PRO AGRO LECTORIUM

How to Make Policies to Promote Technological Innovations to Address Farmers' Adaptation Needs?

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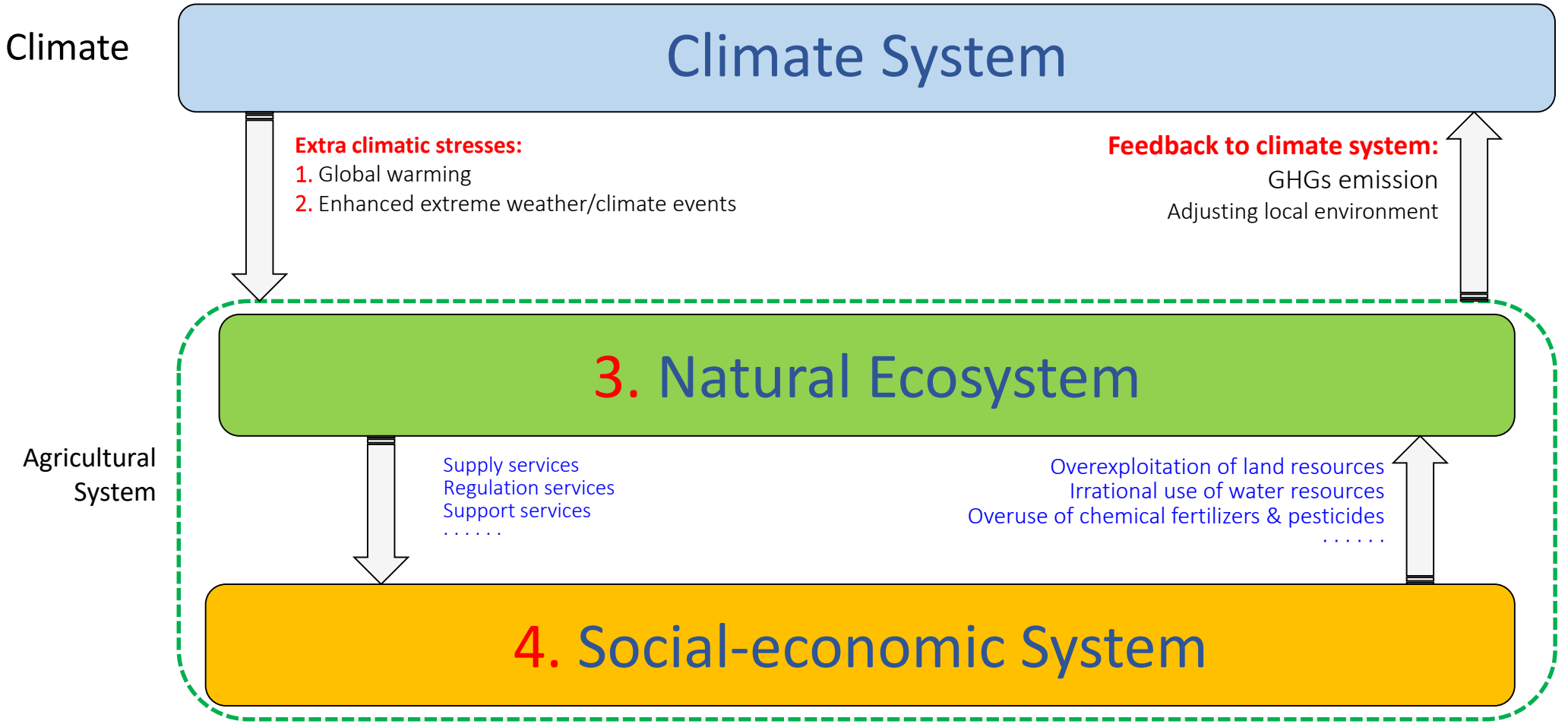
Interaction of Climate ~ Natural Ecosystem ~ Agri-Food System



Logic Layers of Agricultural Adaptation to CC

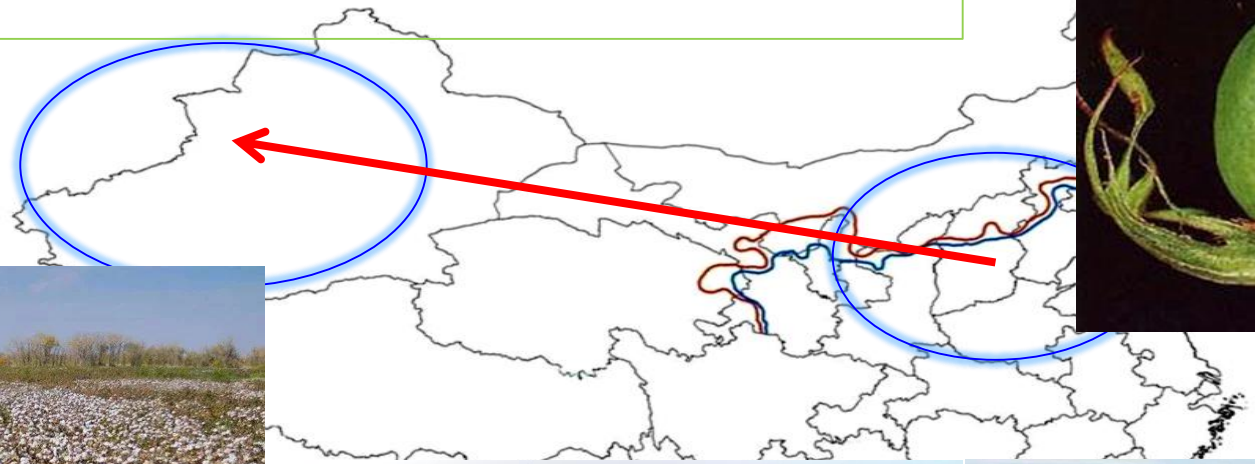
Layers	Adaptation Challenges	Tasks
Average trend	Warming, increase /decrease of precipitation; Chronic drought; Elevation of CO_2 concentration	Utilization of Climatic Resources
Enhanced Extreme Climatic Events	Flooding; Drought; Hot/Cold temperature; Complex extreme events	Strengthen Disaster Reduction
Ecological consequences	Land degradation, Soil erosion, Desertification, Loss of biodiversity, Outbreak of pest & disease, Reduction of ecosystem service	Exploiting the Ecosystem Services to increase Agricultural Climate Resilience
Social-economic consequences	Policies, plans, livelihood, economic structure, infrastructure	Establishing Social Innovative Mechanism to Guarantee Food Security

National Climate Change Adaptation Strategy 2035 — Average Trend

- Optimize the layout of utilization of Agro-climatic resources
- Precise climatic zoning
- Adjust the cropping pattern & structure
- Raise the multi-cropping index
- Northward shift of crop planting boundaries
- Breed Stress-resistant crop varieties
- Promote geographical indication of China's agricultural products

Utilization of Climatic Resources - Case of Extended Cotton Planting in Xinjiang

Technology System in XJ: Lower height; Intensive planting; Early Sowing



National Climate Change Adaptation Strategy 2035 — Disaster Reduction

- Complete the early-warning system according to the new features of agro-meteorological disasters, as well as the diagnosis standard
- Strengthen the material provision
- Develop the adaptive/variable disaster reduction system
- Enhance the application of water-saving technologies

National Climate Change Adaptation Strategy 2035 — Ecological Adaptation

- Strengthening soil and water conservation and ecological protection
- Promoting conservation farming
- Developing agro-forestry and 3-D farming in hilly areas
- Encouraging intercropping
- Adoption of hi-efficiency pesticide & ecological control on pest & disease
- Preventing invasive alien species
- Increasing agro-biodiversity
- Promoting formula fertilization
- Constructing high standard farmland (1.05 billion Mu, 1 Mu=1/15 ha)
- Enhancing germplasm resource protection, building seed banks
- Protecting agricultural heritage
- Optimizing farm landscape design

A Typical Case in China: Rice-Fish-Duck Symbiosis System

Duck & Fish: eat rice hopper, manure as organic fertilizer and ecological measures to control rice disease; control weeds; loosen the soil & increase soil oxygen content ……

Rice: shading for duck & fish, feeding to duck & fish……

Benefits: organic food; increase of soil nutrients; biodiversity; high resilience to drought & flooding—stable production……

National Climate Change Adaptation Strategy 2035 — Social-Economic Adaptation

Principle: Completing the food security guarantee system

- Adjust the layout of agricultural infrastructure according to changed agro-climatic resources
- Redline of 1.8 billion Mu arable land, creating high-standard farmland
- Promote practice of Climate-Smart Agriculture
- Encourage technical innovation-Adaptation Technology System
- Establish the demonstration bases of adaptation technology
- Innovation on the mechanism of disaster sharing & transfer, e.g., disaster insurance mechanism

Innovation on CSA Tech — Big Data & IoT

Data Source: Kebai Beijing Ltd

Effects of Climate-Smart Technology

July, 2017, **hot temperature event**

Data Source: Kebai Beijing Ltd

Effects of Climate-Smart Technology

12 March, 2018, **cold temperature event**

Data Source: Kebai Beijing Ltd

Co-benefits of IoT & Big Data Technology

- Save Water: 50%
- Save Fertilizer: 40%
- Save Pesticide: 35%
- Save Electricity: 50%
- Save Manpower: 95%

Mitigation

Adaptation

- Avoid Heat Damage: 100%
- Avoid Frost Damage: 100%
- ……

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Thank you!