

Adaptation of Chinese Agriculture to Climate Change: Policy Implications for Mainstreaming

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1. understanding the impacts
2. equipping for adaptation;
3. working in partnerships;
4. Policy Implications for Mainstreaming



Climate change with adaptation has taken mix effects for agriculture in different regions of China



Liu YJ

■ The impacts of climate change in China have been validated by observed data..

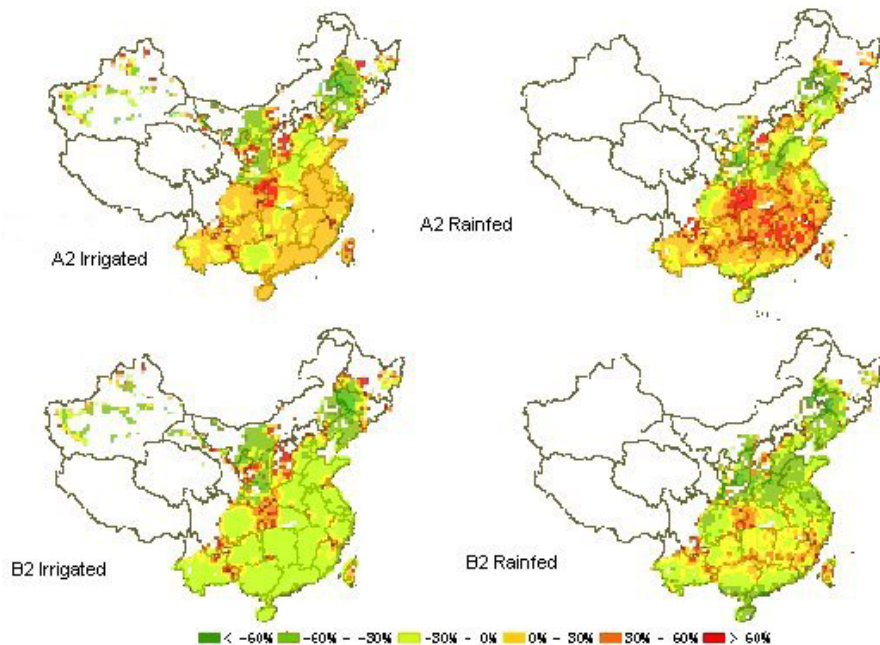
■ NE +

■ NC, NW, SN –

■ SE, SM °



Impacts will vary by extent of adaptation



Rice yields 2080s

- Adjust cropping calendar and crop rotation
- Improve irrigation and water-saving technologies
- Selection of planted crops based on changed climate and prices
- Adopt heat-resistant crops, water-efficient cultivars

	Change in average yield (%)*					
	With CO ₂ fertiliser effect			Without CO ₂ fertiliser effect		
	2020s	2050s	2080s	2020s	2050s	2080s
A2: rainfed	2.1	3.4	4.3	-12.9	-13.6	-28.6
A2: irrigated	3.8	6.2	7.8	-8.6	-12.4	-16.8
B2: rainfed	0.2	-0.9	-2.5	-5.3	-8.5	-12.7
B2: irrigated	-0.4	-1.2	-4.9	-1.1	-4.3	-12.4

Projected function of adaptation in China

Warming	1~2°C (2020)	2~3°C (2050)	3~5°C (2080)
water	All regions balance	N China: -2% NW China: -3%; others: balance	N China: -1% NW China: -4%; others: balance;
Agriculture	additional water requirement; Cold disaster alleviated in NE China	Crop yield decrease 5~10%, variation among regions and crops ;550 ppm CO2 increases C3 crop yield 17%; Adaptation increases all crops above baseline yield	Adaptation with CO2 fertilization effect of 560~720 ppm will set off a decrease of crops production due to the warming climate in 3.2~3.8°C,

Adapt extreme events as adapt CC

A regional cooperation study is ongoing, funding new cross-sectoral studies with contributions from regional bodies: water, poor reduction, extreme climate events

- assess the impact of cc on water management & infrastructure,
- examine the effect of realistic scenarios of single and combinations of extreme drought events on water resources,
- consider the adequacy of current policy and guidance for managing water in the context of extreme climate, and
- recommend how decision-making and management could be improved.



Equipping for Adaptation

- Stakeholders are increasingly looking for practical advice on **how to undertake adaptation**, and this needs to draw on a suitable toolkit, the latest academic research, as well as **experiences already engaged in adaptation**.
- The advice needs to address **the institutional or 'process' aspects of developing and implementing adaptation**, so that it explains how climate risks can be mainstreamed within an organization. Where it is available, sector-specific information, e.g. on climate-proof technologies, is also invaluable.
- To **have excellent contacts with most of the local organizations** that are active on adaptation, so we are well-placed to work alongside them to further develop our understanding of the practicalities of mainstreaming adaptation.

Develop the practical, on-the-ground experience that so many of stakeholders are seeking.

- Develop the existing toolkit, including: database; assessment tool, guidance, socio-economic information; risk, uncertainty and decision-making framework; costing method; adaptation wizard.
- Develop a checklist or scoring tool so that stakeholders can self-assess their adaptive capacity and the quality of their adaptation strategy development process.
- utilizing the twin-track adaptation typology ('building adaptive capacity' and 'delivering adaptation actions')
- Assist a local authority or a group of local authorities in addressing climate adaptation as part of Environmental Assessment of local projects and plans;

Guidance and Partnership

- Develop guidance on adaptation, **drawing initially on academic research**, and on the experiences of those decision-makers who have already begun to develop adaptation strategies and who have not yet begun to plan for adaptation through ‘**learning by doing**’ The emphasis is on practical guidance both **technically and institutionally**, including case studies.
- Work in close partnership with stakeholder organizations that are more advanced in their thinking on adaptation, to develop a deeper understanding of **how adaptation is already happening in practice**.



Working in Partnership

- To **promote consistent programs** of work on impacts and adaptation across China, working through partnerships with stakeholders and other researchers in regional national contexts.
- This will involve equipping regional partnerships and networks, fostering collaborative relationships with NNSF and other Chinese centers in climate change research, and exploring options for increased leverage of stakeholder funds.
- **UNFCCC may play more important roles in international cooperation**

Policy Implications for Mainstreaming

- Identify the issues with CC in their plans
- Contract with partnership for adaptation
- Involve adaptation in project environment assessment reports
- Hortative policy implications, winter wheat, promoting large scale plantation of superior crop varieties in suitable areas; water saving
- Involve adaptation in government plans of different levels



Establish a Procedure for Monitoring and Sharing New Adaptation

- we are fairly successful at monitoring developments in China climate impacts on agriculture research, but we have yet not to standardize this process for adaptation use
- we have evaluated gaps in research and consulted stakeholders on how to address them on a relatively informal and ad-hoc basis.
- A wide array of adaptation options is available, but more extensive adaptation than is currently occurring is required to reduce vulnerability to future climate change. There are barriers, limits and costs, but these are not fully understood.

Looking Future Cooperation under UNFCCC