

The Webinar 12 on Revamping Manufacturing of Agricultural Machinery in Africa

June 13th , 2024



中國農業大學
China Agricultural University

China's agricultural mechanization and international cooperation

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Outline



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- **The importance of small farmers in agricultural production**
- **Overview of sustainable agricultural mechanization in China**
- **International cooperation on agricultural mechanization**
- **Future prospects**



The importance of small farmers in agricultural production



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- On September 27, 2023, FAO held the **First Global Conference on Sustainable Agricultural Mechanization (GAMC)** in Rome.
- The theme of GAMC focused on **efficiency, inclusiveness and resilience**.
- QU Dongyu, Director-General of FAO said: "Mechanization is **a strong driver** for Food Systems Transformation, while ensuring **environmental sustainability** and leaving no one behind, especially **women and smallholder farmers**."
- At present, the global hunger and food insecurity situation is very serious, and more than **3 billion** people still cannot afford **a healthy diet**. It's hard to do not mind.
- There is an urgent need to drive the transformation towards **more efficient, inclusive, resilient and sustainable agri-food systems**.



The importance of small farmers in agricultural production



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G20 2nd AWG Meeting, Brasilia, April 29-30 2024



Agriculture Working Group Meeting on Public Policies for Family Farming

Paulo Teixeira, Minister of Agrarian Development and Family Farming of Brazil, attended the meeting and delivered a speech.

FAO: the small-scale family farms (under 2 hectares), comprising over 84% of the world's farms, operate on only 12% of agricultural land yet produce approximately 36% of the world's food.

Therefore highlight the significant potential of sustainable mechanization of small-scale family farms in enhancing productivity While safeguarding natural resources.



The importance of small farmers in agricultural production



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"Big country and small farmers" are the basic national conditions of China

- The number of small farmers in China accounts for **more than 98%** of the agricultural business bodies.
- Small farmers are **90%** of agricultural workers. And the cultivated land they own is **70%** of the total cultivated land.
- There are **230 million households** in China, with an average of **0.52 hectares (7.8 mu)** per household.
- The proportion of small farmers, which are **under 2 hectares**, is **95.8%**.
- The number of agricultural production and operation personnel in China is 314 million, of which nearly **150 million are women**, accounting for **48%**.
- How to **drive small farmers and women** to develop agricultural production is a problem that must be considered in China's agricultural modernization.

The proportion of farmers

who operate the scale of different cultivated land (%)

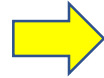
Scale of different cultivated land (acre/ha)	The proportion of farmers (%)
Under 10 mu (0.67 hectares) (small-scale and even more small-scale)	85.3
10-30 mu (0.67-2 hectares)	10.5
30-50 mu (2-3.33 hectares)	2.5
50-100 mu (3.33-6.67 hectares)	1.1
100-200 mu (6.67-13.33 hectares)	0.4
Over 200 mu (13.33 hectares)	0.2
合计	100

The importance of small farmers in agricultural production



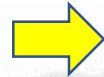
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China lifted 55.75 million rural people out of poverty

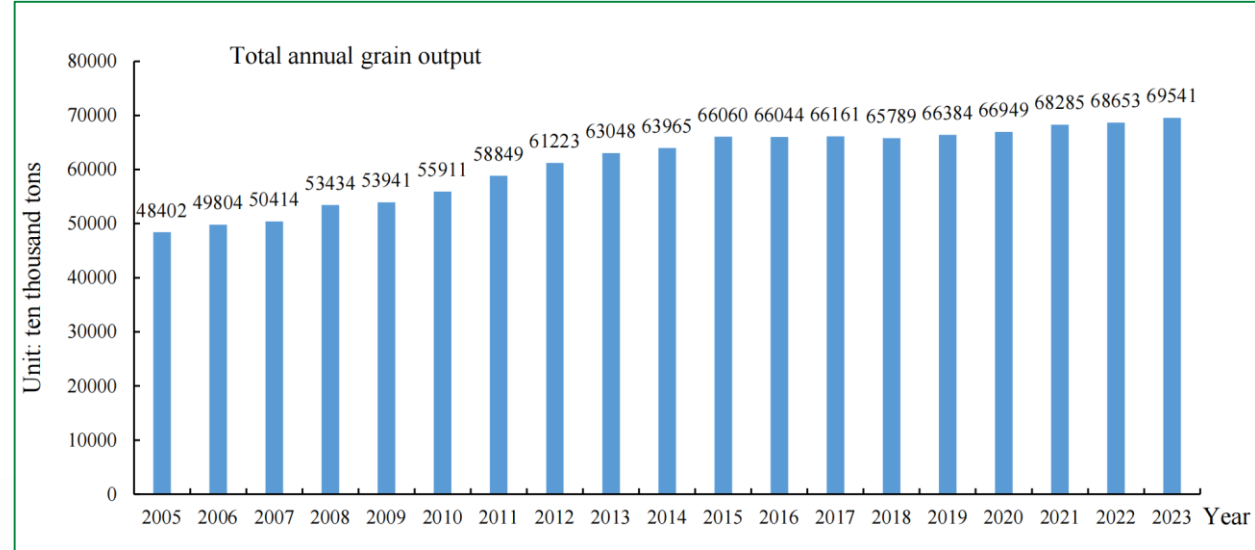


A miracle in the history of human poverty reduction

100 million agricultural people moved to cities



China's urbanization rate has reached 65.22%



China grain output has exceeded 650 million tons for nine consecutive years.

China has achieved comprehensive out of poverty, which is a miracle in the history of human poverty reduction, and grain output has exceeded 650 million tons for nine consecutive years



Agricultural mechanization has played a huge supporting role

Outline



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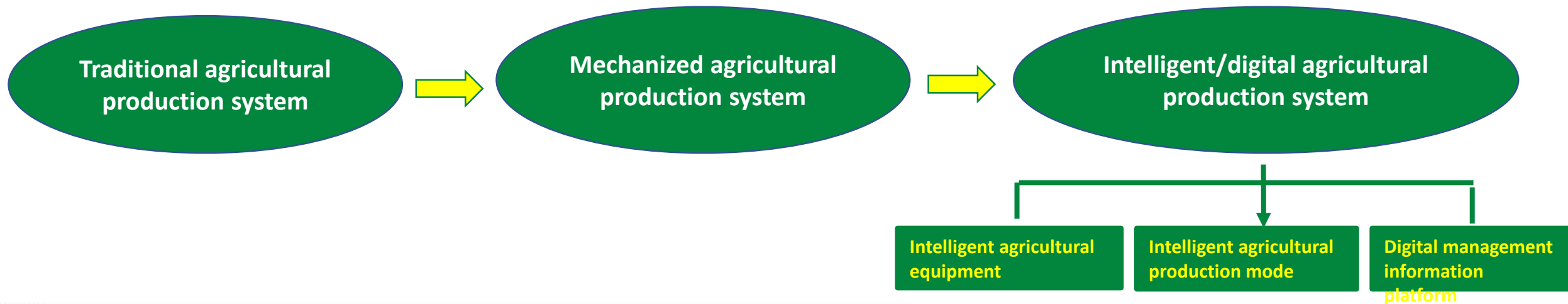
- The importance of small farmers in agricultural production
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Overview of sustainable agricultural mechanization in China

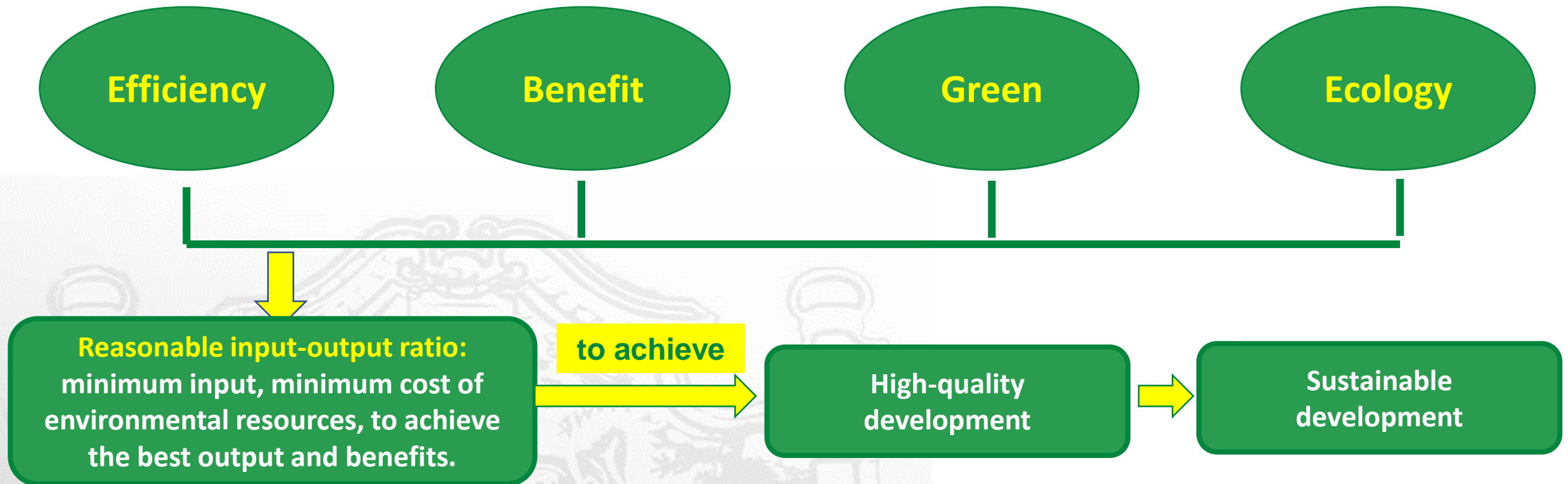


Overview of sustainable agricultural mechanization in China



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China has promoted the development of efficient, benefit, green and ecological agricultural mechanization, emphasizing a scientific and reasonable input-output ratio to achieve high-quality and sustainable development.



Overview of sustainable agricultural mechanization in China



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- By 2022, China comprehensive level of tilling, planting and harvesting mechanization had reached **73%**.
- The three main grains of wheat, rice and corn have been **fully mechanized**.
- **Intelligent agricultural machinery and equipment, information and digital technology** have been applied in agriculture, greatly increasing agricultural productivity.
- Farmers can study mechanized technologies through **Field Day activities, technical promotion training** and **mobile phone APP**.
- Agricultural mechanization drives the development of small farmers, promotes **appropriate scale management of agriculture**, and improves productivity and efficiency.
- This shows that farmers can easily obtain relevant knowledge by querying the **"Agricultural Machinery Know-It-All"** app on their mobile phones



Overview of sustainable agricultural mechanization in China



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National Agricultural Machinery Big Data System Platform

National Agricultural Machinery Big Data System Platform organized and developed by team of CAU and Golden Datian Technology Co., Ltd. has comprehensively improved agricultural production and management efficiency, guaranteed food security.



By June 10 , 2024, more than **1.79 million** agricultural machines, **470 billion** pieces of data, the total operation area of agricultural machinery is over **187 million hectares** (2.8 billion mu), covering **28** of China's 31 provinces

Overview of sustainable agricultural mechanization in China



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National Agricultural Machinery Big Data System Platform

This is the national wheat harvesting operation Beidou big data situation monitored on National Agricultural Machinery Big Data System Platform on June 10



Overview of sustainable agricultural mechanization in China



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- The mechanization of **animal husbandry**, **aquaculture**, **primary processing of agricultural products**, **protected agriculture**, **fruit and tea** developed rapidly
- Greatly promote **agricultural efficiency** and increase **farmers' income**.



Overview of sustainable agricultural mechanization in China



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China has a sound law and regulation system, management system, scientific research system, manufacturing system, extension system and hire service for agricultural mechanization.

Agricultural mechanization

**Laws, regulations and
policies system**

Agricultural mechanization

**Management service
system**

Agricultural mechanization

**Scientific and technological
innovation system**

Agricultural machinery

**industry and
manufacturing system**

Agricultural mechanization

**Technology extension
system**

Agricultural mechanization

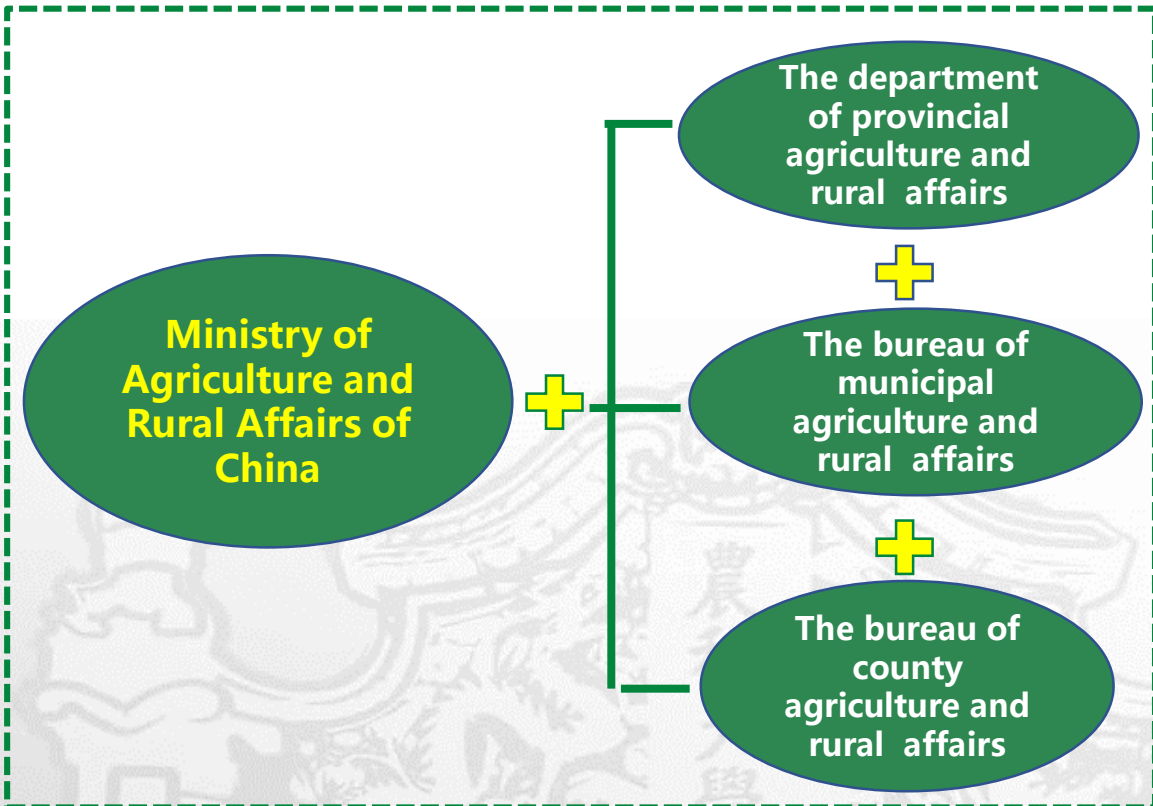
**Hire service system
(socialized service in
China)**

Overview of sustainable agricultural mechanization in China

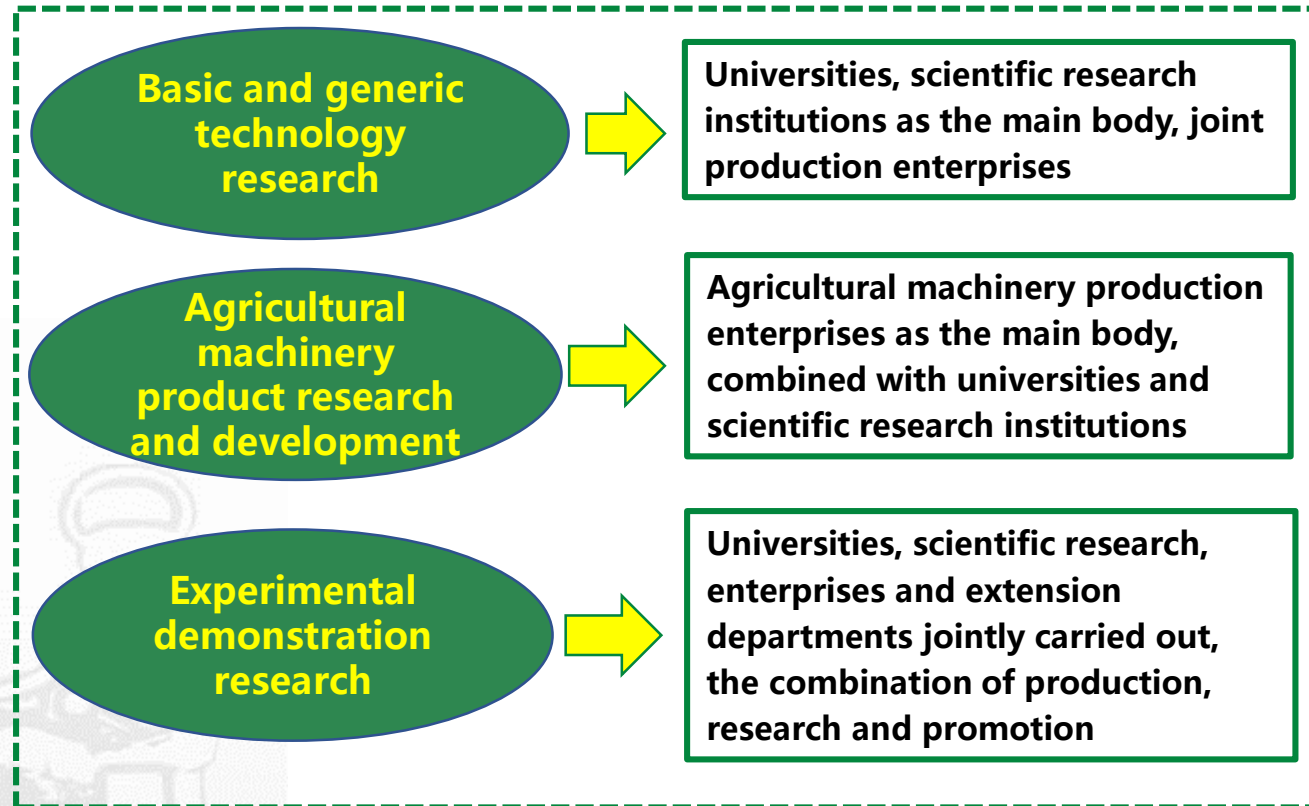


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Agricultural mechanization Management service system



Scientific and technological innovation system of agricultural mechanization

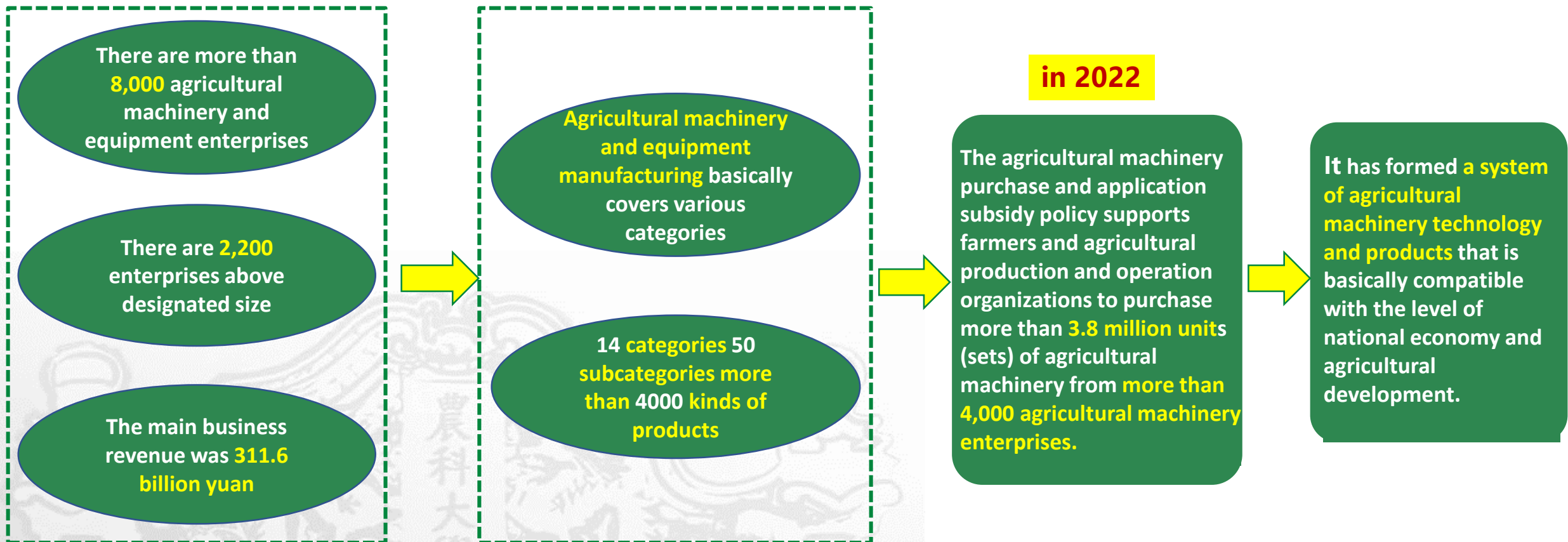


Overview of sustainable agricultural mechanization in China



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Agricultural machinery industry and manufacturing system



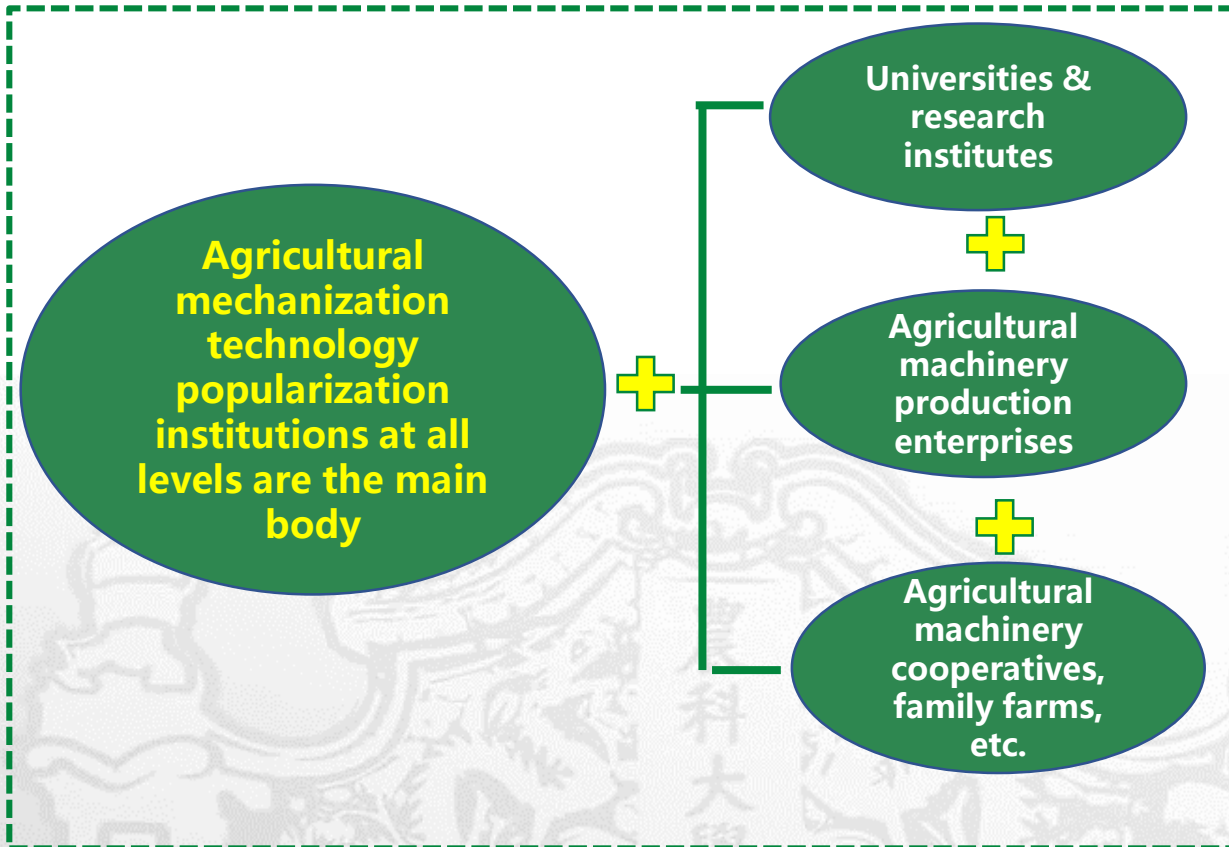
Meet **90%** of China's agricultural machinery market demand

Overview of sustainable agricultural mechanization in China

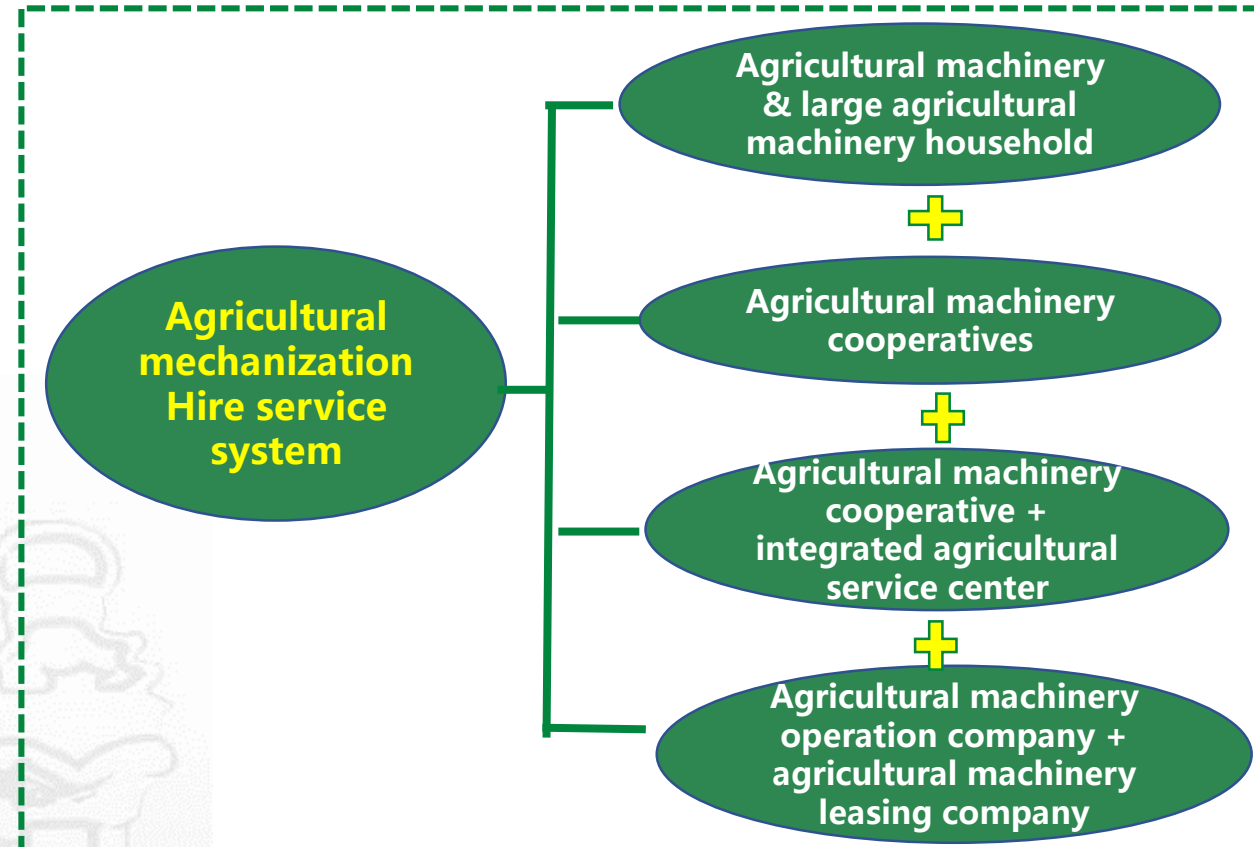


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Agricultural mechanization technology extension system



Agricultural mechanization Hire service system

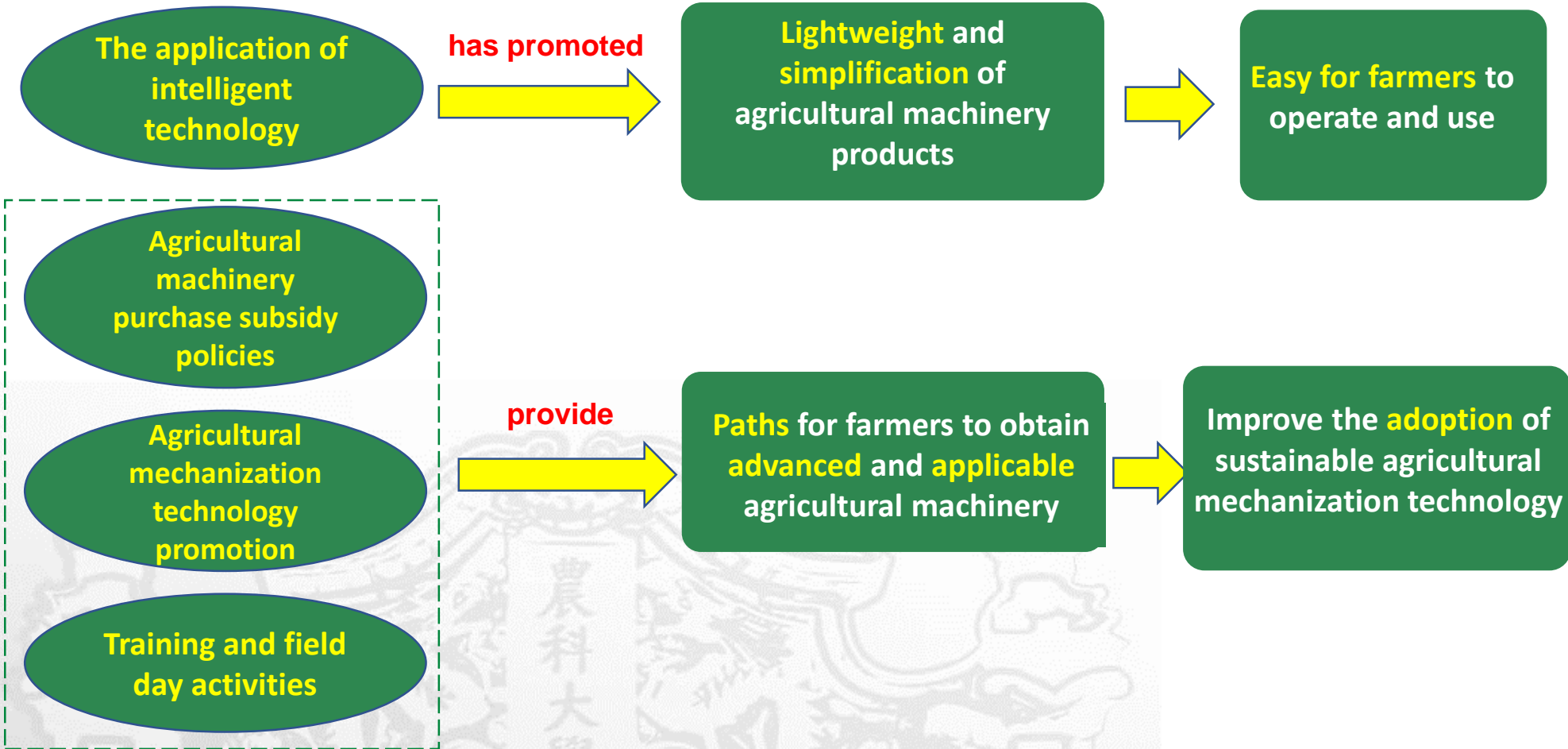


They are also the most important systems that directly contribute to agricultural mechanization by smallholder farmers

Overview of sustainable agricultural mechanization in China



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International cooperation on agricultural mechanization

China-Brazil



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Agricultural mechanization
technology and equipment

Agricultural products
processing technology and
equipment

Agricultural and rural energy
technology and equipment

Agricultural mechanization
supports the development
of family farming

Agricultural machinery and
equipment test demonstration
and promotion

Agricultural mechanization
education and training

Integration of education, technology and industry



International cooperation on agricultural mechanization

China-Brazil



Invite IAPC to participate in China International Agricultural Machinery Exhibition

September 2021



Held the "Belt and Road: China-Brazil Family Farming Machinery Supply and Demand Exchange Meeting"

December 2021

June 2022



Signed the Memorandum of Understanding on Agricultural Mechanization and Agricultural Energy Cooperation between China and Brazil

国际民众合作协会 (IAPC)

October 2021

Held online training on agricultural mechanization

2022年5月

Held "Special Dialogue on Chinese Agricultural Machinery and its Potential for Brazilian farmers and family Farming"

September 2022



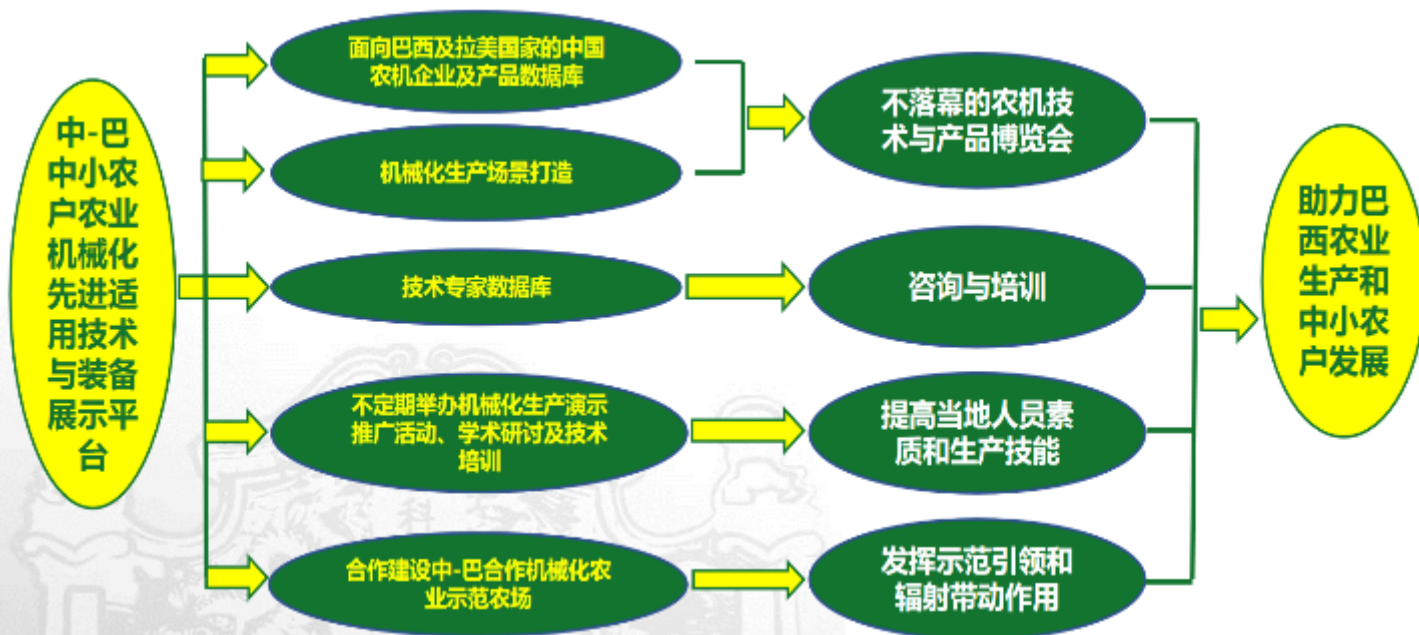
International cooperation on agricultural mechanization

China-Brazil



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March 2023: Approved the project of the Ministry of Science and Technology of China "**China-Brazil construction of an international transfer platform for advanced and applicable agricultural mechanization technologies for small and medium-sized farmers**" to help agricultural production in Brazil and promote poverty reduction and rural revitalization of small and medium-sized farmers



Increase production, reduce costs, improve efficiency, promote value-added and income, and enhance the status and value of women in family farming

The screenshot shows the website interface for the 'China-Brazil Agricultural Mechanization Advanced Technology and Equipment Exhibition and Cooperation Platform'. The header includes the Chinese and Brazilian flags, the platform title, and language options (Simplified Chinese, English, Portuguese). A search bar is also present. The main navigation menu includes: Home Page, About Us, Bilateral cooperation, news information, agricultural machinery, Online Training, and Expert Consultation. The content area features a group photo of participants in front of a building labeled '工学院' (College of Engineering). Below the photo is a 'news information' section with a list of recent events: 'Special press conference of the 15th Meeting' (2023-08-26), 'Media in Portuguese-speaking countries pay attention to BRI...' (2023-08-26), 'The 15th BRICS Summit Johannesburg Declaration' (2023-08-26), and 'Ahead of the BRICS summit, Brazil has made a decision in f...' (2023-08-26). A banner below the news section reads 'China-Brazil Cooperation in the Field of Science and Technology on Agricultural Mechanization'. At the bottom, there are images of agricultural machinery, including a red 'ZF-30' fertilizer spreader and green irrigation equipment.

International cooperation on agricultural mechanization

China-Brazil



中国农业大学



March 2023



Vice President Du Taisheng met with Minister Paulo Teixeira in Beijing

MST donated 32 books to CAU's Library

May 2023



CAU's professors visited Brazil to inspect universities and learn more about family farming in Brazil

April 2023

Professor Yang Minli was invited to attend the The "**First Forum on China-Brazil Struggle Against Poverty and for Rural Revitalization & Intersectoral Dialogues**" and delivered a speech on "The Contribution of Agricultural Mechanization in China's poverty Alleviation and Rural Revitalization"

Maria de Fatima Bezerra, Governor of Rio Grande do Norte, visited CAU

Mr. Lima, Director of the Department of Rural Development and Family Farming of Rio Grande do Norte, visited Chinese agricultural machinery enterprises



July 2023

Governor Fatima believed that **the cooperation would open a new chapter in Brazilian agriculture**; The president of the Apodi Union believed that **farmers in Northeastern Brazil would have a chance of agricultural mechanizing**.



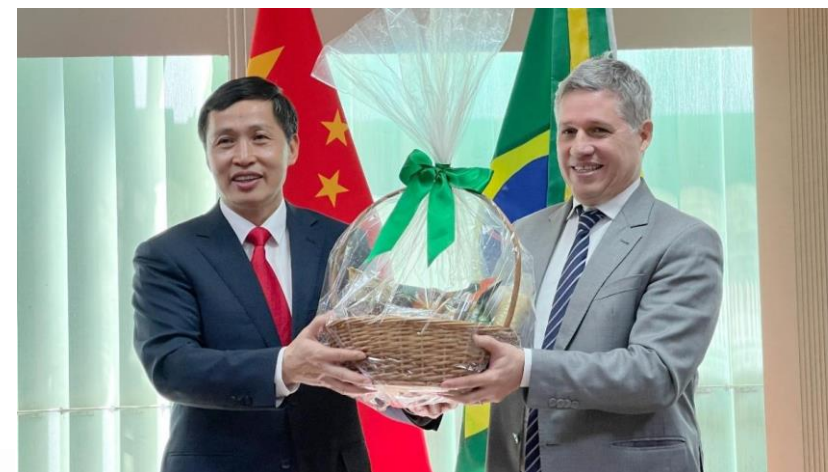
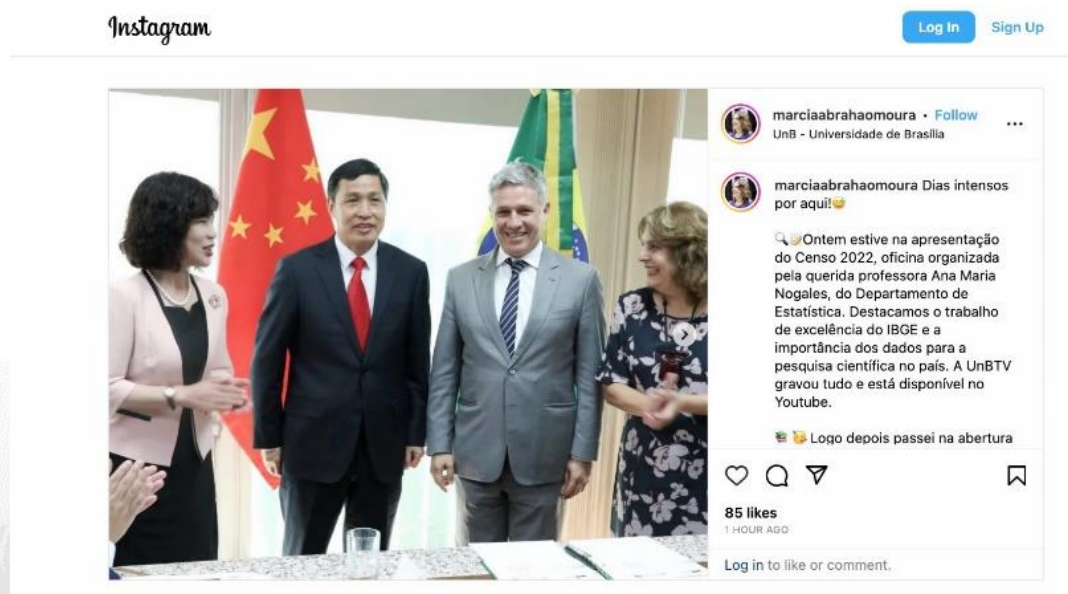
International cooperation on agricultural mechanization

China-Brazil



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September 2023: Secretary Zhong Denghua of CAU led a delegation to visit Brazil and met with Minister Paulo Teixeira.



The College of Engineering of China Agricultural University and the University of Brasilia signed the Memorandum of Understanding on **"China-Brazil Family Agricultural Mechanization Joint Research & Development and Technology Promotion Center"**

International cooperation on agricultural mechanization

China-Brazil



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November 2023: At the invitation of President Sun Qixin, Rector Marcia of the University of Brasilia attended the WAFI organized by the University and visited the College of Engineering



International cooperation on agricultural mechanization

China-Brazil



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February 2, 2024: The launch ceremony of the **China-Brazil Agricultural Mechanization Cooperation Demonstration Farm** was held in Abodi, Rio Grande do Norte.



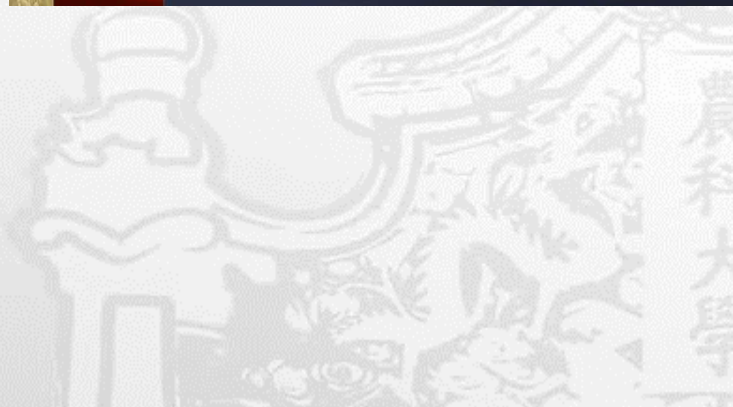
Brazilian Vice President Alckmin delivered a video speech

More than 1,000 people, including Chinese Ambassador to Brazil Zhu Qingqiao, Brazilian Minister of Agrarian Development and Family Farming Paulo Teixeira, Governor of Rio Grande do Norte Fatima, officials of the 9 state governments of the Interstate Consortium for Sustainable Development of the Northeast, representatives of MST, family agriculture, IAPC, as well as representatives of China Agricultural University, China Association of Agricultural Machinery Manufacture, and Chinese agricultural machinery enterprises, attended the launch ceremony



International cooperation on agricultural mechanization

China-Brazil



International cooperation on agricultural mechanization

China-Brazil



Chinese agricultural machinery products arriving in Brazil

农机企业
Agricultural machinery enterprise

7

Tillage machinery

Sowing and planting machinery

Field management machinery

Harvest machinery

Transportation machinery

农机种类

Types of agricultural machinery

22

农机数量

Number of farm machinery

31



International cooperation on agricultural mechanization

China-Brazil



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China Agricultural University

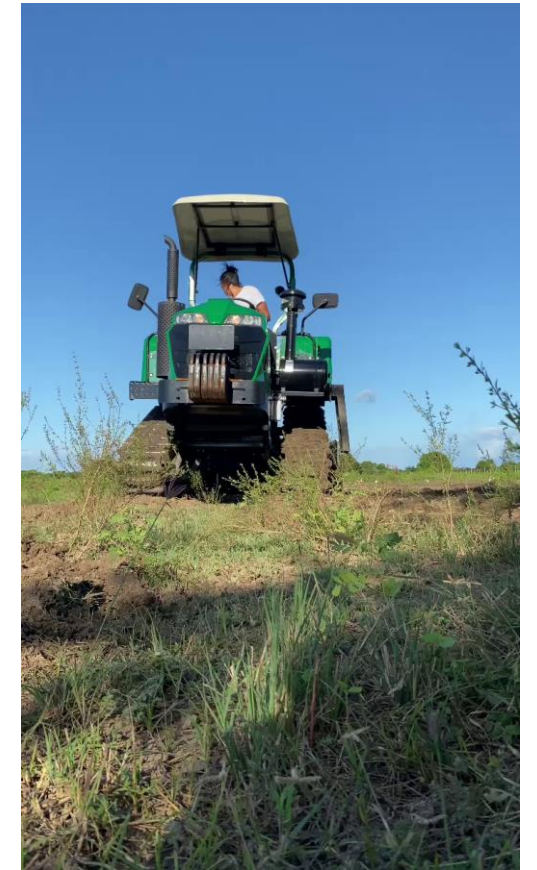
- At present, China's small and medium-sized agricultural machinery has begun to be applied in Brazilian family agricultural production
- The medium crawler tractor **operates well** in the muddy fields of the rainy season in northeastern Brazil and is **well received by local farmers**
- The use of small combine harvesters has reduced the time required for manual harvesting **from 25 days to 6 days.**



Rice harvesting in Maranhão



Rice harvesting in Apodi



Tractor operation in Apodi

International cooperation on agricultural mechanization

China-Brazil



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- Chinese agricultural machinery testing and determination of its adaptability in Brazilian family farming



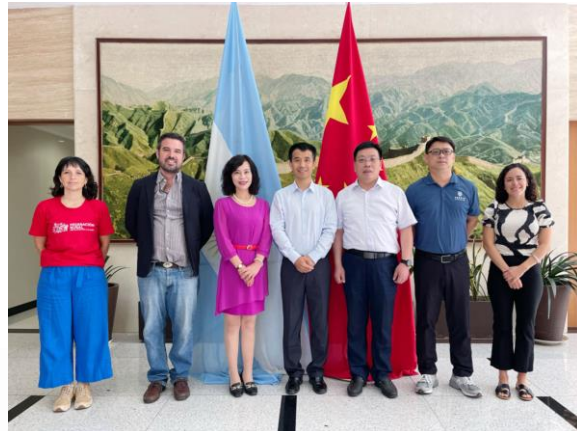
International cooperation on agricultural mechanization

China-Argentina



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➤ Signed a MOU on Cooperation with the Ministry of Agricultural Development of Buenos Aires Province, Argentina



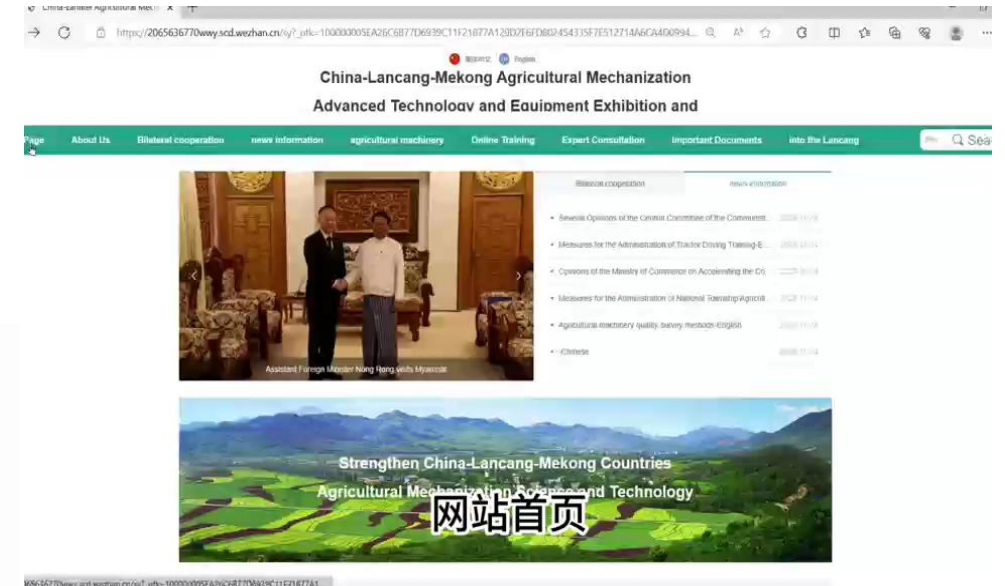
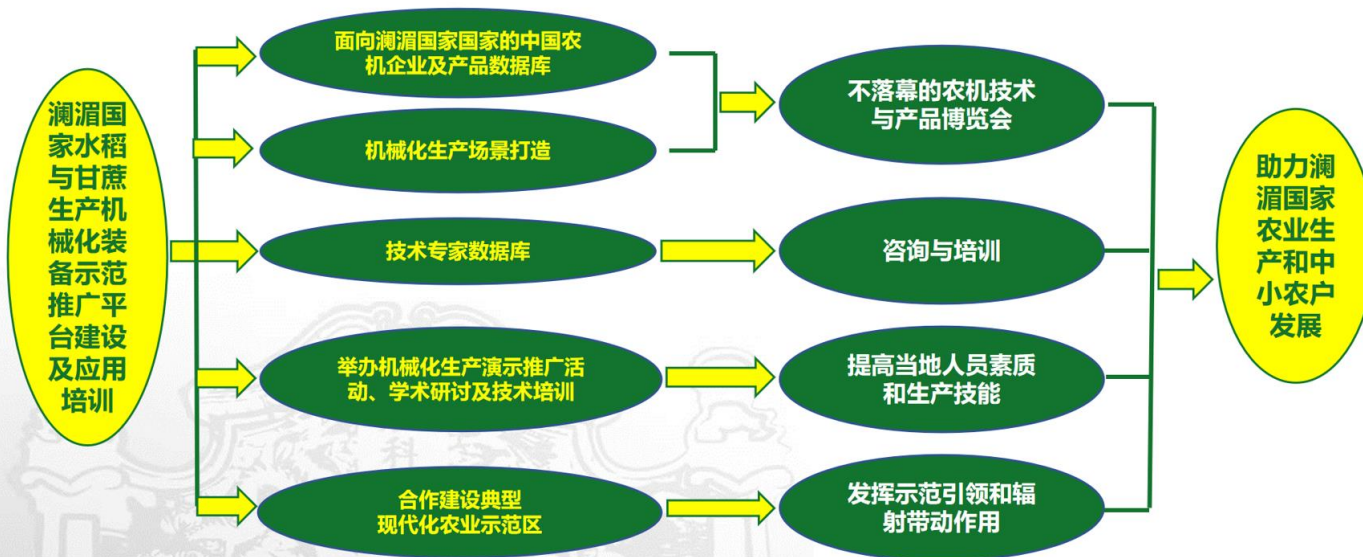
International cooperation on agricultural mechanization

China-Lancang-mekong countries



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June 2023: Approved the project of the Asian Cooperation Fund project "**Construction and application training of demonstration platform for rice and sugarcane production mechanization equipment in Lancang-Mekong countries**" to help agricultural production in Lancang-mekong countries and promote poverty reduction and rural revitalization of small and medium-sized farmers



Increase production, reduce costs, improve efficiency, promote value-added and income, and enhance the status and value of women in family farming

International cooperation on agricultural mechanization

China-Lancang-mekong countries



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- Signed MOUs on Cooperation in Agricultural Mechanization with Lancang-mekong countries



Signed a MOU with the Lao Ministry of Agriculture and Forestry, visited the Lao National University and carried out technical exchanges

No.	Report topic and reporter
1	China's agricultural mechanization and international cooperation —Dr. Minli YANG, Professor of College of Engineering, Dean of "Belt and Road" International Innovation Institute of Agricultural Equipment and Smart Agriculture, CAU
2	Key Technology for the New Energy Agricultural Power Equipment —Dr. Zhenghe SONG, Dean & Professor of College of Engineering, CAU
3	Production of organic fertilizer from agricultural organic solid waste and its returning equipment & technology to field —Dr. Guangqun HUANG, Vice Dean & Professor of College of Engineering, CAU
4	Exploration and thinking of digital Twin about smart agriculture and machinery —Dr. Yue-Feng DU, Associate Professor of College of Engineering, CAU
5	Precision agriculture production based on Beidou satellite navigation —Dr. Yongliang ZHANG, R & D Director, Golden Field Technology Co., Ltd.
6	Modular tractor and sugarcane step harvesting equipment —Dr. Qiaoming GAO, Guangxi Hepu County Huilaibao Machinery Manufacturing Limited Company
7	Rice seeding cultivation and Mechanization technology of rice transplanting —Mr. Xian JIN, Marketing Director of Suzhou Jofae Agricultural Machinery Co., Ltd.
8	Zhengzhou Zhonglian peanut and sesame mechanized harvesting technology and products —Mr. FAN Dongdong, Director of Technology Department, Zhengzhou Zhonglian Harvest Machinery Co., Ltd.
9	Smart agriculture, Eavision drone is committed to solving users' pain points —Mr. Bin HUANG, Sales Manager of Suzhou Eavision Robotic Technology Co., Ltd.

International cooperation on agricultural mechanization

China-Lancang-mekong countries



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➤ Signed MOUs on Cooperation in Agricultural Mechanization with Lancang-mekong countries



Yeking Agricultural University, Myanmar

Myanmar visit, discussion, technical exchange, farmers' discussion



Visit to Thai Institute of Agricultural Engineering

Kasetsart University visit, signing, technical exchange, agricultural machinery exhibition and agricultural carnival



Outline



- The importance of small farmers in agricultural production
- Overview of sustainable agricultural mechanization in China
- China-Brazil cooperation on agricultural mechanization for family farming
- Future prospects



Future prospects



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- We will promote the construction of demonstration farms for China-Brazil agricultural mechanization cooperation.
 - ✓ Agricultural machinery performance and application test (Apodi, Maranhão, Ceara)
- We will build two China-Brazil Family Farming Mechanization Science and technology Backyard and one China-Thailand Intelligent Agricultural Machinery and Smart Agriculture Science and technology Backyard
 - ✓ Will build in Brasilia and Apodi, Rio Grande do Norte of Brazil and in Kampangsaen of Thailand
 - ✓ China Agricultural University + Chinese agricultural machinery enterprises + Brazilian/Thai universities and government + international organizations + local farmers
- Hold **summer international training courses** on intelligent agricultural machinery equipment in August 2024
- Invite relevant personnel of Brazil/Argentina/Lancang-mekong countries to attend the "**Belt and Road**" **International Agricultural Equipment and Smart Agricultural Technology Innovation Conference**, the **2024 China International Agricultural Machinery Exhibition** and the "**China-Brazil Family Farming Machinery Supply and Demand Meeting**" in October 2024

Future prospects



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- We actively participated in the construction of the **China-Brazil Modern Agriculture Demonstration Zone** (the Ministries of Agriculture of both sides) and the **key laboratory for the joint research and development of intelligent agricultural machinery and equipment for family farming** (the Ministries of Science and Technology of both sides), and sign the MOUs.
- Continue to deepen cooperation with the universities of Brazil/Lancang-mekong countries and other countries' universities in the field of agricultural mechanization
- Continue to **organize some agricultural machinery products** to participate in Brazilian family farming production, including tractors, rice seedling lines, rice transplanters, planters, fertilizer trucks, vegetable transplanters, vegetable harvesters and fruit picking platforms, etc., to promote the development of family farming production in Brazil.
- China-Brazil agricultural mechanization cooperation project officially included in the “**Global Development Project Pool**” of China International Development Cooperation Agency.
- Hope the cooperation project can be promoted and applied on a larger scale in the future, so as to bring **more benefits to the development of family agriculture in Brazil and other countries in the South.**

Acknowledgement



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Brazil: MDA, Sedraf, MST, UnB, UERN, Ufersa, IFRN, Family farmers, Farming cooperatives

Argentina: MDA, Rural Federation; **IAPC:** International Association for Popular Cooperation

Laos: Department of Agriculture, Lao Ministry of Agriculture and Forestry, Lao Agricultural Production and Processing Association, Lao Agricultural Industry Technology Group, National University of Laos

Myanmar: Myanmar Ministry of Agriculture and Irrigation, Yezin Agricultural University, Good Brother Group

Thailand: Kasetsart University, Thai Society of Agricultural Engineering, Thai Institute of Agricultural Engineering

China: Ministry of Agriculture and Rural Affairs, Ministry of Science and Technology of China, CAU, CAAMM, Chinese agricultural machinery enterprises

Embassy: Chinese Embassy in Brazil, Chinese Embassy in Argentina, Chinese Embassy in Laos, Chinese Embassy in Myanmar, Chinese Embassy in Thailand, Embassy of Brazil in China



Acknowledgement



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On June 3, 2024, Brazilian Minister of Agrarian Development and Family Farming led a delegation to visit China Agricultural University.

On June 7, 2024, Brazilian Minister of Agrarian Development and Family Farming held a discussion and exchange with Chinese agricultural machinery enterprises at China Agricultural University





Thank you

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