Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 24-Nov-2019 | Report No: PIDA27481

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Project Name	Parent Project ID (if any)
China	P169758	Henan Green Agriculture Fund Project	
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
EAST ASIA AND PACIFIC	18-Nov-2019	26-Mar-2020	Agriculture and Food
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	People's Republic of China	Henan Agriculture Development Financing Investment Corporation	

Proposed Development Objective(s)

The proposed objective is to demonstrate the viability of financing green agriculture investments in Henan, fostering adoption of innovative green agriculture standards and replicable green technologies.

Components

Component 1: Green Agriculture Fund
Component 2: Technical Assistance and Risk Capital

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	200.00
Total Financing	200.00
of which IBRD/IDA	200.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	200.00

Environmental and Social Risk Classification

Substantial

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

1. China is a global leader in agriculture – in terms of the sheer size of its agricultural economy and in the sustained high agricultural growth. At nearly US$1.6 trillion in 2011 constant Public Private Partnership terms, China's agricultural Gross Domestic Product (GDP) is nearly 8 times that of the US. China's agricultural growth over nearly four decades has averaged 4.2 percent a year from 1978 to 2015, also among the highest in the world. The success of these efforts is evident in feeding a population of nearly 1.4 billion people, or 19 percent of the world's population, with only 8 percent of the global arable land and 13 percent of irrigation water resources. Currently China produces 18 percent of world's cereal grains, 29 percent of world's meat, and 50 percent of the world's vegetables.

2. Following the famines in the decade of 1970, the Chinese agricultural policies has been until recently driven by the quest to achieve self-sufficiency in grains. Moving forward, Chinese food systems will be shaped by urbanization and income growth. China has already seen the rapid decline of its rural population since around 1995, due to massive rural-urban migration (about 200 million). It is expected that China will reach urbanization rate of 70 percent by 2030 up from 55 percent now. Urbanization will increase aggregate demand for food as changing dietary patters and increased income levels of urban population lead to increased demand for higher value products, especially meat, dairy, horticulture products and processed food. The consumption growth projections by the World Bank show that China will be consuming 14 percent more pork, 10 percent more milk and 97 percent more high value dairy products by 2030. On the other hand, China's increasingly affluent urban consumers are demanding safer, healthier, and greener food. For example, while the aggregate consumption of horticulture products is expected to increase only slightly, there is a marked shift towards green and organic products.

3. Meeting the challenge of changing consumption shifts will impose even greater strains on Chinese food production systems due to increasing environmental supply constraints. China's arable land per capita is already about 40 percent and water resources 25 percent of world average. These resources are dwindling rapidly due to urbanization (expected loss of arable land is 5-6.1 percent by 2030), as well as industrial pollution. Some 7 percent of irrigated lands is contaminated with polluted water and 19 percent of farmland has excessive levels of heavy metals. Farming on 3.3 million ha of land is banned indefinitely.

4. China is the world's largest producer and user of chemical nitrogenous (N) fertilizers, both on an absolute and per hectare basis. Consumption of fertilizers in China was 58 million tons in 2017. Grain production is the leading user of fertilizers, although the highest fertilizer application rates occur in fruit and vegetable production. It has been estimated that only about 25 percent of N is taken up by crops in China compared to 50 percent in Europe and almost 70 percent in the U.S. and Canada, with the remainder running off into water sources or entering the air as nitrous oxide. Ammonia

emissions from N fertilizer use contribute around 10 percent of the air pollution (PM2.5) in the North China Plain and Pearl and Yangtze River Deltas. According to the first census on national pollution sources in 2010, Chemical Oxygen Demand (COD), Total Nitrogen (TN) and Total Phosphorus (TP) are major sources of pollutants from agriculture sector. While COD mainly comes from livestock sector, accounting for 96 percent of its total emissions, TN and TP are primarily attributable to overuse of fertilizers in crop sector, with 38 and 59 percent of total emissions respectively. Consumption of pesticides in China was 1.8 million tons per year in 2015, and about 30 percent of it was utilized by crops. Overuse of pesticides affects about 10 million hectares of farmland.

5. China's agricultural sector heavily contributes to greenhouse gas (GHG) emissions. It makes up about 14 percent of global agriculture-related GHG emissions (about 1.5 gigatons). It is a major source of two highly potent greenhouse gases: methane (from livestock manure and rice), and nitrous oxide (from manure and use of nitrogen fertilizers). Nitrogen fertilization makes up about 30 percent of all total agriculture GHG emissions in China, followed by livestock production (27 percent), energy use (20 percent), and rice production (13 percent). By one estimate, China is on a path to emit more than 500 million tons of emissions by 2050 from various parts of N fertilization production and use.

6. Food Loss and waste (FLW) is another area which has important implications on the GHG emissions and resource use efficiency in general. Food that is either lost or wasted generates significant GHGs (i.e. 8 percent of annual global GHG emissions), which occurs through decomposing organic matter, fertilizer use (i.e. interference with the global nitrogen and phosphorus cycles), and the overall process of producing and processing food that is not consumed. According to data from China's State Administration of Grain, in 2014, 35 percent of China's annual food produced was lost or wasted, mostly at consumption stage. Even without a reduction in FLW, a smaller carbon footprint of agriculture production and processed foods would contribute to lower levels of FLW related GHG emissions and pollution. More efficient production and/or processing of food would reduce the need for land conversion for additional food production and slow the rate of increase in fertilizer applications.

7. Over the last five years, China has taken number of policy and reform steps towards transformation of its agriculture and food sector from high-input/high-environmental footprint practices towards more sustainable intensification. In 2015, the Ministry of Agriculture and Rural Affairs (MARA), issued the Action Plan for Zero Growth of Chemical Fertilizer Use by 2020 and the Action Plan for Zero Growth of Pesticide Use by 2020, which was the first effort to seriously curb fertilizers and pesticide overuse. In 2016, the Ministry of Finance and MARA jointly issued the Reform Plan for Establishing Agricultural Subsidy System Guided by Green Ecology which was the first effort to restructure massive agricultural subsidy system in China to provide incentives for more efficient utilization of natural resources and environmental protection. This was followed by the Notice of Five Actions for Green Development of Agriculture in 2017 by MARA, which aimed to encourage improved management of livestock manure, replacing chemical fertilizers with organic fertilizers, encourage straw treatment, agricultural plastic recycling and the action of aquatic biodiversity protection. In 2018, the MARA issued first time the technical guidance notes for green agriculture development (2018-2030), which outline investments to accelerate the pace of green input creation, improve green technology supply, establish low carbon model, build or enhance green standards system, and formulate monitoring and early warning mechanism of natural resources and the environment. However, there are no technology specific green standards nor unified definition of green agriculture, which limits the knowledge and awareness of existing green agriculture technology solutions among potential investors. The existing standards which come closest to green agriculture are related mostly to agriproduct quality and food safety (i.e. green and organic food labeling).

8. Transformation of Chinese agri-food systems towards more sustainable development path requires massive financing. Increasing demand for high quality, nutritious and safe food in China has created renewed private sector interest to invest in agri-food sector, which provides scope to harness green agriculture finance. This renewed interest

is creating new opportunities for financial institutions and other investors to capture opportunities in investing in green agriculture within the emerging green financing policy and regulatory framework.

9. China introduced the Green Credit Policy first time in 2007 to encourage financial institutions to offer green credit for environmental protection, emission reduction, and energy conservation projects. The aggregate national level green finance portfolio is currently about US$1.2 trillion of green credit and US$ 89 billion in green bonds. Most of it has gone to energy, urban water, transport and industrial sectors where commercial investments options and technologies are relatively well defined. Total green financing for agriculture, on the other hand is only about US$9 billion or 0.4 percent from aggregate national green financing. This is related to general reluctance of financial sector institutions in China to finance agriculture investments, which are generally perceived to be of high risk and low returns. According to the available figures, only about 20 out of 4,000 active registered asset management companies in China engage to some degree in agriculture (and none in green agriculture investments). Any equity and longer-term commercial debt funding available for agriculture goes mainly to larger agribusiness corporates, with agribusiness SMEs only receiving working capital and short-term finance. On top of the challenges that constrain the financing of agriculture, green agricultural finance is in addition constrained by limited track record of green agricultural investments, which are not yet well known and understood by financial institutions and fund managers. As such, most of the limited financing for green agriculture in China is carried out by public entities, which consider such investments as fulfilling public policy objectives. Today, green agriculture finance goes primarily to improve the energy efficiency of agribusinesses. On the demand side, the main constraints facing agribusiness in the adoption of green technologies are related to the lack of clarity and guidance on the green standards for agriculture in China; lack of knowledge and awareness of existing green agriculture technology solutions that can be implemented profitably; and the incipient nature of many potential new technologies whose profitability and risks cannot yet be assessed conclusively.

Sectoral and Institutional Context

10. Henan is a major agricultural and industrial production province in China. It is located in mid-eastern China, at the lower-middle reaches of the Yellow River, with a land area of 167,000 km2. In 2016, its total population was 95.3 million -- the third most populous province in China -- with rural population making up 51.5 percent of the total population. In terms of economic development, Henan was the 5th largest provincial economy of China with a GDP of RMB4,016 billion in 2016 (about US$620 billion), while agricultural GDP was about RMB429 billion (about US$65 billion). It is also one of China's least developed areas with a per capita GDP of RMB42,363 (US$6,378), which ranks only 20th in China.

11. According to the National Bureau of Statistics (NBS) national household survey, Henan had a total of 6.4 million poor in 2013. As of end-2014, Henan had 53 designated poor counties (about 50 percent of all counties and county-level cities in the province) and 8,103 designated poor villages. According to the NBS data (2017), Henan had the third largest provincial concentration of rural poor in China as of 2016 (after Guizhou and Yunnan), comprising of 3.7 million rural poor (8.7 percent of China's total poor). There are roughly 3 million poor in Henan that retain their full capacity for work. Consistent with national policy, those poor with labor will be assisted through support for gaining employment in agribusiness and other enterprises outside their home villages and counties, and other measures. Agriculture and agribusinesses continue to have thus an important role in poverty reduction in Henan, as well as in China in general.

12. Henan is the largest producer of livestock and the second largest producer of grains (6.8 million ha of arable land) in China. It produces significant quantities of oil crops, fruits and vegetables. Agriculture has a significant environmental footprint in the province. For example, the total manure discharges from livestock industry have risen since 1990, reaching about 253 million tons per year by 2010. The increase is attributed to rapid growth of pig and cattle production

since 1990s as a response to increasing demand for meat. The pork industry accounts for 50 percent of the total manure discharges, followed by cattle (28 percent), and poultry (13 percent). The consumption of pesticides in Henan was 128,700 tons in 2015 (the second largest after Shandong province), while the consumption of chemical fertilizers reached 7.1 million tons in 2017 (the largest in China). Grains, fruits and vegetables are the major users of fertilizers, accounting for 83 percent of total crop fertilizer consumptions. The crop sector was a major contributor of TN with 93,500 tons and TP discharges with 5,300 tons (NBS, 2017). Henan is the fourth largest province in China in COD emissions and the third largest province in ammonia nitrogen emissions. The total amount of COD emissions from agricultural sources were 12 million tons, accounting for 48 percent of the total COD emissions in China (First Census on National Pollution Sources, 2010). Total GHG emissions from agriculture in Henan increased from 16.6 million tons in 1999 to 18 million tons in 2015 (9 percent). The main sources of agriculture related GHG come from enteric fermentation (29 percent) and use of synthetic fertilizers (22 percent).

13. Henan agriculture sector is also vulnerable to climate change. Increasing evidence shows that shifts in China's climate have already occurred and will continue in the coming years. The average surface air temperature across China increased 0.5-0.8˚C during the 20th century and there is evidence that this process is accelerating. Regionally warming trends have been more significant in areas north of the Yangtze River, which includes Henan. There is evidence from Henan that increasing temperatures have started to have an impact on grain production due to increased risk of frost damages in spring as crops start flowering earlier. There are also signs of changing rainfall patterns. Precipitation rates have declined in North China Plain, which includes Henan. Beginning in the 1950s, rainfall decreased between 20 to 40 mm/decade on average. Specifically, average annual rainfall levels in Henan have dropped from 597mm between 1971 and 2007 to 529mm between 1997 and 2007. Rainfall patterns in Henan have also become increasingly concentrated with 70 percent of rainfall occurring now in June-September. There is an evidence of increased frequency of early spring droughts (63 percent cases), which have especially negative impact on winter wheat yields, while summer droughts (35 percent) have negative impacts on maize yields, especially in the northern Henan. Based on the historic data, in average, grain output in China could decline about 20-30 percent as a result of droughts, and as much as 50-60 percent in severe cases. On the other hand, there is an evidence of increasing frequency and floods and waterlogging in the southern parts of Henan.

14. Addressing the above environmental and pollution issues in agriculture, both in Henan and in China more generally, requires simultaneous attention on the modernization of farming systems and post-harvest practices (including processing of agricultural products), while responding to increasing consumer demand for nutritious, high quality and safe food. Creating more modern and resource efficient production structures, while ensuring environmental sustainability and food safety, would require potentially far reaching adjustments both on-farm production structures and in the post-farm food value chains. Given its oversized importance in Chinese food systems, Henan has a potential to make significant contributions to reduce agriculture environmental footprint at national level and globally, as well as to produce safe, high quality and nutritious food which meets the changing dietary patters of Chinese consumers.

C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

15. The proposed PDO is to demonstrate the viability of financing green agriculture investments in Henan, fostering adoption of innovative green agriculture standards and replicable green technologies.

Key Results

16. The proposed project would aim to achieve green agriculture impacts by developing and adapting market-demand and testing new green technologies, investing in new and existing technologies that reduce agriculture related GHG emissions and pollution (TN, TP, COD), improving the health of agro-ecological environment, increasing the resource-use efficiency of energy, water and other natural resources and/or ensuring production of high quality, nutritious and safe food products.

17. To realize these impacts, six types of green interventions are determined, including and not limited to green crop production expansion, livestock manure management, energy use efficiency, water use efficiency, waste water treatment and knowledge-based services. Each intervention is expected to have specific green technology solutions which must be effectively applied by sub-projects in a commercially viable manner by various actors in the value chains, such as input producers, technology developers, crop and livestock producers, post-harvest and storage service providers, processors, transport/distribution/logistic service providers, and knowledge service providers.

D. Project Description

18. The proposed project would contribute to the development of a green agriculture financing mechanism for promoting green agriculture growth in Henan Province through market transformation and commercial sector engagement. The proposed project would aim to build credible institutional systems in Henan, which could contribute to green financing beyond the project through standard setting and demonstration effect. The proposed project design brings together a twin strategy that creates an enabling environment for green agriculture growth by establishing dedicated and specialized investment vehicles in eligible green agriculture sub-projects while providing knowledge driven technical assistance (TA).

Component 1: Green Agriculture Fund (GAF) (IBRD: US$190 million).

19. This component of the proposed project would support the establishment of a dedicated investment facility to demonstrate the viability of financing green agriculture investments in Henan by providing financing for equity investments and on-lending to eligible firms. The facility will operate in a transparent manner adhering to market principles on a sustainable basis. The GAF will finance targeted firms and value chains for enhancing green agriculture impacts by investing in technologies that reduce agriculture related GHG emissions and pollution (TN, TP, COD), improve the health of agro-ecological environment, increase the resource-use efficiency of energy, water and other natural resources and/or that ensure production of high quality, nutritious and safe food products. It will support: (i) investments in climate smart agro-food systems, (ii) the expansion of green or organic agriculture production bases; (iii) investments by agriculture industrial value chains to meet Good Agriculture Practices, Codex standards, etc.; (iv) investments for improving energy, water and resource efficiency; (v) investments for reducing FLW; and (vi) acquisition of equipment and facilities such as waste treatment plants, etc. for meeting compliance with existing environmental regulations.

Component 2: Technical Assistance and Risk Capital (IBRD: US$10 million).

20. This component will support the strengthening of institutional, fiduciary and safeguards management systems of the Henan Agriculture Development Financing Investment Corporation (HADFIC) for achieving institutional performance and governance benchmarks in compliance with China's green finance system regulations and global best practices (such as Equator Principles). It will also help to put in place in Henan green agriculture standards and monitoring protocols as well as mechanisms for market development while fostering innovation and partnership development. The focus of

these TA activities is to: (i) identify/discover opportunities for green agriculture investments; (ii) enhance the knowledge regarding the financial returns and cash flows related to green technologies; and (iii) strengthen the capacity of the HADFIC to process such investments and develop suitable financial instruments for green agriculture. In addition to the TA activities, this component will also provide funding in the form of risk capital to be invested in higher-risk innovative green projects.

Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Assessment of Environmental and Social Risks and Impacts

21. Overall, the project will bring about positive environmental and social (E&S) benefits in terms of reducing the pollution from agricultural production, reducing GHG emissions, and reducing health risk for consumers by improving the food safety and quality. The typology of the activities eligible to be financed by the project generally cover the whole value chains, and could include input suppliers (e.g. high efficiency and slow-release fertilizers, seeds, livestock feed, biocides, etc.), primary production (e.g. land-based cropping systems, livestock production units and related manure management facilities, etc.), processing facilities, storage facilities, logistics centers, and equipment manufacturing facilities. The size of most sub-project enterprises ranges from small to medium, but some livestock farms and cropping bases may be built/expanded to a large size by the project. Investments in expansions would be approved only if they establish more economical and efficient manure management systems, such as innovative pens for feeding efficiency, improved energy and water use efficiency, which can help reduce the waste discharges and GHG emissions more cost effectively. In addition, the policy for livestock waste management in China also supports the intensified and large-scale livestock farms which operate waste management facilities according to environmental regulations and have stronger bio-security measures.

22. The potential environmental impacts in the construction phase may include the dust, noise, solid waste, wastewater, and social disturbance, such as the traffic safety. The potential adverse environmental impacts in the operating stage could typically include noise, dust, nuisance odor, waste gas, solid waste, general wastewater, toxic materials and wastes. The occupational health concern is related to mechanical damage by operating machines, inhaling fine particles in processing of agro-products, and toxicity of biocides production. The transportation of toxic materials and wastes may cause health and safety risks to communities. The probability for such risks is very low, and the impacts are small given the size of proposed sub-projects. An exclusion criterion to exclude the genetically modified varieties from the project has been established and incorporated into the Environmental and Social Management System (ESMS). The environmental risk rating of the project is Substantial, given the nature and magnitude of the potential environmental risks and impacts associated with the livestock farms and slaughter houses.

23. The GAF would make investments in sub-project activities throughout the crop and livestock value chains, for which the scale would vary a lot by typology of activities. The social risk screening identified the following main risks: (i) leasing of land use rights for scale farming and livestock breeding; (ii) managing labor and working conditions of direct workers, primary supplier workers and contracted workers; (iii) conducting stakeholder consultations throughout the project lifecycle proportionate to the risks and impacts; (iv) land acquisition and resettlement for establishing facilities and structures by targeted enterprises; (v) ethnic minorities; and (vi) community health and safety.

24. An ESMS, Stakeholder Engagement Plan (SEP) and Environmental and Social Commitment Plan (ESCP), have been developed by the HADFIC as per the ESF. The existing policy, procedure for fund management and E&S risks control systems established in the HADFIC have been assessed and enhanced following the requirements of the Environmental and Social Standard 9 (ESS9). An E&S management capacity enhancement action plan has been developed, which aims to enhance the awareness and capacity of the HADFIC, its investee enterprises and external E&S experts who support implementation of the ESMS.

25. A set of tools have been developed and annexed to the ESMS to facilitate the ESMS implementation, including the exclusion list, E&S screening sheet, sub-project's Environmental and Social Risk Classification guidance and reporting template, indicative outline of environmental and social impact assessment and environmental and social management plan, enhanced procedure for land leasing, template of sub-project labor management procedures, resettlement policy framework, ethnic minority development framework, indicative outline of social due diligence review, sub-project SEP template, indicative outline of pest management plan, etc.

26. The HADFIC will establish several sub-funds under the proposed project to leverage social capital for specific green technology solutions. The portfolio of the sub-funds will be exclusively built up for the purposes of this project and will be managed by the HADFIC. As such, the ESMS will apply to the whole portfolio of sub-funds. All candidate sub-projects will be screened against the exclusion criteria and screening checklist, categorized and assessed for their E&S risks and impacts prior to financing under the project. All sub-projects will be prepared and implemented according to the national regulations and the ESMS. The E&S documents for sub-projects, will be prepared by the sub-borrowers, disclosed locally, and revised as needed according to the disclosure requirements. The E&S instruments of the sub-projects will be reviewed by the HADFIC's in-house environmental and social specialists, subject to spot checks by the World Bank. The World Bank will review and clear the E&S documents of the first three Substantial or High sub-projects representative of the typology of the sub-projects. The World Bank review will continue if it is found that the E&S screening quality is low and/or the HADFIC has capacity issues in implementing the ESMS. For the high-risk sub-projects, the HADFIC should notify the World Bank before making investment decisions and will apply relevant requirements of ESSs in a manner agreed with the World Bank, as set forth in the ESMS.

27. An overall project SEP, which is consistent with the ESS10 has been prepared by the HADFIC. Following the SEP, key stakeholders were consulted during the project preparation to inform the establishment of the HADFIC's ESMS. A public consultation meeting was held on September 29, 2019 on the draft ESMS. The ESMS was updated incorporating the feedback from the consultation progress. The SEP documented the stakeholder engagement activities during the preparation and will be updated during the project implementation. For sub-projects, a template for the SEP was developed in the ESMS. If a sub-project is screened against its environmental and/or social risks, a SEP will be prepared

and implemented by the sub-borrowers before sub-project approval, proportionate to the E&S risks and impacts of the specific investments.

28. The E&S documents (i.e. ESMS, ESCP and overall project SEP) were disclosed on the HADFIC's website on September 29, 2019, and on the World Bank's website on November 20, 2019. The E&S documents for sub-projects will be disclosed locally and at the website of the HADFIC and the World Bank before approval of sub-projects.

E. Implementation

Institutional and Implementation Arrangements

29. The project will be implemented by the Henan Agriculture Development Financing Investment Corporation (HADFIC). The HADFIC, is the subsidiary of the Henan Agriculture Investment Group Co. Ltd (HAIGC). The HADFIC acts both, as an investor, typically General Partner (GP), representing the entity providing fiscal funding, and as the fund manager. If there is interest from external fund managers, the HADFIC typically acts as the GP only and hires external fund managers. For funds with a strong policy mandate that may not attract enough external interest as fund managers, the HADFIC typically acts as the fund manager.

30. The project implementation draws on the existing institutional structure of the HADFIC. In addition to the existing institutional structure, the HADFIC will establish a new unit specifically for the management of the GAF, which will fall under the oversight of the Chief Investment Officer. The staffing of this department comes from existing departments of the HADFIC, as well as externally recruited contract-based staff with specialized technical skills to address gaps in its current skill profile (both full-time and part-time basis). The GAF management department will receive additional technical support from the existing HADFIC's departments as part of its sub-project investment cycle screening, due diligence and approval process, most notably the Departments of Finance and Risk Control.

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APPROVAL

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