

# Transitioning Australian research collaboration with China

## Future opportunities in conservation agriculture

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*Scaling up Conservation Agriculture to Accelerate Agrifood Systems Transformation in the Global South*

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Australian Centre  
for International  
Agricultural Research

**Australian  
Aid** 

# The Australian Centre for International Agricultural Research

- Independent agency within government for 40 years
- **Mandate:** brokering and funding agricultural research-for-development partnerships in the Indo-Pacific region for the benefit of the rural and urban poor.
- *A research partnership broker*
- *An arm of government for science diplomacy*



## 1. ACIAR-China collaboration in conservation tillage

- Early research
- Long term impacts

## 2. Trilateral collaboration opportunities



# The early research...

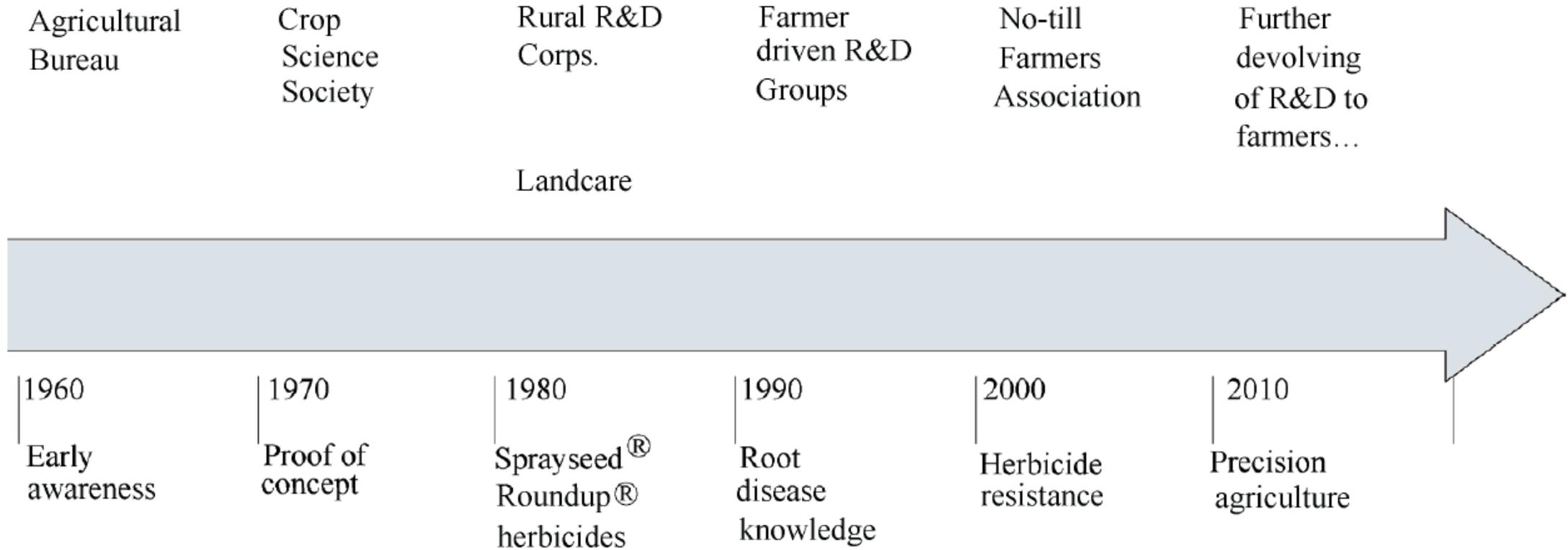
In the 1980's and 1990's farmers in the north China Plain were experiencing severe water shortages.

Stubble burning & heavy use of agricultural chemicals.

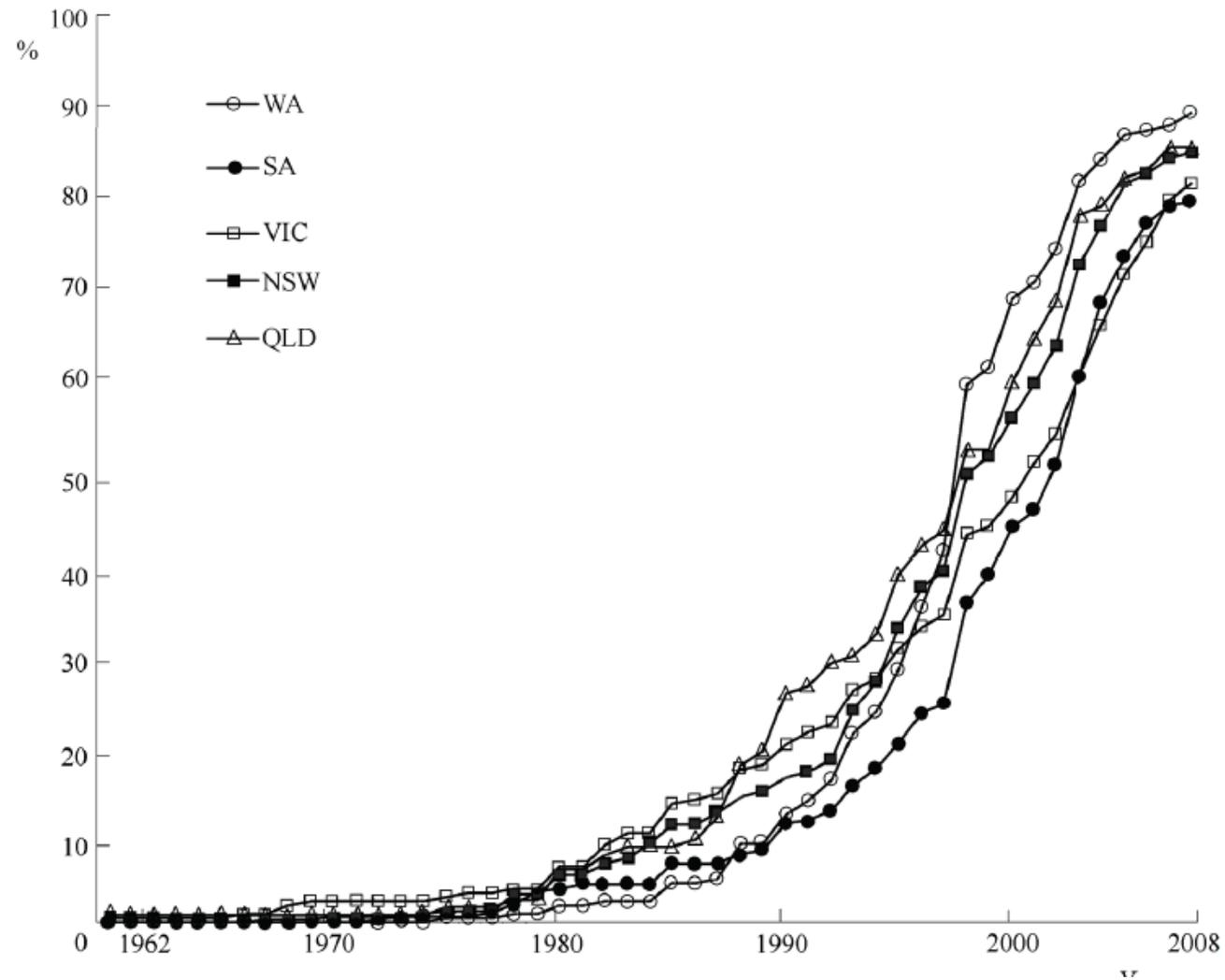
In Australia, minimum or zero till were not new concepts. Machinery development was a key issue.



## Key developments in farmer participation in conservation agriculture



Source: Bellotti and Rochecouste (2014)



Cumulative adoption (survey %) of no till cropping systems in Australia (Source: Bellotti and Rochecoste 2014)

In 2022 approximately 23 million hectares under no-till equal to 67% of cropland.

# The early research...

Opportunity to demonstrate practices and associated benefits presented an opportunity to facilitate interest and adoption in CTF.

Two projects from 1992-2003:

1. Conservation/zone tillage research for dryland farming
2. Sustainable mechanised dryland grain production



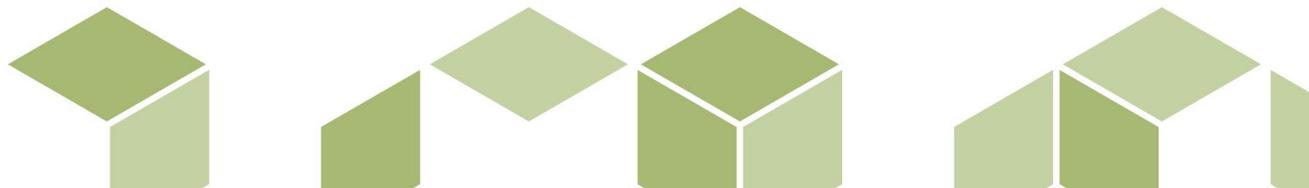
中國農業大學  
China Agricultural University



# The early research ...

The two projects aimed to assess if and how conservation tillage (CT) technologies developed in Australia could successfully be adapted to China through research on:

1. equipment and residue treatment methods
2. economically and socially viable CT systems suitable for wheat and maize in north-western China



# The impacts...

In 1993, there were 1,300 hectares of wheat and maize under CT (0.1% of total area)

At the end of the projects in 2003, there were:

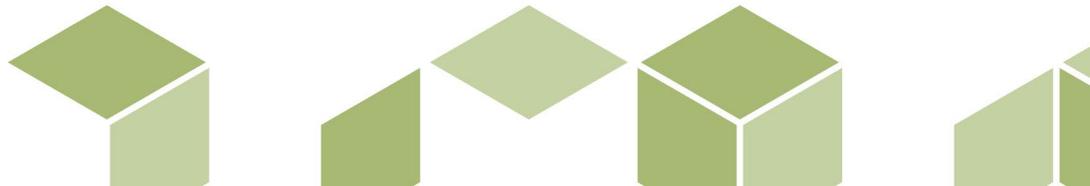
- 220,000 hectares of wheat and maize under CT (1.2% of total area)
- 20 no-till planter factories as a result of CT uptake
- Policy impact



# The impacts...

In 2018, there were:

- 8.2 million hectares wheat and maize under CT (25% of total area)
- A plan to reach 60% of total area under CT
- Equipment innovation (>100 factories producing CT equipment with >50% based on CAU prototypes)
- Illegal to burn straw residue from tillage



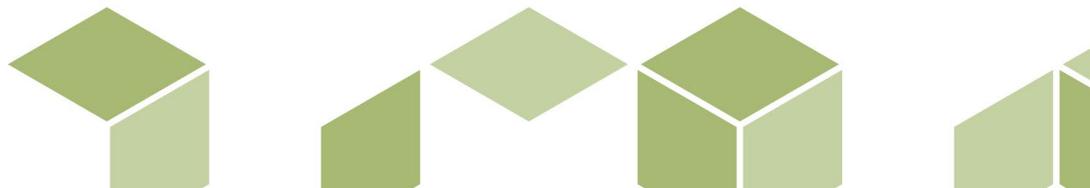
# The impacts...

In 2018:

- Meta analyses of >60 research papers showed 4-8% increases in yield, significant increases in soil organic carbon, water retention and reductions in GHGs.
- China Institute for Conservation Tillage at CAU (2019)

Multiple factors delivered these outcomes

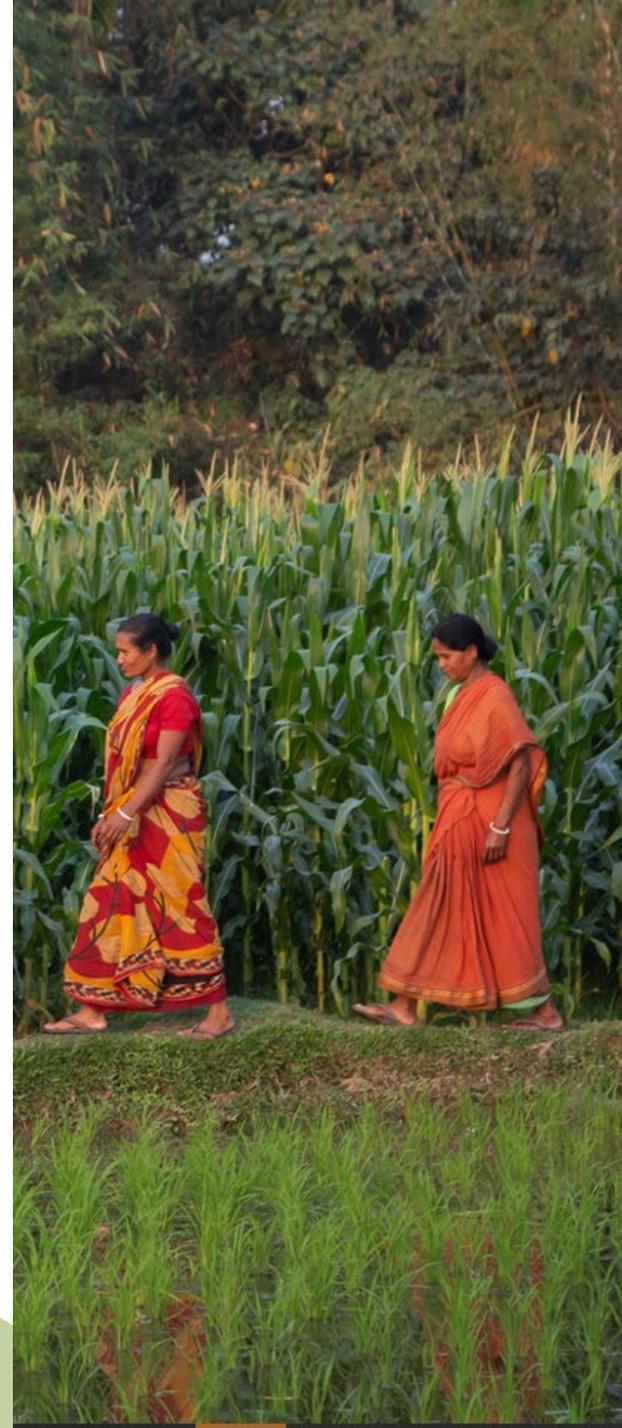
ACIAR acknowledges Professor Li Hongwen and his teams at CAU and CICT for these very significant achievements



# Trilateral collaboration opportunities...

Our relationship with China has transitioned quickly from bilateral research collaboration to trilateral opportunities in east Asia and the Pacific

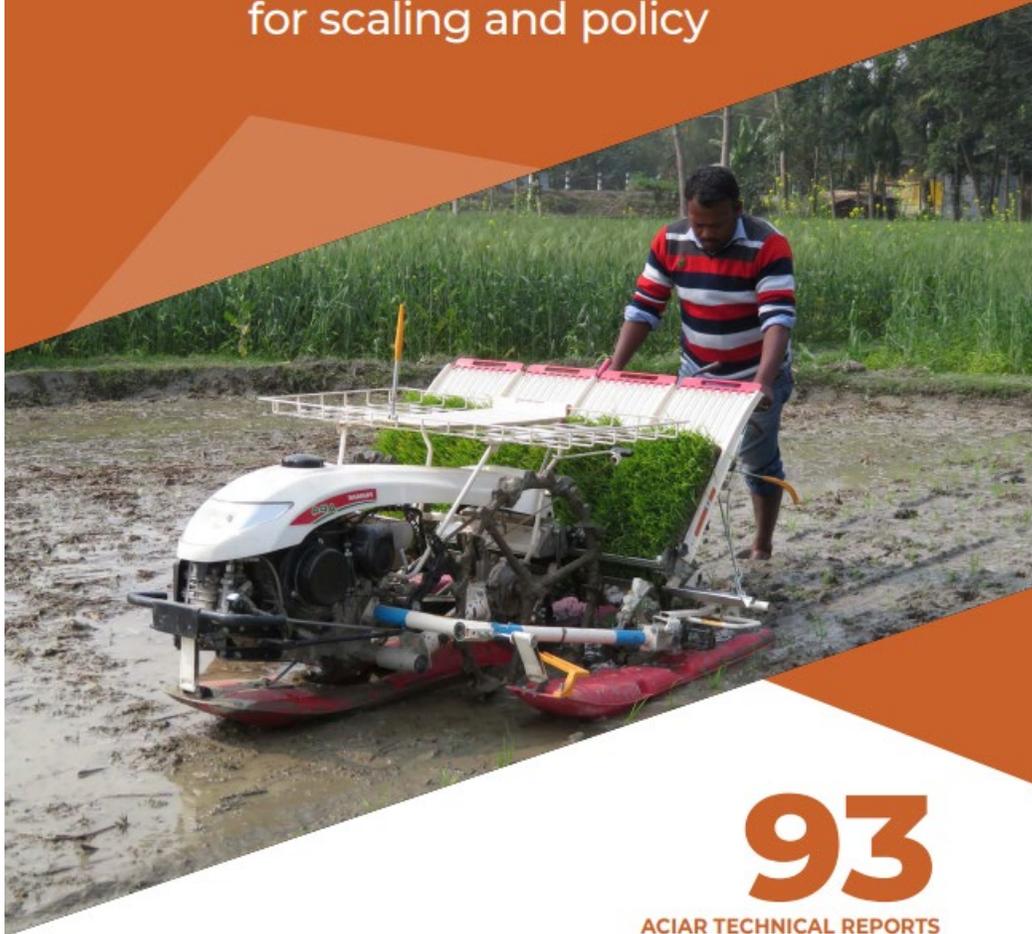
Since 2003, ACIAR has expanded research collaboration on CT to South Asia, Africa and the Pacific.





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## Implications of conservation agriculture–based sustainable intensification technologies for scaling and policy



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## SUSTAINABLE INTENSIFICATION OF MAIZE-LEGUME SYSTEMS FOR FOOD SECURITY IN EASTERN AND SOUTHERN AFRICA (SIMLESA)

### LESSONS AND WAY FORWARD



ACIAR MONOGRAPH 211

# Trilateral collaboration opportunities...

Aging populations and declining natural resource base but opportunities for some farmers to step up into markets

Critical shortage is appropriate CT machinery and business models – strength of China.

