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PRC Fund Knowledge Sharing Webinar Series

Integrated Approach to Agriculture Infrastructure Investment

### China's Food Security and Public Investment in Agriculture

### Jing Zhu

**Centre for International Food and Agricultural Economics(CIFAE)** 

**Nanjing Agricultural University** 

### Increasing level of food security in China

Daily Energy Intake Per Capita in China & World, 1961-2019 (kcal/capita/day)



### Increasingly level of food security in China







*Note:* Cereals excludes beer, fruits excludes wine, milk excludes butter *Sources:* FAOSTAT "Food Balance Sheets"



### **Challenges to achieve food security in China**

#### **Challenges:**

- Large in population, scarce in arable land and fresh water
- Fragile environmental conditions
- Low level in modern agricultural production
- Vast area, fragmented agricultural production and distribution
- Large rural-urban income disparity

- Availability
- Accessibility
- Affordability

"When all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life" (FAO 2003).



### Public investment in agriculture in China





• Agricultural value chain and industrialization...

### **Growing fiscal expenditure**



#### **China's Agriculture Fiscal Expenditure**, 1978-2020



Source: China Rural Statistical Yearbook China Statistical Yearbook

#### **Major investment areas:**



- Telecommunication
- Internet coverage...

- Cash-for-work
- Rural education
- Agricultural R&D and extension service
- Agricultural value chain and industrialization...

- Farmland and irrigation construction
- Agriculture research and extension
- Agricultural mechanization
- Agricultural ecological environment protection
- Rural infrastructure in transportation and communication
- Agricultural value chain and industrialization



#### **Farmland and Irrigation construction**

- Farmland Construction from "Medium Low Yield Fields" to "High Standard"
- Increase small and medium-sized farmland Irrigation construction and water-saving irrigation



Medium-low Yielding Fields Project

Ensure arable land in China will not be less than 1.92 billion mu by 2005

**1** th (2006~10)

Medium-low Yielding Fields Project 12<sup>th</sup> (2011~15)

Farmland irrigation construction (Enhance small and watersaving irrigation facilities )

Land consolidation ( Supplement arable land 24 million mu) **13**<sup>th</sup> (2016~20)

Farmland Construction (Ensure High-standard farmland 800 million mu )

Farmland irrigation construction

Solve the "Last kilometer" problem of farmland and irrigation construction



#### **Agricultural Research and extension service**

- Long-term focus on seed industry, more varieties included in support.
- Agricultural technology progress contribute more to food security.

### **11**th (2006~10)

**10**<sup>th</sup> (2001~05)

New variety extension payment (improve grain products seeds quality) New advanced varieties extension and demonstration program

Advanced hog breed nurturing program

Contribution rate of agricultural t echnology progress from 48% to 53% 12<sup>th</sup> (2011~15)

Modern seed industry Project (setup national seed production base, regional breeding base for livestock, poultry and aquatic species)

Contribution rate of agricult ural technology progress reach 55% 13<sup>th</sup> (2016~20)

Modern seed industry (Strengthening R&D in breeding for key technology, such as hybridization. Set up 100 regional bases for superior seed breeding)

Contribution rate of agricultura I technology progress reach 56%

- Agricultural Mechanization
  - Overall mechanization rate of farming and harvesting major crops has been rising.
  - Gradually adapt to different process, varieties and landscape

### **10**<sup>th</sup> (2001~05)

Overall mechanization rate of farming and harvesting major crops reach 39%

### **11**th (2006~10)

Overall mechanization rate of farming and harvesting major crops reach 45%

### 12<sup>th</sup> (2011~15)

Overall mechanization rate of farming and harvesting major crops reach 60%

Agricultural mechanization promotion project

### 13<sup>th</sup> (2016~20)

Overall mechanization rate of farming and harvesting major crops reach 70%

Improve mechanization rate for rice planting, maize and potato harvesting, and for cash crop, livestock, aquatic, vegetable and primary processing.



### **Rural Transportation and Communication**

- Electricity, Road and Internet from "Build" to "Connect"
- "Every Village and Every household" is connected by transportation and communication.

### **10**<sup>th</sup> (2001~05)

Solve the problem of electricity consumption in no electricity area

Urban and rural electricity and call charge same price

### **1** th (2006~10)

Rural road (Build and upgraded rural roads: 1.2 million kilometers)

Power to villages

**12**<sup>th</sup> (2011~15)

Rural road project (Promote hardening roads in every villages for eastern and central region, above 80% for western region)

Rural power supply

13<sup>th</sup> (2016~20)

Promote urban-rural connectivity of infrastructure such as water, electricity, gas, and telecommunications

Broadband connectivity to villages project

### **Agricultural value chain and industrialization**

Extending agricultural value chain to increase farmers' income

### **10**<sup>th</sup> (2001~05)

Support Processing and export of agricultural products. **11**th (2006~10)

**Training and services** for off-farm jobs and rural migration

### **12**<sup>th</sup> (2011~15)

Speed up agricultural product processing industry

Improve the capacity of township enterprises

Promote the development of rural tertiary industry

### **13**<sup>th</sup> (2016~20)

Integration of primary, secondary and tertiary industries in 100 counties, 1,000 townships and 10,000 villages

Improve the marketing and logistics facilities for agricultural products



#### **Food consumption**: above world average in most food items

#### Per Capita Consumption of Major Food Items: China vs world average, 1961 vs 2019



*Note:* Cereals excludes beer, fruits excludes wine, milk excludes butter *Sources:* FAOSTAT "Food Balance Sheets"

#### Food consumption: above world average in most food items



#### China Ranked 34th among 113 Countries in the 2021 GFSI Ranking

#### **GFSI Scores Comparison between China and Other Countries**



Notes: score 0-100 where 100=best. Sources: EUI "Global Food Security Index".







#### **Development and Future Prospects**

#### • from general to more targeted coverage

- Water Conservancy to Small sized and Water-saving irrigation
- Mechanization: adapt to different process, varieties and landform
- from relatively unified to increasingly diversified projects
  - **R&D and Mechanization** : besides grain, **more varieties** added in(Cotton, livestock, poultry, aquatic and vegetable...)

#### • *from* focusing on quantity needs *to* meeting upgrading demand for quality life

- Use **poor** soil and water **resources**(Medium Low Yield Fields)
- **Green Production** and improve food **quality and safety** (High Standard farmland, Zero Increase in Fertilizers and Pesticides)

#### **Development and Future Prospects**

### China's 14<sup>th</sup> Five-Year Plan

Part VII

Prioritizing agricultural and rural development, pushing ahead with rural revitalization

*Chapter* 23-26

*Chapter 23*: Improving agricultural quality, efficiency and competitiveness *Chapter 24*: Implementing rural development actions *Chapter 25*: Improving institutional arrangements for rural-urban integration *Chapter 26*: Connecting poverty alleviation effectively with rural revitalization

Box 10: Projects for modern agricultural and rural development

#### **Box 10: Projects for modern agricultural and rural development**

- 01 High Standard Farmland
- 02 Modern Seed Industry
- 03 Agricultural Mechanization
- 04 Animal Epidemic Prevention and Crop Pest Control
- 05 Control of Agricultural Non-point Source Pollution
- 06 Agricultural Products Cold Chain Logistics Facilities
- 07 Rural Infrastructure
- 08 Improving Rural Living Environment

| 01 高标准农田         |
|------------------|
| 02 现代种业          |
| 03农业机械化          |
| 04 动物防疫和农作物病虫害防治 |
| 05农业面源污染治理       |
| 06农产品冷链物流设施      |
| 07 乡村基础设施        |
| 08 农村人居环境整治提升    |

#### **01 High Standard Farmland**

#### The 14th Five-Year Plan

### • Additional: 275 million mu

- high-efficiency water-saving irrigation: 60 million mu
- Protective farming: 140 million mu of dark-soil land in northeast China

- Ensure: 800 million mu Strive: 1 billion mu
  - high-efficiency water-saving irrigation by 100 million mu, effectively utilized farmland irrigation water, and raised the irrigation coefficient to above 0.55
- Implementation of cultivated land quality rating and monitoring project

#### **02 Modern Seed Industry**

#### The 14th Five-Year Plan

- Constructing national long-term and medium-term germplasm resources bank for crops
- **Upgrading** the level of national seed breeding and production bases in Hainan, Gansu and Sichuan
- Establishing regional seed breeding and production bases for soybeans in Heilongjiang Province
- Build, upgrade and expand national germplasm banks for livestock and poultry and aquatic products, seed conservation farms (areas) and gene banks, promote the construction of national core breeding farms for livestock and poultry

- National germplasm collection and research system
- set up state-level seed breeding and production bases in Hainan, Gansu and Sichuan provinces, 100 regional bases for superior seed breeding
- Focus on key technology research and development of seed



#### The 14th Five-Year Plan

- Set up demonstration counties with full-process mechanization of crop production: 300
- Build demonstration counties with full-process mechanization of facility agriculture and large-scale farming: 300
- Promote the development of deep thawing and preparation of agricultural machinery and the mechanization of farmlands in hilly and mountainous areas

- Set up demonstration counties with full-process mechanization of crop production: 500
- Overall mechanization rate of farming and harvesting major crops : 70%



#### **04** Animal Epidemic Prevention and Crop Pest Control

#### The 14th Five-Year Plan

- Establishing monitoring centers and emergency prevention and control centers for crop diseases, monitoring centers for pesticide risks at different levels
- Construction of grassland plant diseases and insect pests prevention and control center
- Promote animal disease monitoring national reference laboratories and etiology regional center facilities conditions, improve the pastoral areas dedicated for animal epidemic prevention facilities and grass-roots animal vaccine cold storage facilities, construction of specified channel and dead animal harmless treatment for animal epidemic prevention

- Strengthen the monitoring, early warning and green prevention and control of diseases and insect pests, establish a traceability information system for the supervision and control of **the quality and safety** of agricultural products, and realize the interconnection of various traceability platforms and the sharing of regulatory information
- Dvelop pollution-free agricultural products, green food, organic agricultural products and agricultural products with geographical indications

#### **05** Control of Agricultural Non-point Source Pollution

- The 14th Five-Year Plan
- Build demonstration counties for comprehensive control of agricultural non-point source pollution:

**200**, in environmentally sensitive areas in key river basins such as the Yangtze and Yellow rivers

- Continue to promote the recycling of livestock and poultry manure
- Promote the treatment of aquaculture tailwater in major aquaculture producing areas

- Zero Increase in Fertilizers and Pesticides
- **Goals and Tasks:** Strive to achieve zero growth in the use of chemical fertilizers and pesticides by 2020
- Achievements: In 2017, the utilization rate of fertilizers and pesticides for rice, corn and wheat was 37.8% and 38.8%, respectively, and the zero increase of fertilizers and pesticides was realized three years ahead of schedule
- Monitoring and Control of Agricultural Nonpoint Source Pollution
- Base on the first national pollution survey in 2007, established the long-term national monitoring network for farmland non-point source pollution
- Achievements: Since 2013, the total phosphorus emissions from farmland began to decline, while the total nitrogen emissions stabilized

#### **06** Agricultural Cold Chain Logistics Facilities

- The 14th Five-Year Plan
- Build key cold-chain logistics bases for agricultural products:
  - **30** national and **70** regional
- Improve storage and fresh-keeping facilities in farmlands
- Upgrade cold-chain storage and transportation facilities in designated slaughtering-processing plants for livestock and poultry



#### Past Measures and Achievements

- Measures: By the end of 2020, various departments had issued a total of 14 policy documents on China's agricultural cold-chain logistics
- Achievements (2017 2019) : The scale of the domestic market is growing rapidly: 15.3% (Annual compound growth rate of ). 339.1 billion yuan(2019, the market size of the cold chain logistics industry), 17.5% (year-on-year growth).

Infrastructure construction is gradually improved: Cold storage construction scale: 60.53 million tons(2019, the total amount of cold storage), 8.145 million tons(new storage capacity), 15.6%( year-on-year growth );Size of refrigerated vehicles: 214,700(2019, the number of refrigerated vehicles in China ), 34,700(an increase of compared with 2018 ) and 19.28%( year-on-year increase)

#### **07 Rural Infrastructure**

#### The 14th Five-Year Plan

- Promote the construction of water source protection and water supply guarantee projects in rural areas
- Promote hardening roads in natural villages in light of local conditions, strengthen connectivity among village groups and build roads within villages
- Upgrade and transform rural power grids, improve the level of rural broadband networks, and strengthen operation management and protection

#### **The 13th Five-Year Plan** A pleasant countryside

- Move ahead with ensuring that new types of rural communities have access to centralized water supplies and that 80% of rural areas have access to tap water
- Make progress in the renovation of rural dilapidated housing, coordinate earthquakeresistant renovation efforts for rural housing, and basically complete renovation work on existing dilapidated houses

#### **08 Improving Rural Living Environment**

#### The 14th Five-Year Plan

- Lavatories: Move in an orderly way to improve lavatories in rural areas in underdeveloped areas and areas with high altitudes, cold and water shortages
- Living environments: Support 600 counties in improving their living environments
- Household garbage and sewage treatment: Building facilities

#### **The 13th Five-Year Plan** A pleasant countryside

- Lavatories:Undertake a complete overhaul of rural lavatories taking local conditions into account
- **Environment:**Comprehensively improve the environment in 130,000 administrative villages

#### • Household garbage and sewage treatment:

Launch a special campaign to treat rural household garbage, implement showcase projects for agricultural waste recycling,develop sewage and refuse collection and treatment facilities,progressively promote the treatment of household wastewater, and ensure that the household

refuse of 90% of administrative villages is treated

Improve river embankments

### **Future prospects**

- **D** Production efficiency
  - **D** Modern seed industry
  - **Green production**
- **D** Rural Infrastructure
- **Urban-rural integration** 
  - **G** Food system
  - Market development
  - **Digitalization**







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