Combining ecosystem-based adaptation, disaster risk reduction and mitigation to food security through diversification

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Why sustainable agriculture?

- Need greater amount and diversity of food across the world and preserve diversity and ecosystem services
- Increasing populations mainly in least developed countries where needs are the greatest BUT less fertile soils, conflicts, etc.

- Belief: technology will fix the problem!

And also why?

- Environmental and climate changes ($3 B crop loss per year over time)
- Few sustainable systems remain

- So solutions: REDD+, action plans, green climate fund (UNFCCC), etc.
- But does this mean in the field?
  - Need for DRR, EbA and even mitigation (or in fact a gradient all these strategies)

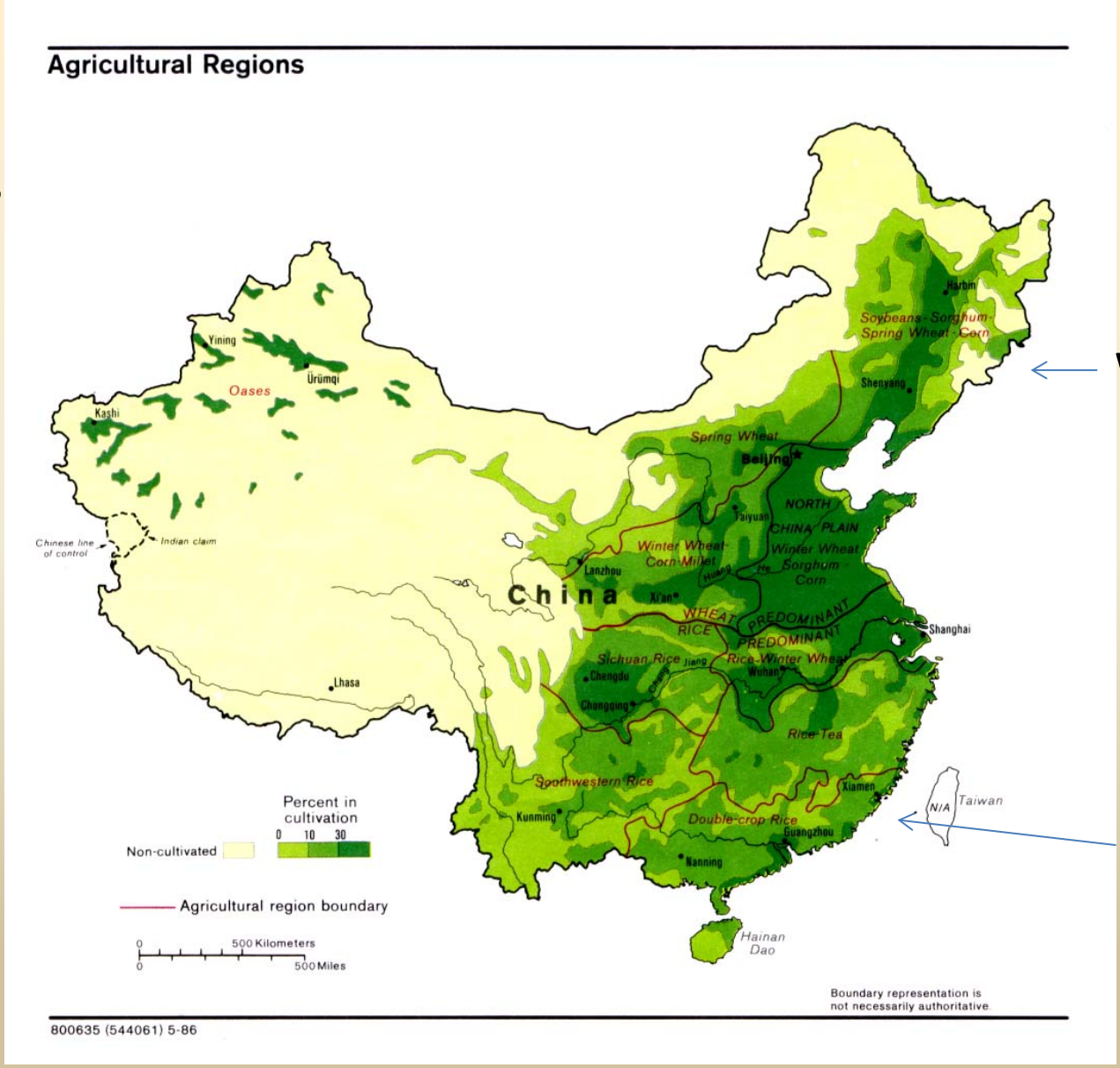
China: context

- Over 300 M farmers, 10% of world's farmable lands, 22% of world population: i.e. not that much land
- Issues: pests, soil fertility, water and now climate change
- Crop production still increasing
- BUT…

Population and crop regions

30% deserts and threatening 90% of the country

75% of farmable lands are for food



Wheat

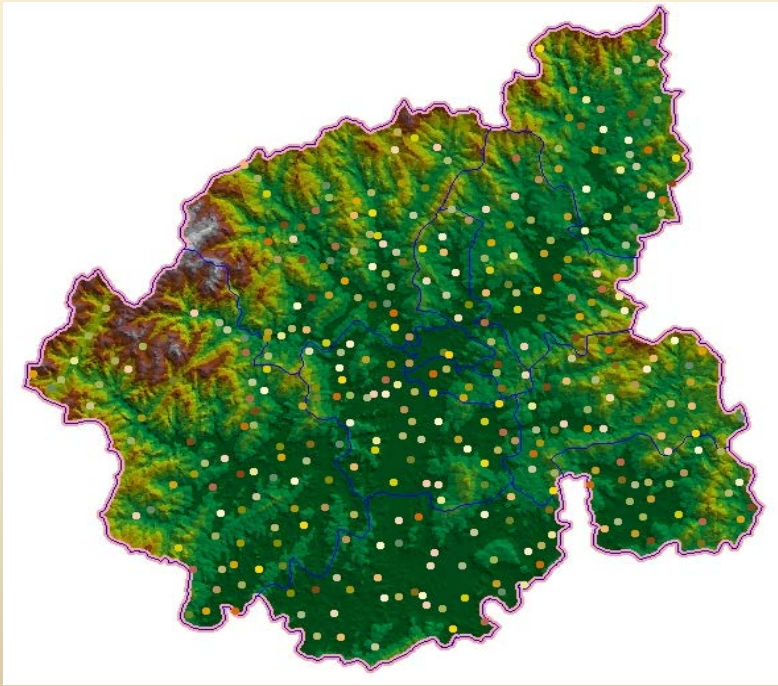
Rice

Master plan

- Pushing towards a more sustainable agriculture since 2006
- Why?
  - Pesticide residues and human health issues
  - Soil fertility and erosion
  - Water quality and quantity
  - Climate change: desertification, decline in rainfall, temperature rise, extreme events

Polyculture

- Wuyi Mt, Fujian Province of China
  （27°39′10.16″N, 117°53′20.99″E）



Yao et al. (2012)

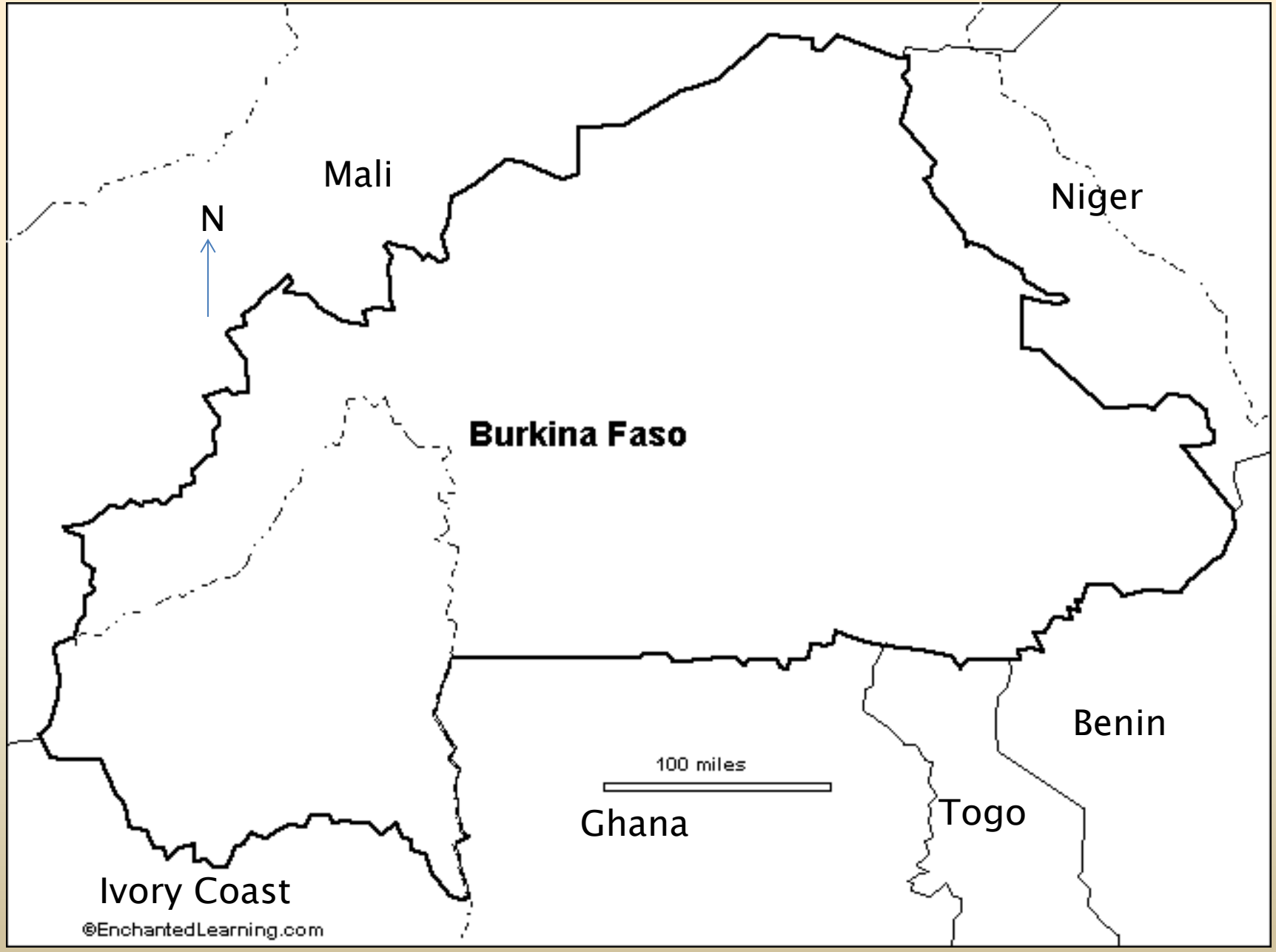
Intercropping

- Example of tobacco and garlic (Lai et al. 2011)
- Results:
  - 39% reduction of destructive insects on tobacco
  - 10% increase in tobacco production with a 11.4% increase in economic value
  - Net benefit: $US3526 / ha versus $US2248 / ha (for conventional method)
- Onion and lettuce (Dehaan and Vasseur 2014)

Cover crops and trees in tea plantations: Issues of pesticides residues, erosion, irrigation: DRR, EbA, and mitigation

From China to West Africa

- Efforts have been concentrated in transferring technologies and seeds from industrial northern countries
- BUT, productions no longer increase and meet the demands of the local populations (FAO 2011)
- Many reasons…



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Burkina Faso

- Small country of West Africa (11 M in 2003; 15 M in 2010, 16.5 M in 2014)
- Second poorest country according to the human development index (ranked 176th): rural, mostly agriculture

- Projections: temperature increase by 0.8% by 2025 and 1.7% by 2050
- Decline in annual rainfall of 3.4% by 2025 and 7.3% by 2050

Case study: Sièna

- Crop diversification for the school garden with manure

Traditional medicinal plants in Elsipogtog, Canada: storm surges

Sweetgrass / holygrass

Sea milkwort

Spike grass

Solutions – Mixed DRR and EbA

- Population protection
- Restoration when needed after storms
- Assisted migration and nurseries

- Early warning system for storms: reduce risks to humans
- Possibility to move infrastructure

Thank you!

Questions?