

Brief Introduction of NIAM



- 1 AM Development in China
- 2 NIAM historical Contributions
- 3 NIAM Scientific Research
- 4 Reserch Achievements
- 5 Int'l Cooperation and Training
- 6 Future Development



Agricultural Mechanization Development in China

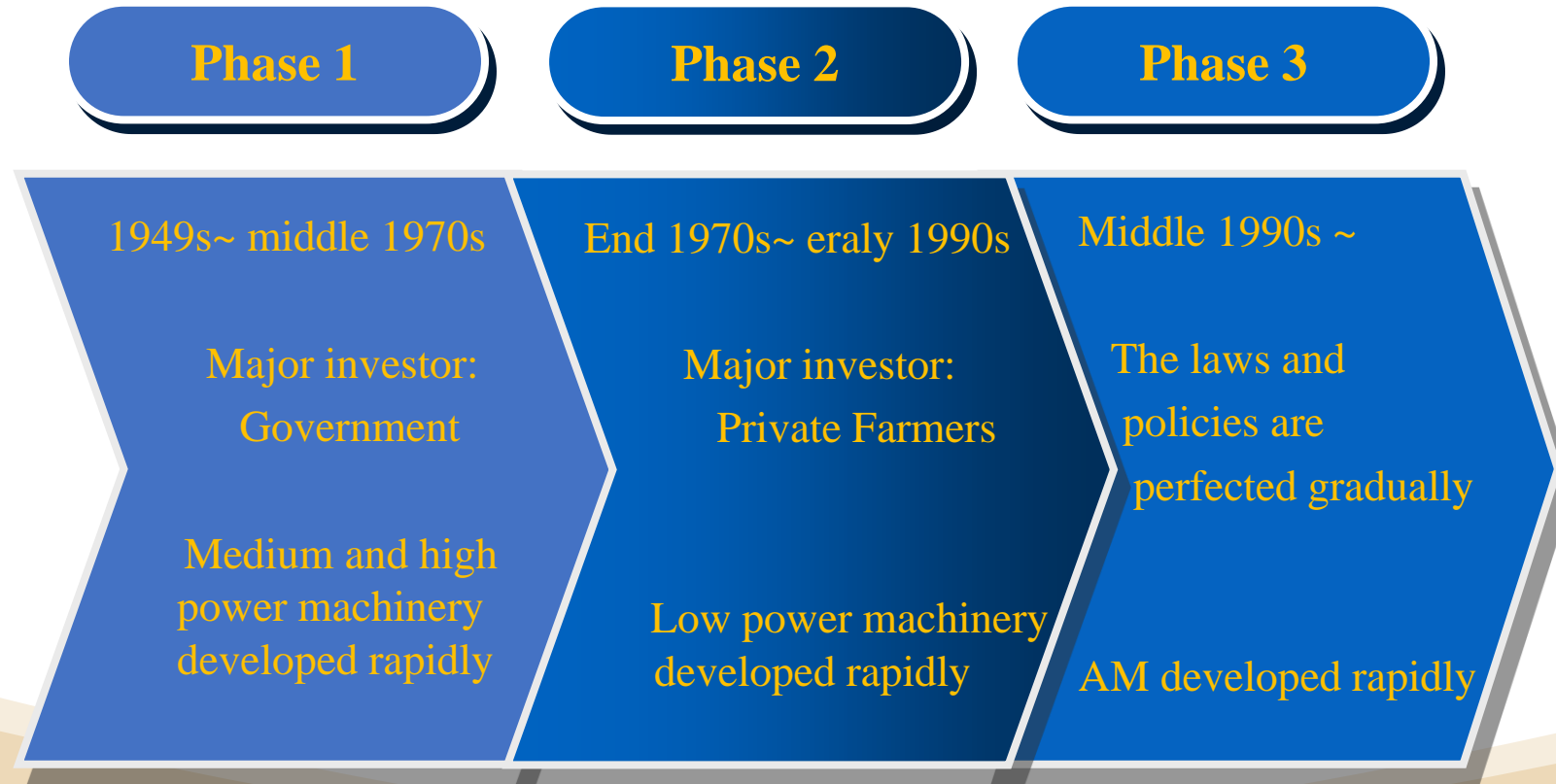
AM Development in China

The earliest agricultural tools appeared 3000 B.C. The evolution of agriculture tools divided to **primitive agriculture**, **traditional agriculture** and **modern agriculture**.

Primitive Agriculture → Traditional Agriculture → Modern Agriculture



AM Development in China



AM Development in China

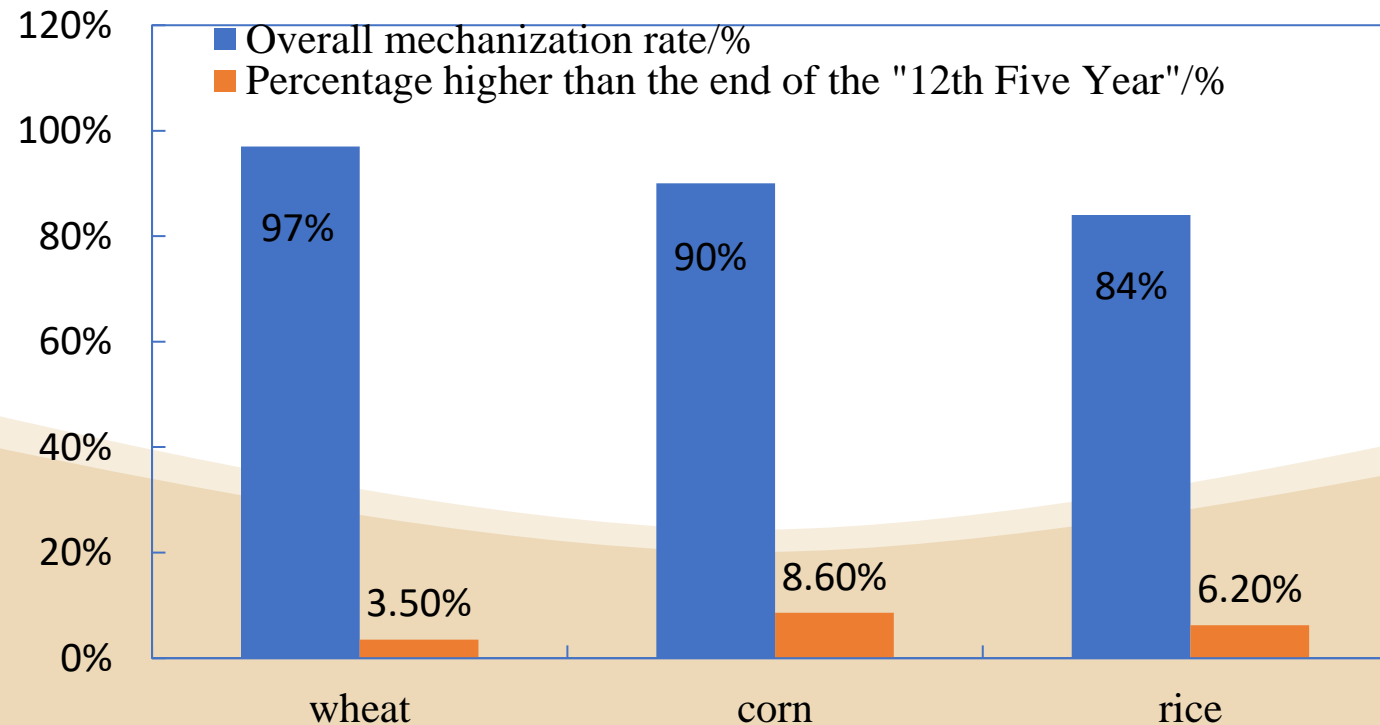
- From the regional perspective, the development of mechanization is faster in the northern plains, but slower in the southern part, especially in the hilly and mountainous areas of the southwest.
- The overall rate of mechanization in typical hilly and mountainous counties is lower than 50%.



AM Development in China

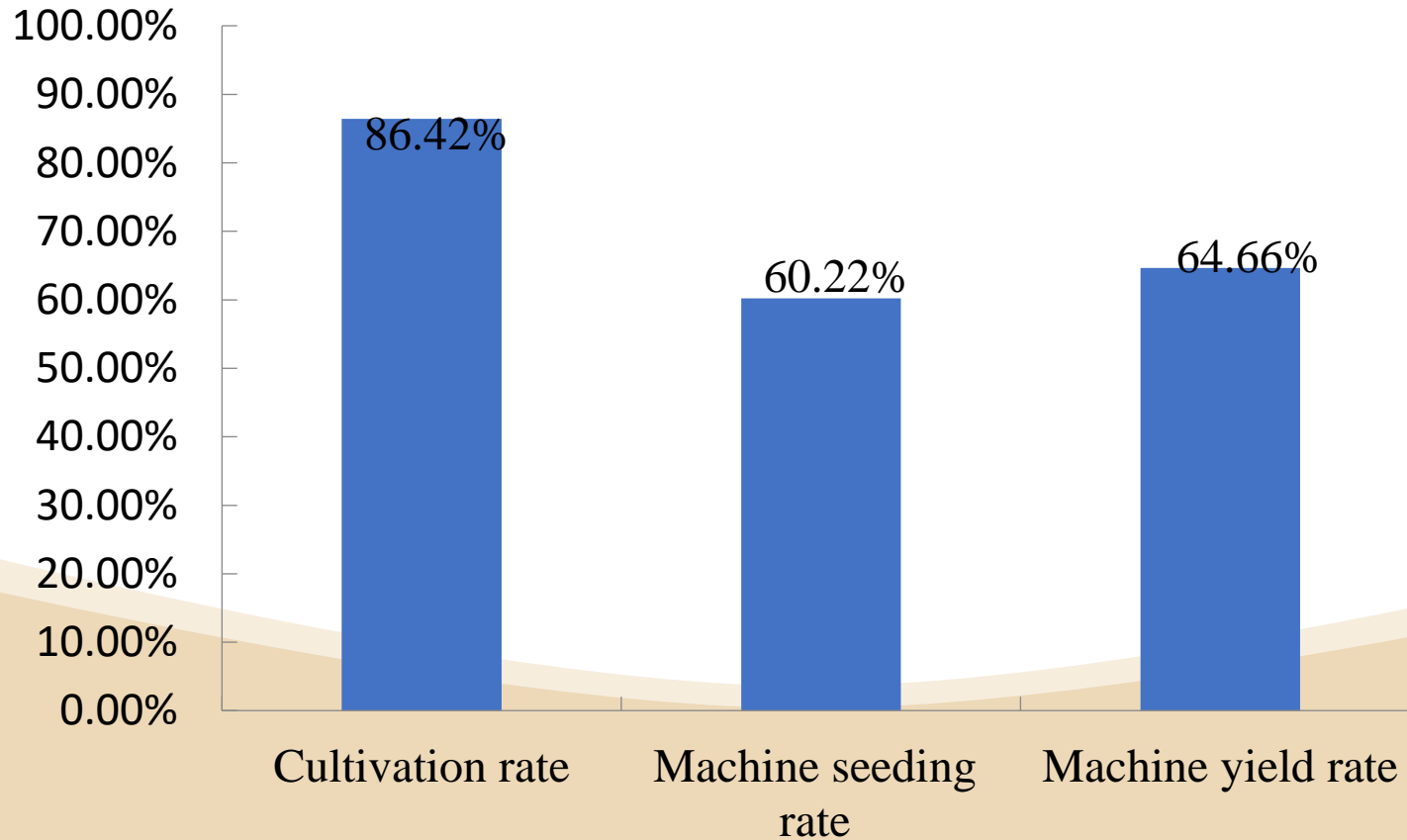
At the end of the 13th Five-Year period of agricultural mechanization, the total power of agricultural machinery reached 1.056 billion kw, an increase of 17% over that at the end of the 12th Five-Year period.

The overall level of mechanization in plowing, sowing, and harvesting increase to 71.25 %, 7.4 percentage points higher than that at the end of the 12th Five-Year Period.



AM Development in China

In 2021, The overall level of mechanization in plowing, sowing, and harvesting reached 72.03%, 0.78 percentage points higher than that in 2020.





NIAM historical Contributions



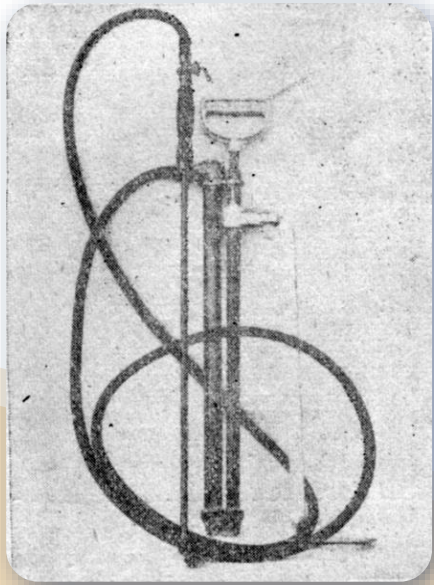
OVERVIEW

Nanjing Institute of Agricultural Mechanization, Ministry of Agriculture and Rural Affairs (NIAM) was established in 1957, NIAM is a non-profit national research institute, belongs to The Chinese Academy of Agricultural Sciences(CAAS), Ministry of Agriculture and Rural Affairs.



OVERVIEW

Developed the first rice trans-planter in the world and also the first automatic sprayer in China.



**Automatic sprayer
developed in 1934**



**The world's first
rice trans-planter**



Tractor pulled share plow in 1955

OVERVIEW



NIAM has Won a total 14 national scientific and technological achievements awards.

序号	成果名称	奖项类型	年度
1	南-4103型沤田绳牵引机组	国家发明奖	1964
2	东风-2S型机动水稻插秧机	国家发明三等奖	1981
3	农业机械测试数据实时处量和仪器的研究	国家科技进步三等奖	1985
4	农家微型水力发电装置	国家科技进步二等奖	1985
5	我国不同地区实行农业机械化方案制定方法的研究	国家科技进步三等奖	1987
6	旋耕机工作部件及其与拖拉机配套合理性的研究	国家科技进步二等奖	1987
7	种植业适度规模研究	国家科技进步三等奖	1989
8	新型背负式机动喷雾机研制开发	国家科学进步二等奖	2001
9	花生收获机械化关键技术与装备	国家技术发明二等奖	2015
10	1.5万只蛋鸡笼养成套设备与标准鸡舍设计推广	国家科技进步三等奖	1985
11	太湖地区三麦免(少)耕学以适用技术	国家科技进步二等奖	1986
12	国家12个重要领域技术政策的研究	国家科技进步一等奖	1987
13	2000年振兴目标的研究	国家科学进步二等奖	1989
14	杂交水稻机械采授粉制种实用新技术	国家科技进步四等奖	1991

OVER VIEW

There are 14 post experts been selected in the national modern agricultural industrial technology system and 2 in Jiangsu Province system



Oil crop

Rape	2人
Peanuts	2人
Soybean	1人



Grain crop

Sweet potato	2人
Bean	1人
Barley	1人



Industrial crop

Tea	1人
Hemp	1人
Mushroom	1人
Melon	1人
Green manure	1人



Providence

Vegetable	1人
Special grain	1人



NIAM Scientific Research



Scientific Research

Responsibility of NIAM

Research on theory and policy of agricultural mechanization

AM technology and equipment research and development

Technical standard system of AM engineering

AM technology consulting and information services

AM quality supervision and inspection、 promotion

Technology transformation and experimental demonstration

Agricultural,Rural and park planning and engineering design

Innovation Groups



NIAM built 12 innovation groups, divided into five fields

Field of disciplines	Research direction	Lead
Farming Machinery	Planting Machinery Group	Zhang Wenyi
Harvest Machinery	Green Farming and Root Crop Harvesting Technical Equipment Group	Wu Feng
	Crop Production Technology and equipment Group	Zhang Min
	Tea Fruit and Vegetable Harvesting Technical equipment Group	Song Zhiyu
	Cotton and hemp harvesting technical equipment Group	Zhang bin
Agricultural Product Processing Machinery	Main grain and crop processing equipment group	Xie Huanxiong
	Fruit and vegetable products and processing equipment Group	Song Weidong
Agricultural Ecological Environmental Protection Maintain cooperation	Plant protection machinery Group	Xue Xinyu
	Agricultural production waste resource utilization equipment Group	Chen Yongsheng
Agricultural Mechanization And Intelligent Control	Agricultural mechanization development and system optimization group	Cao Guangqiao
	Main crops intelligent agricultural machinery equipment group	Jin Chenqian
	Western cold and arid regions mechanized group	Gong Yan



Reserch Achievements



Representative Achievements

Rape blanket seedling combined transplanter
transplanting frequency is 280 times/min · row , at the world's
leading level.



Representative Achievements

Rapeseed segmentation - combined low loss harvesting equipment

low loss, high efficiency and high quality harvesting for rapeseed.

Simultaneously, the technologies and equipment can also achieve the harvest of rice, wheat, and other highland barley crops.



Representative Achievements

Cotton intelligent topping machine

Using the self-developed control system, the application of laser ranging, image analysis and recognition technology, to achieve top real-time recognition and detection of cotton, combined with high-speed position control technology, to achieve speed adaptive precision topping.



Representative Achievements

Intelligent plant protection UAV integrates a number of core technologies such as high-precision autonomous navigation, ultra-low altitude enhanced stability imitation flight, active obstacle avoidance, variable spraying, etc., which can achieve efficient, green, safe and accurate application of pesticide.



Representative Achievements

Orchard inspection robot

The fruit quantity can be dynamically identified and counted, and the fruit yield can be evaluated.

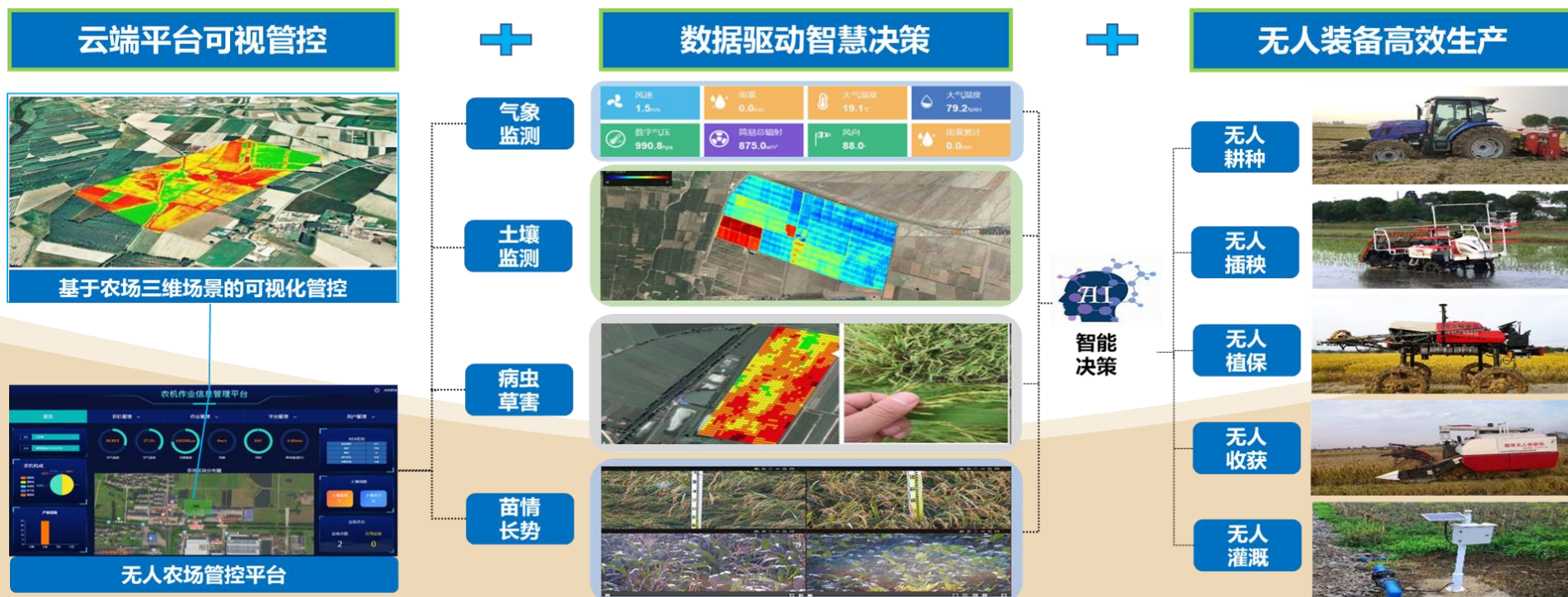
The operation efficiency is more than 10 times of the humanpower.



Representative Achievements

Smart farm solutions for large-scale fields

Aiming at the whole-link agricultural machinery and equipment for farm works, we innovated the whole-path planning method of machine-road coordination and multi-machine cooperation.



Representative Achievements

High ground clearance remote control multifunctional management machine for tea plantation

High ground clearance remote control multifunctional management machine for tea plantation



Representative Achievements

Multi-functional field management robot

It is suitable for the collection of phenotypic information, plant protection, fertilization, ploughing and weeding of various dryland crops.





International Cooperation and Training



Academic Communications

International cooperation platforms

- “The Sino-USA Laboratory of Pesticide Application Technology Cooperation”
- “The Sino-USA Laboratory of Peanut Production Engineering Technology”

From 2016 to 2022, NIAM held about 20 international academic conventions.



Academic Communications



NIAM is the host institution of various academic journals, including:

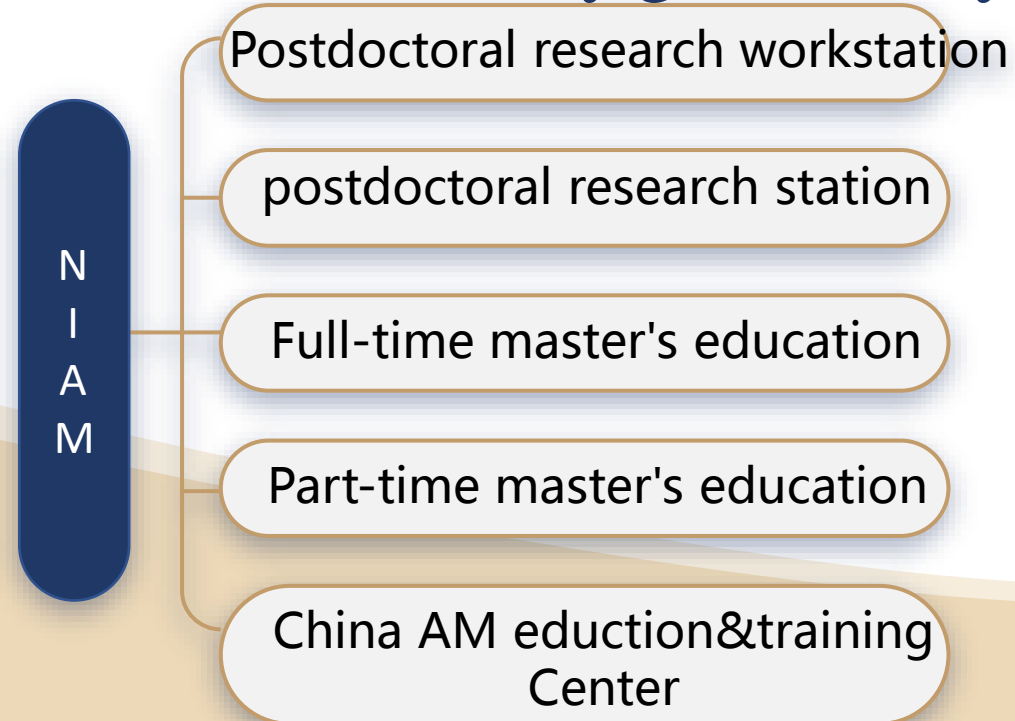
- “The Journal of Chinese Agricultural Mechanization”
- “Agricultural Development and Equipment”
- “Journal of Intelligent Agricultural Mechanization (in Chinese and English)”



Degrees and Training

We have 6 licensed doctoral degree tutors and 60 licensed master degree supervisors.

Recently, we have 26 doctoral and 59 master students are enrolled in NIAM, after they graduated they will get the diploma from CAAS.



Degrees and Training

NIAM holds the China Agricultural Mechanization Education and Training Center for domestic as well as international training in agricultural engineering, with an average annual 2000 persons have been trained.



International Training

We are also keep cooperation with international organization for example, CSAM, FAO etc. to hold agricultural mechanization training workshop.





Future Development



Future Development



Institute Development

- Promote Intelligent machine technology action of CAAS
- Promote the research and development for hilly&mountain agricultural equipment
- Promote build the Smart Agriculture and Equipment Science Center of CAAS
- Promote deepen international cooperation

Future Development

International Cooperation

- Technical Exchange
- Build Research Platform
- Hold Technique Training and Workshop
- Demonstration and Extension of Existing Technology
and Equipment

In future, NIAM will continue to serve as the innovation center for agricultural engineering theory, technology and equipment. it will also connects universities, institutes, and manufacturers all over the world, forging a mutually beneficial and win-win mechanism of international collaboration and actively contributions to national food security and global elimination of poverty and hunger.

1 NO
POVERTY



2 ZERO
HUNGER





农业农村部南京农业机械化研究所
Nanjing Institute of Agricultural Mechanization,
Ministry of Agriculture and Rural Affairs

谢谢

Thank you