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Adapting to Climate Change in China
Sharing Knowledge Globally

Dealing with Climate Uncertainty and Risk in Social Assessments

如何处理社会评估中的气候不确定性和风险

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Overview 概论

- Definitions of vulnerability and risk
  脆弱性和风险的定义
- Questions to answer when conducting RAs:
  进行风险评估时需要回答的问题
  - Extreme event analysis and hazard thresholds
    极端事件分析和灾害临界点
  - Scenario creation 情景创建
- How VA and RA support identification of adaptation options.
  脆弱性和风险评估如何支持选定适应对策

Definitions 定义

- Risk = ƒ(likelihood of hazard or impacts, vulnerability)

  风险=ƒ(灾害/影响的可能性,脆弱性)
- Vulnerability = ƒ(sensitivity, exposure, adaptive capacity)

  脆弱性=ƒ(敏感性,暴露程度,适应能力)

Vulnerability and Risk Assessments
脆弱性和风险评估

- Phase 1: Assessments of Current climate vulnerability and risk:

  第一阶段: 当前气候脆弱性和风险的评估

  - Who/what is vulnerable to which current climate hazards and what are the underlying factors that contribute to their state of vulnerability? 谁/什么对当前什么气候灾害有脆弱性? 有哪些因素促成这些脆弱性?
  - What are the historical levels of risk associated with each current climate hazard or its impacts? 与现存气候灾害/影响相关的风险的历史等级是什么?

- Phase 2: Developing scenarios of Future vulnerability and risk:

  第二阶段: 建立未来脆弱性和风险的情景

  - How might vulnerability change in the future if exposure, sensitivity or adaptive capacity change? 如果暴露程度,敏感度, 适应能力在未来发生改变,脆弱性会发生怎样的变化?
  - Given changes in the likelihood of climate hazards (derived from climate science) or their impacts + scenarios of vulnerability, how might risk change? 气候灾害的可能性如果发生变化,或其影响或脆弱性情景发生变化, 风险将如何改变?
    - If various options are implemented, how will these options change risk levels? 如果采取不同的适应对策,这些对策将如何改变风险等级?

Focusing Future Vulnerability and Risk Scenario Development 未来脆弱性和风险情景制定

- Identify critical thresholds or sensitivities from assessments of current vulnerability and risk, stakeholder consultations 从现在的脆弱性和风险评估及利益相关者讨论中选定重要临界点或敏感领域
- Identify current decision priorities and perceptions of allowable risk from stakeholder consultations 选定当前的优先决策,(利益相关者讨论中)确定可接受风险的观念
- Identify timelines and geographic scales of concern for various types of decisions. 为不同的决策类型选定时间尺度和地理规模
- Identify uncertainty – the range in climate projections for various types of hazard events & in socio-economic projections 甄别不确定性—所作的气候预估(针对不同灾害)及社会经济预估中得到的系列值

Critical Thresholds – Changing Sensitivity
重要的临界点—改变中的敏感度

- Where people, their livelihoods or critical systems are particularly sensitive to:人们的生计/生活/重要系统对以下情况尤其敏感:
  - Climate variability and extremes 气候变异和极端事件
  - Changes in mean climate – gradual shifts in temperature, precipitation or seasons 平均气候值的改变:气温，降水或季节的逐渐改变
  - Changes in social or environmental conditions 社会/环境情况的改变

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Critical Thresholds – How to Find
重要临界点-如何寻找

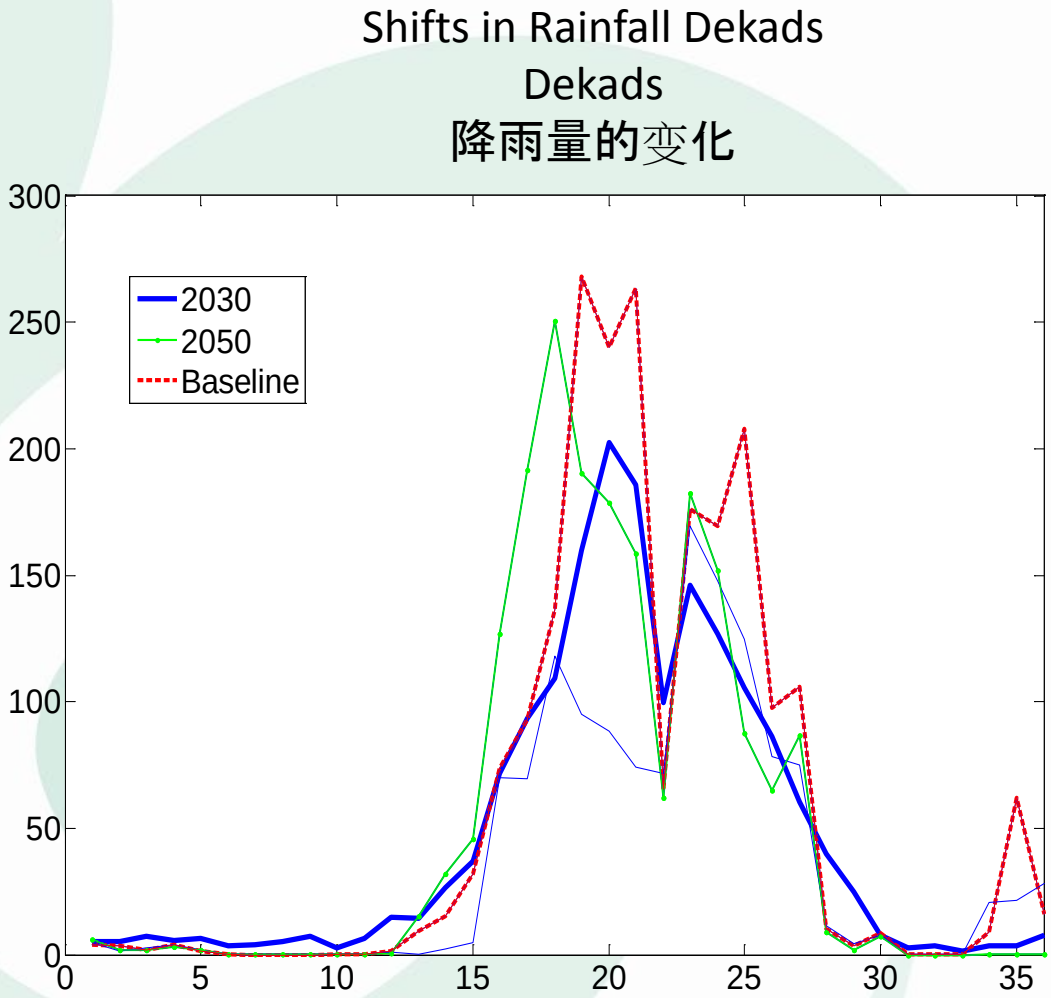
分类		财务影响		非财务 影响	
		直接影响/财务	间接影响/经济	直接	间接
社会层面	家庭 农户 农场的工作人员 社区 健康 教育 稳定性 凝聚力			受灾人口	食品安全 营养不良 移民
经济层面	私人领域： 家庭 经济领域： 农业 工业 商业 服务业 公共领域： 教育 卫生 水和污水处理 电力 交通 能源消耗	作物受到影响或破坏	家庭收入 贫困 债务 生产力 市场行为 对外贸易 市场 救灾的花费	饮水（人畜）	

Critical Thresholds – Extreme Events Analysis
重要的临界点-极端事件分析

- Climate statistics – 5th, 10th, 90th and 95th percentiles
- 气候统计-按照5%，10%，90%和95%的数据统计

OR 或者

- Critical thresholds as identified in baseline VA and RA 选择脆弱性评估和风险评估基线调查中确定的重要的临界点



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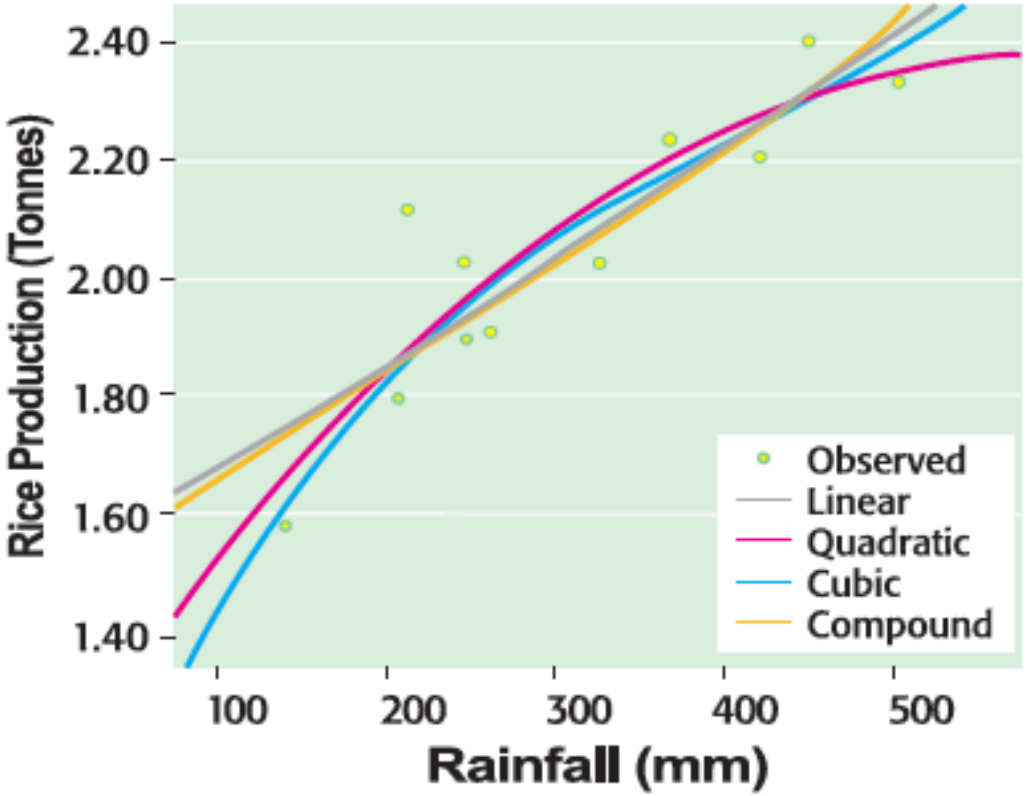
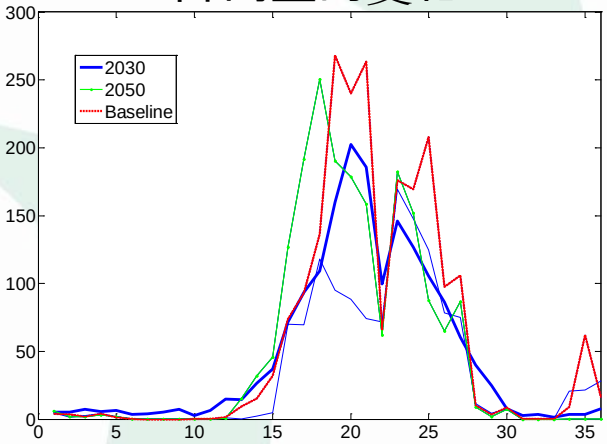
Critical Thresholds – Sensitivity Analysis
重要的临界点-敏感度分析



Shifts in Rainfall Dekads

Dekads

降雨量的变化



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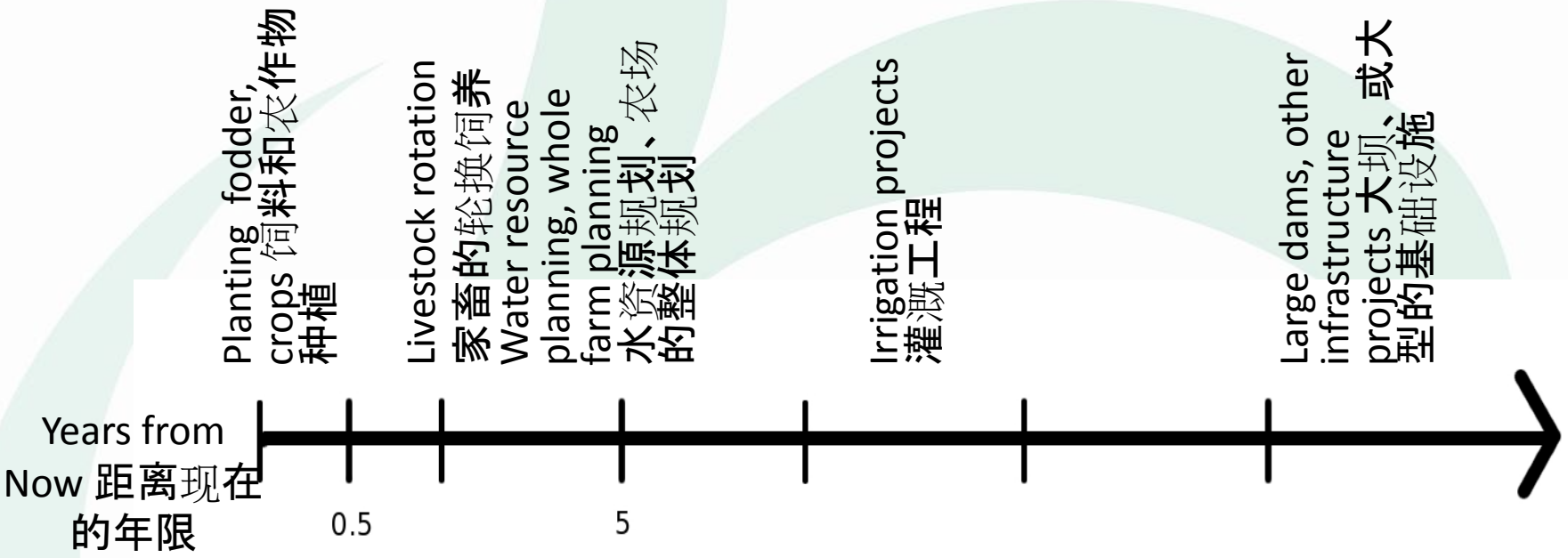
Timelines and Geographies of Future Risk
未来风险的时空分布



Extreme Events
极端事件

Bad winter storm
严重的冬季风暴

Multi-year drought
多年的干旱

Changing Trends
变化趋势

Increased rainfall variability
降水变化的加剧

Increasing summer temperatures of ~3C by 2060s
预计2060年夏季气温会增加3摄氏度左右

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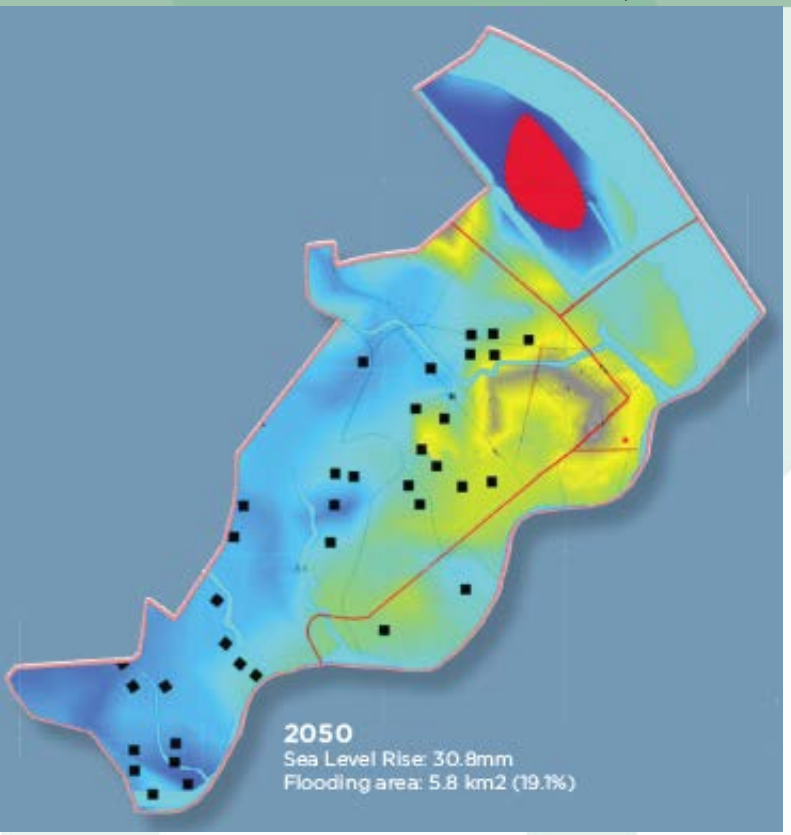
The ACCC Model
创建情景



- Start with actual policy. What is planned for the next 5-10 years that will change exposure, sensitivity or adaptive capacity?
- 从实际的政策出发，未来5-10年间改变暴露程度、敏感度或适应能力的政策规划
- Examine trends in livelihoods and sensitivity, natural resource use and ecosystem well being.
- 检验生计和敏感度、自然资源利用和生态系统福利的发展趋势

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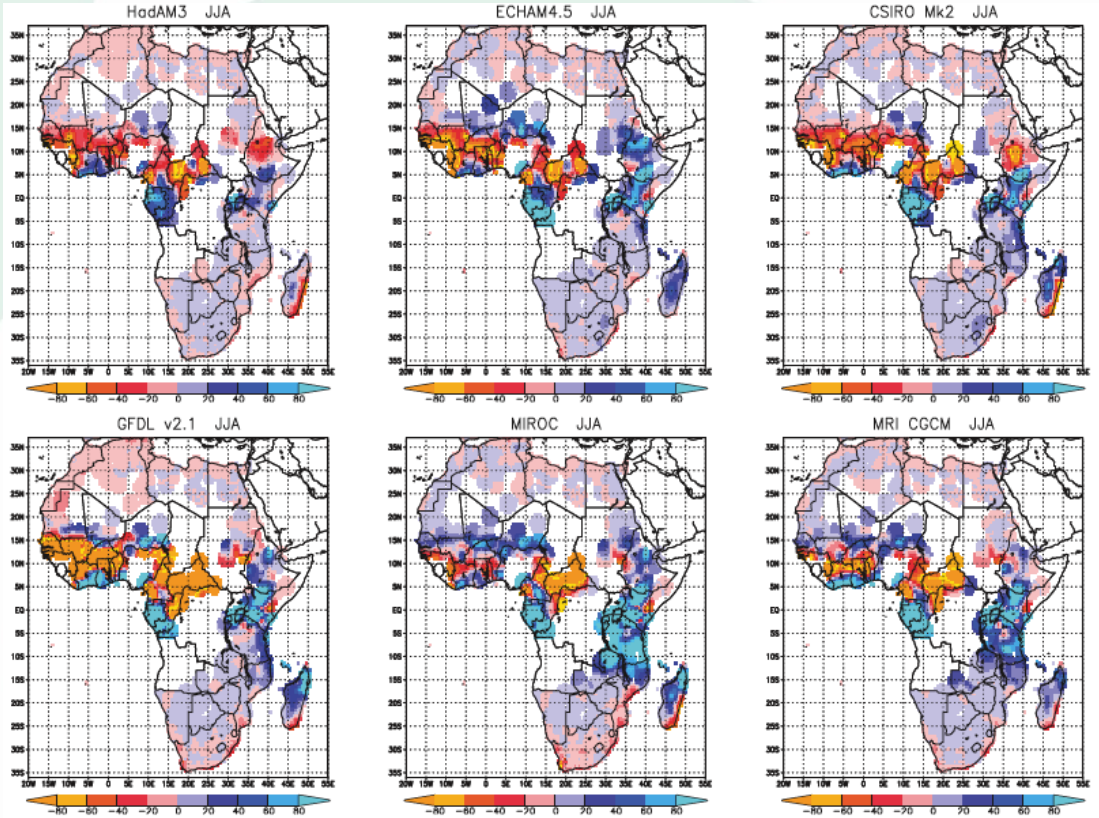
Acknowledge Uncertainty in the Analysis of the Future 承认未来分析的不确定性

- Identify the range of changes in likelihoods of extreme events and mean climate.确定极端气候事件可能性的变化范围和平均温度
- Identify the plausible range of changes in socio-economic and environmental systems
- 确定社会经济和环境系统变化中看似合理的范围区间



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From Analysis to Options Identification
从分析到措施的确定

- From both phases of the VA and RA, can identify options that build capacity, reduce exposure and alleviate underlying factors contributing to sensitivity.
- 通过脆弱性评估和风险评估这两个步骤，能够确定出哪些措施有力于能力建设、降低暴露程度并减少潜在因素给敏感性带来的影响
- In the "futures" VA and RA scenarios, can explore the outcomes of various adaptation options. Do the options increase or decrease vulnerability and risk?
- 预计在"未来的"脆弱性评估和风险评估情景中，是否能够对不同适应措施的后果进行探索和研究。这些措施是否能够增加或者降低脆弱性和风险性？
- Can then decide which options to prioritize for further study using costing techniques, stakeholder outreach, policy review and environmental impact assessments, among other methods.
- 能否通过成本效益分析、利益相关分析调研、政策回顾、环境影响评估或其他的方法来决定选取哪些重点措施开展后续的研究

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Legitimacy 合法性:

Stakeholder Methods 利益相关分析:

1. *Interviews 访谈*
2. *Focus group discussions 焦点小组讨论*
3. *Sankey Diagrams 桑基图*
4. *Problem/ Decision Trees 问题树*
5. *Delphi Methods 专家打分法*
6. *Vision Sheets 视觉图*
7. *Ranking Exercises 排序练习*
8. *Scenario Construction 情景构建*
9. *Qualitative Multi-Criteria Analysis 质性多重标准分析*
10. *Surveys 调研*

Equity 公平性:

Vulnerability Assessments 脆弱性评估
Risk Assessments 风险评估
Stakeholder Methods 利益相关法
Policy Review 政策回顾
Environmental Impact Assessments 环境影响评估
Social Assessments 社会评估

Efficiency 效率:

Costing Techniques 成本技术:

11. *Real Options Analysis 真实对策分析*
12. *Quantitative & Qualitative Cost Benefit Analysis 定量和定性成本效益分析*
13. *Cost Effectiveness Analysis 成本效益分析*
14. *Sankey Diagrams 桑基图*
15. *Socio-Economic Scenarios 社会经济情景*

Technical Feasibility 技术可行性:

- *Environmental Impact Assessments 环境影响评估*
- *Risk Assessments 风险评估*
- *Engineering Reviews 工程评估*
- *Policy Reviews 政策回顾*
- *Systems Analysis 系统分析*
- *Climate Thresholds Analysis 气候临界分析*

Effectiveness 效力:

Sensitivity Analysis 敏感度分析
Vulnerability Assessments 脆弱性评估
Risk Assessments 风险评估
Stakeholder Methods 利益相关
Policy Reviews 政策回顾
Environmental Impact Assessments 环境影响评估
Climate Threshold Analysis 气候临界点分析

Monitoring and Evaluation 监督和评估:

- **Development of Indicators 指标制定**
- **Process of M&E 监督评估的过程**
- **Responsibility for M&E 监督评估的责任**