Public Disclosure Authorized

# Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 20-Jun-2023 | Report No: PIDC36147

## BASIC INFORMATION

### A. Basic Project Data

| Country | Project ID | Parent Project ID (if any) | Project Name |
|---|---|---|---|
| China | P181021 | | Sustainable Grassland Management and Low Emission Livestock Development Project (P181021) |
| **Region** | **Estimated Appraisal Date** | **Estimated Board Date** | **Practice Area (Lead)** |
| EAST ASIA AND PACIFIC | Jan 15, 2024 | Mar 28, 2024 | Agriculture and Food |
| **Financing Instrument** | **Borrower(s)** | **Implementing Agency** | |
| Investment Project Financing | Ministry of Finance | Gansu Provincial Department of Agriculture and Rural Affairs | |

**Proposed Development Objective(s)**

The Project Development Objective is to promote improved grassland management and low GHG emission livestock value chains in selected areas of Gansu province in China.

## PROJECT FINANCING DATA (US$, Millions)

### SUMMARY

| | |
|---|---|
| **Total Project Cost** | 300.00 |
| **Total Financing** | 300.00 |
| **of which IBRD/IDA** | 200.00 |
| **Financing Gap** | 0.00 |

### DETAILS

**World Bank Group Financing**

| | |
|---|---|
| International Bank for Reconstruction and Development (IBRD) | 200.00 |

**Non-World Bank Group Financing**

| | |
|---|---|
| Counterpart Funding | 100.00 |
| Local Govts. (Prov., District, City) of Borrowing Country | 100.00 |

| Environmental and Social Risk Classification | Concept Review Decision |
|---|---|
| Substantial | Track II-The review did authorize the preparation to continue |

Other Decision (as needed)
n/a

## B. Introduction and Context

Country Context

1. **China's continued quest for green growth and poverty reduction is increasingly constrained by slower economic growth and the impact of climate change.** After 40 years of unprecedented economic growth, China eradicated absolute poverty in 2020, ten years ahead of the United Nations' Sustainable Development Goal target of 2030. According to the last accessible household survey data from 2018, the share of people living below the extreme international poverty line of USD 1.90 per day had fallen to below 1 percent. But the high economic growth rates that enabled such remarkable progress with poverty reduction have slowed since 2020, resulting from the short-term impacts of the Covid-19 pandemic and a longer-term imperative to shift the drivers of growth from public investment in infrastructure to private consumption. Climate change has further constrained growth by increasing the frequency and severity of adverse weather events. The challenge going forward is to move to more sustainable sources of economic growth and mitigate the impacts of climate change, without compromising poverty reduction. China needs to grow and green its economy at the same time.

2. **The challenges posed by slower economic growth and climate change are closely linked – particularly in rural areas.** Of the 250 million Chinese who remain below the USD 5.50/day poverty line recommended for upper-middle-income countries, two-thirds live in rural areas. Rural disposable incomes were only 40 percent of urban disposable incomes in 2021[1]; and recent growth in real agricultural GDP (2015-2021) is much lower than in other sectors and the economy as a whole[2]. China's limited water resources and arable land increase the vulnerability of agriculture and livelihood of rural people to adverse climatic events. The economic losses caused by natural disasters were estimated at US$ 51.8 billion in 2021[3]. Measures to sustain growth and strengthen climate resilience are thus critical to continued poverty reduction – especially in rural areas.

3. **China's strong response to the challenges created by climate change is clear in its ambitious goals to reach peak emissions of carbon dioxide before 2030 and achieve carbon neutrality by 2060 (known as the dual 30-60 goals).** China is one of the largest sources of greenhouse gas emissions (GHGs), with 27 percent of carbon dioxide ($CO_2$) emissions and one third of all GHG emissions globally. In terms of methane ($CH_4$), which has 84-87 times the Global Warming Potential

[1] China Statistical Yearbook, 2022.
[2] World Development Indicators, 2023.
[3] China Statistical Yearbook, 2022.

(GWP) of carbon dioxide over a 20-year time-scale, China is the world's largest methane emitter.[4] China is also globally the largest emitter of nitrous oxide ($N_2O$), another highly potent GHG[5]. Agriculture is the fourth largest source of GHG emissions in China after the energy sector, manufacturing and construction, and industry, representing around 5 percent of all GHG emissions, or 662.6 million tons of $CO_2$ equivalent.[6] Both methane ($CH_4$) and nitrous oxide ($N_2O$) are mainly produced through agricultural activities, such as from livestock production (in particular gastroenteric fermentation and poor manure management), and from the use of synthetic and organic fertilizers. Achieving China's ambitious dual 30-60 goals will require significant structural changes in energy, industrial and transport systems, cities, and agriculture and land use, in order to reduce emissions. However, given the global nature of GHG mitigation efforts, the realization of these goals will benefit all countries, not just China itself.

4. **The strategic framework for achieving green growth in rural areas is based on the 14th Five Year Plan (FYP 2021-2025) for the National Green Development of Agriculture (NGDA).** Associated No. 1 Central Documents in 2018 – 2023 focus on rural revitalization framed around agriculture, rural areas, and farmers. The NGDA aims to: (1) use China's limited land and water resources more efficiently and sustainably; (2) reduce the adverse environmental impacts of agricultural production, (3) strengthen farmland ecology, protect biodiversity and enhance the ecological functions of forests, grasslands and wetlands; (4) promote the production of safe, high quality green agricultural products; and (5) strengthen the capacity to reduce emissions and sequester carbon.

## Sectoral and Institutional Context

5. **China's agricultural sector is the largest in the world[7]**. It produces about 18 percent of the world's cereal grains, 29 percent of the world's meat, and 50 percent of the world's vegetables. China's agricultural GDP represents 7.3 percent (2022) of the national GDP (US$ 18.1 trillion)[8]. Agriculture sector growth averaged 4.5 percent per annum in real terms from 2015-2021[9], slower than growth in services (7.2 percent per annum) and industry (5.6 percent per annum) and the economy as a whole (6.3 percent per annum). Agriculture sector growth was driven by higher total factor productivity, the introduction of new technologies and large producer subsidies for cereals. There is considerable scope to increase sector growth rates through further improvements to crop and livestock productivity, which still lag productivity levels in western economies. As the world's largest importer of soybean, maize, beef, and aquatic products, as well as the largest exporter of nitrogen fertilizer, China also plays an important role in international agricultural trade.

6. **With 13 percent of global Green-house Gas (GHG) emissions[10], China's agriculture sector is also the largest global emitter of GHG emissions from agriculture**. Although the level of GHG emissions from the agri-food system has increased in most years since 2000, the rate of growth has slowed considerably since 2014 – with an average growth rate of 3.0 percent per annum from 2000-2013 versus 0.3 percent per annum from 2014-2020[11]. The slower increase in GHG emissions from agriculture is attributed to a fall in cattle numbers, a ban on the burning of crop residues, improved manure

[4] Methane Tracker 2020 – Analysis - IEA
[5] Nitrous oxide is **300 times more potent** than CO 2 and takes 114 years to break down.
[6] Our World in Data, 2019.
[7] World Development Indicators, 2023.
[8] Statista, 2023.
[9] World Development Indicators, 2023.
[10] China: Country Climate and Development Report, 2022
[11] FAOSTAT, 2023

management and more efficient fertilizer use. Progress towards the goal of reduced GHG emissions from agriculture is thus being made, although the agriculture sector remains far from carbon neutrality.

7. **The livestock sub-sector is the largest source of GHG emissions from agriculture – accounting for 39.2 percent of the total agriculture GHG emissions in 2020**, **significantly higher than its contribution to agricultural GDP**[12]. By order of magnitude, the major sources of agriculture sector GHG emissions are: gastroenteric fermentation from ruminant animals (28.7 percent), excessive or inefficient fertilizer use (21.8 percent), paddy rice cultivation (16 percent), and poor livestock waste management (10.5 percent) including manure, sewage and urine. Methane ($CH_4$) is the largest source of GHG emissions (46 percent), followed by nitrous oxide ($N_2O$) (39 percent) and carbon dioxide ($CO_2$) (15 percent). Livestock are the main sources of both methane (through gastroenteric fermentation and poor manure management) and nitrous oxide (through use of fertilizers for feed production and storage and use of untreated manure) emissions. The livestock sector is also a key contributor to the degradation of grassland, forest, aquatic, and other ecosystems, and intensive livestock production systems are a leading non-point source of water pollution. Livestock production is also a critical source of bio-security risks, ranging from zoonosis and unsafe food to the development of drug-resistant bacteria. A significant reduction of GHG emissions from livestock production will be critical if China is to achieve its dual (30-60) goals for emissions reduction.

8. **Livestock production accounts for approximately one third of China's agriculture GDP and contributes significantly to the livelihoods of a large proportion of the rural population.** It is particularly important in the northern regions of China where conditions are less suitable for crops and extensive grazing systems predominate. China has a very large livestock population, with 98.2 million cattle, 186.4 million sheep, 133.3 million goats, 449.2 million pigs, 5.1 billion chickens and 984.2 million other poultry in 2021[13]. Livestock sector GDP amounted to CNY 4.03 trillion in 2020 (approx. US$ 575.7 billion), equivalent to 31 percent of agriculture GDP. The gross value of livestock production grew five-fold from 2000-2021, as measured in current US dollars[14]. The structure and composition of the livestock sector changed during this period, however, with a 21 percent fall in cattle numbers, a 43 percent increase in sheep numbers[15] and a 46 percent increase in poultry numbers[16]. Pig production suffered severely in 2018-2019 when multiple severe outbreaks of African swine fever (ASF), a fatal pig disease, killed a quarter of the world's pig population including around 60 percent of the hog herd in China. Pork production has recovered in 2022.[17]

**Table 1: Changes in China's Livestock Population Numbers**

| Type of Animals | Number in 2000, million | Number in 2010, million | Number in 2021 million | % Change 2000 - 2021 |
|---|---|---|---|---|
| Cattle | 123.53 | 98.20 | 98.17 | -21% |
| Pigs (end of year) | 416.34 | 467.65 | 449.22 | 8% |
| Sheep | 130.03 | 145.35 | 186.38 | 43% |
| Goats | 149.46 | 141.95 | 133.32 | -11% |
| Chicken | 3,500.00 | 5,200.00 | 5,118.30 | 46% |

[12] FAOSTAT, 2023.
[13] FAOSTAT, 2023
[14] FAOSTAT, 2023
[15] China Statistical Year Books, 2022, 2015
[16] FAOSTAT, 2023. China Statistics Bureau.
[17] Statista, 2023.

Sources: China Statistical Yearbook 2022 (cattle, pigs, sheep, goats); FAOSTAT (Poultry)

9. **A shift to large-scale, intensive production systems for poultry, pigs and dairy production has also occurred.** These changes in the structure and composition of livestock production have wide ranging implications for livestock productivity and GHG emissions. The shift from cattle to sheep production is likely to have contributed to a reduction in methane emissions from enteric fermentation. However, the growth of large-scale intensive production systems for pigs, poultry, dairy and fattening (sheep and beef) will have raised GHG emissions from methane and nitrous oxide through increased manure production; and increased non-point air and water pollution.

10. **The five-fold growth in the value of livestock production is also a response to rising incomes in China and a concomitant increase in the demand for livestock products.** Chinese consumers responded to a 65 percent increase in real personal disposable income from 2013-2021 with concomitant increases in per capita consumption of livestock products of: 67 percent for beef, 56 percent for sheep meat, 94 percent for poultry meat and 27 percent for pork[18]. Pork remains the most popular meat, with approximately 55 percent of meat consumption, followed by poultry (31 percent), beef (13 percent) and mutton (3 percent). As a result of this increase in meat consumption, China is the second largest meat market in the world after the United States, with a value of US$ 61.6 billion in 2021.[19] Demand for livestock products is likely to continue increasing given that personal disposable income is expected to increase further; and that Chinese consumption levels are still below those observed in Western Europe, particularly for beef and dairy products.[20]

11. **Grasslands are the largest ecosystem in China, with 264.5 million ha, or approximately 33 percent of the total land area[21], and provide a significant scope for GHG emission reduction.** Grasslands have an important ecological function in regulating climate, conserving water, sequestering and retaining carbon, providing habitat for biodiversity, and preventing sandstorms. They are also China's traditional animal husbandry base. Due to the sheer size of grassland areas, even small improvements in carbon sequestration per unit area can result in significant emission reductions. Changing patterns of land use have resulted in widespread degradation, however. At present, 90 percent of the available grasslands are degraded to some degree[22], with over one-third of grassland area classified as moderate to severely degraded – including desertification and loss of biodiversity in some areas. This degradation is attributed to excessive "reclamation" of grasslands for cropping, overgrazing and over-harvesting of grassland biomass. Country-average stocking rates are more than 20 percent higher than carrying capacity of the grassland pastures. In the arid and semi-arid areas of northern and western China this degradation destroys soil structure and decreases soil organic matter with a consequent decline in the quality and quantity of pasture production, as well as carbon sequestration capacity. The reduced quantity and quality of plant cover also renders grassland areas more prone to wind and water erosion, further accelerating degradation. Some improvements to grasslands management are underway in response to the government's Master Plan for The National Major Ecosystem Protection and Restoration and Protection (2021-2035). There is also considerable scope to use Nature-based Solutions (NbS) in grassland, forest and wetland areas in China to mitigate climate change and increase resilience.[23] More than 768 Mt $CO_2$ equivalent could be removed annually by 2030 through NbS – off-setting emissions in other sectors and enhancing ecosystems, biodiversity conservation, wetland management and pollution reduction.

[18] China Statistical Year Books, 2022, 2012.
[19] www.statista.com
[20] FAOSTAT, 2023. As measured by per capita levels of food supply.
[21] China Statistical Yearbook, 2022.
[22] Transforming Rural China: Greening Agricultural Modernization (P171518); World Bank; draft for publication, 2023.
[23] WBG, Country Climate and Development Report (CCDR), 2022.

12. **Given the continued growth in demand for livestock products in response to rising disposable incomes, the livestock sector's large contribution to GHG emissions is likely to increase without effective and proactive mitigation efforts.** The changes in the composition and structure of livestock production described earlier have wide ranging implications for livestock productivity and GHG emissions. The shift from cattle to sheep production is likely to have contributed to a reduction in methane emissions from enteric fermentation. However, it likely has also contributed to increased pasture degradation and loss of diversity, compared with cattle grazing. The growth of large-scale intensive production systems for pigs, poultry, dairy and fattening (sheep and beef) will have raised GHG emissions for methane and nitrous oxide through increased gastroenteric fermentation and manure production; and increased non-point air and water pollution. Green growth for livestock production will, therefore, require a reduction in the intensity of livestock emissions (tons $CO_2$ equivalent/tons of livestock product output), an associated increase in livestock productivity and increased carbon sequestration on grazing lands. Absent these changes, growth in livestock production will be driven largely by increased livestock numbers – with a concomitant increase in GHG emissions.

13. **A wide range of technologies and management practices are being developed in China and internationally that China can use to reduce GHG emissions from agriculture and mitigate the impact of adverse weather events caused by climate change.** For livestock production these internationally and domestically developed technologies and practices include: the development of feed additives and changes in feed and pasture composition to reduce methane emissions, more efficient use of fertilizer and more effective recycling of manure to reduce nitrous oxide emissions, the selection and breeding of livestock with lower methane emission levels, and the development of "vaccines" to change the microbial composition of ruminant digestive system to modify enteric fermentation and reduce methane emissions. A renewed emphasis is also being given to climate-smart management practices to improve livestock productivity, in order to reduce the intensity of livestock emissions (kg $CO_2$ equivalent/kg of meat or milk production). These practices focus on: improving feed conversion ratios, reducing livestock replacement rates, increasing reproductive rates (lambing, calving and farrowing percentages), reducing livestock illness and mortality rates, shortening breeding intervals, lengthening lactation periods and improving the quality of conserved livestock feed (hay and silage).

14. **There is widespread awareness and understanding of these technologies and management practices in the Chinese academic and research community for agriculture, and growing adoption of many of these technologies and practices by large-scale, intensive farms but less so on medium-sized and smaller farms**. Measures to increase livestock productivity are the priority for the large-scale farms, with particular attention to improved feed conversion efficiency, reduced livestock sickness and mortality, and increased reproduction rates. Manure management is also improving substantially. Government has supported an effective program to improve manure management on 279,000 large-scale livestock farms, which has increased manure utilization rates to 75 percent, and modernized and mechanized 95 percent of manure management systems on these farms. Of the other technologies used internationally, some feed additives appear to be available in China, but their use is restricted by slow licensing procedures. There is no use of vaccines to change the microbial composition of ruminant digestive system to modify enteric fermentation and reduce methane emissions; and no breeding for lower methane emissions.

15. **Progress is also being made with research and technology adoption for grassland and forage production.** Active research programs have demonstrated the potential impact of: non-tillage, re-seeding of grassland areas; and optimal combinations of grasses, legumes, maize and tree crops in different agro-climatic zones. The re-seeding of grassland areas is constrained by a lack of suitable seeds but improved alfalfa varieties are widely used on farms, both alone and in

combination with maize. World Bank and GEF-financed projects have also contributed to piloting and scaling up sustainable grassland and livestock management practices as described in Box 1.

**Box 1: Lessons Learned on Sustainable Grassland and Livestock Management Practices in Bank-financed Operations**

**Sustainable Management of Grassland Ecosystems**. The Climate-Smart Grassland Ecosystems Management project (P166853) is a GEF-financed project in the amount of US$ 3.77 million. The project has three components: Component 1: Grassland Management Pilots (GEF Financing: US$2.7 million), Component 2: Policy and Strategy Development (GEF Financing: US$0.45 million); and Component 3: Knowledge Management (GEF Financing: US$0.42 million). It supports three types of activities: a) no-till grass seeding/fertilization for 530 hectares of degraded natural grasslands to restore grassland productivity; b) no-grazing in spring for about 50 days on 3,200 hectares of winter/spring pasture to allow initial grass growth, and c) enhancement of cultivated grasslands of 167 hectares. It is expected that the activities will result in increased grassland productivity, soil carbon content, and incomes of herders. By the end of the second year of implementation in 2022, the project-supported measures had resulted in the increase of grassland productivity of 23.2% (Baseline: 0; Target: 30%); sequestration of 396,490.73 tons of soil carbon (Baseline: 0; Target 160,000); and a 6.52% increase in herder incomes (Baseline: 0; Target: 10%). It is also expected the grassland biodiversity (measured as a number of plants) will also increase by the end of the project.

**Sustainable Livestock Management**. The recently completed Livestock Manure Management Project (P127775/P127815) in Guangdong used a blend of IBRD lending (US$100 million) and GEF Grant (US$5.1 million). Component 2: Livestock Waste Management (LWM) (US$57.13 million) had a particular focus on sustainable livestock management. It mainly supported two activities: a) construction of LWM facilities to promote proper collection and treatment of pig manure; and b) output based sub-grants to finance the incremental costs incurred in the construction of pilot high-rise pig production facilities. Through these activities, the project contributed to successful reduction of chemical oxygen demand (COD), Ammonia nitrogen (NH3-N), biological oxygen demand (BOD), and total phosphorus (TP). The ICR estimated that, on average, the project decreased 83,757 tons of $CO_2$-e annually. This was realized through the following activities: (i) improvement of soil nutrient management (decreased chemical fertilizer application and increased use efficiency); (ii) adoption of Integrated Pest Management (IPM) technologies and practices (increased application efficiency of pesticides and alternative methods such as insect lamps, stick boards); (iii) adoption of high-rise pig production technology (zero manure and waste discharge); (iv) increased use of treated pig manure as organic fertilizer (circular economy); and (v) conversion of pig manure into energy (biogas and power generation).

16. **China continues to align its public animal health system with the "One Health" approach, which is recognized as best practice internationally.** In addition to conventional measures to raise livestock productivity by reducing livestock mortality and disease, the One Health approach contributes to low carbon livestock production through: effective disease surveillance, safe carcass disposal, promoting effective biosafety and reducing the risk of livestock disease from wildlife, cross-border trade and trans-border livestock movement. Its parallel emphasis on ensuring strong links between livestock production, public health and environmental systems will also help mitigate the risks of zoonotic diseases through preparedness and prevention measures. This combination of programs and policies is applicable at all stages along livestock value chains.

17. **Yet, despite making tremendous investments in the prevention and control of animal diseases, China continues to be challenged in controlling emerging and transboundary animal diseases**. China has implemented the revision of important animal health laws and food safety regulations, the decentralization of power to provincial Animal Husbandry and Veterinary Bureaus to ensure early response to disease outbreaks, and the expansion of animal health advisory service through community animal health workers, among others. Despite these efforts, China continues to be challenged in controlling emerging and transboundary animal diseases, as it is the case for the deadly African Swine Fever[24] since its

[24] According to official data, by mid-2019, 13,355 pigs had died due to the ASF virus infection, and 1,204,281 pigs had been culled to halt the virus's spread. The ASF epidemic has caused considerable economic losses to the Chinese animal industry and led to a sharp disruption in the livestock supply chain and meat consumption structures.

occurrence in 2018. Furthermore, even though mandatory immunization is implemented through Government subsidies, cases of Foot and Mouth Diseases[25], Peste des petits ruminants, sporadic cases of Lumpy Skin Disease[26] and Anthrax as well as Brucellosis continue to be reported, posing a serious threat to the livestock industry especially in intensive farming systems.

18. **Gansu Province.The project will pilot measures to expand the use of the sustainable low emission practices in Gansu Province and support a replicable system for scale-up of sustainable grassland management and low emission livestock value chains in other provinces of China.** Green growth of Gansu's integrated livestock production system will require measures to improve grasslands management and increase livestock productivity under both extensive and intensive management systems, in order to reduce GHG emissions. Support for measures to reduce the risks and consequences of poor animal health and animal diseases will directly reduce the intensity of GHG emissions by raising livestock productivity. Gansu is well positioned to serve as the pilot province for several reasons.

19. **Located in northern-central China, Gansu is the poorest province in China with a limited natural resource base.** Gansu has an area of 454,000 km$^2$ and a population of 24.9 million people. Rural people accounted for 47 percent of the total population (11.6 million) in 2021.[27] It is one of the poorest provinces in China with lingering relative poverty. Average personal disposable income per capita was CNY 22,066 in 2021 (approx. US$ 3,502), equivalent to 65 percent of national personal disposable income of CNY 35,128 per capita.[28] Mining, energy and services are the major economic activities, with agriculture, forestry and fisheries accounting for 13.7 percent of gross regional product in 2021. The geography and climatic are quite diverse, with semi-arid to arid plateaus (above 1,000 m) in the north, including parts of the Gobi desert; and high mountains and a warmer, monsoonal climate in the south. The region has complex environment systems that are water-scarce and have highly erodible and low-quality soil, poor-quality forest and vegetation cover, and river systems with high sedimentation. The natural resource base for agriculture is limited by a harsh, arid climate with average rainfall of 300 mm and long, cold winters due to its high altitude (> 1000 m); a limited area of good quality arable land and limited water for irrigation. Gansu is one of China's provinces hardest hit by desertification. The province, which includes parts of the Gobi, Badain Jaran, and Tengger Deserts, is suffering moisture drawdown year after year. Annual precipitation is low, varying from 35-40 mm in the north to 735 mm in the south.

20. **Gansu's agriculture sector is characterized by a large livestock sector and a significant grassland area.** Of the total cropped area of 4 million ha, approximately one-third (1.34 million ha) is irrigated[29]. Livestock accounted for 44 percent of the value of agriculture sector production in 2021, with 5.1 million cattle, 19.9 million sheep, 4.5 million goats, 6.85 million pigs and 61.3 million poultry. A marked increase in ruminant livestock numbers is evident with cattle numbers increasing by 55 percent from 2000-2021, sheep numbers by 131 percent and goat numbers by 49 percent[30]. For beef and sheep meat production, stock is bred and raised on both small-scale farms in grassland areas and larger, intensive farms, and sold after weaning to large-scale fattening enterprises in quasi-urban areas. Dairy farms are intensive enterprises in quasi-urban areas, breeding their own replacement stock. Gansu's grassland area of 17.87 million hectares is one of the largest in China. Of the total grassland area in the province, approximately 37 percent (6.7 million ha) is subject to a grazing ban, and 53 percent (9.4 million ha) is used for grazing. The vegetation coverage was estimated at 53

[25] On 19 May 2023, the country notified to WOAH one additional FMD, serotype O, outbreak in Xinjiang Uygur Autonomous region. Between April – May 2023, a total of three FMD, serotype O, outbreaks were reported in China in Guangxi and Xinjiang Uygur Autonomous region. Previously FMD occurred always in Guangxi in June 2022.

[26] First reporting on 26 August 2019, onset date 03 August 2019. As of 23 May 2023, LSD is confirmed in 12 provinces.

[27] Ibid.

[28] China Statistical Yearbook, 2022.

[29] China Statistical Yearbook, 2022

[30] MARA, Gansu Province

percent in 2015. Most livestock production is in the meadow grassland areas of central Gansu. Land use rights to grazing areas are conferred by local government authorities to both individual users and to collectives such as cooperatives. The sheep and cattle raised on grassland areas are typically sold after weaning to large-scale fattening enterprises in quasi-urban areas.

21. **Intensity of emissions from beef production in Gansu is the third highest in China[31] and ruminants, along with climate change, are a key factor accelerating degradation of grasslands.** Ruminants account for 78 percent of GHG emissions from meat production in Gansu, with beef accounting for 56 percent and sheep for 22 percent. In the absence of measures to reduce the intensity of GHG emissions, the total GHG emissions will rise significantly if livestock numbers continue to increase in Gansu. While the high absolute level of GHG emissions is attributable to the high numbers of cattle in the province, the high intensity of GHG emissions for beef suggests that there is considerable scope to reduce emissions at all stages of livestock production and across livestock value chains. The primary environmental challenges in Gansu are soil erosion (from wind and water) and desertification (caused by drought and forest denudation), likely to be exacerbated by climate change. Environmental degradation, including grassland degradation, and weak climate resilience are key concerns in the fragile landscapes of Gansu province. The poor management and overuse of the grasslands for ruminant breeding further exacerbates the grassland degradation.

22. **Low output efficiency, high resource dependence, insufficient adoption of green and low emission technologies characterize the value chains in Gansu**. While the province has a number of large-scale and technologically advanced agro-enterprises, most of the farms and medium and smaller agro-enterprises deal with low animal productivity, fragmented and low premium value chains, low value addition and low awareness and adoption rates of green and low emission technologies and practices. On the grassland management side, there is a significant need to increase productivity and reduce the degradation of grasslands, as well as intensify opportunities for carbon sequestration and retention, and biodiversity protection.

23. **The veterinary services in the province, similar to the rest of the country, are challenged by the ever-growing needs and public concerns to address issues related to food safety, and control zoonotic and animal diseases**. As the livestock sector continues to expand in Gansu province to meet the increasing demand for animal source foods, safeguarding food safety and reducing the use of antibiotics and combatting antimicrobial resistance will be a priority. The existing gaps in the system, therefore, needs to be addressed, including the challenges associated with the need to improve epidemiological understanding of zoonotic diseases and the high threat viruses through targeted risk-based surveillance, upgrading veterinary capacity for diseases preparedness and strengthening the early response and containment. Preparedness and control activities need to be constantly adjusted to adapt to situations observed in the field that may be contrary to what was expected based on international standards or experiences from other parts of the world.

### Relationship to CPF

24. **The proposed project fully aligns with the World Bank's Country Partnership Framework (CPF, FY 2020–2025) for China (Report No. 11785-CN)**,[32] which was discussed by the World Bank Board of Directors on December 5, 2019. The CPF identifies two broad areas of support: closing the remaining institutional gaps in China's development and the

[31] Ying Wei, Xue Zhang, Mejia Xu, Yuan Chang. 2023. "Greenhouse Gas Emissions of meat products in China: A provincial-level quantification." Resources, Conservation and Recycling 190 (2023) 106843.

[32] World Bank Group. 2021. China – Country Partnership Framework for the Period FY2020–2025. (Report No. 117875-CN). Washington, D.C.: World Bank Group. https://documents1.worldbank.org/curated/en/902781575573489712/pdf/China-Country-Partnership-Framework-for-the-Period-FY2020-2025.pdf.

generation of global public goods (GPGs); and three associated areas of engagement: (1) advance market and fiscal reforms, (2) promote greener growth, and (3) share the benefits of growth. Planned project activities respond directly to Engagement Area 2 (EA2) of the CPF – Promoting Greener Growth. Under EA2, the World Bank Group (WBG) aims to support the government's efforts to (1) reduce air, soil, water, and marine plastics pollution; (2) demonstrate sustainable agricultural practices and improve agro-food product quality and safety; and (3) strengthen institutional capacity for sustainable natural resource management, especially the efficient use of scarce arable land and water. The proposed project aims to promote greener growth by: facilitating the transition to a lower carbon path in livestock sector development; reducing air, soil and water pollution; demonstrating sustainable livestock and agricultural practices; improving animal health aspects of the selected livestock value chains, resulting in safer and higher quality products for end consumers, and strengthening natural resource management in the participating province. These activities will also contribute to the priority accorded to measures to "enhance climate resilience and adaptation in rural landscapes and urban areas" in the recent China Country Climate and Development Report (October, 2022).

25. **Project's contribution to Global Public Goods (GPG).** Given China's sizeable global contribution to GHG emissions from agriculture, the planned project activities will generate significant global and regional public goods. The proposed project will contribute to global public goods through: (i) *increased carbon sequestration and reduced GHG emissions* through improved grasslands management (e.g., rotational grazing, reseeding), improved livestock feeding regimes (pasture and fodder production, high protein/legumes feeds), improved manure management, and contributing to development of tradeable emission reductions from the livestock sector; (ii) *improved protection of biodiversity* in grasslands through natural regeneration; and (iii) contributing to the *One Health Agenda*, through strengthened animal health and food quality and safety system for the selected livestock value chains in the participating province. It is also expected that the incidence of non-point water and air pollution will fall in response to more effective livestock manure management in the participating counties.

26. **The proposed project is also aligned with the WBG's Global Crisis Response Framework (GCRF)[33], Green, Inclusive, and Resilient Development Framework, the WBG's Climate Change Action Plan (2021–2025), and the Bank's Gender Strategy.** The proposed project responds to three key pillars of the GCRF—Pillar 1 Responding to Food Insecurity, Pillar 3 Strengthening Resilience, and Pillar 4 Strengthening Policies, Institutions and Investments for Rebuilding Better. Under Pillar 1, the proposed project is consistent with the World Bank's Planned Actions for Global Food Crisis Response, as it will support livestock production and livestock producer market access through promoting greener and more sustainable livestock sector, and improving the potential of grasslands as a feed source. It will invest in sustainable food and nutrient security by strengthening and greening the food system to make it more resilient to rising climate risks. Under Pillar 3, the proposed project aligns well with the World Bank Group's Green, Inclusive, and Resilient Development (GRID) framework and the Climate Change Action Plan (2021-2025). The Program will focus on climate mitigation and adaptation measures to reduce GHG emission intensity from livestock production, improve resilience of livestock production, and increase the capacity of grasslands to capture and retain carbon, as well as on contributing to strengthening pandemic prevention through its animal health-related project activities. Under the Pillar 4, the Program will support institutional strengthening and capacity building to create the enabling environment to promote sustainable grassland management and low emission livestock production at a larger scale, as well as strengthen the institutions involved in animal health and veterinary services, which will improve the long-term development outcomes of food security, climate mitigation and pandemic prevention. Responding to the World Bank's Gender Strategy, the proposed

[33] World Bank Announces Planned Actions for Global Food Crisis Response (link)

project aims to address the potential issues of women's limited access to agricultural inputs, other productive resources, extension services and trainings which would enable women to benefit from more economic opportunities in downstream livestock value chains, while also taking the effort to increase women's representation decision-making processes in the project-supported value chains. These are aligned with Pillar 2 (Removing Constraints for More and Better Jobs) and Pillar 3(Enhancing Women's Voice & Agency and Engaging Men and Boys) of the Bank's Gender Strategy (2017-2023).

27. **The proposed project also supports the implementation of China's Nationally Determined Contribution (NDC),**[34] updated in October 2021; and is consistent with a range of recent climate policy commitments made by the country, including the Glasgow Leaders' Declaration on Forests and Land Use and a joint declaration signed by China and the United States in the margin of the United Nations Framework Convention on Climate Change Conference of the Parties (COP26) in November 2021, providing, among other things, for incentives and programs to reduce methane emissions from the agricultural sector.

## C. Proposed Development Objective(s)

The Project Development Objective is to promote improved grassland management and low GHG emission livestock value chains in selected areas of Gansu province in China.

Key Results (From PCN)

28. The proposed project would achieve the following key results:
(a) Increase grassland productivity in project areas (NPP[35]; percentage);
(b) Reduce the intensity of GHG emissions in livestock value chains supported by the project (percentage; tons/per unit of output);
(c) Increase the number of certified green and/or organic livestock products (percentage);
(d) Number of beneficiaries adopting project-promoted technologies and practices (number).

## D. Concept Description

29. The proposed project aims to reduce GHG emission intensity and environmental footprint, and increase resilience in the grasslands and livestock sector by: (i) promoting technologies that improve the productivity of grasslands and adoption of practices for improved the grassland management to increase absorption of GHG emissions and improve their climate resilience; (ii) promoting technologies and practices that lower GHG emissions from intensive livestock production systems – especially cattle and sheep – to reduce emission intensity (lower emissions) per unit of production; (iii) improving selected areas of livestock value chain operation and sustainability to reduce their GHG emission intensity and environmental footprint, and (iv) strengthening the province's capacity for infectious animal disease preparedness, response, prevention, and control - in support of One Health approach, - to support safer animal-origin food products for the final consumers. The proposed project would have the following three components:

[34] China updated its NDC targets to include the following: (1) carbon dioxide emissions will strive to peak by 2030, and strive to achieve carbon neutrality by 2060; (2) by 2030, China's carbon dioxide emissions per unit of GDP will drop by more than 65 percent compared with 2005; (3) the proportion of non-fossil energy in primary energy consumption will reach about 25 percent; (4) the forest volume will increase by 6 billion $m^3$ compared with 2005; and (5) the total installed capacity of solar power generation will reach more than 1.2 billion kilowatts.

[35] Net Pasture Productivity.

**Component 1: Sustainable management of grasslands.**

30. The component aims to improve the grassland sector resilience and adaptation to climate change through: (i) strengthening grasslands capacity for carbon sequestration, maintain and improve existing carbon stocks, boost biodiversity dependent on grassland ecosystem, and contribute towards the global public goods (GPGs) and (ii) enhancing the quality and net primary productivity (NPP) of grasslands as a livestock feed base, helping to improve value chain participants' access to sustainable and organic food markets. The project will finance infrastructure for grassland improvement, as we as training, demonstrations and extension to support introduction of carbon-capture and carbon-retention grassland utilization and management technologies and practices. Key activities that the project will finance include: (i) preparation of participatory grassland management plans building on local knowledge and expertise of all relevant stakeholders including farmers, villagers and herders; (ii) adoption of climate smart grassland management technologies and practices, such as reseeding with no tillage or reduced tillage, in particular in degraded areas; (iii) improvements in grassland productivity and quality by encouraging regeneration of native grass species, forage crops, diversification and enhancement of species richness, control of invasive species and weeds; (iv) improvements in grazing management, such as rotational grazing and deferred grazing; (v) promotion of silvo-pastoralism with preferred fodder species; (vi) building of climate-resilient facilities to enhance animal welfare; (vii) development of a database of nutrient contents of seasonal grass species, legume and grass ratio, and feed value table to use for supplemental feeding formulation; (viii) building easy-to-use low methane emission diet formulation app for grazing livestock; (ix) provision of training and extension services to farmers and herders on various aspects of grassland management such as rotational grazing and carrying capacity assessment; (x) biodiversity conservation (collect native seeds, intensify seed production, reseed in wider area for restoration of degraded grassland and promote biodiversity); and (xi) strengthening remote sensing and monitoring capacity for floral and avifaunal diversity in grasslands.

31. The specific sites for grassland interventions would be selected during the project preparation using the criteria such as level of degradation, as well as significance for livestock grazing, potential to enhance carbon stock, support to livelihoods of farmers and herders, and improved livestock quality and health.

**Component 2: Strengthening sustainability and emission reductions in the livestock value chains.**

32. **Sub-component 2.1**: **Promoting low carbon and resilient livestock production**. This Sub-component would support the province's efforts to promote the overall greening of the main intensive livestock value chains (specifically, dairy cattle, beef cattle, and sheep) being developed in the different counties. For this, the adoption of efficient emission-reducing practices and technologies would be piloted in selected, representative intensive production enterprises, which would serve as demonstration units for the dissemination of these improved, environmentally friendly mitigation practices to other existing and new enterprises, as well as extensionists and private technicians throughout the province. In order to address the entire value chain, thus ensuring the reduced carbon nature of the end products, the promotion of best practices would be supported in breeding grassland-based farms (see Component 1), as well as selected intensive production enterprises, feed supply operations, and processing facilities. Based on the relative importance of livestock production in the province, the value chains to be targeted are sheep, beef and dairy.

33. More specifically, the project will finance investments and support services that would reduce the overall environmental footprint of the targeted value chains, targeting nature-based solutions and climate-smart livestock best practices, including improved collaboration with grassland farmers and cooperatives, efficient use of resources (soil and

water) for feed production and feeding, animal husbandry, and manure management technologies and practices aimed at supporting on-farm resilience. Efficient reduction of emissions in livestock value chains would be achieved through upgraded infrastructure for eligible project beneficiaries (farmers, farmer cooperatives and agribusinesses with interest and commitments to reduce GHG emission along the livestock meat/milk value chain in project areas). The eligible investments will include but not be limited to: (i) increasing livestock production efficiency through introduction of improved animal genetics and artificial insemination (AI) facilities; (ii) increasing input utilization efficiency through improved diet formulation with balanced nutrients and establishment of precision feeding facilities; (iii) improving resource efficiency (energy, water) through application of green and renewable energy, energy and water saving technologies and equipment/machines along the value chain, such as farming machinery, feed milling, livestock slaughtering and meat processing, cold chain storage and logistic transportation; (iv) improving whole-chain oriented food safety management practices through establishment of traceability system, food safety laboratory, big data and quality certifications; (v) improving waste management and crop residue utilization, particularly to reduce emissions at farm level, and in slaughtering/processing and distribution links of the value chain through establishment of waste handling facilities; and (vi) improving agri-food distribution facilities including cold chain and wholesale markets compliant with WHO Healthy Market Principles. Access to finance for farmers and agri-businesses under the project may require a financial intermediation (FI) arrangement, which will be determined during the further preparation work.

34. Regarding support services, the project would finance technical assistance to improve the overall performance and governance of a low emission livestock value chains. The project will finance technical assistance including but not limited to: i) developing and updating an inventory of emission mitigation solutions based on current international and Chinese experience, and updated as it goes. Third party consulting agents/agencies will be hired to develop the technical inventory of good practice with co-efficiency for low emission livestock value chain; ii) applying a Training-of-Trainers (ToT) capacity building approach, technical training and extension of proved good practice of low emission livestock production would be provided to farmers, managers, and operators. The trainers will be selected from government extension system and value chain actors in private sector in project areas, such as the “farmer experts”; iii) management training of green value chain development through development of training curriculum and materials, implementation of training sessions, meetings, workshops, conference and study tours. The trainees will target at leaders and managers of livestock value chain. The trainers will be selected from reputable universities and agribusiness consulting agencies. The combination of pilot investments and technical assistance is expected to contribute to reducing the GHG emissions and increase climate resilience of the entire value chains. The project would also aim to promote branding of low emission livestock products and linkages to carbon markets and maximizing benefits from emission trading schemes. The project will include development of digital tools for supporting efficient functioning of the project-supported value chains.

35. **Subcomponent 2.2: Strengthening of animal health and food safety aspects of the livestock value chains.**[36] This component aims to enhance the capacity for animal diseases preparedness and response, prevention, and control, and minimize risks and impact of priority zoonotic diseases and transboundary animal diseases and other health threats. This component will finance investments to upgrade veterinary services and laboratory capacities and accelerate the adoption of good biosecurity, food safety and welfare practices in selected livestock value chains contributing to the prominent One Health agenda in China. Support for measures to reduce the risks and consequences of these diseases will directly reduce the intensity of GHG emissions by raising livestock productivity. Key activities include activities such as:

[36] Where feasible, the project will learn lessons from the Emerging Infectious Diseases Prevention, Preparedness and Response Project (P173746) which works in three other provinces of China, namely, Shandong, Jiangxi and Hainan.

(i) Risk-based disease surveillance systems and related information collecting mechanisms will be improved through (a) upgrade of early warning systems; (b) improve reporting systems and information sharing; (c) conduct regular risk-assessment and risk-based periodic serological surveys and outbreak investigations to advise preparedness and response actions; (d) strict enforcement of quarantine, and prevention of unauthorized live animal movements; and (e) guidelines and incentives mechanisms to farmers to reinforce vaccination against PPR, FMD and Brucellosis.

(ii) Strengthening and upgrading capacities of selected laboratory[37] capacities for effective diagnostic and sero-monitoring post-vaccination of priorities diseases, including brucellosis, tuberculosis, FMD, PPR etc, and technical assistance to improve quality assurance and biosafety of the laboratory systems.

(iii) Maintain ongoing One Health support for addressing zoonotic diseases, antimicrobial resistance (AMR), and food safety standards. This could be achieved by reinforcing cross-sectoral collaboration and communication between veterinary services, public health, and environment (wildlife and forestry), reinforce the control of drugs residues, and promote best practices for responsible use of antibiotics.

(iv) Promoting science-based animal husbandry and food safety practices (promote on-farm biosecurity, responsible use of antibiotics, reducing human, animal and wildlife interface, improve milk and meat quality through tailored capacity building to farmers (e.g., Farmer field schools) and enhanced extension service delivery (capacity development & curriculum development for veterinary technicians and community animal health workers)

(v) Strengthening the assessment, management, and communication of public health and food safety risks along the dairy and meat value chains. Support will be provided to better communicate behavioral and environmental risks for disease occurrence or outbreaks, development of risk communication tools for influencing health, food, and hygiene behaviors, campaigns to communicate the risks of human exposure to wildlife, and others.

**Component 3: Capacity Building and Project Management.**

36. The Component will finance capacity building activities to support the enabling environment for promotion and scaling-up of low emission livestock value chains and sustainable grassland managements. To strengthen the enabling environment, the project will: (i) identify the regulatory and standards gaps for promotion and scale-up of low emission livestock production, processing and logistics and support work for closing these identified gaps; (ii) identify any institutional gaps, and aim to close them during the project implementation, and (iii) support review and strengthening of the existing livestock sector Measuring, Reporting and Verification (MRV) systems, as well as support development of new MRV protocols for GHG emissions in grassland areas, with a view of enabling sale of the emission reductions resulting from the project in the country's agricultural carbon markets once they are reopened.[38] The project will also increase awareness and understanding of carbon trading markets[39] among livestock producers in the grassland areas and the public

[37] Provincial or County Epidemic Control Center

[38] On March 30, 2023, the Ministry of Ecology and Environment (MEE) officially announced its plan to open the national voluntary carbon market, and called for proposals to develop and refine the methodologies for voluntary GHG emission reduction projects, including the methane reduction projects in agricultural sector. MEE. Public Solicitation of Methodologies for Greenhouse Gas Voluntary Emission Reduction Projects.

[39] The preparatory works for resuming carbon trading from agricultural sector have started. The team will monitor the progress closely.

agencies responsible for implementing the MRV protocols, and, if feasible, support development of the regulatory framework required to operate carbon markets, as needed, to ensure the province's ability to participate in the national carbon markets. These activities will be carried out at the provincial level. The project will support design of digital apps to measure farm-level GHG emissions, in order to raise farmer awareness and understanding of the sources and levels of GHG emissions from livestock and to motivate them to reduce GHG emissions intensity. The farm-level data may feed into the project-supported MRV systems. IN addition, the project will include measures to build the institutional capacity to measure soil carbon levels.

37. This component will also ensure project implementation and management at the county and provincial level. A project implementation unit has been established in the Department of Rural Affairs (DARA) in Gansu province and in the five participating counties, to manage and coordinate project activities, including: financial management and procurement, environmental and social safeguards, technical assistance, financial instruments to be designed under the project for project beneficiaries; and monitoring and evaluation activities, including the baseline survey, mid-term review and final impact survey.

**PROJECT BENEFICIARIES AND LOCATIONS**

38. **Project Beneficiaries.** The project's direct beneficiaries will be farmers, farmer cooperatives and agribusiness enterprises operating in the participating counties/districts. Small, medium and large farmers and agribusiness enterprises are expected to benefit from project support, either through engagement in project-supported livestock value chains, or benefitting from the grassland management-related technical assistance and investment support. Women play a significant role in production activities in the livestock sector, which makes them important beneficiaries of the proposed project. In order to reach women beneficiaries better, the project will include specific training and capacity building activities targeted to women and under arrangements suited for women. Women's participation in the project implementation activities will be closely tracked through measurable monitoring indicators. Extension workers will benefit from capacity building to enable them to provide relevant advice on low emission livestock production technologies and sustainable grassland management practices.

39. **Project locations.** The project is expected to be implemented in a minimum of five counties/municipalities of Gansu Province, namely, Minle county of Zhangye municipality, Lanzhou New District of Lanzhou municipality, Jingchuan county and Lingtai county of Pingliang municipality, and Zhengning county of Qingyang municipality. In addition to the fiscal considerations, key selection criteria for the participating counties included: commitment to the project objectives; drive to introduce green and low carbon technologies and practices and serve as a demonstration site; and commitment to ensure inclusiveness in the activities to be supported under the project. Gansu province has expressed a strong interest in project support to promote low carbon livestock production, and submitted a detailed proposal for project consideration through the MOF and NDRC.

| Legal Operational Policies | Triggered? |
|---|---|
| Projects on International Waterways OP 7.50 | No |
| Projects in Disputed Areas OP 7.60 | No |

Summary of Screening of Environmental and Social Risks and Impacts

40. Environmental risk is substantial. The project will support civil works to establish new and strengthen and modernize existing grassland and livestock value chain facilities, which probably include climate-resilient grassland facilities (such as shelters, shading canopies, feeding stalls, salt licks, scratching posts, drinking water troughs, sheep baths, and fences); grassland interventions; upgraded livestock breeding grassland-based farms, intensive production enterprises, feed supply operations, and processing facilities with the value chains to be targeted including sheep, beef and dairy; upgraded veterinary services and food safety laboratory; improved manure and waste water management; improved agri-food distribution facilities (cold chain and wholesale markets). The location and scales of these activities are unknow at concept stage but are expected to be defined prior to appraisal. Works related to the construction activities will have some adverse environmental impacts including dust, noise, wastewater management and disposal of debris and other construction related waste. However, these environmental risks and impacts will be site specific, temporary, and reversible by applying good construction practices. The operation of improved grassland, livestock breeding facilities, intensive production enterprises, feed supply operations, livestock production processing facilities, veterinary services and food safety laboratory, manure and wastewater management, and agri-food distribution facilities, will have potential environmental impacts including pesticides use, odors, noise, wastewater, manure generation and disposal, other solid waste and hazardous waste, animal welfare issues, zoonotic diseases and transboundary animal diseases, OHS issues, but aim to contribute to positive public goods by promoting low emission livestock value chain development and improved grassland management. Technical Assistance activities will not result in any direct environmental risks and impacts but may have downstream environmental implications. Gansu Provincial PMO has implemented many projects financed by international financial institutions and donor organizations, including the World Bank, Asian Development Bank (ADB), Global Environmental Facility (GEF) and the World Food Program (WFP) in the last decade. However, the provincial and county DARAs have no specific experience with the ESF. The implementation capacity risk will be mitigated through capacity building activities which will be provided to key PIUs staff and ensuring that environmental and social focal points supporting the PIUs are in place and well trained. Executive agency hired E&S specialist will provide continuous support to PIUs throughout of the project implementation. The implementation capacity, uncertainty of supported activities' locations and scales contribute to substantial environmental risk. The Borrower will prepare an Environmental Impact Assessment (EIA) to covering all activities with an integrated Environmental and Social Management Plan (ESMP) before appraisal to mitigate the environmental risks of specific activities. ESMS will be prepared as per ESS9 for any FIs identified. Environmental risk rating will be further assessed during project preparation.

41. Social risk is substantial. The reason to sign substantial to social risk is because, i) the project activities would entail adverse social risks including land acquisition and resettlement, ethnic minority, labor and OHS, community health and safety; ii) Technical Assistance studies potentially involved may also have downstream social implications. The planned civil works will result in significant land acquisition from activities including climate-resilient grassland facilities (such as shelters); grassland interventions (livelihood support activities); upgraded livestock breeding farms; disease and food safety laboratory; manure and wastewater management; agri-food distribution facilities (cold chain and wholesale markets). Manure and wastewater facilities will also cause impacts on community health and safety, requiring careful site selection to address the community’s concerns, etc. In terms of labor and working conditions risks, the project would engage direct workers and contracted workers. The labor law and relevant OHS requirements are usually not strictly enforced in rural areas due to budget constraints and low awareness. The concerns related to labor and risk of workplace SEA/SH, which usually is low due to the low rates of gender-based violence in general in China and demonstrated by other projects practice, will be further assessed during project preparation. Risks related to community health and safety would

be primarily related to poor farm facilities, livestock product chain and various waste treatment facilities. It is considered unlikely that the physical investments will cause relocation of ethnic minorities, but adversely economic impact seems possible at some facility sites due to land acquisition, and safety and health issues. Tackling the grassland and livestock issues also requires a fundamental overhaul of cross-coordination among many line departments and proactive stakeholder engagement. Some activities may be implemented by financial institutions (FIs), which will increase the complexity of social impacts and risks under the project. The Provincial PMO has implemented many projects financed by international financial institutions and donor organizations in the last decade. However, the provincial and county DARAs have no specific experience with the ESF.

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## APPROVAL

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