Transformative Solutions and Green Finance in the People’s Republic of China and Mongolia

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Introduction

Asia has experienced widespread transformation and growth, accompanied by increased demographic pressures, greater intensification of agricultural production, industrialization, and urbanization. This economic growth has been very resource- and carbon-intensive, at the expense of the natural environment. In addition, climate change has further exacerbated water scarcity, extreme weather events, vegetation, and soil quality, and triggered or exacerbated behaviors and defense mechanisms, that have come at the expense of the natural environment, resulting in further pressure on natural resources and increasing the vulnerability of communities and ecosystems. Sustaining economic growth and development would be increasingly constrained if current trends of environmental degradation remain unchecked.

From an economic perspective, environmental degradation can be considered a public good. The cause of market failures for public goods such as water and air pollution, overgrazing, and overfishing is that resource users simply try to maximize their profits or develop protective behavior to meet external shocks such as climate change or the coronavirus disease (COVID-19) pandemic. Individuals (people, companies, countries) often opt for the immediate personal benefit or solution rather than collective long-term gain. A more serious case would be when a tragedy of the commons occurs in the marketplace, when a natural resource—such as fishery or rangelands—is made available to all and individuals exploit the resource far beyond optimal levels. Although this is an individual, rational action, in the aggregate it leads to a socially undesirable outcome. In developing Asia, this individual rational action leads to low investment in the development of green businesses because the financial returns are comparatively small, and users of the public good neglect future environmental degradation.

So how is it that this issue is still ongoing? Well, there are a number of reasons and factors that explain the ongoing environmental degradation in the region. Weak national and local institutions, huge investment needs for environmental programs and projects, the urgent need for government funding for job creation and poverty reduction at the expense of the environment, and weak environmental awareness, among others, have contributed to environmental degradation (Gunatilake and De Guzman 2008). Typically, governments
tax, subsidize, and regulate environmental markets by using the “carrot and stick” approach. However, the problem of environmental degradation goes beyond the funding capacity of the public sector alone. In addition to funding, certain situations require a change in behavior by free riders toward greater cooperation to halt environmental degradation and reverse it in the future.

This case study reviews and compares three ADB projects promoting sustainable green development in two Central Asia Regional Economic Cooperation (CAREC) member countries: one in the People’s Republic of China (PRC) and two in Mongolia. These projects offer solutions to the challenges posed by limited public sector financing and capacity issues, as well as working at the grassroots level to foster collaboration among key stakeholders. The case study aims to provide a comparative analysis of modern approaches, innovative green financing, and holistic and transformative approaches that aim to change the behavior and perceptions of key stakeholders in these two countries. The comparisons of these projects aim to identify effective, innovative, and sustainable solutions for the developing economies in CAREC countries.

Both the PRC and Mongolia are facing severe environmental and ecological stress as a result of rapid urbanization, economic development, vulnerability to climate change, and migration. Rapid industrialization and urbanization in the PRC has resulted in high environmental costs in recent decades, with water pollution and flooding becoming major challenges. Meanwhile, agriculture has overtaken industry as the largest source of surface water pollution in the PRC. For example, urbanization, intensive agriculture, and tourism in Huangshan municipality have made it increasingly difficult to maintain good water quality in the Xin’an River. Urban and rural water pollution in the area was caused by eroded urban embankment and revetment sections of the river system. On the other hand, poor public infrastructure and inadequate sanitation services in rural areas led to direct discharge of rural point pollution into the river system. In addition, water quality degradation due to nonpoint source pollution has become a problem. Of this pollution, 85% comes from rural sources, particularly pollutant discharges from agriculture.

Mongolia is also experiencing serious rangeland degradation that could reach an ecological tipping point. The problem is of particular importance in a country like Mongolia, where the livestock sector, especially the nomadic pastoralist livestock production, is the backbone of the rural economy, an important source of income and jobs for the rural population, and ensures food security in Mongolia—the livestock sector accounts for about 25% of total employment, but its contribution to gross domestic product (GDP) is only 10%. The development of the pastoral livestock sector has been largely unchecked, resulting in unsustainable livestock numbers that far exceed the sustainable carrying capacity of the rangelands and are not supported by competitive, low-carbon, and climate-resilient livestock value chains. Weak infrastructure and underdeveloped value chains with numerous intermediaries result in significant transaction costs, making pastoralists indifferent to investments in pastoral farms. All of this has led to lower productivity in key pastoralist products such as meat and milk. In addition, the effects of climate change have led to extreme weather events and natural disasters that make the herders even more vulnerable. Apart from extreme climate shocks, gradual climate change is leading to a decline in water availability, vegetation productivity, and increasing desertification of rangelands, resulting in a steady decline in carrying capacity. If this trend continues, overstocking of livestock would increase greenhouse gas (GHG) emissions and reduce rangeland carbon sinks. Inaction will have long-lasting adverse consequences for Mongolia:
(i) severe degradation of rangelands, where ecological tipping points could be reached and there is no turning back; (ii) productivity decline in livestock production; (iii) increase in poverty and social conflict over rangeland use; and (iv) decline in food production and security.

In contrast, in the capital city of Ulaanbaatar, substandard living conditions in peri-urban areas and increasing climate migrants from rural areas (i) make ger (traditional tent) areas highly vulnerable to climate change impacts and a hot spot of carbon emissions from coal-fired individual stoves and furnaces; (ii) increase the cost of doing business, discourage investors and developers, and inhibit both economic integration and the process of urban redevelopment; and (iii) create very harsh living conditions, especially in winters due to air pollution, particularly affecting vulnerable groups such as women, children, the elderly, and the disadvantaged.

To address these issues, ADB and development partners have begun implementing transformational mechanisms, holistic ecosystem-based approaches, nature-based solutions (NbS) to address pollution, integrated mechanisms for public–private–people partnerships (PPPPs), and innovative financing tools. To overcome the systemic blockages of interrelated development constraints that impede human and economic development, high levels of environmental degradation and GHG emissions, and vulnerability to climate change, ADB and development partners are using innovative and integrated green financing mechanisms that leverage private sector resources to support large-scale transformative projects.

**Approach and Methodology**

For this case study, we use project documents, secondary materials, and ADB resources for project design and implementation. We have conducted a detailed desk review of project documents and reports, academic literature, and discussions. This case study presents a comprehensive summary, project and program details, and a synthesis of findings and comparison of the two countries based on three ADB projects. Conclusions and policy recommendations are provided.

**People’s Republic of China: Anhui Huangshan Xin’an River Ecological Protection and Green Development Project – Innovative Green Financing and Nature-Based Solutions**

**Background and Context**

The PRC has experienced unprecedented economic growth over the past 30 years, rising to become the world’s second-largest economy and significantly reducing poverty. However, the country faces serious environmental problems and a widening economic gap between urban and rural areas. The Yangtze River Economic Belt (YREB) occupies a key position in the economy of the PRC. It accounts for more than 40% of the country’s population, 40% of its freshwater resources, and
about 45% of its economic output. However, increasing pollution, natural resource degradation, and limited transportation access are constraining the YREB’s growth. Pollution is a particular threat to the Xin’an River, which flows from a river system within the YREB. The Xin’an River, which flows from the city of Huangshan in Anhui province through the municipality of Hangzhou, the capital of Zhejiang province, is vital to residents along its banks—about 11 million people rely on its water supply. With a population of 1.48 million in 2018, Huangshan is a popular domestic tourist destination, largely because of its mountain scenery. Rapid economic development, urbanization, intensive agricultural production, and tourism growth have increased the pressure on water resources and the environment in the basin. Although the PRC government continuously promotes the economic development of the YREB, it still faces major development challenges due to increasing pollution, slow transition to green development, and weak institutional coordination for strategic planning.

The river is the sole source of water for Huangshan municipality and also the source of water supply for Qiandao Lake, a large reservoir downstream in Zhejiang province. In the 1990s, water quality downstream became increasingly eutrophic. According to Junwei and Huijin (2012), the main downstream water quality indexes, chemical oxygen demand (Table 1) and ammonia-nitrogen content (Table 2), increased significantly between 1996 and 2010. The gap between the need to protect water resources and economic growth in upstream and downstream regions has also deepened.

### Table 1: Chemical Oxygen Demand of Each Year for the Xin’an River Upstream

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<tr>
<td>COD</td>
<td>mgL-1</td>
<td></td>
<td></td>
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<tr>
<td>1996</td>
<td>2.57</td>
<td>2.32</td>
<td>1.99</td>
<td>2.65</td>
<td>3.04</td>
<td>3.40</td>
<td>2.98</td>
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<td>2004</td>
<td>2.42</td>
<td>2.02</td>
<td>1.76</td>
<td>1.19</td>
<td>1.37</td>
<td>1.45</td>
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COD = chemical oxygen demand, mgL = milligrams per liter.
Data source: Department of Environmental Protection of Anhui Province.

### Table 2: Annual Ammonia-Nitrogen Content of River Water Upstream

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<td>Nitrogen content (mgL-1)</td>
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<tr>
<td>1996</td>
<td>0.11</td>
<td>0.06</td>
<td>0.01</td>
<td>0.05</td>
<td>0.07</td>
<td>0.14</td>
<td>0.18</td>
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<td>2004</td>
<td>0.22</td>
<td>0.19</td>
<td>0.16</td>
<td>0.14</td>
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<td>0.14</td>
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mgL = milligrams per liter.
Data source: Department of Environmental Protection of Anhui Province.
To address these issues and promote regional development, the government introduced a pilot transboundary ecological compensation (eco-compensation) scheme between Anhui and Zhejiang provinces in 2012 to address water quality problems in the Xin’an River Basin across borders. By the end of 2020, the pilot project on ecological compensation in the Xin’an River Basin was implemented in three rounds. Most of the mobilized funds were invested in Huangshan for comprehensive control of industrial wastewater pollution, improvement of wastewater collection and treatment capacity, adjustment of industrial structures, optimization of industrial layout and other specific ecological compensation measures, and restoration of the ecosystem along the river. The water quality of the Xin’an River and the eutrophication of Qiandao Lake have improved significantly after the implementation of the eco-compensation scheme. The water quality at the provincial boundary steadily reached the standard of class II for surface water environmental quality, and some indexes reached the standard of class I (Huangshan Municipality 2020). In the PRC, ADB and development partners have continued development in these areas to address the problems of environmental degradation and insufficient green development.

Despite good progress in combating urban pollution, a significant portion of the urban wastewater system needs to be upgraded. Many of the existing sewerage systems in Huangshan have not been systematically planned or designed to keep up with the pace of urbanization, but rather have been designed as combined stormwater and sewerage systems. As a result, sewage overflows that occur during the rainy season are discharged directly into streams and waterways. Huangshan is also prone to flooding during the rainy season because of its mountainous terrain. The eroded urban embankment and revetment sections of the river system pose another problem, not only for flood management, but also for water pollution control. Exposure of the river system to stormwater runoff has contributed to seasonal fluctuations of water quality.

In addition, as in the YREB and much of the PRC, rural areas in Huangshan face relatively significant challenges compared with other urban areas. About 75% of Huangshan’s 889 administrative villages have no wastewater treatment facilities. The inadequate public infrastructure and sanitation in rural Huangshan adversely affects the living conditions of residents and leads to direct discharge of rural point pollution into the river system. Another key contributor to water quality degradation is nonpoint source pollution, 85% of which comes from rural sources, especially the discharge of pollutants such as total nitrogen and total phosphorus from agricultural activities. The dispersed nature of agriculture activities makes controlling nonpoint source pollution challenging. In addition to agricultural activities, the resilience of the river ecosystem is compromised by poor forest management and pest attacks, which undermine the ability of forests to control soil erosion.

**Introduction of the Project**

In 2019, ADB approved a $100 million loan as a demonstration project to improve the water quality of the Xin’an River in Anhui province, PRC, under the ADB–PRC YREB program. The project aims to help Huangshan municipality demonstrate the reduction of water pollution in the Xin’an River Basin. The project was designed with the following five components: (i) green financing instruments, (ii) urban stormwater pollution management, (iii) rural pollution control, and (iv) environmental management capacity building. These components will be implemented
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through an integrative and holistic approach that addresses the aspects that pollute the Xin’an River Basin. This includes institutional interventions (integrated river resource management), two-pronged financing targeting stakeholders, and the provision of hybrid grey and soft infrastructure. The project provides innovative ecosystem-based approaches through NbS, low-impact development, smart water resource management, and green financing that use mechanisms that address the root cause of pollution. The project leverages public funds to mobilize private sector capital to accelerate green development through the establishment of the GIF. The project period is 6 years, from 25 September 2020 to 30 December 2026, and covers 7 districts and counties in Huangshan municipality.

To address the impacts of NPS pollution from agriculture in Huangshan and improve the long-term sustainability of the eco-compensation scheme, the project is piloting innovative green financing mechanisms through the Green Incentive Mechanism (GIM) and the Green Investment Fund (GIF) (Figure 1). These eco-compensation and equity investment schemes are precisely targeted at grassroots beneficiaries (incentive grants) and eligible firms that want to invest in the development of a green industry (preferential terms, equity financing). The pioneering instruments are output-based, in contrast to the traditional input-based and infrastructure-oriented public interventions in the PRC. The GIM promotes ecological and environmentally friendly tea farming, using a participatory approach by farmers. The GIF supports the green agenda of the Huangshan Municipal Government (HMG) by providing equity financing to small and medium-sized enterprises (SMEs) for investment in organic agriculture, ecotourism, pollution control, climate change adaptation/mitigation, and green businesses.

Figure 1: Innovative Features of the Green Incentive Mechanism and Green Investment Fund

• Green Incentive Mechanism for tea farmers
• Green Investment Fund to support small and medium-sized enterprises (SMEs)
• Promoting green production
• Results-based compensation scheme with certification procedure
• Sustainable equity financing modality to support SMEs in ecological agriculture, ecotourism, pollution control, and green business development

Project Summary for the Huangshan Xin’an River Ecological Protection and Green Development Project

Project Loan Modality, with Financial Intermediary Loan (FIL) Component

**Amount:** Total cost $214.38 million, including $100 million from ADB resources and $58.88 million cofinancing from KfW Bankengruppe. The PRC government is financing $55.5 million. Contributions from the private sector and the beneficiaries are estimated at $31.7 million.

**Outcome and outputs:** The planned outcome of the project is to improve economic and environmental conditions upstream of the Xin’an River, with the following outputs: (i) installation of urban and rural point source pollution management; (ii) improvement of nonpoint source (NPS) pollution control; (iii) introduction of green financing mechanism (FIL component); (iv) strengthening capacity for ecological system and project management; and (v) climate change adaptation and mitigation. The project, implemented in 2020, introduced new operating and financing mechanisms that build on the existing eco-compensation system for a more comprehensive model of green development; demonstrated water pollution reduction in the Xin’an River Basin by improving urban and rural wastewater management (reducing point source pollution); prevented soil erosion through drainage ditches and river embankments; reduced agriculture-related NPS pollution; and strengthened institutional capacity and public awareness of environmental issues. The project takes a holistic, ecosystem-based approach to create synergies among numerous linkages. These linkages include institutional mechanisms (farmer cooperatives, Huangshan Municipal Government officials, local government cooperation in the Xin’an River Basin), rural and urban points, and NPS pollution control systems. The project introduced innovative concepts and technologies, particularly two output-based green financing instruments: cash grants for farmers adopting improved farm management practices and equity financing for enterprises promoting green business. Other NbS measures include a sponge city and low-impact development program to address urban stormwater pollution, and the establishment of a smart platform for environmental, health, and safety management systems.

The Green Incentive Mechanism

Changing farmer behavior is key to achieving more sustainable farming practices. Given the prevalent impact of NPS pollution by the agriculture sector in Huangshan, a financial incentive mechanism was needed to complement the existing cross-provincial eco-compensation scheme. Under the project, the GIM was designed as an additional eco-compensation mechanism aimed at raising awareness, building capacity, and encouraging tea farmers to actively adopt green farming practices such as organic farming. Since 2012, Huangshan City and Zhejiang province have carried out three rounds of pilot eco-compensation projects in the Xin’an River Basin, effectively controlling pollution of the Xin’an River from Huangshan industry and households. However, the current focus is on controlling NPS pollution from agriculture.
Managed by HMG, the GIM is a results-based, financial reward mechanism for farmers. The GIM is a reward-type eco-compensation mechanism to promote green tea farming practices in Huangshan, through which HMG provides cash grants to farmers who have achieved pollution control targets by adopting NbS and sustainable farming practices (e.g., integrated pest management, slope stability, water conservation, and drainage improvement) in accordance with a specific pollution control plan. It creates incentives for ecological and environmentally friendly farming, using a participatory approach. In an innovative pilot scheme, it provides technical assistance in the areas of production, results-based compensation, standards, and certification procedures. HMG has allocated CNY60 million ($8.39 million) of the ADB loan proceeds for establishing the GIM as a pilot project. The GIM is also exploring other market incentive mechanisms such as direct subsidies, interest-free or low-interest loans, etc. If the results-based targeted compensation method of the GIM proves to be effective, it will provide a new way to mobilize funds and resources for the current ecological compensation mechanism of the Xin’an River and serve as a best practice example for dealing with environmental pollution and public goods degradation in the region. It can also be widely applied to encourage more farmers to adopt innovative and diversified sustainable farming solutions. The GIM is entrusting a third-party agency to study the standards and implementation of eco-compensation, as well as to provide concessional loans and green insurance to tea businesses and eligible farmers.

**The Green Investment Fund**

SMEs engaged in green development suffer from not having access to long-term financing because they believe that investments in areas such as ecological agriculture, ecotourism, and pollution control yield low financial returns. Therefore, in parallel with the GIM, a financial investment fund, GIF, is being introduced in the municipality. GIF is jointly funded by ADB, KfW, and HMG. The GIF fund is CNY200 million, of which 50% is ADB loan, 25% is KfW loan, and 25% is HMG. GIF is established as a targeted mechanism under the project to finance the introduction of green investment in key sectors. GIF is a new financing modality that adopts equity financing in private SMEs engaged in green business development, generates revenue, and acts as a catalyst for commercial green financing. Also, a portion of the GIF revenue replenishes the GIM reward fund pool to ensure financial sustainability. The fund, established as part of the existing Xin’an River cross-provincial eco-compensation scheme, targets sustainable businesses and partners that need capital for investments (e.g., eco-agriculture, ecotourism, and other green projects are also financially feasible) that support the green agenda of HMG. These enterprises will use technology to improve farmland efficiency, minimize fertilizer and pesticide use, contribute to the local economy, and practice green agriculture. The initial $290 million from GIF will be financed in a 2:1:1 ratio of ADB loans, KfW Bank loans, and the Xin’an River Ecological Compensation Fund managed by HMG. This fund is managed by a private corporation and has a term of 25 years (2021–2045). Its operational period is 5 years, including the investment phase in the first 3 years and the exit phase in the last 2 years. The financing costs for the ADB and KfW loans are calculated on the basis of EUROBOR rates.

GIF’s selection indicators consider both financial indicators and expected environmental benefits. These include (i) reductions in point source and NPS pollution control indicators (total nitrogen, total phosphorus, chemical oxygen demand, and ammonia nitrogen) discharged to water;
(ii) reductions in the use of chemical fertilizers and pesticides; (iii) green economy indicators (e.g., farming land converted to green or organic agriculture, number of jobs created by green industry, and number of ecotourists); (iv) climate change adaptation and mitigation indicators (e.g., land used for climate change adaptation/reduction in GHG emissions). These economic, environmental, and social performance indicators are used to regularly monitor the progress of the GIF. The investment portfolio targets are 40% ecological agriculture, 30% ecotourism, and 30% pollution control. Individual investments will not exceed 30% of the total size of GIF and will not exceed 49% of the shares of the qualified investment company. The investment turnover is expected to be between 4 and 7 years.

The proposed dual fund arrangement is intended to improve the sustainability of the current eco-compensation scheme. In other words, revenue from the green investment fund can be used to provide cash grants under the eco-compensation scheme. This pilot arrangement with dual pooled funds provides a self-financing mechanism for compensation by encouraging commercial financing and reducing the fiscal burden on the budgets of central and local governments. Capacity building will ensure that cutting-edge elements of information and communication technology are used to develop smart management information systems for different areas, including water quality monitoring and environmental health and safety.

**Mongolia: Aimag and Soum Green Regional Development Investment Program – Green Agro-Territorial Development in the Provinces of Mongolia**

**Background and Context**

Average temperatures in Mongolia have increased by 2.1°C over the past 70 years. Average precipitation has declined, and extreme climate events (such as the dzud[1]) are occurring more frequently. These changes are having a significant impact on the natural capital of Mongolia’s vast rangelands,[2] declining their productivity and availability and reducing carrying capacity. This is compounded by decades of unsustainable herding practices, in which herders compensate for their vulnerability and losses of livestock and income due to extreme climate events by expanding their herds far beyond the carrying capacity of the rangelands.[3] This contributes to herd vulnerability and low livestock quality, which in turn leads to livestock and income losses, forcing herders to compensate by increasing livestock numbers, creating a vicious cycle. Currently, overgrazing averages 23% above the carrying capacity of the rangelands. About 70% of Mongolia’s rangelands are degraded. The continuous increase in herds also means that the impact on the rangeland ecosystem and resources is just beginning to be felt. Rangeland degradation is also accompanied by significant decline in above- and below-ground biomass and a reduction in soil carbon storage.

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1. A dzud is a succession of droughts and severe winters.
2. Rangeland covers more than 80% of Mongolia’s territory.
Improving rangeland management therefore offers Mongolia tremendous opportunities to mitigate climate change. It is estimated that Mongolia can avoid more than 440 million tons of carbon dioxide equivalent emissions over a 20-year period through soil carbon sequestration.

Program Summary for the Aimags and Soums Green Regional Development Investment Program

Multitranche Financing Facility (Three Tranches Over 10 Years)

Amount: Total cost $735.0 million composed of a blended financing package that includes grants and loans from ADB, Green Climate Fund, European Investment Bank, and the European Union; government budget; private sector investments; and beneficiaries’ participation.

Outcome and outputs: The planned outcome of the program is green and inclusive agro-territorial development that is advanced, and with the following outputs: (i) development of climate-resilient, low-carbon, and attractive aimag and soum centers (e.g., water supply, wastewater treatment, waste treatment, electrical power and heat supply, transportation, housing, agro-processing facilities, and public facilities); (ii) implementation of climate-resilient, high-carbon sequestration, and sustainable rangeland management; (iii) creation of accessible financing for low-carbon and climate-resilient livestock value chains (financial intermediation loan component); and (iv) strengthening of institutional capacity and policies for low-carbon and climate-resilient agro-territorial development.

To break the above vicious cycle, a number of interrelated barriers need to be addressed, such as the lack of (i) a viable model for integrating sustainable pastoralism into the market economy, incentives and capacity-building support for herders to implement sustainable rangeland management practices; (ii) an enabling regulatory and market environment; (iii) herder organization and support systems (such as certification and traceability systems); (iv) adequate funding to support private sector investment in low-carbon and climate-resilient livestock value chains; (v) livestock health and breeding services; and (vi) adequate provision of public infrastructure and urban services in secondary cities and rural towns (aimag and soum centers). The financing ecosystem for agribusiness development in aimags is mainly characterized by risk-averse financing conditions, high and rigid collateral requirements, unaffordable interest rates and short-term loans, and rigid repayment terms.

The above challenges are interrelated, and addressing these barriers individually has proven inefficient and unsustainable in the past. Restoring the rangeland requires reducing grazing pressure on rangelands through improved grazing practices, better herd composition, and limiting

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4 Carbon sequestration is the process of capturing and storing carbon dioxide. This reduces the amount of carbon dioxide in the atmosphere and helps mitigate global climate change.
livestock numbers. These measures must be combined with increased value per livestock to provide sufficient incentives for herders. This requires higher demand, better processing, logistics, and breeding materials that can only be supplied through aimag and soum centers that are livable, have the necessary infrastructure to provide services and inputs, and are sufficiently attractive to professional service providers. It is important to note that without these conditions, investments in agribusiness cannot be made at the point of need, which prevents job creation, local development, and economic diversification.

**Introduction of the Program**

The program represents a fundamental paradigm shift in applying a transformative model to promote green territorial development and urban–rural linkages, in which livable human settlements—aimag (province) and soum (subunit of an aimag) centers—become anchors of green agribusinesses that promote sustainable, resilient, and high-carbon rangeland management. The program will initially focus on Mongolia’s western aimags and promote climate finance and private sector investment mechanisms that can be replicated countrywide. It aims to significantly improve rangeland management and reduce the vulnerability of the rural economy to climate change, overgrazing, and uncontrolled migration to Mongolia’s capital city; promote green economic diversification; and increase the capacity of grasslands as carbon sinks. The program will be implemented over a 10-year period using a multitranche financing facility with a financial intermediation component to support the development of green agribusinesses. It will be supported by three cofinanciers: the European Investment Bank (concessional loan), the Green Climate Fund (concessional loan and grant), and the European Union (grant). These project investments will

- Create an enabling environment through the construction of climate-resilient and low-carbon settlements that provide adequate services to support local agribusiness, create conditions for the restoration of its key functions in the rural economy, and attract investment in agro-processing facilities at the point of need. This is done by investing in low-carbon and climate-resilient infrastructure and services, necessary infrastructure for agro-processing (agro-business park), and priority public amenities (e.g., business incubators, schools, laboratories, public spaces). In addition, key investments such as livestock shelters, livestock health facilities, storage facilities, and irrigation systems required for feed production investments will help maintain livestock productivity during harsh winters and improve poor animal health so that yields can be maintained and premature deaths avoided.
- Transform behaviors and practices of the sector through a series of plans that take into account the expectations, objectives, and constraints of all stakeholders, in order to synchronize the different components and promote synergies: participatory and inclusive herd management plan, social and gender action plan, low-carbon, and climate-resilient livestock value chain, rangeland use agreement, low-carbon and climate-resilient agribusiness development plan, and environmental management plan. These plans provide guidance on the scope of consultations to encourage private sector, public sector, and beneficiary participation, ensure their ownership and commitment during project implementation and beyond, and disseminate information to gain consensus and support from target beneficiaries and key stakeholders, reduce potential problems during
implementation, and enhance positive impacts. At the herders’ level, behavior change is promoted through grant-based support to herder groups, enabling them to practice sustainable rangeland management. Incentives such as community-based investments, working capital, and equipment for cooperatives, capacity building, salaries, or destocking incentives will be provided to help herders cooperate in implementing low-carbon, climate-resilient rangeland management that includes more sustainable grazing practices and herd reduction, restoration of traditional herd composition with a lower proportion of goats based on rangeland carrying capacity, and smooth conflict resolution among herders.

Incentives to reduce livestock numbers and manage rangeland sustainably also require herders to form groups that use the same pastures and offer collective incentives to these groups depending on herders’ willingness to participate, raising awareness among the herders of the potential degradation of rangelands due to their activities and climate change, and of the need to resolve these issues collectively. Finally, support for traceability and certification systems is paramount to improve marketability and ensure price premiums for products and as criteria for investment support.

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Figure 2: Herders’ Engagement Process

- **Herders**
  - Managed at PUG level
  - Rangeland Use Agreements RUA

**GET ACCESS TO**
- **COMMUNITY-BASED INVESTMENTS**
  - Managed at PUG level
  - BENEFIT FROM
  - HERDER COOPERATIVES and SMEs
  - Supported by ASDIP

**RUA** = monitoring tool for sustainable rangeland management

**SIGN and IMPLEMENT**

**RUA targets are reached**
- Increased revenues for herders if RUA targets are reached with annual monitoring and evaluation

**New economic opportunities and increased revenues**
- New agribusinesses
- Certification on low carbon products
- Increased herd value added

ASDIP = Aimag and Soums Green Regional Development Investment Program, PUG = pasture-user group, RUA = rangeland user agreement, SMEs = small and medium-sized enterprises.

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5 ASDIP will use the mechanisms of the pasture-user group organization and rangeland user agreement developed under the Green Gold Program. Based on traditional rotational grazing management, this will lead to more sustainable grassroots social and productive organization, conflict resolution, and promotion of social harmony, without which the model cannot be successfully implemented.
Figure 2 describes the herder engagement process and incentive mechanisms to promote sustainable rangeland management.

- Use of green financing mechanisms to bridge the gap between grant-based financing (grant-based support to herders as described above) and market-based financing in the low-carbon and climate-resilient livestock value chain through the revolving Green Inclusive Regional Agri-Business Fund (GIRAF) financed by the Green Climate Fund. GIRAF will address the financing constraints that prevent agricultural cooperatives and agribusinesses from investing in targeted aimag and soum centers. It will use a blended financing strategy to support the formation of a well-functioning, inclusive, low-carbon, and climate-resilient livestock agribusiness value chain and fully realize its benefits. GIRAF will provide low-interest loans, credit guaranty mechanisms, and performance-based green innovation grants to support only qualified investments in livestock processing agribusiness subprojects that involve shared ownership or profit agreements with herders and herder cooperatives certified in sustainable rangeland management.

Investments should be located in the agro-industrial park (or similar conditions) financed by the program. The commitment to partnership and profit-sharing through a certification system provides herders with additional income from processing activities that compensates them for maintaining smaller herd sizes. The revolving nature of GIRAF will allow it to cover a wide geographic area and encourage other aimags to adopt criteria for developing low-carbon and climate-resilient agribusiness. This will increase the capacity, quality, and added value of finished agro-products and agro-processing industries based on local production of food and raw materials, improve livelihoods of herders, and support geo-economic redistribution of value chains in regional clusters (Figure 3).

- Strengthen institutional capacity and policies and support the government in formulating, implementing, and enforcing policies and plans conducive to integrated green agro-territorial development, including climate-smart livestock husbandry, rangeland management, urban development, and replication within and outside Mongolia, and explore partnership for low-carbon and climate-resilient rangeland management in Central Asia.
Figure 3: Geo-Economic Transformation of Agro-Business Value Chains Location, at the Point of Need

**Current Situation**
- Processing industries
  - Ulaanbaatar
  - Aimag center

**With ASDIP**
- Agri-processing SMEs and urban infrastructures
  - Aimag center
  - Intersoum center
  - Integrated livestock value chain development and rangeland use management
  - Urban-rural integration, livestock value chain development
  - Link with export market

ASDIP = Aimag and Soums Green Regional Development Investment Program.
Mongolia: Affordable Housing and Resilient Urban Renewal Project – Eco-District and Green Affordable Housing Development in Ulaanbaatar Substandard Urban Areas

Background and Context

The ger areas of Ulaanbaatar are vast substandard peri-urban settlements of low- and medium-income households with poor basic infrastructure and urban services. They have spread around Mongolia’s capital as part of the rural–urban migration and currently house about 850,000 people. This is 60% of Ulaanbaatar’s 1.4 million inhabitants (about 30% of the country’s population). Dwellings in the ger areas consist mostly of gers and wooden houses. Inadequate urban planning, housing policies, and provision of infrastructure have resulted in loosely aligned plots and irregular and unpaved roads. Poor insulation and inefficient heating due to the use of coal, coal briquettes, and biomass stoves cause large amounts of carbon dioxide emissions and air pollution, especially in winter. Poor sanitation, as most households rely on open-pit latrines and waste disposal is poor, leads to unsanitary living conditions. Residents have limited access to water provided through water kiosks,10 while access to public places, public facilities, commercial areas and economic activities is nonexistent. This situation (i) makes ger areas highly vulnerable to climate change impacts and a hot spot for carbon emissions; (ii) increases the cost of doing business, discourages investors and developers, and inhibits both economic integration and the urban redevelopment process; and (iii) creates very harsh living conditions, especially during winters, mostly affecting vulnerable groups such as women, children, the elderly, and the disadvantaged. Due to increasing growth and migration, the number of people living in these poor conditions continues to increase, as there are few affordable housing options. The need for housing is estimated at approximately 150,000 units, while the available stock of affordable housing is very limited.11 More than 60% of ger area residents are willing to move into housing units if acceptable and affordable solutions are offered near their communities.

Several barriers prevent ger area residents from accessing affordable, climate-responsive green urban housing, including (i) an oversupply of mid- to high-end residential units and an undersupply

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6 The ger areas are named after the traditional Mongolian tent in which 44% of the inhabitants of these areas live.
7 Mongolia has experienced rapid rural–urban migration caused primarily by (i) extreme climatic events such as droughts and severe winters (dzud) combined with inadequate veterinary services and poor livestock management; and (ii) the introduction of a policy in 2003 granting each citizen access to about 700 square meters of land in urban areas.
8 In contrast, the city center consists largely of apartment blocks with complete utilities, including heating, water, and sanitation.
9 Air pollution leads to health risks such as cardiovascular and respiratory diseases.
10 Water consumption in ger areas is about 10 liters per capita per day, more than half the minimum consumption recommended by the World Health Organization in similar situations. Residents pay 2–10 times more than those in non-ger areas.
11 For low-income households, housing costs are considered affordable if rent or mortgage payments do not exceed 30% of gross monthly income.
of affordable housing units; (ii) the lack of financial and institutional mechanisms to support comprehensive green housing;¹² (iii) inadequate mortgage programs for the majority of low- and middle-income households; (iv) the lack of adequate infrastructure that discourages private and public investment, creating major barriers to the creation of housing, jobs, and services, as well as the integration of ger area residents into the economic and human development of the capital city; (v) lack of low-cost, long-term financing for developers to provide affordable housing that meets the borrowing capacity of low- and middle-income households living in ger areas; (vi) lack of examples that demonstrate best practices and procedures in developing urban solutions that are inclusive and address climate-related issues;¹³ or (viii) complex resettlement process and land access for the private sector in ger areas and the lack of fair, participatory, and efficient mechanisms that promote on-site housing redevelopment. To initiate an effective and transformative approach, the abovementioned barriers should be addressed in a comprehensive and integrated manner. Attempting to address each aspect individually will not change the current paradigm and status quo in which ger area residents are trapped and which prevents the process of in-situ redevelopment.

**Introduction to the Project**

The project promotes sustainable and comprehensive solutions to bridge the current gaps in climate-responsive urban development and green affordable housing by transforming Ulaanbaatar’s highly climate-vulnerable and heavily polluting ger areas into low-carbon, climate-resilient, and affordable eco-districts.¹⁴ The project aims to leverage private sector investment to deliver 10,000 green affordable housing units and redevelop 100 hectares (ha) of ger areas into eco-districts (Figure 4). It is designed as an integrated public–private–people partnership (PPPP) model with innovative green financing mechanisms. Building on the ongoing development of main trunk infrastructure and basic services in existing urban centers in ger areas through a complementary ADB-financed program,¹⁵ the project aims to overcome systemic barriers and create sustainable market conditions for green affordable housing and investment in eco-districts. Public and private sector investments will be combined with sector reforms to develop core eco-district subprojects that can be replicated by subsequent eco-district subprojects. In total, the project will develop 20 eco-districts with an average area of 5 ha each, based on the core subproject plan. The project will set a new precedent for the link between urbanization, affordable housing, climate change, and climate risk, and help the government and the Municipality of Ulaanbaatar translate their local and sectoral development plans into actionable investments and coordinated policies, actions, and institutional reforms. The main features of the projects are as follows:

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¹² Green housing maximizes climate action through (i) mitigation measures using resource-efficient and energy-efficient construction techniques and materials, renewable energy systems, and operation and maintenance that ensure building performance and occupational health; and (ii) adaptation measures to reduce ger area residents’ vulnerability to harsh winters, flooding, hot summers, and soil pollution.

¹³ Especially promoting highly energy efficient buildings and the use of renewable energy solutions.

¹⁴ Eco-district development is a highly integrated urban planning and development process at the neighborhood level, bringing local responses to build up citywide green and sustainable development.

¹⁵ The ADB-financed Ulaanbaatar Urban Services and Ger Areas Development Investment Program is extending basic urban and social services in Ulaanbaatar’s ger areas to upgrade existing economic hubs or subcenters and initiate an urban redevelopment process based on an enabling environment for private and public investments. This provides an opportunity to implement on-site solutions and options for households to access apartments within their communities by integrating housing solutions into an urban renewal program.
Affordable Housing and Resilient Urban Renewal Project Summary

**Modality:** Sector Loan with Financial Intermediary Loan (FIL) Component

**Amount:** Total cost $570.1 million, including ADB’s blended loans ($80 million); Green Climate Fund ($50 million grant and $95 million loans); High Level Technological Fund ($3 million grant); Municipality of Ulaanbaatar ($35 million); and commercial banks, developers, and beneficiaries ($307.1 million)

The planned outcome for the project is to improve access to low-carbon and climate-resilient eco-districts and green affordable housing in the ger areas of Ulaanbaatar. The project will have three outputs: (i) construction of resilient urban infrastructure, public facilities, and social housing in the ger areas (public sector component); (ii) long-term financing of developers for low-carbon affordable housing, market-rate housing, and economic facilities in the ger areas, and households for green mortgages through the FIL component; and (iii) implementation of sector policy reforms and capacity strengthening. The project leverages private sector investments to (i) deliver 10,000 affordable green housing units; and (ii) transform 100 hectares of the ger areas into low-carbon, climate-resilient, mixed-income, mixed-use eco-districts.
• The integrated and comprehensive design of the eco-district design is based on a PPPP approach that brings together the resources of the public sector, community beneficiaries, commercial banks, and real estate developers to develop an urban solution for the eco-district. It defines a clear division of roles for all stakeholders for each eco-district, such as responsibilities and financial contributions to implement integrated infrastructure and architectural design, green technical specifications, and planning principles that promote (i) a social mix with an appropriate ratio of social housing (15%), affordable housing (55%), and market-rate housing (30%); (ii) mixed land use with a balance of public space and amenities, commercial space, and residential units; (iii) financial viability and rentability to enable private sector participation; (iv) people-centered and inclusive design with universal design, gender-friendly features, and livelihood opportunities; and (v) low-carbon development by maximizing the use of renewable energy and energy efficiency and implementing a smart building performance monitoring system.

• Innovative green financing mechanisms for eco-district and green housing development (Figure 5). The project uses four integrated green mechanisms:

1) A green mechanism for voluntary swap credit for land and assets for against the cost of new low-carbon and climate-resilient housing units. This mechanism provides on-site housing solutions when all residents in a specific area are willing to participate in the redevelopment of the eco-district. Residents with land ownership, most of whom have land tenure, can then swap their land and assets for housing units, and residents without land ownership can access rent or rent-to-own schemes or receive priority access to affordable housing in the eco-district. Because the process is in situ, it maintains social cohesion among participants and prevents them from being moved from their community, while removing the barrier to land access for developers and building eco-districts.

2) A municipal debt and grant financing to finance the eco-district’s internal infrastructure (such as hot and potable water supply, wastewater collection, solid waste management, roads, lighting, drainage), public lands and green spaces (for approximately 30% of the eco-district’s land), and social housing. It also includes investments in renewable energy such as photovoltaics on the roofs of residential buildings and a smart monitoring system for renewable energy and building performance. Through public financing, the project provides private developers with an appropriate physical environment and improves the attractiveness of the selected area for green housing and commercial development.

3) A green financial intermediation loan (FIL) to establish the Eco-District and Affordable Housing Fund (EDAF), a private investment fund structured as a revolving fund. EDAF is onlending a portion of the Green Climate Fund (GCF) loan proceeds to participating commercial banks and/or real estate developers based on eligibility and selection criteria, leveraging private resources and channeling them to finance housing supply and demand and commercial development. On the supply side, EDAF will provide selected private developers with medium-term, low-interest rate loans that will be combined with the developers’ equities and additional loans and participating commercial banks to finance and build the affordable and market-

Housing units beyond those provided in the land swapping process will be accessible based on income criteria for social, affordable, and market housing.
rate housing units and commercial space. On the demand side, the loan proceeds are converted into low-cost long-term green mortgages for home buyers to purchase the affordable and market-rate housing units. The strong leverage factor of private sector investment results in a small share of public financing (less than one-third) in the total project financing.

4) A performance-based grant (Green Building Facility) is financed by the GCF grant to subsidize a portion of selected private developers’ investments for climate change mitigation and adaptation, such as the use of high-performance and energy-efficient building materials or techniques in accordance with the eco-district technical specifications. The grant will be used to (i) demonstrate the benefits of these investments by providing a strong impetus for an enabling environment that integrates policy, regulatory, and supply chain features for climate change mitigation; and (ii) ensure that housing is affordable and of high quality.

- **Effective and meaningful community participation** and engagement, which includes three phases of stakeholder participation: (i) project feasibility, to build a consensus and cooperation with affected communities on the land swap and resettlement plan;

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17 EDAF will only provide up to 30% of the required funding amount to the selected developers.
(ii) detailed design, to achieve consensus with key project stakeholders, including affected communities, municipal and government organizations, the private sector, and relevant associations and nongovernment organizations, on final plans for the development of the eco-district; and (iii) construction, supervision, operation, and maintenance arrangements to ensure good cooperation with key project stakeholders in accordance with the work schedule. Effective engagement will also be achieved through (a) social and gender action plans, including skills training and livelihood opportunities; and (c) community-based activities such as urban farming and community-based solid waste management.

- **Sectoral, institutional, and policy reforms** will lead the transformative impact and paradigm shift in regulations, standards, and sectoral capacity that will enable (i) climate-responsive urban planning; (ii) increased performance, energy efficiency, and renewable energy in buildings; (iii) efficient supply chains for renewable energy systems; (iv) improved supply of and access to low-carbon affordable housing; energy-efficient construction techniques and materials; (iv) sustainable green finance and green banking policies that encourage private sector participation in low-carbon and climate-resilient urban development; and (v) eco-efficient urban services.

### Integration and Comparative Analyses

This section integrates and comparatively analyzes the PRC and Mongolia case studies, highlighting innovative project features suitable for replication in developing economies in Asia and the Pacific.

### Innovative Characteristics of the PRC’s Anhui Huangshan Xin’an River Ecological Protection and Green Development Project

The project design has provided well-designed new public and private financing mechanisms that could be important for scaling up NbS to reduce chemical use in agriculture. Significant ecological and economic benefits have been achieved through the introduction of NbS in three rounds of the cross-provincial pilot ecological compensation project on the Xin’an River. However, this requires coordinated and integrated development among regions. Motivating farmers to participate in controlling NPS pollution is an important part of the solution. To establish a long-term mechanism for controlling NPS, it was important to engage the key free riders in the ecosystem, namely tea farmers, for compensation. Green agricultural practices such as soil testing and the use of formulas and organic fertilizers in tea gardens, construction of rural rain, and wastewater diversion systems were rewarded. Active participation of farmers (e.g., through their cooperatives or associations) is a critical factor for effective eco-compensation. The impact of farming activities on NPS pollution will be monitored and verified through approaches such as self-reporting, on-site inspection and monitoring, and sampling and analysis. Finally, the dual pooled fund comprising the GIF and GIM is a financial innovation to improve the long-term sustainability of the country’s flagship eco-compensation scheme. Innovative financial and policy mechanisms are therefore important and essential for watershed protection and other environmental protection challenges. The use of a sustainable financing modality (through equity financing) funded by the government and other development partners is a notable catalyst for funds. Financial sustainability of the GIF and GIM can be achieved by expanding funding sources and using financial returns from the GIF to support the GIM program.
Innovative Characteristics of the Aimags and Soums Green Regional Development Investment Program

The integrated territorial approach and the combined synergistic actions of public and private investments, together with the behavioral changes of the program, are expected to generate powerful synergies to (i) promote sustainable and equitable management of natural capital and ecosystem services, reverse rangeland degradation, and improve herders’ resilience; (ii) increase carbon stocks in rangelands (above and below ground biomass) and ecosystem resilience in specific rangelands in the context of climate change; (iii) support green economic diversification and post-COVID-19 green recovery to promote vibrant green local development and reverse rural migration to Ulaanbaatar; and (iv) reduce urban pollution, vulnerability, and GHG emissions, enhancing the attractiveness of urban areas, and promoting green urban–rural linkages; and achieving the following benefits: (a) ecosystem regeneration of 28.8 million ha of rangeland; (ii) creation of 11,400 direct and 150,000 indirect green jobs; (c) reduction of 117.40 million tons of carbon dioxide equivalent (tCO2e), including 94.0 million tCO2e from soil carbon sequestration (potential for 440 million tCO2e countrywide over a 20-year period); and (d) improved climate change adaptation for 550,000 people, including 54,000 vulnerable herder households.

Innovative Characteristics of the Affordable Housing and Resilient Urban Renewal Project

Integrating PPPPs; a design-based approach; and innovative green financing to overcome systemic affordability, financial, policy, and physical barriers to public and private sector investment in green housing and eco-district development is possible. By catalyzing initial investment through financial incentives, they will create a transformative model, sustainable market conditions, and a critical mass of investment to attract suppliers of eco-efficient building materials and renewable energy equipment. Practical experience and know-how creation, combined with sustainable market conditions and the revolving nature of EDAF, will catalyze the impact of the project beyond the implementation period and ensure that the change initiated continues to have an impact beyond the end of project implementation to be efficiently transformative. Removing market distortions and barriers will ensure both incentives and resources for continued implementation and replication of project interventions. The project’s transformative impacts will deliver cross-cutting climate benefits: 8 million tCO2e of direct GHG emission reductions and a total of 39.59 million tCO2e including indirect benefits and replication effects, and 1 million direct and indirect beneficiaries through reduced vulnerability to climate change.

Integration and Comparative Analysis

The PRC and Mongolia have encountered challenges in promoting sustainable and equitable management of natural capital and ecosystem services. In the PRC, the barriers relate to water resource management and environmental degradation, while in Mongolia the issues are on farmland...
practices and rangeland degradation in rural areas, and inadequate provision of basic services and green affordable housing in urban communities. In both countries, the practices and behavior of farmers (PRC) and herders and urban dwellers (Mongolia) are key to addressing environmental and urban development problems. Common to both countries is the impact of innovative financing mechanisms on green development and diversification. Both countries need innovative and integrated approaches that go beyond top-down, structural, and infrastructure interventions and require policy and institutional development approaches and different modalities.

In the case of the PRC, dual financing mechanisms and pioneering tools have been used as a parallel strategy to address water quality issues in the Xin’an River Basin and the barriers identified above: (i) GIM as grants to incentivize farmers to improve their farming practices, and (ii) GIF as a loan intermediary to provide access to credit and equity for SMEs seeking to engage in the green business. After several rounds of the PRC’s flagship eco-compensation scheme, the scheme for Huangshan and Zhejiang provinces has shifted to addressing the main causes of pollutants currently attributed to NPS pollution from agricultural practices. SME funding is also focused on the green economic development of Huangshan. The project provides a comprehensive approach that includes introducing urban and rural point source pollution management, improving NPS pollution control, introducing green financing and mechanisms, and strengthening institutional capacity through improved integrated water resource and environmental management. The project comprehensively promotes NbS in all project interventions to adapt to and mitigate climate change impacts while improving sustainable livelihoods and protecting natural ecosystems and biodiversity. By combining a project loan modality with FIL and parallel financing from KfW Bankengruppe, the project is able to provide parallel interventions for all stakeholders through the government (HMG), an intermediary bank, a third-party assessment agency, SMEs, and individual farmers. The two cases of ADB’s Xin’an River Basin Ecological Protection Project and the World Bank’s Qiandao Lake Water Fund show that output-based green financing is a new way to support green agriculture and value addition of ecological products, and that it is worthwhile to support more agricultural NbS in the future.

The Mongolia projects have also provided innovative and targeted green financing mechanisms, bridging the gap between grant-based financing and market-based financing, and providing FILs through blended financing to achieve their goal of ecosystem regeneration and urban renewal. In both cases, systemic, interrelated barriers to development limit human and economic development and lead to high levels of environmental degradation, GHG emissions, and community vulnerability. To overcome this status quo, green financing mechanisms have been integrated into a holistic and cross-sectoral intervention framework to address existing barriers and initiate sustainable systemic change. The concept of transformation is important because it introduces a paradigm shift and a reorientation of development strategies. It introduces systemic, structural, and institutional change that encompasses new narratives and paradigms that are distinct from incremental change, which are discrete and well-defined shifts. Change is not complete until the new system has become mainstream and sufficiently resilient to hold that position. This requires a comprehensive transition period in which projects are considered the main component.
In both cases, systemic change is based on a blended and integrated strategy that enables powerful synergies between public, human, and private interventions to address current barriers to a resilient and low-carbon paradigm shift. Both projects are based on four principles embedded in an overall integrated approach: (i) creating an enabling physical environment (through investments in structures, infrastructure, and public facilities); (ii) grant-based incentives to change the behavior of communities and sector stakeholders; (iv) financial intermediation to support private sector investments that are linked to the new physical environment and enable the private sector to capture the behavioral change and align with new regulations; and (v) regulatory improvement through capacity building and certification, which provide the basic framework and condition for market linkage. As in the case of the PRC, green financing will help address the financing constraints that prevent agricultural cooperatives and agribusiness enterprises from investing in the targeted aimag and soum centers. Innovative financing under the program includes performance-based green innovation grants that support only qualified investments in agribusiness subprojects related to livestock production. The financial intermediation component was developed to leverage funding from various partnering financial institutions, promote market-based financing mechanisms and institutional capacity for private sector green investments, and broaden access to a wide range of green investment solutions. In parallel, institutional development has been promoted to enable integrated green agro-territorial development as well as climate-smart livestock production, rangeland management, and urban development. In the case of Mongolia in urban development and housing, the program uses integrated and transformative approaches that include (i) innovative green financing mechanisms to advance the redevelopment of ger areas into eco-districts and green affordable housing; (ii) effective and meaningful community participation and involvement; (iii) private sector participation; and (iv) sectoral, institutional, and policy reforms. Innovative mechanisms include a green mechanism for voluntary land and asset credit swaps, municipal debt financing, green FIL, and performance-based grants (Green Building Facility). Incentive mechanisms include support to public–private partnerships (PPPs) that pool the resources of the public sector, community beneficiaries, commercial banks, and real estate developers to develop the eco-district urban solution.

The above cases have overcome the barriers and constraints of previous efforts. As in the case of the PRC, where lessons were learned from previous ADB- and World Bank-funded eco-compensation programs, the next step was to create an innovative dual financing mechanism. The integrated and transformative approaches are expected to generate powerful synergies to promote sustainable and equitable management of natural capital and ecosystem services, support economic diversification, and improve institutional and policy frameworks. Lessons learned from the above cases also include close collaboration between developing member countries and ADB, strong government commitment and ADB’s prompt response to meet evolving financing needs in a timely manner; flexible and innovative project design provides solutions tailored to local conditions and government policies; and close coordination and collaboration with participating partners support smooth project implementation.
Conclusion

Comparative analyses of the three projects show that inadequate climate-responsive solutions and lack of access to green financing have prevented governments from addressing insurmountable barriers to overcoming the common pressures of widespread environmental degradation, climate change vulnerability, and high levels of GHG emissions. Systemic and interrelated environmental, social, and economic problems require comprehensive analysis and solutions. Therefore, green financing solutions should be equally comprehensive and integrated, promoting solution-based financing support for transformative mechanisms. These mechanisms can be sustained and replicated, leading to a green paradigm shift. In addressing environmental degradation, due to the complexity of the challenges and stakeholders, interventions should comprehensively target environmental rehabilitation and promote behavior change among key stakeholders with market-based instruments such as cash grants, soft loans, and capacity building. All three projects were highly tailored to the situation on the ground, with green financing solutions using the entire spectrum of financing products such as concessional loans, grants, incentives, guarantees, green bonds, and private sector investments.

Policy Recommendations

(i) Design projects that include high-quality research and analysis of the current state of environmental degradation at baseline, favorable policies for intersectoral collaboration, actionable recommendations, and application of international best practices for scaling up.
(ii) Promote integrated, innovative, and comprehensive approaches, and focus on output-based green financing solutions with replication and scaling-up mechanisms to promote a green paradigm shift.
(iii) Replicate NbS for rural and agricultural pollution through the concept of sponge cities, low-impact development programs, and agricultural NbS.
(iv) Promote access to affordable eco-housing in substandard peri-urban areas through in situ PPP mechanisms in eco-districts.
(v) Expand GIRAF through performance grants to herders and low-interest loans for dissemination of knowledge products.
(vi) Replicate the integrated green and inclusive model for agro-territorial development throughout Mongolia and disseminate it to other CAREC countries and the Asia and Pacific region.
(vii) Regulatory reforms, capacity building, and institutionalization of the certification system, standards, and mechanism for GIMs that will provide the basic framework and prerequisite for market linkages and green product certification.
References


Study Questions

1. It is essential to comprehensively address the root causes of rural development. In the case of the PRC and Mongolia, the root cause of environmental degradation lies with the farmers and herders, respectively. The same is true for economic development in rural and urban areas. The case studies have cited solutions. Please list specific solutions and key elements for each country.

2. What are the main advantages and challenges of integrated and comprehensive approaches? Why are they considered important elements for transformational projects?

3. In the three cases, financial intermediation loan (FIL) components have been integrated in the project design. How would you define the role and importance of private sector intervention promoted by the FIL component? How does private sector intervention support sustainability and contribute to transformative approaches?

4. Why are the three cases considered transformative and green? How can they be replicated and/or adapted in other countries to solve similar climate and development challenges?

5. Suppose you were to implement these three innovative projects, please list the key risk factors that may impede the implementation of the projects.

6. In this case study, we have provided the key data/information. In the case of the PRC and Mongolia, please indicate how they can be replicated in the countries themselves as well as in other countries. Provide other special features that apply to your area.

7. How would GIM and GIF be practically implemented in the PRC and the GCF financial intermediation loan in Mongolia? How could resources be mobilized to fund these innovative mechanisms?

8. Please provide specific action plans and strategies for replication in your own country to promote green development.