

Common Language on Financially-Supported Agricultural Green Development

Classification Scheme and Evaluation Method of Agricultural Green Development



Foreword

In April 2019, the Agricultural Development Bank of China (hereinafter referred to as ADBC) and the Climate Bonds Initiative (hereinafter referred to as CBI) signed a memorandum of understanding on cooperation in Beijing. Based on the consensus of the urgency of financing green transition in China's agriculture sector, the two parties intend to jointly promote the development of a classification scheme for China's green development of agriculture sector that is in line with international green definitions, China's climate and environmental policies, and its agricultural development strategies. Meanwhile, the two parties also agreed to work together to explore and make full use of China's agricultural green investment opportunities; study and identify potential agricultural green projects, feasible financing tools and support measures. The two parties will jointly promote the classification scheme and evaluation method of China's green development of agriculture sector.

ADBC is the only agricultural policy bank in China under the direct leadership of the State Council. Its mission is to raise funds for supporting agriculture through a market based on national credit to act as a strategic pillar of the country in supporting the development of: agriculture, rural areas and farmers. ADBC has been dedicated to supporting the green development of agriculture sector. ADBC is committed to exploring the transformation model of 'clear waters and green mountains are as valuable as mountains of gold and silver' through innovative development of green financial products (such as green bonds) and green collaborative research, and working with all parties in the market to jointly promote resolution of issues concerning agriculture, rural areas and farmers. As an institution that develops the Climate Bonds Standard (CBS), a broadly recognised international green bond standard, CBI, has been committed to developing and promoting classification schemes that provide guidelines on defining green for various industries in the global market.

In June 2019, ADBC and CBI jointly established a special study team and commissioned CECEP Consulting Co. Ltd. to take a lead in the formulation. In September 2019, the study team held a thesis proposal review meeting. In June 2020, the project successfully passed the final acceptance. The research outcomes of the study team have been widely recognised by relevant experts from various institutions, including leaders of the Financial Research Institute of the People's Bank of China and the Policy Research Bureau of the China Banking and Insurance Regulatory Commission, as well as the Research Centre on China's Green Development of Agriculture Sector of the Chinese Academy of Agricultural Sciences, the Planning and Design Institute of the Ministry of Agriculture and Rural Affairs, the International Institute of Green Finance of Central University of Finance and Economics, CIB Research, and Agricultural Bank of China.

As a next step, ADBC will take the lead in demonstrating the application of the outcomes of this project. ADBC will follow the guidance of the classification scheme for the green development of agriculture sector proposed by the project to increase support for the green development of agriculture sector, and encourage wide participation and practical case sharing among various financial institutions.

Agricultural Development Bank of China

Climate Bonds Initiative

July 22, 2020

Abstract/Executive Summary

The green development of agriculture sector is vital to food, resource and ecological security, the construction of ecological civilization, the well-being of people today and the sustainable development of future generations. Promoting the green development of agriculture sector is a concrete manifestation of the overall plan for promoting economic, political, cultural, social, and ecological development, and the focus of supply-side structural reform in agriculture. Financing green transition in China's agriculture sector is important in many ways. It does not only encourage investment in the green development of agriculture sector industries, but also increases the awareness of cost, market and risk of agricultural business entities, and promotes the development of industrial, production and management systems for the green development of agriculture sector.

At present, China has made positive progress in promoting financing green transition in China's agriculture sector and building a financial service system to support it. However, the road towards financing green transition in China's agriculture sector is still beset by many challenges: (1) unclear scope of the green development of agriculture sector makes it difficult for financial institutions to identify and apply; (2) agricultural green benefits that cannot be rationally evaluated have brought obstacles to the design and risk management of related financial products.

In regard to the above-mentioned issues, we will focus on the following key areas:

- A classification scheme of financing green transition in China's agriculture sector will be proposed, and the scope of the green development of agriculture sector assets will be clarified;
- Based on the classification scheme, practical evaluation methods of the green development of agriculture sector projects will be proposed from the perspective of environmental risks and performance;
- Financial application of the green development of agriculture sector evaluation methods will be proposed.

Classification scheme

Determination of the type and scope of the green development of agriculture sector assets is an important foundation for financing green transition in China's agriculture sector. In this project, a classification scheme is proposed, the main principles are clarified, and a systematic work method with industrial working groups as the core is outlined. Based on the analysis of resources, environment, climate change and other issues that China is currently facing within its green development of agriculture sector, together with an in-depth study of the green development of agriculture sector patterns, measures and key tasks, a classification scheme of financially-supported agriculture is proposed, including 5 primary classes and 14 secondary classes. It covers multiple links of the industrial chain and multiple fields such as agricultural inputs, agricultural production links, origin environment, agricultural product processing and circulation, and agricultural ecological protection.

The classification scheme of the green development of agriculture sector that is being proposed is in line with China's national conditions and has given full consideration to the forms and trends of China's agricultural development, especially the key tasks and directions in building technical, industrial, and structural systems that support the green development of agriculture sector in China. It also draws on the best and feasible practices from the international community in financially-supported sustainable and climate-smart agriculture. The proposed classification scheme is clear and executable. It does not only meet the current needs of financial institutions to support the green development of agriculture sector, but it has also made it possible to conform with international standards, thus laying a solid foundation for establishing a common language used in green finance in the agricultural sector, domestically and internationally.

Evaluation method

The evaluation of existing financially-supported activities mainly focuses on the financial attributes of projects or assets, i.e., the investment return attributes and risk status of projects. However, the evaluation of relevant assets in the field of financing green transition in China's agriculture sector shall also be reflected in the 'green additionality', including two aspects, namely, green benefits and environmental risks.

Based on the classification scheme, this project puts forward a practical evaluation method for financially-supported agricultural green projects based on a thorough study and analysis of the green benefits and environmental risk characteristics of the various types of projects, including:

- Evaluation index;
- Materials used for evaluation;
- Methods for obtaining and calculating indexes.

Over 80% of the evaluation indexes proposed by this project are quantitative, which provides a foundation for financial institutions to continue developing IT-based evaluation tools designed to improve environmental and social risk and performance management.

Models of Financing Green Transition in China's Agriculture Sector

Compared with general agriculture and traditional agriculture, the green development of agriculture sector features additionality. Compensation for its additionality is one of the most important driving forces to promote financing green transition in China's agriculture sector. However, at present, China has not yet put in place a relevant mechanism to compensate additional value of the green development of agriculture sector (such as ecological service value compensation), yet information related to the green development of agriculture sector is still valuable to financial institutions.

By analysing relevant domestic and foreign application cases, we believe that financial institutions can make use of evaluation information for the green development of agriculture sector by: negative screening, information integrated application, benefit value quantification and other methods to promote financing green transition in China's agriculture sector.

Considering the above evaluation methods of information application and the focus of financial institutions on green information, it is recommended to promote the financially-supported application of the green development of agriculture sector information from three aspects:

- Application in credit evaluation;
- Application in financial product design;
- Indexed application.

Innovation

The innovations of this project are mainly reflected in:

Wide coverage. The scope of our study involves many aspects of agricultural activities, including pre-production, mid-production, and post-production. It covers various types of agricultural industry, including plantation, animal husbandry, fishery, forestry, and agricultural-processing industries. It also includes infrastructure related industries such as water conservancy, environment, and public facilities.

New study methods. Based on the study purpose and applicable objects, and drawing on the relevant domestic as well as international green development concepts, we proposed three major classification principles in the agricultural sector, namely, (1) the ones that have green benefits and

belong to the key areas of the green development of agriculture sector in China; (2) the ones that have economic attributes and belong to investment and financing activities suitable for financial institutions to support; (3) the ones that have low environmental risks.

Practical evaluation method. Based on the current supporting status of financial institutions for agricultural development, we put forward specific evaluation benchmarks and methods, and specific operation steps for different types of projects listed in the financing green transition in China's agriculture sector classification scheme proposed by this project; this included project classification evaluation, environmental risk evaluation and environmental benefit evaluation.

Forward-looking application approaches. Based on study and analysis we proposed to apply evaluation information for the green development of agriculture sector in innovative ways such as: negative rejection, information integration and application, and quantification of the green development of agriculture sector impact and benefit value. We also proposed forward-looking approaches to the application of the green development of agriculture sector evaluation information in credit evaluation, financial product design, and indexed development.

Outlook

In this project, we proposed the scope and evaluation methods of financing green transition in China's agriculture sector, and shared our views on the prospective applications. We are dedicated to studying the outstanding problems and challenges faced by the green development of agriculture sector in China, and hope to demonstrate the potential strategies to tackle these challenges through our exploration of basic standards.

Based on our understanding of the current status and trends of the green development of agriculture sector and financing green transition in China's agriculture sector, we proposed to promote the study of financial-support mechanisms in the following aspects in the future:

- Development of IT-based evaluation system for the green development of agriculture sector projects;
- Information disclosure in financing green transition in China's agriculture sector;
- Exploration of an innovative approach integrating finance and the green development of agriculture sector technology.

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Preface

The green development of agriculture sector is vital to food, resource and ecological security, the construction of ecological civilization, the well-being of people today and the sustainable development of future generations. Promoting the green development of agriculture sector is a concrete manifestation of the overall plan for promoting economic, political, cultural, social, and ecological development, and the focus of supply-side structural reform in agriculture. The Report at the 19th National Congress of the Communist Party of China emphasised the promotion of green development as part of the special efforts to solve the enormous environmental problems and protect the ecosystem. Although China has made extraordinary achievements in agricultural development in recent years, the resource-intensive development pattern of agriculture that mainly relies on resource consumption has basically remained unchanged. Environmental pollution and ecological degradation have not been effectively curbed; the supply of high-quality green agricultural and ecological products cannot meet the growing material and cultural needs of our people for a better life. The tasks that we face to implement the green development of agriculture sector are still arduous and formidable.

Especially since the beginning of 2020, with the impact of the global Covid-19 pandemic and the world economy still mired in recession, instability and uncertainty have increased significantly. These have brought major difficulties and challenges to the economic and social development in China. In May 2020, Vice Premier Hu Chunhua of the State Council emphasised the imperative to fully implement a series of important instructions made by General Secretary Xi Jinping, and resolutely implement the policy decisions and arrangements of the central leadership, with an aim to advance security in the six areas and achieve leapfrog development in the agricultural sector. He made a commitment to ensure successful completion of the goals for stabilising food production and resuming pig production, ensuring food security and a stable supply and a stable price of important non-staple foods. Vice Premier Hu Chunhua also indicated that food security is an important foundation for China's national security as it plays a basic and prerequisite role in the tasks to advance 'security in the six areas.'

Amid the global pandemic in July 2020, the meeting of the Political Bureau of Central Committee of Communist Party of China proposed that attention be given from the perspective of protracted battle, to accelerate the establishment of a 'dual circulation' development pattern in which domestic economic cycle plays a leading role while international economic cycle remains its extension and supplement. Meanwhile, in accordance with the spirit of the meeting, there was a commitment to establish a mid to long term coordination mechanism in epidemic prevention/control and economic and social development, to adhere to the strategic direction of structural adjustment, and achieve a long-term balance between stable growth and risk prevention. From the perspective of the production, circulation, distribution, and consumption of the economic cycle, the current poor circulation is mainly reflected on the poor quality of enterprise supply, which made it difficult to effectively meet the needs of our people for high-quality goods and service consumption. Promoting the green development of agriculture sector is an important step to improve the quality of agricultural supply and promote the 'dual circulation.'

Finance is an important means to promote the green development of agriculture sector. Exploring the new model and mechanism of financing green transition in China's agriculture sector is not only an inevitable choice for innovative development, and the transformation and upgrading of financial institutions, but also an important measure for financial institutions to win in the three critical battles to promote high-quality economic development.

There are many obstacles faced by financing green transition in China's agriculture sector. Among them, the lack of the green development of agriculture sector standards and optimised feasible practices in the green development of agriculture sector investment and financing are key problems which are in urgent need of resolution. In view of the continuous development and improvement of related concepts and models, there is no unified set of methods for statistical classification and definition of the green development of agriculture sector. As a result, financial support is unable to be defined, and the greenwashing is widespread.

Guided by the above-mentioned issues and from the global perspective of green finance, we systematically studied and analysed the relevant domestic and international green development of agriculture sector concept, and clarified the connotation and scope. In addition, an in-depth analysis of the status, challenges and opportunities of the green development of agriculture sector in China was conducted, and the environmental risks and benefit characteristics of each segment in the green development of agriculture sector was clarified. Meanwhile, classification schemes and evaluation methods for the green development of agriculture sector were proposed, and the models and practices of financing green transition in China's agriculture sector were summarised. All these have laid a solid foundation for the development of clear enforceable unified financial standards for China's green development of agriculture sector in line with international standards.

Part 1: The role of the agricultural sector in China's National Plan to Implement SDGs

Sustainable Agriculture has become a global consensus

Despite rapid global economic development and increased agricultural productivity over the past two decades, sustainable agriculture development still faces unprecedented difficulties and challenges. In the next 35 years, there will be increasing scarcity of land due to population growth, increasing competition for water and energy resources, and increasing survival threats posted by climate change.

In September 2015, the United Nations Sustainable Development Summit was held at UN headquarters in New York. The 17 sustainable development goals (hereinafter referred to as SDGs) were adopted by all UN 193 Member States at the summit. Among them, the SDG 2 aims to end all forms of hunger and malnutrition by 2030, and achieve several sustainable development goals (Sustainable Development Goals, SDGs) such as: climate change, pollution prevention, and ecological protection. And the achievement of these goals directly relies on the development of sustainable agriculture (Figure 1).

Based on SDGs, a large number of developed and developing countries have formed a common vision on sustainable food and agriculture at the UN level. Five key principles for the development of sustainable agriculture are defined in the 'Building a common vision for sustainable food and agriculture—PRINCIPLES AND APPROACHES:'

- Improving efficiency of the utilisation of resources is essential to sustainable agriculture;
- Sustainability requires direct action to conserve, protect and enhance natural resources;
- Agriculture that cannot protect and improve rural livelihoods and social well-being is unsustainable;
- Enhancing resilience of people, communities and ecosystems is the key to sustainable agriculture;
- Sustainable food and agriculture require responsible and effective governance mechanisms.

By working with countries to formulate and apply these principles throughout food and agricultural production systems, the Food and Agriculture Organization (FAO) expects that national, regional, and global systems will be more socially, economically, and environmentally sustainable. In the context of developing sustainable agriculture, many countries have proposed strategies or policies regarding sustainable agriculture. For instance, the United Kingdom incorporated agriculture's response to climate change into its national green development strategy; Brazil put in place a 3-year plan for climate agriculture; and India incorporated financing of the green development of agriculture sector into the category of sustainable finance.

The green development of agriculture sector is China's national plan to Implement Sustainable Agricultural Development

The green development of agriculture sector is the Chinese wisdom and Chinese plan that China contributes to global development of sustainable agriculture. China actively promotes the development of sustainable agriculture, and the green development of agriculture sector is an innovative model for high-quality and sustainable agricultural development. Promoting the green development of agriculture sector is significant in advancing agriculture supply-side structural reform, accelerating agricultural modernisation, and promoting the development of sustainable agriculture.

Figure 1. UN Sustainable Development Goals and Agriculture



The green development of agriculture sector is an integral requirement to ensure food, resource, and ecological security in China, maintain clear waters and green mountains, and build an ecological civilization. China has issued a series of policy documents to promote the green development of agriculture sector, creating a sound policy environment for that development (Figure 2).

Figure 2. China's agricultural green development policies (partial)

2015.2	• The General Office of the State Council issued the Opinions on Accelerating the Transformation of Agricultural Development Model to promote the green development of agriculture sector
2015.5	• 9 ministries (including the Ministry of Agriculture and the National Development and Reform Commission) jointly issued the National Sustainable Agricultural Development Plan (2015-2020)
2016.12	• The Ministry of Finance and the Ministry of Agriculture jointly issued the Reform Plan for Establishing a Green Eco-oriented Agricultural Subsidy System
2017.9	• The General Office of the State Council issued the Opinions on Innovating Systems and Mechanisms to Promote the Green Development of Agriculture Sector
2018.7	• The Ministry of Agriculture and Rural Affairs issued the Technical Guidelines for the Green Development of Agriculture Sector(2018-2030)
2019.1	• The Ministry of Agriculture and Rural Affairs issued the Focus of Work for Agricultural and Rural Green Development 2019

Currently, China has established a coherent ‘top-down’ policy system with three levels, which conveys a positive policy signal for green transition of agricultural development models and high-quality agricultural development:

For nine consecutive years, the China’s No. 1 Central Document has made the protection of agricultural ecological environment an important aspect. The green transition of agricultural production means requires strong policy support. From 2012 to 2020, the China’s No. 1 Central Document has made the protection of agricultural ecological environment an important aspect. Thanks to the promotion of agricultural green production means such as eco-friendly agriculture, efficient resource-use agriculture, and water-saving agriculture, the agricultural industrial system has been further improved, the integration and optimisation between the agricultural industrial system and its derivative industries have been promoted as has the green development of agriculture sector.

A clear top-level system and support system for the green development of agriculture sector has been established. In addition to China’s No. 1 Central Document each year, the State Council, the Ministry of Agriculture and relevant ministries and commissions have also issued a series of policy documents on the green development and sustainable development of agriculture since 2015. It can be seen from these policies that China has included more comprehensive goals and more holistic measures for the green development of agriculture sector (In the initial stage China only supported iconic activities such as ecological governance activities). In September 2017, the State Council issued the Opinions on Innovating Systems and Mechanisms to Promote the Green Development of Agriculture Sector, which indicated that the transition of the green development of agriculture sector pattern has triggered a fundamental and overall change in the agricultural development system and agricultural production means.

Green development policies in key areas have provided strong support for the green development of agriculture sector. Meanwhile, with an aim to support the overall transition, in addition to comprehensive agricultural development policies, the Ministry of Agriculture has also issued a series of special policy documents in key areas: *the Action Plan for Protection and Improvement of Arable Land Quality* (Nong Nong Fa [2015] No. 5), *the Implementation Plan for Promoting Water and Fertilizer Integration (2016-2020)* (Nong Ban Nong [2016] No. 9), *the Action Plan for Zero Growth of Fertilizer Use by 2020*, and *the Action Plan for Zero Growth of Pesticide Use by 2020* (Nong Nong Fa [2015] No. 2), among others.

In light of the prominent issues in agricultural development, by employing the carrying capacity of resources and environment as a benchmark and giving high priority to promoting the supply-side structural reform in agriculture, transition of the agricultural development pattern will serve the fundamental objectives of resource conservation, protection of place of origin environment and improvement of ecological service function. It also helps to build a new pattern of agricultural development featuring the harmonious coexistence between man and nature, and promoting the formation of green production means and lifestyles. From a policy perspective, China has established a basic systematic policy framework which has provided a top-level institutional design basis for the green development of agriculture sector.

Connotation and scope of the green development of agriculture sector

China endeavours to innovate the system and mechanism for promoting the green development of agriculture sector and is committed to accelerating the establishment of a green eco-oriented agricultural subsidy system. The concept of the green development of agriculture sector has won greater popularity and become the shared aspirations of the community. However, there are many different explanations for the connotation of the green development of agriculture sector.

Related models for the green development of agriculture sector

The development of agriculture is also accompanied by the innovation of related models for agricultural development. Agriculture has been influenced by climate change, ecological environment destruction, food security and other issues, which has resulted in concepts of organic agriculture, ecological agriculture, climate-smart agriculture, and sustainable agriculture, etc. They have great similarity with the green development of agriculture sector in regard to connotation and goals, but each has a different emphasis. We have compared and analysed various agricultural production means from three perspectives: industry coverage, industrial link, and connotation. The results are shown in Table 1.

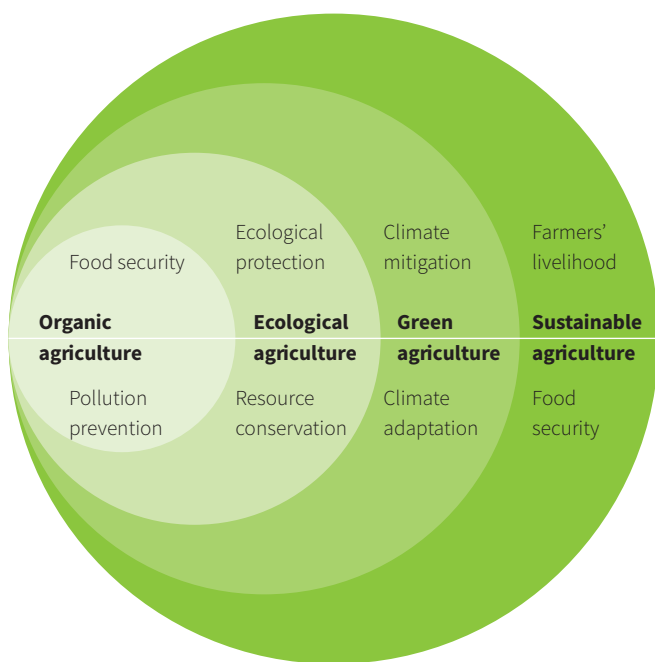
Table 1. Comparison of different green development of agriculture sector models

Agriculture Model	Industry Coverage	Industry Link	Focus
Organic agriculture	Mainly plantation, animal husbandry, fishery, forestry	Product, place of origin, processing, sales	Avoid use of fertilizers and pesticides in production
Climate-smart agriculture	Mainly plantation Expand to animal husbandry	Mid-production	Continually increase agricultural production and income; Enhance adaptive capacity to climate change; Reduce or avoid greenhouse gas emissions.
Sustainable agriculture	Plantation, animal husbandry, fishery, forestry	Pre-production, mid-production, post-production, place of origin	Energy conservation, food security, agricultural product quality and safety, ecological environment security
Ecological agriculture	Plantation, animal husbandry, fishery, forestry	Mid-production	Emphasize the ecosystem as a whole, the integrity and internal circulation of the ecosystem
Agricultural green development	Plantation, animal husbandry, fishery, forestry	Pre-production, mid-production, post-production, place of origin	Pollution prevention and control, sustainable use of resources, climate change mitigation, ecological protection, agricultural product safety, etc.

The green development of agriculture sector model is proposed in light of the prominent issues in resource and environment in China.

From the perspective of objectives, the green development of agriculture sector involves not only food security, but also comprehensive objectives in a number of aspects, such as pollution prevention, ecological protection, sustainable use of resources, and climate change mitigation. Compared with other agricultural models, it puts more emphasis on the approach in response to the resource and environmental issues that restrict China's agricultural development, and food security. Its connotation is similar to sustainable agriculture, but it pays more attention to the prominent issues in environment, resources and ecology (Figure 3).

Figure 3. Comparison of related concepts of agricultural green development



Industry chain for the green development of agriculture sector

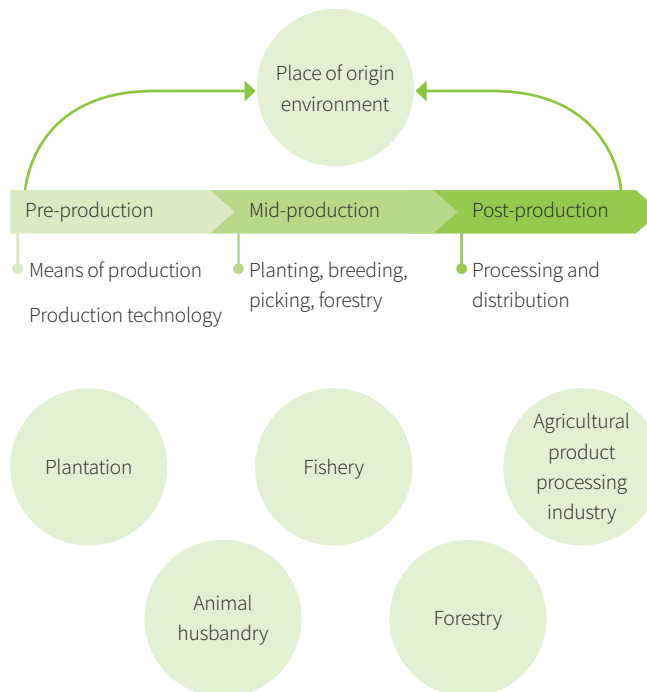
The green development of agriculture sector is a green revolution in the agricultural industry chain. The green development of agriculture sector is an innovative model for high-quality agricultural development. In terms of scope, it involves many aspects and many links of agricultural activities, including pre-production, mid-production, and post-production. In terms of industry coverage, it includes many types of agriculture, including plantation, animal husbandry, fishery, forestry, and agricultural product processing industries. It also covers water conservancy, environment, public facilities, and other infrastructure related industries.

The green development of agriculture sector is essentially the green transition of the development pattern of many links in the agricultural industry chain. It is a green transition of the industrial chain and value chain for agricultural development.

Table 2. Industry categories involved in the green development of agriculture sector

A. Agriculture, forestry, animal husbandry, fishery, sideline	01 Agriculture
	02 Forestry
	03 Animal husbandry
	04 Fishery
	05 Agriculture, forestry, animal husbandry, fishery and supporting activities
C. Manufacturing	13 Agricultural and sideline food processing industry
	14 Food manufacturing
	15 Liquor, beverage and refined tea manufacturing
	20 Wood processing and wood, bamboo, rattan, palm and grass product industry
	N. Water conservancy, environment and public facility management industry
76 Water conservancy management industry	
77 Ecological protection and environmental governance industry	
78 Public facilities management industry	
79 Land management industry	

Figure 4. Main scope of the green development of agriculture sector



The problems and countermeasures of the green development of agriculture sector

The concept of the green development of agriculture sector in China is put forward based on the prominent resource and environmental issues in agricultural development in China, with an aim to meet the needs of the transition of agricultural development mechanisms. While China's agriculture is developing rapidly and making remarkable achievements, it is also confronted with many prominent issues and challenges such as over-exploitation of resources, excessive use of agricultural inputs, over-exploitation of groundwater, and inextricably interwoven internal and external sources of agricultural pollution (Figure 5).

Promote the green development of agriculture sector to address environmental resource challenges.

Confronted with the environmental and resource challenges in the development of sustainable agriculture, and focusing on promoting the green development of agriculture sector and transforming the agricultural development pattern, China has put forward a series of solutions at both system and supporting measures level. China has clearly identified the promotion of the green development of agriculture sector as a priority task, and has strengthened key areas of the green development of agriculture sector in the form of symbolic measures. This project studied and analysed the key tasks and symbolic measures in various fields.

Figure 5. Prominent environmental and resource issues in agricultural development

Increasing hard constraints on resources

61%

Reduced quality of arable land, with 1.8 billion mu of arable land red line

Large proportion of agricultural water consumption, low effective utilisation coefficient

Prominent issues in agricultural environmental pollution

16%

Levels of soil pollution is way much higher than normal

Prominent marine eutrophication issues

Grossly inadequate garbage and sewage treatment in rural areas

Significant degradation of the ecosystem

4.5 billion

Prominent soil erosion issues

Farmland ecological structure imbalance

Deterioration of grassland ecosystem

Shrinking areas of lakes and wetlands

Insufficient supply of green agricultural products

Qualification rate of agricultural products needs to be improved

Agricultural standardized production

Non-polluted agricultural products, green food, organic agricultural products and geographical indications of agricultural products

Table 3. Key tasks and goals of China's agricultural green development

Key Area	Key Task	Symbolic Measure	Main Objectives
Optimise development layout and steadily increase agricultural productivity	Optimise agricultural production layout; strengthen capacity building to increase agricultural productivity; promote the development of ecological circular agriculture	<ol style="list-style-type: none"> 1. Act in light of local conditions 2. Certified seed and certified cultivation method; development of agricultural machinery and equipment; agricultural infrastructure construction; various forms of moderate scale operation 3. Return crop residues to the field through cow digestion¹; trials to replace grain crop with feed crop cultivation and pilot program of circular agriculture combining corn cultivation and cow breeding; promotion of economical technology 	By 2020, the contribution of science and technology to agricultural growth will reach 60% and above, and the mechanisation level of the ploughing, sowing and harvesting of main crops will reach 68% and above. By 2020, the state-level modern agricultural demonstration zones and grain production counties will basically realize the recycling of agricultural resources in the region. By 2030 China will basically achieve zero discharge of agricultural waste nation-wide
Protect arable land resources and economical utilization	Stabilise the area of arable land; improve the quality of arable land; Moderately and appropriately reduce arable land;	<ol style="list-style-type: none"> 1. Crop rotation and land fallow, balance between the occupation and supplement of arable land 2. Crop rotation, land reclamation, upgrade of low- and medium-yield farmland, build water conservancy facilities for farmland 3. Agricultural exogenous pollution (such as emissions from industrial and mining enterprises and municipal waste and sewage) + prevent heavy metal pollution and organic pollution on arable land 	<p>1.8 billion mu of arable land, 1.56 billion mu of basic farmland;</p> <p>Contiguous area of 800 million mu of high-standard drought and flood resistant farmland. By 2020 and 2030, the basic fertility of arable land across China will be increased by 0.5 grade and more than 1 grade</p>
Water conservation and high efficient water use and ensure the security of agricultural water	Implement red line management of water resources; Promote water-saving irrigation; Develop rain-fed agriculture;	<ol style="list-style-type: none"> 1. Establish red lines for water resources development and water use efficiency 2. Large-scale water-saving irrigation by zone; promotion of water-saving irrigation technology; agronomic water-saving and moisture-preserving technology 3. Build farmland rain collection facilities and rain collection cellars, and promote plastic film covering technology; optimize crop cultivation structure 	<p>By 2020 and 2030, China's agricultural irrigation water consumption will remain at 372 billion cubic meters and 373 billion cubic meters respectively, the effective utilization coefficient of farmland irrigation water will reach 0.55 and 0.6 respectively, the effective farmland irrigation rate will reach 55% and 57% respectively, and the water irrigation rate will reach 64% and 75% respectively;</p> <p>Develop 288 million mu of efficient water-saving irrigation area by 2020</p>
Curb environmental pollution, improve agricultural and rural environment	Prevent farmland pollution; Comprehensively curb pollution from livestock and poultry; Improve rural environment;	<ol style="list-style-type: none"> 1. Promote and deepen soil testing and formula fertilisation; Promote use of high-efficiency, low-toxicity and low-residue pesticides, biological pesticides and advanced pesticide application machinery; promote the construction of farmland ecological ditches and sewage purification ponds; build farmland ecological ditches and sewage purification ponds; demonstration, promotion mechanised picking up of waste plastic film and recycling of waste plastic film; establish and improve the national agricultural environmental monitoring system 2. Standardised transformation and construction of large-scale livestock and poultry farms (communities); standardised transformation and ecological restoration of aquaculture ponds 3. Scientific separation of large-scale livestock and poultry breeding areas and residential areas; building ecological villages and beautiful villages; recreational agriculture development 	By 2020, the coverage rate of China's soil testing and formula fertilisation technology promotion will reach 90% and above, the utilization rate of chemical fertiliser will be increased to 40%, the fertiliser application will have a zero growth, the coverage rate of China's overall crop pest and disease management will reach 40%, and the pesticide application will have a zero growth. By 2030, agricultural film and pesticide packaging waste in major agricultural production areas will be recycled and reused; By 2020 and 2030, the comprehensive utilisation rate of aquaculture waste will reach 75% and 90% respectively, the livestock and poultry waste from large-scale farms will basically realize recycle and reuse, and the ecological absorption or discharge standards will be achieved. By the end of 2017, livestock and poultry farms (communities) and professional breeding households in the prohibited areas will be shut down or relocated according to law, and this task will be completed one year in advance in the Beijing-Tianjin-Hebei, Yangtze River Delta, Pearl River Delta and other regions. By 2030, crop straws in major agricultural production areas will be fully utilised

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Table 3. Key tasks and goals of China's agricultural green development *continued*

Key Area	Key Task	Symbolic Measure	Main Objectives
Repair agricultural ecology and improve ecological functions	Enhance forestry ecological functions; Protect grassland ecology; Restore aquatic ecosystem; Protect biodiversity;	<ol style="list-style-type: none"> 1. Speed up sand prevention and control in the west, strengthen the protection of natural forest resources, and establish a plain farmland shelter forest system; 2. Put in place a subsidy and reward mechanism for grassland ecological protection; 3. Water saving, moderate water diversion and water transfer, and use of reclaimed water in the basin; 4. Special rescue of endangered animal and plant species; establish a monitoring and early warning system as well as a risk analysis and remote diagnosis system for agricultural alien invasive organisms, and comprehensive prevention and utilisation demonstration bases 	By 2020, the forest coverage rate will reach 23%. By 2020 and 2030, the control rate of China's farmland forestry net will reach 90% and 95% respectively, the comprehensive vegetation coverage of China's grassland reached 56% and 60% respectively, and the healthy aquaculture area in China accounts for 65% and 90% of the aquaculture area respectively

Part 2: Financing green transition in China's agriculture sector

Challenges and opportunities

At present, China is in a critical stage of agricultural transition and leapfrogging. The development of agricultural and rural economy has resulted in an increasingly stronger demand for financial support and services, with an increasing degree of dependence. Finance is an indispensable part of the policy-support system for strengthening agriculture, benefiting farmers and enriching rural areas. In recent years, thanks to the top-down 'green finance' and 'inclusive finance' policies, positive results have been achieved in China's financial services for agriculture, rural areas, and farmers, especially in financial services for the green development of agriculture sector.

Regarding credit, as of the end of 2017, the credit balance of supporting projects for the green development of agriculture sector from 21 banks was RMB 53.603 bn yuan, the credit balance of supporting projects for green forestry development was RMB 44.698 bn yuan, the credit balance of supporting projects for rural drinking water security and small rural water conservancy facilities was RMB 53.70 bn yuan and 53.374 bn yuan respectively. The green credit balance of the above-mentioned projects was about RMB 205.2 bn, accounting for 2.49% of the total green credit balance.

Regarding bonds, as of the end of 2019, the bonds invested in climate change adaptation (including agricultural green projects) was about RMB 27.1bn yuan, of which RMB 15.1bn yuan and 12.1bn yuan were invested in 2018 and 2019 respectively, accounting for 2.69% and 2.61% of the total green bond issuance.

Regarding insurance, in 2019 China's agricultural insurance premium income was expected to reach RMB 68 bn yuan, providing RMB 3.6trn yuan for risk protection. There were over 270 varieties of crops covered by China Agricultural Insurance, which basically covered all areas. Since 2008, agricultural insurance has paid more than RMB 240bn yuan to 360 million disaster-stricken farmers in insurance indemnity.

Financial service is still a short slab for the green development of agriculture sector

Although positive progress has been made in financing green transition in China's agriculture sector, on the whole, the supply and demand of agricultural finance is still not matched well. Especially in regard to promoting the green development of agriculture sector, the institutional mechanism is in urgent need of innovation. Imperfect standards and insufficient additional compensation are major constraints.

Inconsistent standards. The unclear scope of the green development of agriculture sector makes it difficult for financial institutions to obtain effective information to distinguish between the green development of agriculture sector from non-green development of agriculture sector. On the one hand, China still falls behind developed countries in terms of standards for the green development of agriculture sector. At present, the comprehensive standards are mainly the Technical Guidelines for the Green Development of Agriculture Sector (2018-2030), etc. And the standards for specific industrial links and environment of the place of origin are yet to be improved. In terms of relevant standard parameters, there are also differences between Chinese standards and related international standards. On the other hand, from the perspective of evaluation and certification systems suitable for specific standards, China only has related certification systems for green food and organic food, whereas the development of certification systems for agricultural inputs, agricultural production environment and other links is relatively slow. At present, the United States, Japan and other developed countries can perform monitoring and testing in many links in the agricultural industry chain, and have put in place relatively complete certification systems. With relatively imperfect standards and the lagged-behind development of certification systems, it is difficult for financial institutions to obtain effective information to identify the green development of agriculture sector assets, thus leading to the Gresham's Law, i.e., bad money drives out good money.

Equity mechanism is still in need of improvement. The related imperfect equity mechanisms for the green development of agriculture sector has brought challenges to the risk management of the green development of agriculture sector investment. First, due to historical reasons that the development of supporting mechanisms for the circulation of China's agricultural land use rights is not mature enough, a large-scale cross-regional land property transfer market has not yet been established, making it difficult to deal with the farmland management rights. This results in insufficient capital attributes of the land, the most basic means of production in agriculture. Although construction projects with land investment (such as high-standard farmland development) have sound green benefits, taking into consideration the imperfect equity mechanism, it is hard for financing or investment products based on agricultural land design to provide an effective investor protection mechanism. Secondly, China still falls behind in terms of the development of environmental equity mechanism. Like traditional agriculture, the green development of agriculture sector is also vulnerable to natural, climate and market risks. But the green development of agriculture sector itself has higher requirements for the environment. In the event of

related risks, based on the dispersion and liquidity of ecological resources, it is difficult to clearly define environmental property rights. Therefore, the green development of agriculture sector has a greater risk of suffering losses due to external environmental pollution, and a higher operating risk. With the corresponding risk dispersion mechanisms (such as the green development of agriculture sector insurance and environmental liability insurance) still in need of improvement, challenges are still to be confronted by the risk management of the green development of agriculture sector investment.

Insufficient additional compensation. Agricultural development investment has a long payback period and higher requirements for industrial chain integration, therefore, more targeted investment models for the green development of agriculture sector is still in need of exploration. For the green development of agriculture sector, its positive externalities (such as the value of ecological services, climate change mitigation, energy conservation and emission reduction, and pollution prevention) are difficult to compensate through effective mechanisms. The value of the green development of agriculture sector and the long-term return on investment have not been fully estimated and highlighted. Financial institutions supporting the green development of agriculture sector might be confronted with issues of low short-term returns and long return on investment. The agricultural industry chain is relatively long, especially for the green development of agriculture sector, high standards have resulted in higher requirements for industry chain integration and control. When we invest in only one link of the industry chain, we will find that there are many risks and uncertainties, and it is hard to integrate the industrial chain. Subject to their profitability requirements and risk control considerations, financial institutions usually favour a mature, stable and continuous production system for investment. Under the current existing conditions, supporting the green development of agriculture sector requires us to explore more targeted investment and financing models.

Financing green transition in China's agriculture sector is in urgent need of a common language

There are many obstacles faced by financing green transition in China's agriculture sector. Among them, the lack of the green development of agriculture sector standards and the most optimised feasible practices in the green development of agriculture sector investment and financing are key problems in urgent need of resolution. In view of the continuous development and improvement of related concepts and models of the green development of agriculture sector, there is no unified set of methods for statistical classification and definition of the green development of agriculture sector. As a result, financial support cannot be focused, and pan-greening is widespread, and it is difficult to provide high-quality support for the green development of agriculture sector with limited financial resources.

From the global perspective of green finance, we systematically studied and analysed the relevant domestic as well as international concepts of the green development of agriculture sector, and clarified the connotation and scope of the green development of agriculture sector. On top of this, an in-depth analysis of the status, challenges and opportunities of the green development of agriculture sector in China was conducted, and the environmental risks and benefit characteristics of each segment in the green development of agriculture sector were clarified. Meanwhile, classification schemes and evaluation methods for the green development of agriculture sector were proposed, and the models and practices of financing green transition in China's agriculture sector were summarised. All these have laid a solid foundation for the development of clear enforceable unified financial standards for China's green development of agriculture sector in line with international standards.

Part 3: Build a common language for financing green transition in China's agriculture sector

Classification scheme and evaluation method

Classification scheme

Determination of the type and scope of the green development of agriculture sector assets is an important basis for financing green transition in China's agriculture sector. On the basis of the aforementioned study, in this chapter, a methodology for studying the classification scheme of financing green transition in China's agriculture sector is proposed, including the main principles and classification methods. Based on an in-depth analysis of the development model and green characteristics of related areas, a classification scheme of financially-supported agriculture is proposed, including primary classifications and 14 secondary classifications. It covers multiple industrial chain links and multiple fields such as agricultural inputs, agricultural production link, the environment of the place of origin, agricultural product processing and circulation, and agricultural ecological protection.

Classification principle

Factoring in China's national conditions and on the basis of an in-depth analysis of the current status of agricultural development in China and prediction of the green development of agriculture sector trends and models, combined with the work of the industry expert group, we put forward the main principles of asset classification for the green development of agriculture sector:

1. Assets that has green benefits and belongs to the key areas of the green development of agriculture sector in China;

Green is a relative concept that is closely related to the development stage. Based on the study and analysis of green concepts at home and abroad and the prominent environmental resource issues confronting China at this stage, we believe that the goal of green benefits in China's agricultural development should focus on the following aspects:

Benefits of resource conservation through effective utilisation. The hard constraint of resources is a prominent issue confronting China's agriculture. The relative shortage of water and soil resources restricts the green development of agriculture sector. The benefits of resource conservation through effective utilisation is an important aspect of agricultural green performance.

Benefits of pollution prevention. Agricultural land is confronted with serious endogenous and exogenous pollution, and we are faced with mounting challenges posed by the control and prevention of soil pollution. Meanwhile, marine eutrophication, rural pollution and other issues are also becoming more prominent.

Ecological protection. The pastoral ecosystem is an indispensable part of the natural ecosystem. The resource-intensive pattern of agricultural practices has led to the fragmentation of ecosystem and the destruction of biodiversity. Meanwhile, the value of ecological services is an important function of agriculture. Ecological protection benefits (that are protecting both the integrity and diversity of ecosystem) are an important manifestation of the benefits of the green development of agriculture sector.

Climate change mitigation. Low-carbon agriculture and adaptive agriculture are important agricultural development trends, and the benefits of climate change mitigation are also important ways to manifest the benefits of agricultural activities.

Table 4. Classification of investment and financing attributes of the green development of agriculture sector activities

Project Type	Features	Case
General competitive project	Projects with relatively weak public attributes. They can effectively participate in market competition, and their dependence on financial subsidies is relatively weak.	Production of green agricultural products, etc.
Projects with strong externalities and operational nature	Projects with strong externalities. Projects that require some government funds in the early stage, but have operating income.	Water-saving irrigation, high-standard farmland development
Projects with strong public attributes	Projects with strong public attributes and can directly or indirectly generate economic benefits. Projects that are highly dependent on financial subsidies	Construction of farmland water conservancy facilities
Non-economic projects	Purely from the perspective of individual projects, agricultural activities that do not have economic attributes, but are more beneficial to the green development of agriculture sector.	Crop rotation, etc.

2. Assets that have economic attributes and belong to investment and financing activities suitable for financial institutions to support;

Agricultural activities involve multiple fields. Unlike industrial activities, some agricultural activities do not have economic attributes or investment/financing attributes. The requirements of financial institutions themselves for capital gain also put forward requirements for agricultural investment and financing. From an economic point of view, we divide agricultural activities into the following categories:

Financially supported the green development of agriculture sector activities shall have direct or indirect economic benefits. And due to the need of financial activities for capital gain and risk resistance, financial support shall mainly be given to agricultural operations with certain benefits.

3. Assets that have low environmental risks

Additionally, based on the requirements of green development and requirements of bank for environmental risk management, the green development of agriculture sector activities supported by financial institutions shall meet the requirements of economic attributes and green benefits, and also have relatively low environmental risks. On the one hand, they shall meet basic environmental and social compliance requirements. On the other, they shall also rationally predict the possible future risks of long-term agricultural activities and meet the basic requirements of risk control.

In summary, financially supported green development of agriculture sector activities shall meet the following three criteria:

1. Have significant green benefits, including resource conservation, pollution prevention, ecological protection and climate change mitigation;
2. Have investment and financing attributes;
3. Controllable environmental risk management.

Classification methods

Based on the above principles and with the work of the industry expert group at its core, a consistent classification method was developed, including four steps:

1. Identification of key areas for the green development of agriculture sector

Clarify the key issues in the green development of agriculture sector; clarify the key directions and areas of the green development of agriculture sector; identify the key areas and frameworks of the green development of agriculture sector; identify key measures in each area

2. Study and analysis of the green development of agriculture sector activities with investment and financing attributes

1. Study and analyse the main types of financially-supported agricultural activities at home and abroad; clarify the characteristics of financially-supported agricultural activities.

2. Screen the agricultural scope with investment and financing attributes in various areas based on the framework of step 1.

3. Determine the scope and boundaries of activities in various areas.

1. Clarify the technical requirements of each area, determine the evaluation indexes of activities in each area, and determine the evaluation method.

2. Determine the scope and boundaries of support activities in each area.

4. Determine the classification framework and evaluation methods of each segment. Classification scheme of financing green transition in China's agriculture sector

In line with the concept and scope of the green development of agriculture sector, considering the issues, and based on China's future green development of agriculture sector goals and the screening criteria on significant green benefits, we proposed a classification framework. The framework is for financing green transition in China's agriculture sector from the perspective of covering the industrial chain, including 5 primary classifications and 14 secondary classifications. The primary classification is based on the prominent issues in agricultural development and countermeasures, and the secondary classification is based on the production factors under the primary classification.

The main content of each primary classification is as follows:

1. Protection and conservative use of agricultural resources, focusing on the issues with prominent hard constraints as in agricultural water and soil resources, mainly including aspects such as quality improvement and protection of arable land and the efficient use of agricultural water resources.
2. Comprehensive agricultural environment improvement, mainly including farmland pollution control, comprehensive control of agricultural waste pollution and rural environmental improvement.
3. Input of green agricultural products, mainly including the cultivation and promotion of green certified seeds, the research and development and application of green prevention/control products, and the green development of agriculture sector services.
4. Supply of green agricultural products, mainly including the production of green agricultural products and the processing and circulation of efficient agricultural products.
5. Agricultural ecological restoration, mainly including the establishment of the pastoral ecosystem, grassland ecological protection project, fishery resource environment and ecological resource protection, etc.

Table 5. Classification scheme of financing green transition in China's agriculture sector

Primary Classification	Secondary Classification	Main Scope of Activities	Technical Requirements	National Economic Statistics Classification
1. Protection and conservative use of agricultural resources	1.1 Arable land quality improvement and protection	Activities (including soil improvement, soil fertility improvement, moisture and fertiliser conservation, and pollution control and restoration) to improve the quality of arable land, such as high-standard farmland development, upgrade of low- and medium-yield farmland, integrated management of degraded farmland, etc.	For soil fertility protection and improvement projects, the quality of arable land shall be improved by more than one grade; High-standard farmland projects shall comply with the General Rules for High-standard Farmland Development (GBT30600-2014) or pass the annual or end-of-construction evaluation against the <i>Evaluation Specification for High-standard Farmland Development</i> (GB/T33130-2016)	A. Agriculture, forestry, animal husbandry, fishery, sideline 01 Plantation 05 Agriculture, forestry, animal husbandry, fishery and supporting activities N. Water conservancy, environment and public facility management industry 77 Ecological protection and environmental governance industry N. Water conservancy, environment and public facility management industry 79 Land management industry
	1.2 Efficient use of agricultural water resources	1. High-efficiency water-saving agricultural projects, such as the water-saving irrigation projects for farmland and grassland, the construction of water-saving facilities for aquaculture, the harmless treatment and recycling facilities for sewage, and the construction of agricultural facilities for unconventional water resource utilization. 2. Construction of farmland water conservancy facilities (such as irrigation and drainage engineering) with an aim to prevent and control farmland drought, waterlogging, and saline-alkali disasters, such as rural water source projects, dredging and remediation of rural river ponds, supporting projects for field ditch system, reinforcement of dangerous reservoirs, groundwater overexploitation control projects, etc.	The effective utilisation coefficient of farmland irrigation water is ≥ 0.55 or adopts high-efficiency irrigation technology, and accounts for over 80% of the project	A. Agriculture, forestry, animal husbandry, fishery, sideline 01 Plantation 05 Agriculture, forestry, animal husbandry, fishery and supporting activities N. Water conservancy, environment and public facility management industry 77 Ecological protection and environmental governance industry N. Water conservancy, environment and public facility management industry 76 Water conservancy management industry
2. Comprehensive improvement of agricultural and rural environment	2.1 Farmland pollution prevention and control	Activities to reduce farmland pollution through comprehensive prevention and control measures (including source control, process interruption, and end enhancement), such as the nitrogen and phosphorus source control of pesticide and fertiliser, and the construction and operation of integrated water and fertiliser facilities.	The emission intensity and load of facility nitrogen and phosphorus pollutants shall be reduced by 30% and 40% or more respectively	A. Agriculture, forestry, animal husbandry, fishery, sideline 01 Plantation 05 Agriculture, forestry, animal husbandry, fishery and supporting activities N. Water conservancy, environment and public facility management industry 77 Ecological protection and environmental governance industry

Continued on page 14

Table 5. Classification scheme of financing green transition in China's agriculture sector *continued*

Primary Classification	Secondary Classification	Main Scope of Activities	Technical Requirements	National Economic Statistics Classification
	2.2 Pollution prevention and control for livestock and aquaculture	Reduce pollution emissions from livestock and poultry through the construction and operation of large-scale and standardized breeding factories and breeding pollution treatment facilities, such as the upgrading of standardized breeding farms, and the construction and operation of emission reduction facilities for recirculating aquaculture.	The emission intensity and load of facility nitrogen and phosphorus pollutants shall be reduced by 30% and 40% or more respectively	<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>03 Animal husbandry</p> <p>04 Fishery</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p> <p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>
	2.3 Comprehensive control of agricultural waste pollution	Activities to reduce agricultural waste pollution through comprehensive utilization and harmless treatment, such as the facility construction and operation for livestock and poultry manure collection, storage and transportation; the construction and operation of harmless treatment facilities for sick and dead livestock and poultry; the comprehensive utilization of breeding waste; comprehensive utilization of straw; the resource utilization of by-products of agricultural product processing; the recycling and reuse of agricultural film and pesticide packaging, etc.	The comprehensive utilization rate of straw shall be higher than 85%; the comprehensive utilization rate of aquaculture waste shall be higher than 75%	<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>01 Plantation</p> <p>03 Animal husbandry</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p> <p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>
	2.4 Improvement of rural human settlement environment	Integrated management activities to improve the rural production and living environment, such as the protection of rural drinking water sources; the construction and operation of treatment facilities for rural domestic garbage and sewage; and the construction and operation of supporting facilities for rural clean energy.		<p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>
3. Green inputs	3.1 Cultivation and promotion of green certified seeds	Breeding, promotion and commercial application of high-efficiency, high-quality and multi-resistant crops, pastures, livestock and aquatic products.		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p>

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Table 5. Classification scheme of financing green transition in China's agriculture sector *continued*

Primary Classification	Secondary Classification	Main Scope of Activities	Technical Requirements	National Economic Statistics Classification
	3.2 Research and development and application of green prevention/control products	<p>Research, development, promotion and commercial application of green prevention/control products, including but not limited to:</p> <p>Research, development, promotion and commercial application of green prevention/control products such as green efficient functional fertilisers, biological fertilisers, new soil conditioners, low-risk pesticides, pesticide application agents, and physical and chemical inducements; research, development, promotion and commercial application of emerging products (such as green efficient feed additives, low-toxicity and low drug-resistance veterinary drugs, and efficient and safe vaccines, etc.).</p>		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p>
	3.3. Agricultural development services	<p>Related services to improve the green, low-carbon and intelligent level of the agricultural production process, including but not limited to: specialized overall crop pest and disease management and green prevention and control services, etc., and green prevention and control services; energy-saving and low-consumption intelligent agricultural equipment services</p>		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p>
4. Supply of green agricultural products	4.1 Production of green agricultural products	<p>Construction and operation of production facilities for green food or organic agricultural products that meet relevant standards</p>	<p>The environmental quality of the place of origin for green food production shall comply with the NY/T 391-2000 (<i>Environmental Technical Conditions for Place of Origin Environment of Green Food</i>). Chemically synthesized fertilizers, pesticides, veterinary drugs, feed additives, food additives and other substances harmful to the environment and health shall not be used in the production process. It shall be produced in an organic way, and the product quality shall meet the AA level requirements set in the green food standards by the Ministry of Agriculture.</p> <p>The production of organic agricultural products shall comply with the <i>Organic Product Standard of the People's Republic of China</i> (GB/T19630-2011), <i>Good Agricultural Practice</i> (GB/T20014) or <i>OFDC Organic Certification Standard</i> or other standards of the same level or higher.</p>	<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>01 Plantation</p> <p>02 Forestry</p> <p>03 Animal husbandry</p> <p>04 Fishery</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p> <p>C. Manufacturing</p> <p>13 Agricultural and sideline food processing industry</p> <p>14 Food manufacturing</p>

Continued on page 16

Table 5. Classification scheme of financing green transition in China's agriculture sector *continued*

Primary Classification	Secondary Classification	Main Scope of Activities	Technical Requirements	National Economic Statistics Classification
	4.2 Facilities for processing, distribution and storage of low-carbon agricultural products	Construction and operation of processing, distribution and storage facilities for low-carbon, low-consumption, recycling, and high-efficiency agricultural products with an aim to reduce the loss of agricultural products after harvest, such as construction and operation of the initial processing facilities for agricultural products at the place of origin, comprehensive utilization facilities of agricultural products and processing by-products, intelligent deep processing facilities for agricultural products, infrastructure for circulation of agricultural products at the place of origin, and market information service facilities at the place of origin.		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>05 Agriculture, forestry, animal husbandry, fishery and supporting activities</p> <p>C. Manufacturing</p> <p>13 Agricultural and sideline food processing industry</p> <p>14 Food manufacturing</p>
5. Agricultural ecological restoration	5.1 Pastoral ecological protection and construction	<p>1. Construction of agricultural ecological infrastructure, such as biological buffer zone, shelter forest net, irrigation ditch system and other field infrastructure;</p> <p>2. Ecological circulation agricultural activities in "rice-fish symbiosis", "pig-biogas-fruit tree", "forest economy" and other ecological agricultural circulation models, such as regional ecological circular agricultural projects;</p> <p>3. Pastoral ecological improvement and restoration, such as comprehensive improvement farmland, water supplies, roads, and forests, and restoration of rural ecological landscapes.</p>		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>01 Plantation</p> <p>02 Forestry</p> <p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>
	5.2 Grassland ecological protection project	Grassland ecological restoration and protection activities, such as improvement of reclaimed grassland, natural grassland restoration, etc.		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>02 Forestry</p> <p>03 Animal husbandry</p> <p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>
	5.3. Fishery resource environment and ecological protection project	Environmental conservation activities for fishery resources, such as the construction of marine ranches, the construction of aquatic life reserves, the construction of conservation center for rare and endangered aquatic species, etc.		<p>A. Agriculture, forestry, animal husbandry, fishery, sideline</p> <p>04 Fishery</p> <p>N. Water conservancy, environment and public facility management industry</p> <p>77 Ecological protection and environmental governance industry</p>

Evaluation method

On the basis of the aforementioned classification and analysis of the environmental benefits and environmental risks of various green development of agriculture sector activities, an evaluation method for the green development of agriculture sector suitable for evaluation by financial institutions is proposed based on the existing green development of agriculture sector standards.

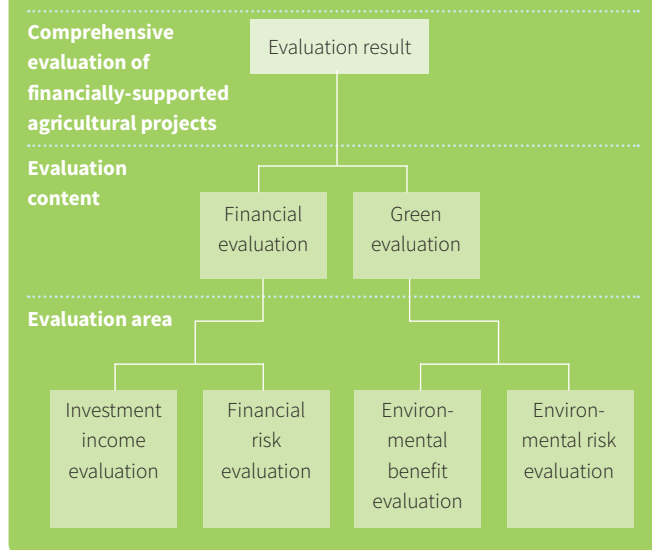
Main objectives

The main objective of the evaluation of financing green transition in China's agriculture sector projects is to consider the environmental benefits of the project in the evaluation of financially-supported agricultural projects. This means that the resource saving benefits, ecological service functions, pollution control benefits and climate change mitigation benefits generated by the project will be included in the evaluation of financially-supported agricultural projects. Meanwhile, the environmental risk factors of agricultural projects will also be considered in the evaluation of agricultural projects.

The evaluation of existing financially-supported activities mainly focuses on the financial attributes of the project or asset, i.e., the project's investment income attributes and risk status. However, the evaluation of the green development of agriculture sector assets will also reflect the additionality of green, which includes two aspects, namely, positive environmental benefits and negative environmental risks. Only projects that are in line with both the financial evaluation requirements and the green evaluation requirements can be considered as qualified green development of agriculture sector projects.

In practice, green evaluation and financial evaluation will be conducted in parallel. When applying the above-mentioned green evaluation results, financial institutions can assign corresponding weights to the results of green evaluation in accordance with relevant bank strategies, policies, and relevant requirements for risk control, with an aim to ensure a successful comprehensive evaluation of the green development of agriculture sector projects.

Figure 6. Comprehensive evaluation method for financially-supported agriculture



Given the fact that financial institutions have put in place a relatively mature system structure for financial evaluation, this project aims to clarify the green evaluation requirements for the green development of agriculture sector activities in different areas, i.e., the specific requirements for environmental benefits and environmental risk evaluation. The financial evaluation of the green development of agriculture sector projects will not be discussed here.

Objects of green evaluation

This evaluation method is applicable to the types of projects listed in the classification scheme of financing green transition in China's agriculture sector projects. Meanwhile, for projects outside the above-mentioned classification scheme, this method can also be used for evaluation based on their relevance.

Evaluation principle

Scientific approach. The evaluation of the green development of agriculture sector projects will be based on scientific methods and basis, and will be based on the scientific evaluation of the environmental performance and environmental risks of agricultural projects.

Comprehensiveness. A holistic approach will be taken for evaluation of the green attributes of agricultural projects. Both the positive environmental benefits and the negative environmental risks of the project will be considered. A comprehensive evaluation will be performed based on a scientific approach.

Accuracy. Deviations and uncertainties will be minimised as much as possible.

Consistency. The evaluation results of agricultural green projects will be consistent. This means that the evaluation conclusions will be consistent for the same project under the same conditions.

Transparency. On the premise of complying with national policies and confidentiality regulations, the environmental performance and risk information of the green development of agriculture sector projects will be disclosed to meet the demand of the society for relevant data.

Evaluation method

The green evaluation of financially-supported agricultural projects is a comprehensive evaluation that covers environmental risks and environmental benefits.

1. Environmental risk evaluation

Environmental risk evaluation is usually targeted at predictable emergencies or accidents (generally excluding man-made damage and natural disasters) during the construction and operation of the project that has caused leakage of toxic, harmful, flammable and explosive substances, or those that have produced new toxic and hazardous substances in the emergencies. Environmental risk evaluation is to assess the impact and damage caused to personal safety and the environment, and propose reasonable and feasible prevention, emergency response and mitigation measures to keep the accident rate, loss and environmental impact of the construction project at an acceptable level.

The evaluation of environmental risks includes two approaches, namely, evaluation based on material compliance and evaluation based on environmental risk indexes. For the convenience of practice, we preferentially recommend you to use the evaluation based on compliance materials. If relevant compliance materials are not required in accordance with relevant policy, the evaluation method based on environmental risk indexes will be used. The specific evaluation methods are as follows:

1. The one-vote veto system is adopted for the evaluation based on the compliance materials. This means that if the compliance materials are required to be submitted but some of the required materials are missing or if the compliance materials are required but are regarded as non-compliant, the project will be deemed to have a huge environmental risk and the evaluation will not proceed.

Table 6. Environmental risk score

0 Score	1 Score	2 Score
The project has a big environmental impact and no corresponding environmental management measures have been taken	The project has medium environmental impact and corresponding environmental management measures have been taken	The project has small environmental impact and corresponding environmental management measures have been taken

2. For projects that do not need to submit relevant compliance materials according to related policy, the evaluation method using the environmental risk factor can also be used during environmental risk evaluation. This means that based on the environmental risk indexes, the project will be evaluated based on whether it has a significant impact on the environment and whether corresponding environmental measures have been taken. If the project is in line with the corresponding requirements for environmental risk management, the evaluation results based on environmental risk indexes will be either 1 or 2. If the project does not meet the corresponding requirements for environmental risk management, the score will be 0.

Only projects that are meet the requirements of compliance or are rated as Category 1 or Category 2 in environmental risk index evaluation can proceed to the environmental benefit evaluation.

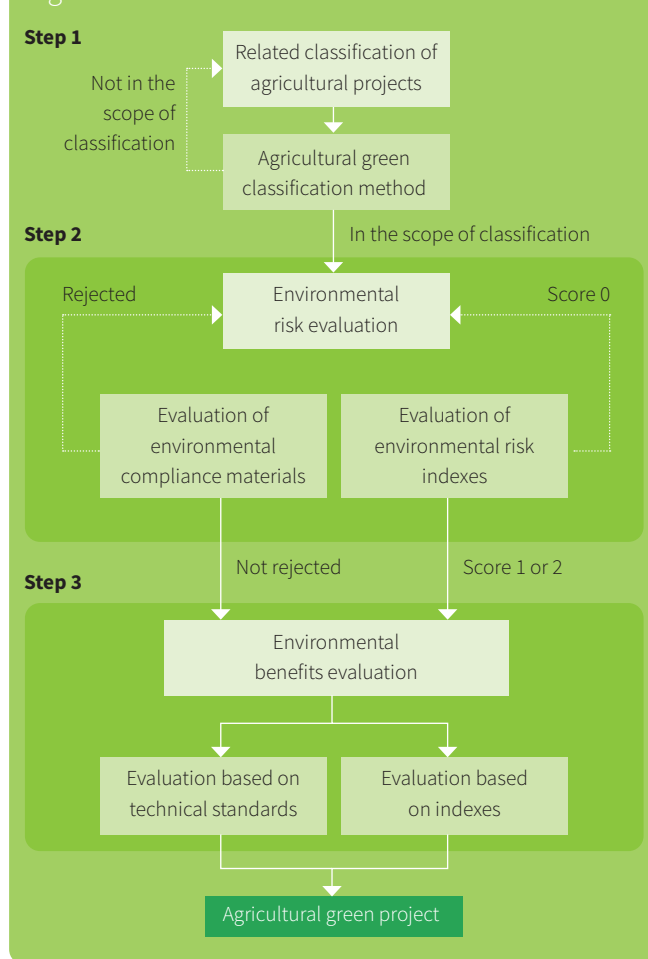
2. Environmental benefits evaluation

Environmental benefits evaluation mainly evaluates the resource conservation benefits, ecological service functions, pollution control benefits, and climate change mitigation benefits generated by the project. There are mainly two sorts of evaluation methods, i.e., 1. evaluation based on technical policy requirements or standards and 2. evaluation based on environmental benefits index. The detailed explanation is as follows:

Evaluation based on technical policy requirements or standards. If the technical policy requirements or standards related to the segment of the project can reflect the environmental benefits of the project, such project is suitable for evaluation based on technical policy requirements or standards. The project can be evaluated as a green project if it is in line with the technical policies or standards.

Evaluation based on environmental benefits index. If the segment of the project does not have any technical requirements or standards that can fully reflect the environmental benefits of such project, evaluation based on environmental benefits index can be adopted. The project can be evaluated if it can meet the relevant requirements of the significance of environmental benefits index. The significance of environmental benefits is determined by comparing the environmental benefit indexes with the baseline. The selection of the baseline is mainly based on the current relevant national standards or technical requirements (Figure 7).

Figure 7. Evaluation methods



Evaluation example

Taking projects for arable land quality protection and improvement as an example, the evaluation method is explained as follows:

Step 1: project classification evaluation

Evaluate whether the project belongs to the category of arable land quality protection and improvement according to the following table.

Table 7. Project category

Project Category	Arable land quality protection and improvement
Project scope	Activities to improve the quality of arable land, including soil improvement, soil fertility improvement, moisture and fertiliser conservation, and pollution control and restoration
Typical project	High-standard farmland development, upgrade of low- and medium-yield farmland, integrated management of degraded farmland, etc.

Step 2: Environmental risk evaluation

Based on project-related data, priority is given to material-based evaluation on environmental risk compliance.

The requirements for material-based compliance evaluation are shown in Table 8. If the project can meet all the requirements specified in Table 8, it will pass the evaluation on environmental risk compliance.

If the aforementioned compliance requirements are not applicable to the project according to related policies or regulations, the environmental risk indexes in the table below shall be used to evaluate whether the project has a big environmental risk.

Step 3: Environmental benefits

Evaluation of environmental benefits:

Where applicable, priority will be given to evaluation based on technical requirements or standards. Please refer to Table 9 for the indexes and requirements of environmental benefit evaluation based on technical requirements. Where applicable, if the project can meet the requirements of any index in Table 10, it can be evaluated as having significant environmental benefits.

Table 8. Requirements for material-based evaluation on environmental risk compliance

Main Index	Evaluation Criteria	Evidence
1. Has the project been approved?	If required and fail to pass, one vote against means veto will be applied	Relevant materials provided by the borrower
2. Does the project require to participate and pass environmental evaluation and ecological impact evaluation?	If required and fail to pass, one vote against means veto will be applied	Relevant materials provided by the borrower
3. Does the project require to participate and pass social stability evaluation?	If required and fail to pass, one vote against means veto will be applied	Relevant materials provided by the borrower

Table 9. Environmental risk index evaluation

Evaluation Category	Evaluation Content
Possible environmental risks	<p>Soil: Large-scale machinery and equipment are used during construction (including levelers and bulldozers). Mechanised excavation, filling, transportation and other activities will damage the mature soil layer, change the physical and chemical properties of the soil, and reduce the organic matter content, thus most likely resulting in soil compaction.</p> <p>Vegetation: Contiguous development increases the reclamation rate of the land, and therefore the natural vegetation in the field is gradually replaced with single crop, resulting in a decrease in the number and coverage of surface vegetation. Meanwhile, the farmland forest nets that have been intensively replanted have not yet fully grown, resulting in damage to the ecosystem at varying degrees.</p> <p>Biodiversity: The hardened field roads cut the habitat of the original biological community into pieces, compress the living space of various animals and plants, hinder the communication between animals and plants, damage the migration and genetic diversity of species, and affect biodiversity, etc.</p>
Mitigation measures	<ol style="list-style-type: none"> 1. In the planning, implementation and evaluation of land remediation projects, great efforts are given to ecological conservation. As a result, soil fertility is improved, topsoil stripping technology is promoted, and the organic combination and integrity of soil profiles is maintained during the process of soil stripping and backfilling. After land remediation, soil fertility is improved by applying organic fertiliser, farmyard manure, and returning straw to the field. 2. The protection of water resources is strengthened. Water pollution caused by excessive cutting and straightening and improper fertilisation during farmland water conservancy construction is avoided. 3. In terms of biodiversity protection, hardened pavement is adopted and a passage for biological migration is provided by drilling through the roadbed. Field roads are designed and clay-bound gravel roads are produced to provide habitat for animals and plants. A certain number of low-lying ditches and ponds are kept reducing the impact of water level changes.

In the event of the absence of technical requirements or standards, the evaluation on significance of environmental benefits based on indexes can be used. Please refer to Table 11 for the requirements of evaluation on significance of environmental benefits based on indexes. If more than 60% of the indexes meet the relevant requirements, the project can be evaluated as having significant environmental benefits.

Step 4: Information disclosure

Information disclosure is required for projects that are identified as green agriculture projects.

Table 10. Environmental benefits evaluation based on technical requirements

Major Index	Index Requirement	Evaluation Basis	Scope of Application
1. Degree of improvement in the quality of arable land	If the improvement of arable land quality >1 grade, the project will be evaluated as dark green; The improvement of arable land quality >0.5 grade	The evaluation results of changes in the quality of arable land before and after construction based on the <i>Arable Land Quality Grade</i> " (GB/T33469-2016)	All items in this category
2. High-standard farmland	The project has passed the high-standard farmland development evaluation	1. Projects under construction or completed shall pass the evaluation at the end of each year or at the end of the planning period. The evaluation is mainly based on the <i>High-Standard Farmland Development Evaluation Specifications</i> (GB/T33130-2016), etc. 2. For unbuilt projects, their main technical plans shall pass relevant technical evaluation according to relevant requirements.	High-standard farmland development project

Table 11. Environmental benefits evaluation indexes

Benefit Category	Measure	Index	Index Requirement
Pollutant reduction	Reduce soil pollutants	Reduced amount of pollutant	The emission intensity of nitrogen and phosphorus pollutants is reduced by 30% compared to those before upgrading or construction
Ecological service benefits	Increase soil fertility	Increased amount of soil nitrogen fixation, phosphorus fixation and potassium fixation	Compared with those before upgrading or construction, increase by more than 20% or soil organic matter content reaches 15g/kg and above
	Projects for farmland protection and ecological environmental protection that can give full play to the comprehensive functions of agricultural ecology and landscape	Area of farmland shelterbelt	The area of farmland shelterbelt is increased by more than 20% or the area of farmland shelterbelt >90%
Resource conservation	Water conservation	Amount of water saved	Compared with those before the upgrading, the amount of water used is reduced by over 20% or the effective utilization coefficient of farmland irrigation water is > 0.6
	Saving fertilizer	Amount of fertilizer saved	Compared with those before the upgrading, the amount of fertilizer used is reduced by over 40% or the fertilizer utilization rate is more than 40%
Climate change mitigation	Energy conservation and carbon fixation	Greenhouse gas emissions per unit of agricultural added value	The greenhouse gas emission intensity per unit of agricultural added value is reduced by 30%
Adaptation to climate change	By improving the physical properties of soil, the construction of farmland water conservancy facilities (such as water interception and drainage) and the implementation of farmland protection and ecological protection projects can bring environmental benefits through rainwater retention and flood control.	Return period of farmland flood control	>10 years

Part 4: Financing green transition in China's agriculture sector

Suggestions for application of evaluation methods

Application of the green development of agriculture sector evaluation

Compared with general agriculture and traditional agriculture, the green development of agriculture sector is featured with additionality. Compensation for its additionality is one of the most important driving forces to promote financing green transition in China's agriculture sector.

International practices

Headed by banks and financial institutions, the Climate Smart Agricultural Loan Platform jointly developed by the International Union for Conservation of Nature (IUCN) and the Climate Policy Initiative (CPI) is committed to helping local lenders make use of climate-smart agricultural loan products (such as climate-smart credit, environmental interest rates and ecological credit systems), with an aim to attract more investment to support climate-resilient agricultural production activities. This additional financing channel will help farmers to increase their profits, minimise losses due to climate impacts, and reduce the climate risks confronting credit providers. This platform is a practice on agricultural and land management that incorporates climate resilience into conditions for loans. As part of the loan agreement, farmers will need to sign a land management agreement which requires them to adopt climate-smart agricultural practices on their land. In this financial product, farmers who need financing can obtain credit support if they meet the conditions. This is to reward the ecosystem services or commodities they provide.

In addition, the lack of qualified collateral is a major obstacle for agriculture to obtain effective financial support. The establishment of a risk-sharing mechanism can help farmers to obtain effective financing to purchase or rent production equipment. This mechanism can help farmers to supply agricultural products that meet sustainable agricultural standards on the one hand and increase farmers' income on the other hand. A more typical case is the Credit Guarantee Scheme (CGS) jointly established by the Common Fund for Commodities (CFC) and the Rabobank Foundation. The CGS operates in a risk-sharing approach and has been successfully applied in sustainable coffee production activities in Ethiopia.

Domestic practices

However, there are currently no mechanisms for additional value compensation for the green development of agriculture sector (such as ecological service value compensation). But information related to the green development of agriculture sector is still valuable to financial institutions. By analysing relevant domestic and foreign application cases, we believe that financial institutions can make use of evaluation information in the following ways to support the green development of agriculture sector.

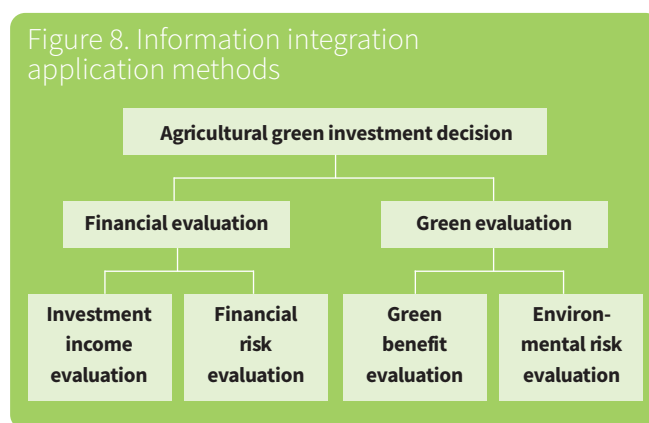
1. Negative rejection

Negative rejection mainly refers to the removal of agricultural projects or agricultural assets that do harm to the environmental and to the goal of the green development of agriculture sector by financial institutions in the evaluation of the green development of agriculture sector. The application of negative information pays more attention to the negative impact information of agriculture on the environment and society, and believes that negative environmental information has a significant negative correlation with its value performance. However, such information pays less attention to the information that can be used to prove environmental benefits. Negative rejection can incorporate relevant information into the risk control considerations of existing financial institutions and enhance the comprehensiveness of risk management.

2. Information integration and application

In this approach, the positive and negative information will be integrated and incorporated into comprehensive investment and financing decisions. At present, the green credit and other institutions in China mainly use this approach to review green information. A compromise approach is to take into consideration the environmental-related performance and risk information, and thus give a comprehensive evaluation result as an indispensable part of the comprehensive investigation. At present, a parallel approach is usually adopted to integrate green information, i.e., add a green information investigation dimension in addition to financial information, as shown in the figure 8. Meanwhile, from the perspective of international trends, analysing the impact of green information on financial information is also the mainstream trend in the application of green information in the future.

Figure 8. Information integration application methods



3. Quantification and application of the impact and benefit value of the green development of agriculture sector

The establishment of a measurement mechanism for the related value of environmental impacts and benefits based on the green development of agriculture sector (such as accounting technical standards for accounting agricultural ecological product price and agricultural resource carrying capacity, the compensation standard system for agricultural ecological environment damage, and the compensation standard system for the market transaction of agricultural ecological products and agricultural ecological protection) quantifies the environmental impacts and benefits of the green development of agriculture sector. Such an approach can help investors to better understand the relevant risks and opportunities, as well as the future financial status reflected in the entity's profit and loss statement, cash flow statement, and its asset and liability statements, so that they can make more informed financial decisions.

Figure 9. Quantitative application of information value

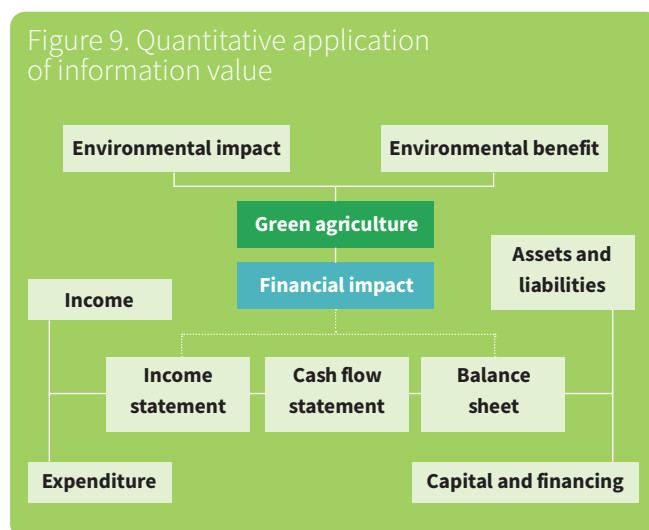


Table 12. Application methods and concerns of various players

Category	Institution	Points of Focus	Objective
Regulatory authority		Statistical information and various types of information on the green development of agriculture sector	Formulation of relevant supervision and incentive policies for financially-supported agriculture
Financial institution	Bank	Impact of environmental risk information, performance information and technological development on credit granting	Improve risk control by using more comprehensive information
	Insurance agency	Negative climate and environmental risks	
	Fund institution	Positive performance information	Make more comprehensive investment decisions
	Asset management/ investment bank	Positive performance information	Make more comprehensive investment decisions
Financial intermediary	Rating agency, etc.	Positive and negative environmental information	Make a more comprehensive rating and evaluation

Players in financial application of the green development of agriculture sector evaluation

The players in appraisal and application of the green development of agriculture sector projects include various players in the financial market. The application methods and concerns of various players are shown in the following table.

Scenarios for promoting the application of the green development of agriculture sector evaluation

Taking into consideration the aforementioned application methods of the green development of agriculture sector evaluation information and the points of focus of financial institutions on green information, we suggest promoting the application from the following 3 aspects, to promote better financial support for agriculture green development.

1. Application in credit evaluation

Where feasible, climate intelligence principles can be incorporated into credit scoring models. In view of different concerns on risks and benefits of different types of financial institutions, financial institutions are advised to consider the needs of the application comprehensively and include risk factors and performance factors of the green development of agriculture sector in the current credit evaluation related modules. In addition, we also suggest to collect data from traditional and non-traditional participants in agricultural financing, and to digitise and analyse big data for credit scoring models. Financial institutions can formulate relevant policies and systems for their internal use, and train relevant personnel to make use of such green technologies in assessing the creditworthiness of agricultural borrowers. Meanwhile, in terms of the investment environment, at the regulatory level, greater priority can be given to the green development of agriculture sector projects in regard to risk weight and other aspects.

2. Application in the design of targeted financial products

In light of the special needs of the green development of agriculture sector and investment and financing analysis in each segment, financial institutions can use the evaluation results of the green development of agriculture sector as an important basis when designing and customising

specific solutions and products, with an aim to assess needs in a targeted manner. The comprehensive consideration of various green risks and performance indexes in the design of financial products will help the design of targeted investment and financing products. Financial institutions are encouraged to incorporate relevant principles of the green development of agriculture sector into the design of their product and service portfolios, and conduct research on effective affordable innovations related to financial products and service mechanisms on the basis of credit evaluation. Taking the green development of agriculture sector technology pledge guarantee as an example, given the fact that the green development of agriculture sector projects generally adopt more advanced and applicable production technologies and often have a higher income than ordinary agricultural projects, it is more feasible to use technology pledge guarantees or other risk mitigation methods in such projects. This is because, on the one hand, such measures can prevent commercial banks from amplifying the risks of green projects and withholding loan guarantees for green projects due to their insufficient professional evaluation capabilities, thus enhancing banks' confidence in green guarantee projects. On the other hand, such a measure can also enhance the financial strength of green guarantee agencies through assistance from professional green guarantee agencies. In the event where the non-performing rate is basically controllable, this can significantly reduce the financing cost of the green development of agriculture sector loans and give full play to the credit amplification capabilities of guarantee funds.

3. Indexed application

The indexed application of the green development of agriculture sector evaluation is another and more comprehensive and standardised application approach. It will not only contribute to effectively integrating positive and negative performance information, but will also help to take into comprehensive consideration the information about technology, development and corporate governance, and dynamically track and manage related information to form the target index for investors to track. Indexed application is a manifestation of the development of green appraisal information in the capital market to a more mature stage, and is also the trend of green appraisal information application.

Conclusion and outlook

Main conclusions of this project

Food security is an important foundation for China's national security. It plays a basic and prerequisite role in the tasks to advance 'security in the six areas'. The green development of agriculture sector is vital not only to food, resource and ecological security, but also to the construction of ecological civilization, the well-being of people today and the sustainable development of future generations. Promoting the green development of agriculture sector is an important measure to improve the quality of agricultural supply and promote the 'dual circulation'. It is also a concrete manifestation of the overall plan for promoting economic, political, cultural, social, and ecological progress, and the focus of supply-side structural reform in agriculture. Financing green transition in China's agriculture sector is important in many ways. It increases investment in the green development of agriculture sector industries, reinforces the awareness of cost, market and risk of agricultural business entities, and promotes the development of the industrial, production and management systems for the green development of agriculture sector.

At present, the financial institutions in China have made positive progress in supporting the green development of agriculture sector through a variety of methods and channels. However, the road toward financing green transition in China's agriculture sector is still beset by many challenges. Firstly, the unclear scope makes it difficult for financial institutions to obtain effective information to distinguish between the green development of agriculture sector from non-green development of agriculture sector. Secondly, the related imperfect equity mechanisms for the green development of agriculture sector has brought challenges to the risk management of the green development of agriculture sector investment. Thirdly, agricultural development investment has a long payback period and a higher requirement for industrial chain integration. A more targeted investment model is in urgent need of exploration to reflect and compensate the environmental and ecological benefits of the green development of agriculture sector.

The agricultural development in China is confronted with 4 prominent issues: increased resource constraints, environmental pollution, ecosystem degradation, and insufficient supply of green agricultural products. In response to the above problems, China has proposed key areas and tasks, and provided a framework for the scope of financing green transition in China's agriculture sector.

In this project, with regard to the issues that have been highlighted, we identified 3 major classification principles for financing green transition in China's agriculture sector, i.e., 1. the ones that have green benefits and belong to the key areas of the green development of agriculture sector in China; 2. the ones that have economic attributes and belong to investment and financing activities suitable for financial institutions to support; 3. the ones that have low environmental risks and have adopted appropriate environmental risk management.

We proposed a classification framework for financially-supported agriculture green development from the perspective of covering the industrial chain, including 5 primary classifications and 14 secondary classifications. The primary classification is based on the prominent issues in agricultural development and countermeasures, and the secondary classification is based on the production factors under the primary classification.

An evaluation method for the green development of agriculture sector suitable for evaluation by financial institutions is proposed based on the existing green development of agriculture sector standards. It includes 4 steps, namely project type rating, environmental risk evaluation, environmental benefit evaluation and information disclosure.

On the basis of proposed classification schemes and evaluation methods for the green development of agriculture sector and analysis of financing green transition in China's agriculture sector models, we proposed the methods to apply the classification schemes and evaluation methods for the green development of agriculture sector. Meanwhile, by taking into consideration the points of focus of financial institutions on green information, we proposed the application methods of the green development of agriculture sector evaluation, including negative rejection, integrated application, and value quantification and application. In addition, we also proposed to promote the application of the green development of agriculture sector evaluation in financial support from 3 application scenarios, i.e., evaluation, financial product design, and indexed application, to promote better financial support for agriculture green development.

Outlook

In this project, we proposed the scope and evaluation methods of financing green transition in China's agriculture sector, and shared our views on the prospective applications. As an exploration of financing green transition in China's agriculture sector, this project is dedicated to studying the outstanding problems and challenges facing the green development of agriculture sector in China, and hope to demonstrate the potential strategies to tackle these challenges through our exploration of basic standards.

On the basis of our understanding of the current status and trends of the green development of agriculture sector and financing green transition in China's agriculture sector, we proposed the following key directions of study:

1. Developing an evaluation information system for the green development of agriculture sector projects;
2. Developing a more robust information disclosure mechanism for financing green transition in China's agriculture sector;
3. Exploring the innovative models that promote integral development of green technology and financing in the agriculture sector.



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