

HOW CAN WE PRODUCE MORE WITH THE SAME?

- Increase in quantity (50% by 2030)
- Shift in consumption (processed, and dietary change)
 - Challenges and alternatives

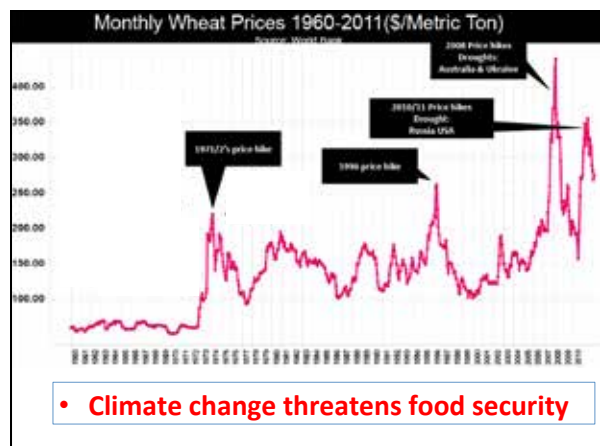
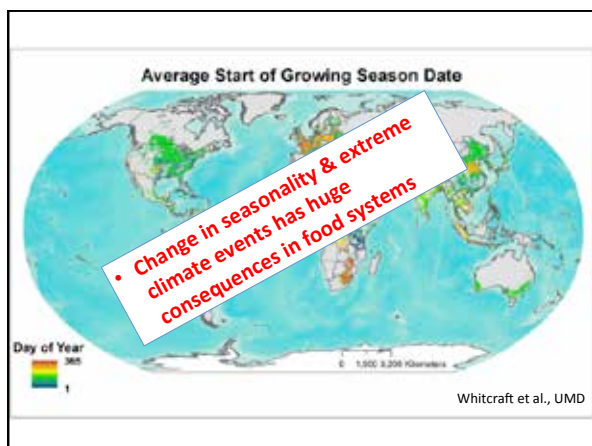
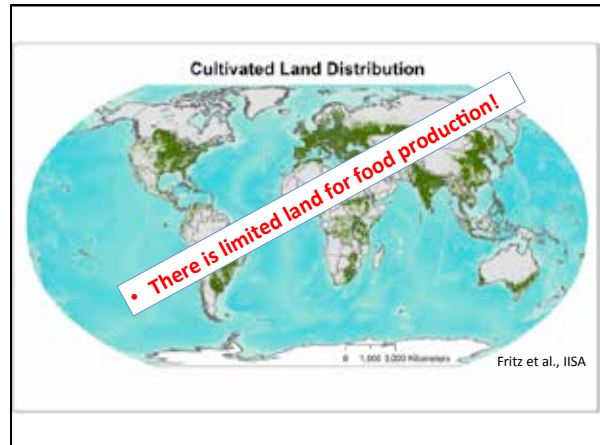
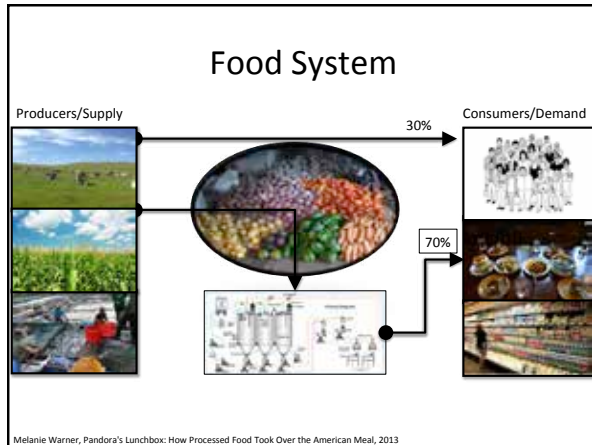
Challenges and Alternatives to Sustainable Management of Agriculture and Pastoral Ecosystems in Asian Drylands

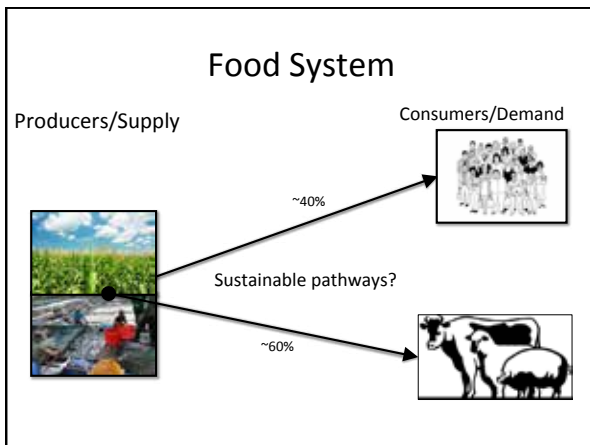
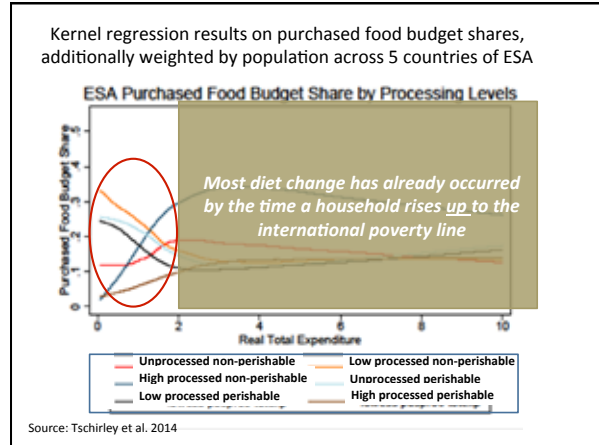
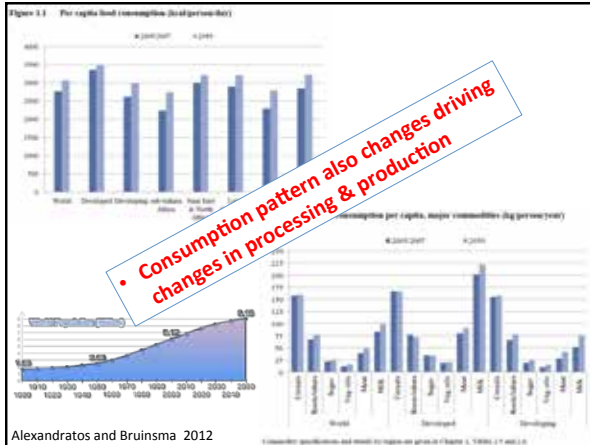
Pasture 100%

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Feed an extra 4 billion: Grow crops for humans, not animals. By VL Baker. Sunday Sep 29, 2013 • 4:30 PM PDT. COMMENTS 164 / 168. RECOMMENDED 54. An additional 4 billion people in the world could be fed if land currently used to grow crops for livestock were given over to crops for human consumption, according to a report from the Center for Global Development. With only grass fed livestock, individual Americans would still get more than the recommended daily allowance (RDA) of meat and dairy proteins, according to Pimentel's report, "Livestock Production: Energy Inputs and the Environment".

FACTS

- It takes 2,500 gallons of water, 12 pounds of grain, 35 pounds of topsoil and the energy equivalent of one gallon of gasoline to produce one pound of feedlot beef.
- One-third of the world's fish catch is fed directly to livestock.
- 70% of US grain production is fed to livestock.
- 5 million acres of rainforest are felled every year in South and Central America alone to create cattle pasture.
- America's farm animals produce 10 times the waste produced by the human population.

Earthsave.org

LAND USES

- One-half of the Earth's land mass is grazed by livestock.
- More than 60% of the world's rangelands were damaged by overgrazing during the past half century.
- As much as 85% of rangeland in the western US is being degraded by overgrazing.
- 35 pounds of topsoil are lost in the production of one pound of grain-fed beef.
- 64% of US cropland produces livestock feed.

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CHALLENGES FOR ASIAN DRYLANDS

Are current practices sustainable?

- Convert more grasslands for crops? Deforest more forest lands to grow animal feeding? Or intensify existing agricultural and pastoral lands?
- In Asian drylands, conversion and intensification happens simultaneously
- In China, increasingly feed animals crops!

CHALLENGES FOR ASIAN DRYLANDS

- Marginal lands are not suitable for crops (which will then be used for animals)
- Lack of system approaches to address the nexus of WEF
 - Trade-offs with other ecosystem services are lacking
 - Need to balance long vs short term benefits
 - Telecoupling

Grasslands degraded due to over grazing intensity and global climate change (China, 90%); globally 70%)



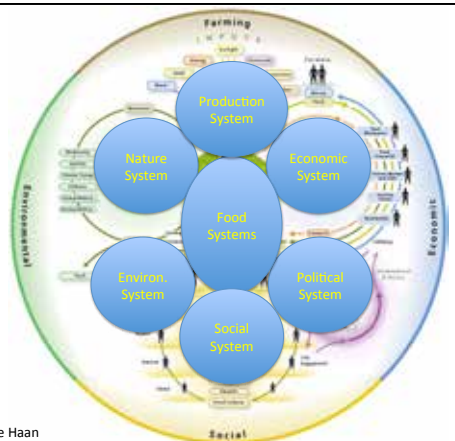
WE ARE ON A TRAJECTORY OF UNSTAINABILITY

- Large deforestation to grow livestock feeding!
- Continued land degradation
- Increasing environmental problems
- Continued urbanization, shift in food systems

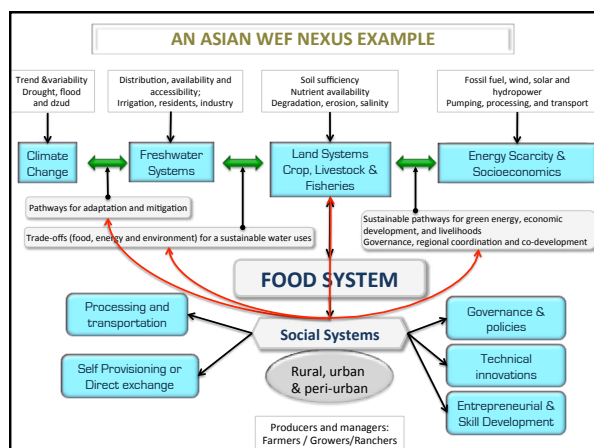
ALTERNATIVES NEEDED

- Eisler et al., (2014) promulgated a series of recommendations for sustainable animal production, focusing on the animal.
 - Feeding animals less 'human' food
 - Eat quality not quantity
- We need to focus on systems approach

Need to look at Nexus



Modified from Stef de Haan



ALTERNATIVES NEEDED

- Principles
 - Maintain soil health
 - Use water efficiently
 - Maintain or improve environment
 - Direct consumptions (do not feed human food to animals)
 - Recycling resources
 - Social and cultural sensitivity

ALTERNATIVES

- Forage production enhancement of existing grasslands (Australia and New Zealand cases)
- Plant community optimization/improvement
- Water use efficiency improvement
- Change breed of animals (e.g. breeds of cattle and sheep that are geographically optimal)
- Optimal management practices (e.g. zero-grazing)
- Change in governance / policy in China – current land ownership is not suitable for optimal management and production

THANK YOU

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