

The Economics of Ecosystem and Biodiversity (TEEB): Promoting a Sustainable Agriculture and Food Sector China project: progress report

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Outline

- 1. Agri-food system and biodiversity**
2. Road so far
3. Agri-food policies in Yunnan Province and Tengchong City
4. Scoping and scenario setting
5. What's next

Globally

We have achieved

- Hiring over 1/3 of world labour
- Sustenance to the poor

At the expense of

- 80% new farmland converted from rainforests since 80s
- Plantation and pasture produce 5–6 billion tonnes ($\text{CO}_2^{\text{equiv}}$) of greenhouse gases annually
- Appropriating 70% of freshwater
- Non-point source pollution
- Etc.

China

Pollution

- **19.4% of farmland monitor sites exceeding threshold (2014)**
- **Fertilizer efficiency 40.2%, chemical efficiency 40.6% (2020)**
- **Water contaminants from agricultural sources (2017): COD 10.67 million Tones (2020)**
- **Etc.**

Land-use

- **Soil fertility 20-30% lower than developed countries (2015)**
- **Moderately and highly degraded grassland and pasture > 1/3 (2017)**
- **Increased farmland in deserts, over-grazing, using eco-restoration water (2015)**
- **Etc.**

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TEEB for Agriculture & Food

An initiative of 'The Economics of Ecosystems and Biodiversity' (TEEB)

Reports Projects Events Media Team

protect biodiversity and contribute to a more sustainable agriculture and food sector' (Malaysia, Mexico and Thailand), with a view to moving towards a level playing field by 2030. It is based on an internationally agreed methodological framework, introducing the concept of ecosystem services and biodiversity.

Beijing—July 2019

2020年7月3日
腾讯会议室ID: 964 587 149



Promoting a Sustainable Agriculture and Food Sector—Implementation

20–21 August 2019, Beijing China

- Facilitated by UNEP-IEMP
- Implemented by IGSNRR, CAS and CRAES, MEE
- Inception workshop in Aug 2019
- First PSC meeting in Jul 2020
 - Tengchong selected as project site
- First field survey in October 2020
- Second PSC meeting in Feb 2021
- Second field survey coming soon...

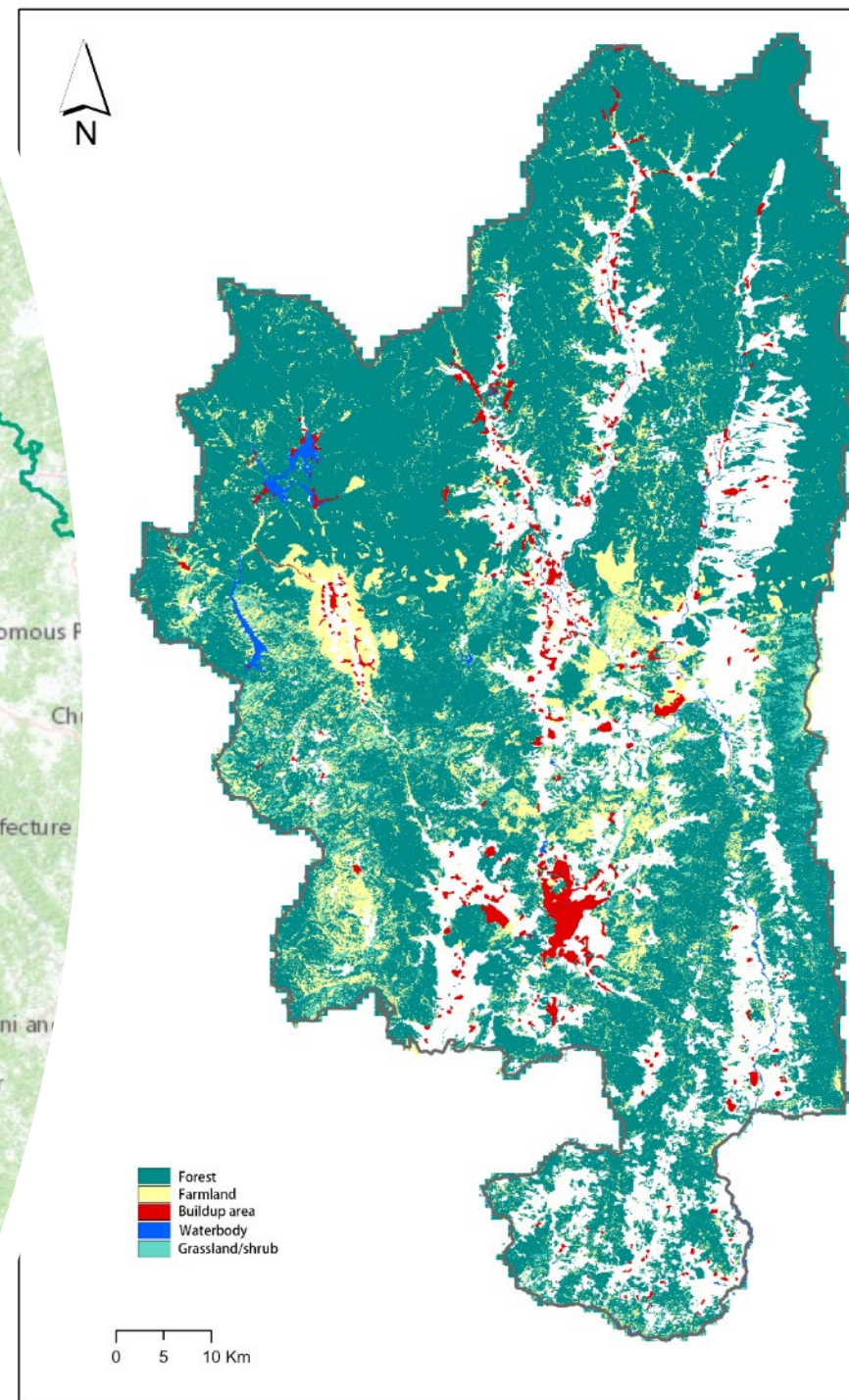
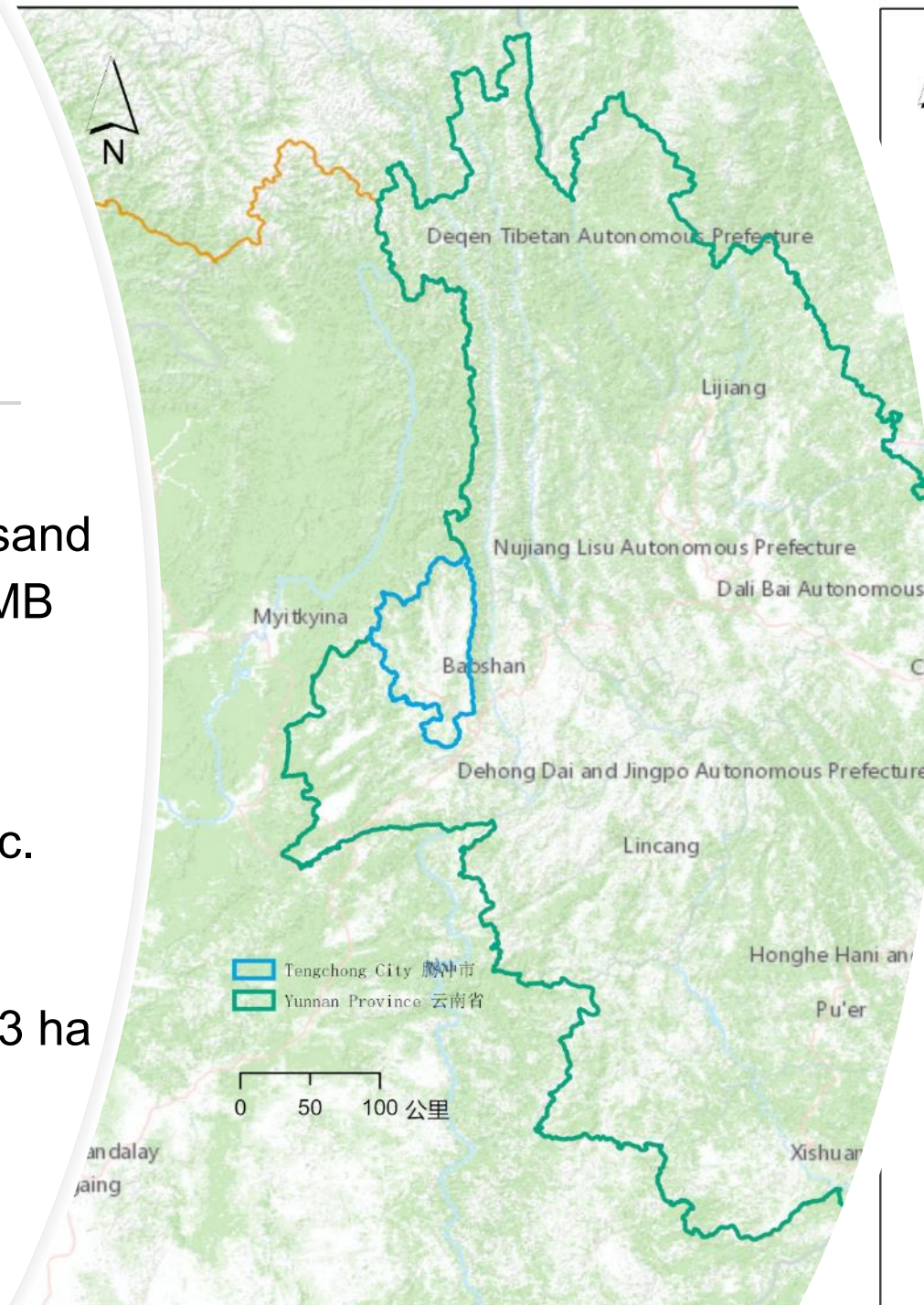


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Tengchong City

- Area: 5848 km²
- Population: 689 thousand
- GDP: 25,27 billion RMB
 - Primary sector 18.6%
- Climate: subtropical monsoon, annual prec. 1531mm,
- Forest coverage 75%
- Basic farmland 66,653 ha (81.4% of total)



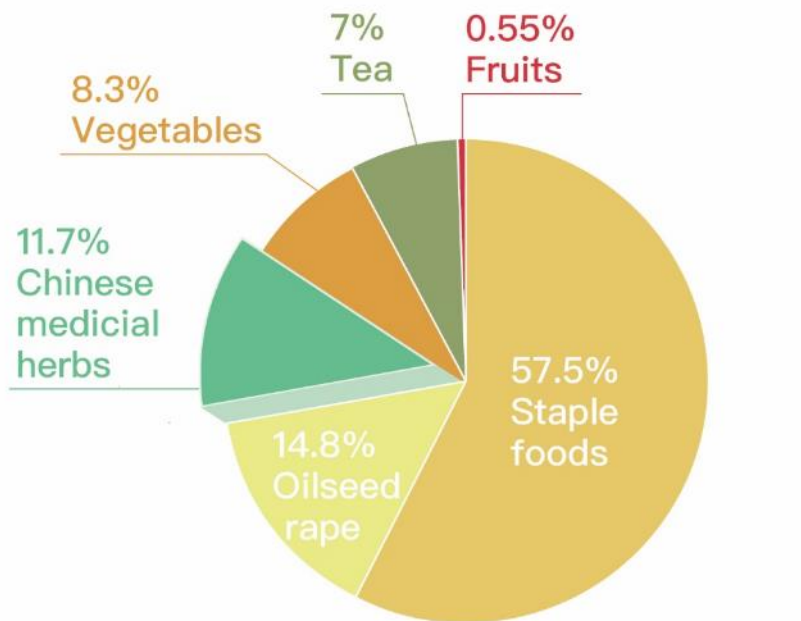
Current status and trends of Tengchong's Agricultural system

Plantation



GDP 4 billion yuan (2020 Q1-3)

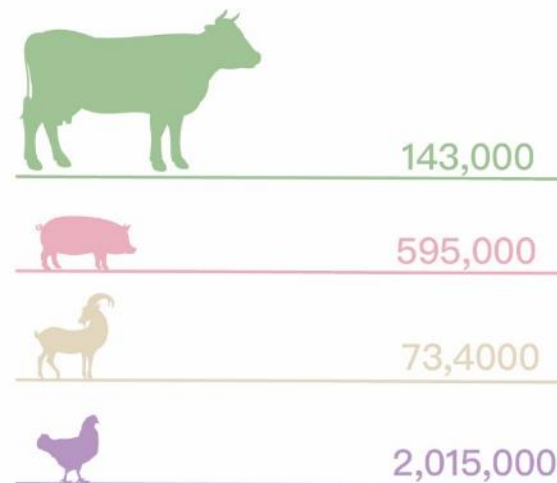
Area of plantation (%)



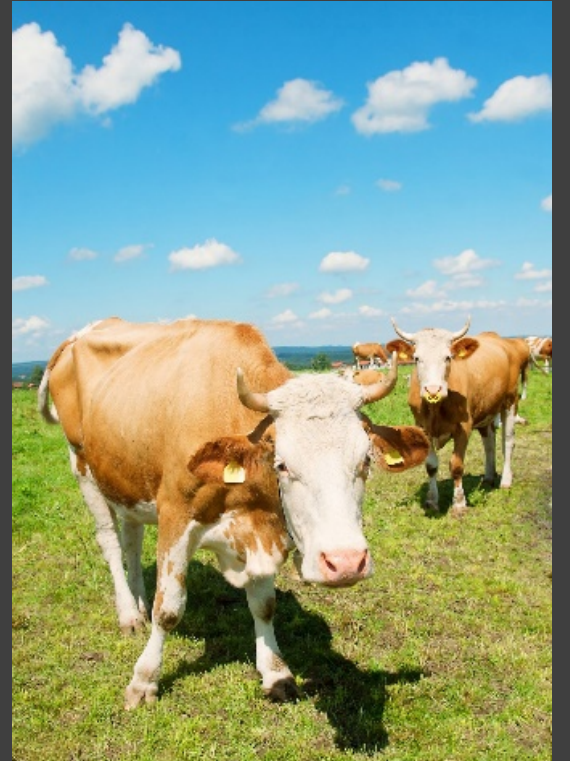
Beef cattle breeding

GDP 2.4 billion yuan (2020 Q1-3)

Stock (head)



Yunnan's push for green food brands



Tengchong's need for transition

National agenda

- Reduction and efficiency rise for fertilizers and chemicals
- National biodiversity conservation strategy and action plan

Local

- Under-canopy medicinal herbs
- Beef cattle breeding
- Healthy living destination
- Biodiversity conservation base

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Driving forces

Natural environmental

- RCP4.5
- RCP8.5

Socio-economic

- Demographic change
 - Total population
 - Population structure
- Urbanisation
 - Expansion of urban area
 - Labour migration
 - Dietary structure
- Agricultural policies

Tengchong's agricultural system

Beef cattle breeding

- Ecological pasture
- Standardized breeding
- Combined planting-breeding
- Conventional free-range

Plantation

- Conventional crops
- Endemic species
- Under-canopy plantation

Industrial integration

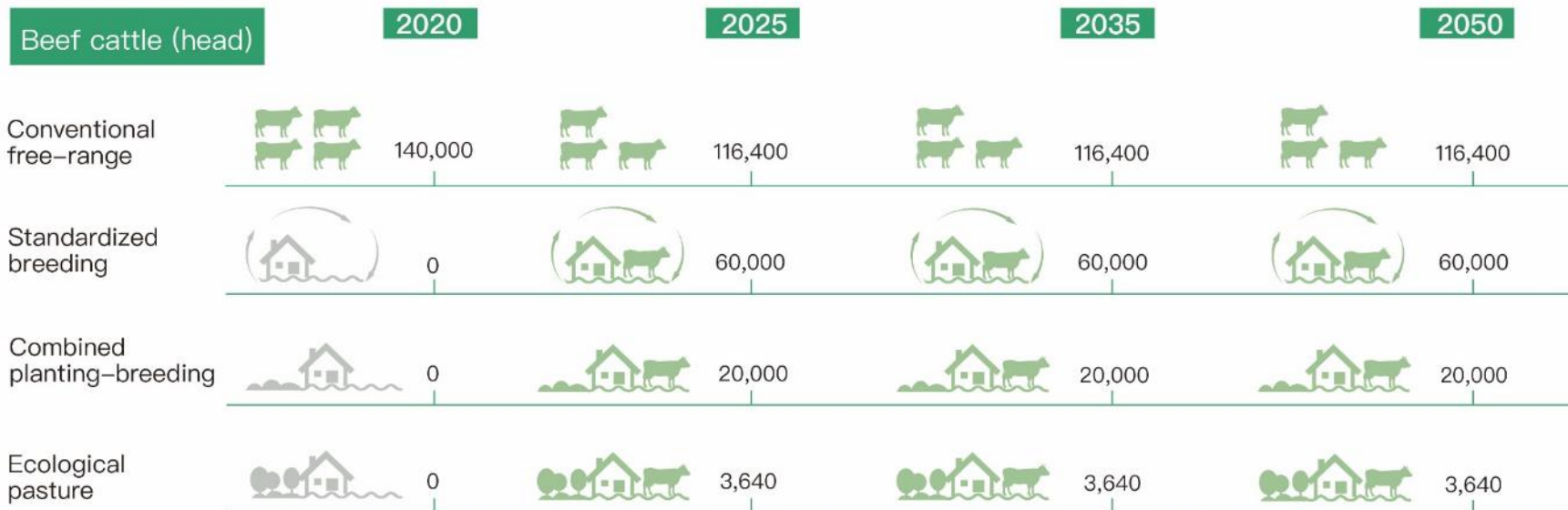
- Agricultural product processing enterprises
- Product quality and brand certification
- Rural tourism and agricultural tourism
- Integration of primary, secondary and tertiary industries

Scenario setting and time scale

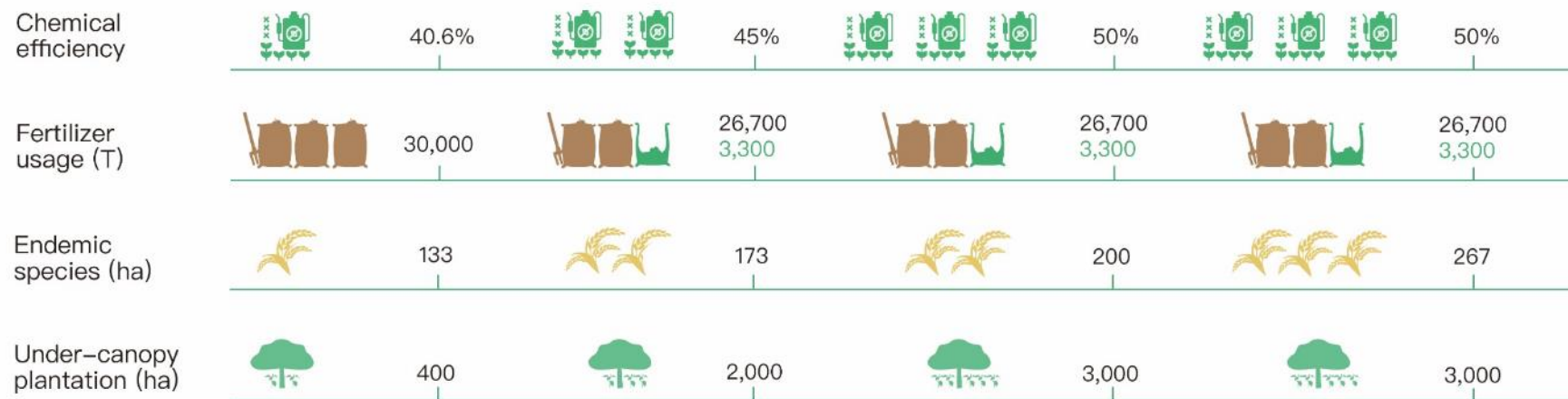
Scenario 1 RCP4.5 + BAU	Scenario 2 RCP4.5 + Optimistic	Scenario 3 RCP4.5 + Pessimistic
Scenario 4 RCP8.5 + BAU	Scenario 5 RCP8.5 + Optimistic	Scenario 6 RCP8.5 + Pessimistic

Short-term (2020-2025)	Mid-term (2020-2035)	Long-term (2020-2050)
<ul style="list-style-type: none">• Endpoint of the 14th Five-year plan	<ul style="list-style-type: none">• Basic realisation of modernisation• Formation of green production and lifestyle	<ul style="list-style-type: none">• Second century-goal• Overall improvement in ecological civilization

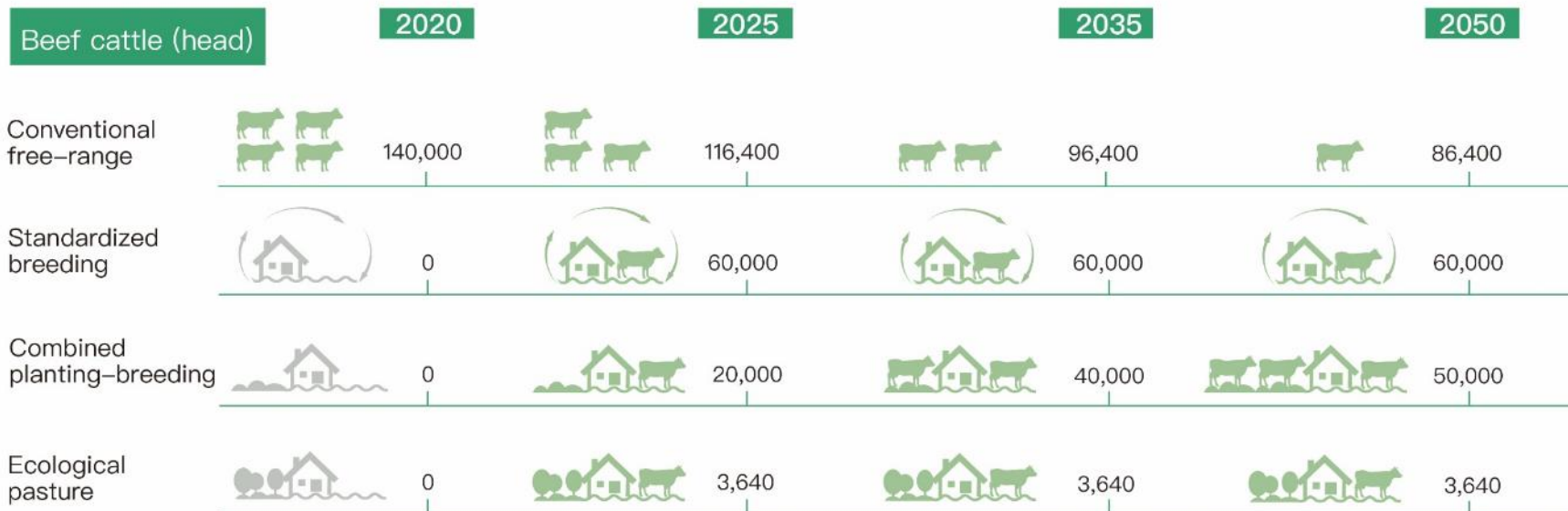
Business as usual



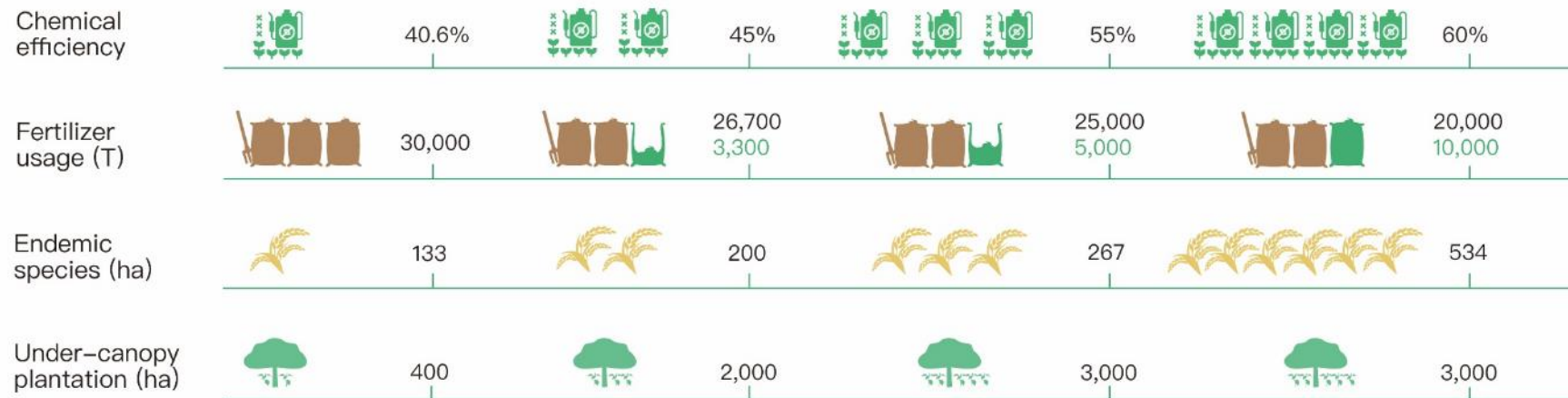
Plantation



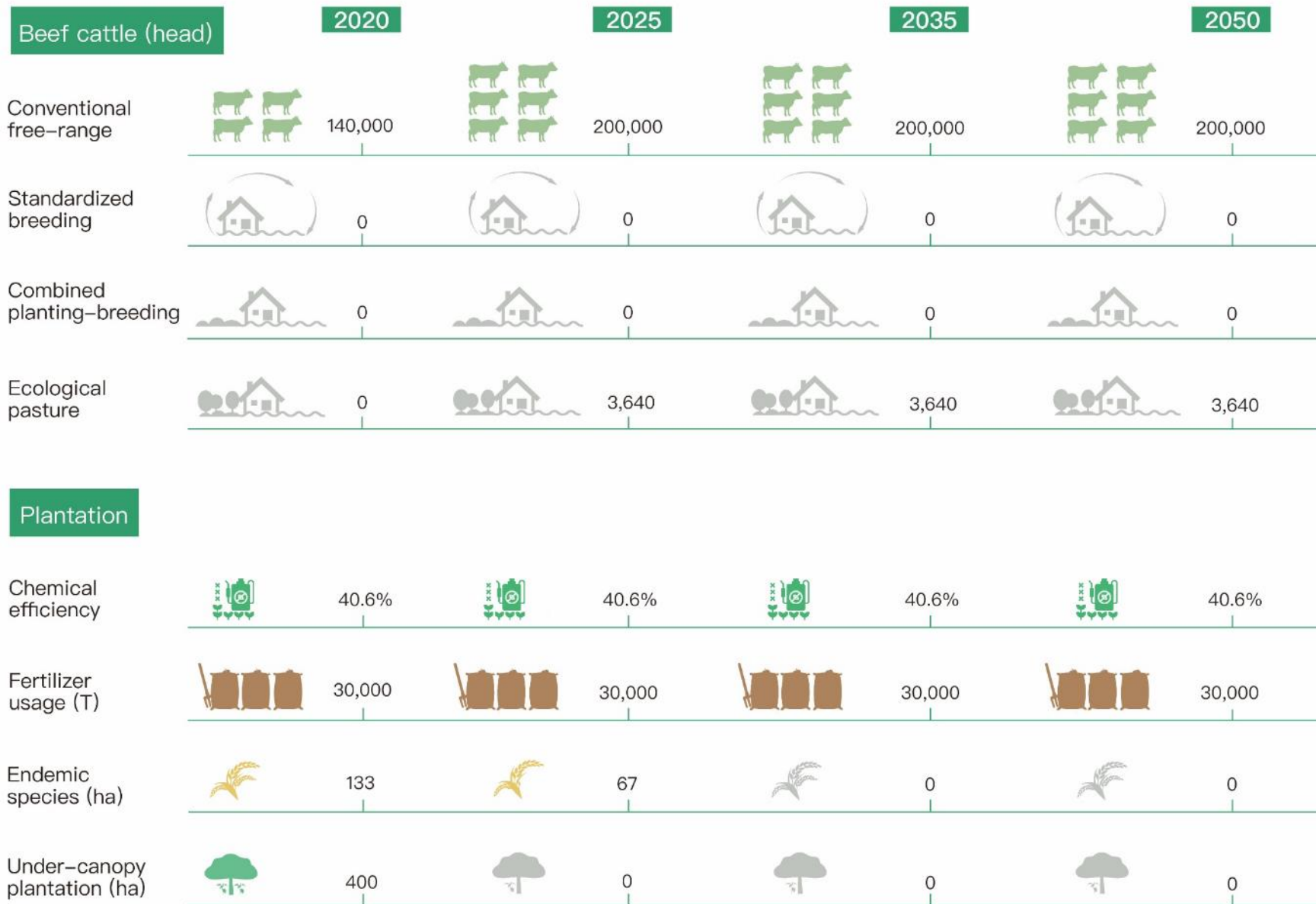
Optimistic scenario



Plantation



Pessimistic scenario



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Objective

Natural capital

Human capital

Social capital

Produced capital



Objective

Natural capital

ES to be assessed

- Carbon sequestration
- Water quality and quantity
- Soil fertility/erosion/degradation
- Biodiversity services (pollination, pest control, etc.)

Human capital

Social capital

Produced capital



Objective

Natural capital

Human capital

Human factors to be assessed

- Labour composition/structure
- Education
- Health
- Etc.

Social capital

Produced capital



Objective

Natural capital

Human capital

Social capital

Social factors to be assessed

- Employment opportunity (government, large industries, educational institutions, etc.)
- Equality (job, gender)

Produced capital



Objective

Natural capital

Human capital

Social capital

Produced capital

Produced factors to be assessed

- Infrastructure (road, irrigation, electricity, running water, etc.)
- Economic structure
- GDP

Data and method

LULC modelling

- **LULC historical data**
- **Development potential (fitness)**
- **Rules of transformation (restrictions)**
- **Development need**

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Invest modelling

- **Based on LULC**

Data and method

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- **Based on LULC**
Watershed map
Vegetation types
Biodiversity conditions
Forest survey results
National census data



International Ecosystem Management Partnership
国际生态系统管理伙伴计划



Thank you for your attention!

UN Environment Programme-International Ecosystem Management Partnership (UNEP-IEMP)

Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences (CAS)

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<http://www.unep-iemp.org>