Natural capital accounting to calculate the country’s aggregated value of ecosystem services is known in the PRC as gross ecosystem product (GEP).

The GEP is a monetary value of final ecosystem goods and services supplied to people at the landscape scale. Like the GDP, the GEP is an accounting rather than an economic welfare measure. It is a single measure to quantify the linkage between ecosystems and human well-being at national or local scales. The aggregated value of ecosystem services is calculated following a biophysical valuation, pricing, and monetary valuation.¹⁹ GEP accounting is an effective tool to inform decision-making for ecological planning and conservation policies. GEP can also be widely applied for evaluating government policies and designing performance indicators for land use and integrated natural resources management.²⁰

ADB has provided technical assistance to develop GEP and ecological asset accounting as performance metrics in four pilot areas representing three different administrative levels in the Yangtze River basin.²¹ A recent study has comprehensively analyzed and compared ecosystem service values in the Yangtze and the Yellow River basins, offering input for regional eco-environmental planning and policy making.²² Knowledge and data sharing of environmental, hydrological, forest, meteorological,

¹⁹ L. A. Mandle et al., eds. 2019. Review: Green Growth that Works: Natural Capital Policy and Finance Mechanisms around the World. *Electronic Green Journal*. 1 (43).

²⁰ For examples, see Stanford University. Natural Capital Project: InVEST. Integrated Valuation of Ecosystem Services and Tradeoffs; and Wealth Accounting and Valuation of Ecosystem Services. About Us.

²¹ ADB. 2020. Completion Report: Developing Gross Ecosystem Product Accounting for Eco-Compensation. Manila.

²² C. Wu et al. 2021. Assessment of Ecosystem Service Value and Its Differences in the Yellow River Basin and Yangtze River Basin. *Sustainability*. 13 (7).

and statistical information can improve the eco-environmental monitoring system, provide a database to support performance evaluation mechanisms, and inform conservation policies for better planning in the Yellow River basin.

Policy Recommendation 2: Applying the gross ecosystem product (GEP) can improve ecological and spatial planning and inform decision-making.

INCENTIVE MECHANISMS TO SCALE UP NATURAL CAPITAL INVESTMENTS

Incentive or market-based policy instruments can provide economic incentives and reduce negative environmental externalities, helping reduce ecosystem degradation with better allocation of scarce resources. Eco-compensation and water fund mechanisms are successful examples in the PRC (Box 4). In 1997 and 1998, the PRC experienced two major water crises. The Yellow River dried up in 1997 and caused a severe water shortage in the basin. In 1998, devastating floods in the Yangtze River affected 223 million people (a fifth of the PRC's population), 3,004 people died, and 15 million were made homeless, with direct economic damage of over \$2 billion.²³ Deforestation and soil erosion in the upper and middle reaches of the Yangtze and the Yellow rivers were identified as the main factors causing the water crisis.

As a response, the government launched two programs, the Natural Forest Conservation Program and the Sloping Land Conversion Program (also known as the Grain for Green Program). The Grain for Green Program is a successful example of payment for ecosystem services, which provided subsidies to farmers for converting cropland on steep slopes to grasslands and forests. From 2000 to 2013, the central government invested approximately \$55.5 billion in afforestation programs, resulting in 31.8 million hectares of new forest and the reduction of soil erosion by 30% and surface runoff by approximately 20% in the Yangtze and the Yellow rivers. To date, over 32 million rural farmers

participated in the national program, which has the dual goals of environmental protection and poverty alleviation through the provision of alternative livelihoods.

Following the success of the Grain for Green Program, the PRC has designed and implemented numerous eco-compensation programs. ADB will provide policy advice and knowledge support to the first national regulation on eco-compensation in 2022. The regulation builds on over 20 years of provincial and regional experience in piloting eco-compensation for ecosystem restoration, reforestation, water pollution control, sustainable land use management, and regenerative agriculture.

The Ministry of Finance, the Ministry of Ecology and Environment, and the State Forestry and Grassland Administration issued a guiding policy paper to promote watershed eco-compensation in the Yellow River basin. The plan will run until 2022 and provide incentives to provinces to improve water use, conservation, and water allocation between upstream and downstream users.

Water funds are a viable governance and finance mechanism to implement NBS. They unite public, private, and civil society stakeholders around the common goal of securing freshwater resources for people and nature through upstream conservation investments. Water funds connect ecosystem service providers and beneficiaries through funding, governance, and management mechanisms across a multi-stakeholder platform. The Nature Conservancy established a water fund in Qiangdao Lake, the largest artificial freshwater lake in the PRC, which supplies drinking water to approximately 10 million people in Zhejiang province. The lake's water quality is at critical risk due to land degradation caused by chemical fertilizers and pesticides, livestock waste, and sediments transported by soil erosion. Similar mechanisms can be piloted in the Yellow River basin.

Policy Recommendation 3: Using governance and financial vehicles as an incentive mechanism, including eco-compensation and water funds, can scale up natural capital investments by generating ecological benefits and economies of scale.

Box 4: Eco-Compensation in the People's Republic of China

Eco-compensation is a diverse set of fiscal policy tools to reward protecting ecosystems and natural resources by compensating for environmental damage. The aim of eco-compensation policies and programs is to duly factor in opportunity costs of foregone development by reducing environmental externalities and valuing nature's ecosystem services. The traditional approach includes government payments directly to ecosystem service providers. While the central government has made conspicuous investments

in ecological protection, poverty alleviation, and regional integration, private sector participation in eco-compensation schemes has been limited. Eco-compensation investments continue to be driven by the public sector and function mainly as budget transfer support mechanisms from the central government to the provinces (vertical eco-compensation) or among provinces (horizontal eco-compensation).

Source: Authors.

²³ United Nations Disaster Assessment and Coordination Team. 1998. Final Report on 1998 Floods in the People's Republic of China.

SUSTAINABLE FINANCE TO INCREASE PRIVATE CAPITAL INVESTMENTS IN NATURE

Sustainable finance integrates environment, social, and governance (ESG) criteria into lending or investment decisions. It also includes approaches to promote more sustainable investment, i.e., greening existing investments and/or promoting greener investments. Scaling up green and low-carbon financial mechanisms has become an urgent need, among other things, due to the recent carbon neutrality pledge. The main barriers to mobilizing sustainable finance include the following:

(i) Low revenue generation. Nature conservation or restoration projects are generally unattractive to private investors. While environmental benefits may be evident, this often does not translate into desirable financial returns for investors. According to a recent survey,²⁴ private investors are willing to invest in sustainable agriculture, forestry, and land use, followed by investments in freshwater resources (wetlands and peatlands). Fewer survey respondents named investments in biodiversity, which presumably reflects the difficulty in measuring financial returns from biodiversity projects. In the case of the PRC, green financial transactions are usually linked to large infrastructure projects such as renewable energy, transport, water, and solid waste treatment. These projects are financed by large commercial banks, which can undertake due diligence and third-party verification, and ensure transparency of the use of proceeds for green loans and bonds. Small and medium-sized enterprises face difficulties in accessing short-term and long-term loans. Farmers in rural areas generally have low levels of income and lack creditworthiness. As a result, large commercial banks perceive the risks to invest in sustainable agriculture projects as too high.

(ii) General maturity mismatch between natural capital projects and financial investments. Most conservation and restoration projects take time to generate revenue streams, requiring long-term perspective and funding. Commercial banks are most suited to fund short-term investments (usually 1–3 years). Such time frames do not match the long-term payback periods needed for investments in natural capital (usually 20–30 years) and generate the “tragedy of horizons.”²⁵

(iii) Small nature projects. The average size of nature conservation and restoration projects is small, unlike climate mitigation projects (i.e., clean energy or production sites). As such, they do not match the size requirements of large asset managers and can usually tap only into impact investing funds.

(iv) Lack of mainstreaming of nature-related risk management practices, metrics, and methodologies (either voluntary or mandatory) across financial institutions and regulators to assess how economic activities impact biodiversity. In the PRC, there is no standardized framework for environmental impact reporting. To address this information asymmetry and increase transparency, the PRC has recently moved from voluntary to compulsory requirements for environmental information disclosure, applicable to all listed companies and bond issuers. Commercial banks are required to categorize “green,” “brown,” and “neutral” lending in their portfolios. However, ESG investing—a set of standards that investors use for screening company operations to align their investment portfolio to sustainable targets—remains at an early stage of maturity.

The following actions can help enhance sustainable finance mechanisms and increase private investment for natural capital:

(i) Incorporate nature-related financial risks into investment risk management. There are at least three types of nature-related financial risks.²⁶ **Physical risks** arise from chronic depletion of natural resources and natural hazards, leading to disruptions of business production and supply process in the supply chain. Sectors with the most exposure are logging, oil and minerals, agriculture, fisheries, power, and water supply. **Transition risks** are associated with strong policies and/or social norms (regulation, reputational, legal liability), which penalize the direct or indirect damages on nature by businesses. Agriculture, infrastructure, and energy sectors are most exposed. **Systemic risks** disrupt a wide section of society and businesses significantly and simultaneously (e.g., the coronavirus disease [COVID-19] pandemic).

While less attention has been paid to nature-related risks, including systemic risks, there is growing awareness of the interplay between their impacts on the stability of the financial system.²⁷ Several methods can be used to incorporate nature-related financial risks into investment risk management practices: (i) positive screening—selecting investments based on their superior performance both financially and against specific ESG metrics, reflecting a positive list of activities; (ii) negative screening—using exclusion lists against a defined set of excluded sectors or activities; and (iii) ESG integration—integrating ESG risk assessment into business-as-usual risk management practices for financial institutions. To incorporate natural capital-related financial risk management in the PRC, the government needs to build capacity, especially locally.

(ii) Harmonize existing regulatory mechanisms in alignment with the European Union Taxonomy regulation and international standards. While the PRC green bond market

²⁴ The Nature Conservancy. 2019. *Investing in Nature: Private Finance for Nature-Based Resilience*.

²⁵ “Tragedy of horizons” refers to the costs that climate change impacts will impose on future generations, and to the idea that the current generation has no (financial) incentive to address these future impacts proactively.

²⁶ Global Canopy and Vivid Economics. 2020. *The Case for a Task Force on Nature-Related Financial Disclosures*.

²⁷ A. Deutz et al. 2020. *Financing Nature: Closing the Global Biodiversity Financing Gap*. The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability.

has been delivering significant environmental benefits, a robust monitoring, reporting, and verification system will help enforce transparency and boost credibility. This can be achieved through enhancing guidelines and governance mechanisms to tackle market fragmentation created by different authorities and regulatory frameworks. The European Union (EU) Taxonomy—adopted in June 2020 and taking effect in 2022 for climate change mitigation and adaptation and in 2023 for other environmental objectives—can be used as a model for further development of the PRC taxonomies and risk management systems. In April 2021, the People’s Bank of China released its updated taxonomy, the “Green Projects Catalogue,” and referenced the “Do No Significant Harm” principle. The catalogue removed fossil fuel projects from the list, making it consistent with the EU Taxonomy. Removing coal- and gas-fired power has been an important milestone to align the PRC national rules with international standards.

(iii) Diversify green financial products to meet natural capital investment financial demands. Green financial products in the PRC include green loans, green bonds, and green funds. In July 2020, the Ministry of Ecology and Environment, the Ministry of Finance, and the Shanghai city government officially launched the National Green Development Fund. This is the first dedicated environmental fund, with initial \$12.64 billion seed investments. It will be used to leverage national strategic programs such as the high-quality green development of the Yangtze River basin.

(iv) Use blended finance mechanisms to de-risk natural capital investments. Blended finance generally refers to using public finance for mobilizing additional private finance. Blended finance instruments include risk mitigation mechanisms (guarantees, insurance); direct funding (equity, debts, or grants); indirect funding (on-lending by public financial institutions such as ADB); or result-based incentives (performance-based contracts). Blended finance facilities can be instrumental in allowing bundling of small projects to increase the likelihood of revenue-generating activities.

(v) Use fintech to increase private market access in the eco-agricultural supply chain. Digital platforms, artificial intelligence, and blockchain technologies can help reduce the transaction costs in the supply chain by tracing and certifying agricultural processes from the planting to the market, boosting consumers’ confidence in eco-labeled food. With sound traceability, certification, and labeling mechanisms, financial tools can facilitate the production and sales of agricultural products trusted by consumers.

Policy Recommendation 4: Enhancing sustainable finance mechanisms by integrating environment, social, and governance (ESG) criteria into lending and investment decisions can increase private sector participation and private capital flows in nature-based projects.

CONCLUSION

Despite the substantial progress achieved over the last decades, the Yellow River basin still faces severe challenges caused by unbalanced, inadequate, and uneven development. In addition to regional disparities in the rural areas, livelihoods are also affected by biodiversity loss, climate change, water insecurity, and land degradation. This is underscored by the July 2021 floods, which displaced more than 1 million people in Zhengzhou. Exacerbated by climate change, such water-related disasters will likely continue threatening livelihoods in the basin over the coming decades. The COVID-19 pandemic was an unprecedented challenge for the Yellow River basin as much as for the rest of the PRC. As societies and economies recover from the pandemic’s impacts, governments worldwide have the unique opportunity to set a course for a nature-positive future. Building back greener and better means ensuring that nature is an integral component of investment and fiscal policy decisions in the post-pandemic economic recovery. Such an approach must include actionable targets to maintain and restore ecosystem services and biodiversity.

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Notes:

In this publication, “\$” refers to United States dollar and “CNY” refers to yuan. ADB recognizes “China” as the People’s Republic of China.

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