



How does agricultural biodiversity contributes to food security?

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Agro-biodiversity and Ecosystem Services: Biodiversity benefits organic agriculture and organic agriculture benefits biodiversity - True or False?
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What
Agricultural
Biodiversity?

- Crop biodiversity
- Intra-specific diversity

Food
security of
whom?

- Poor households
- Marginal environments

Food Security

(Long term availability)

Food production

(Quantity)

Food diversity

(Quality)



Food Security

(Long term availability)

Food production

(Quantity)

Food diversity

(Quality)

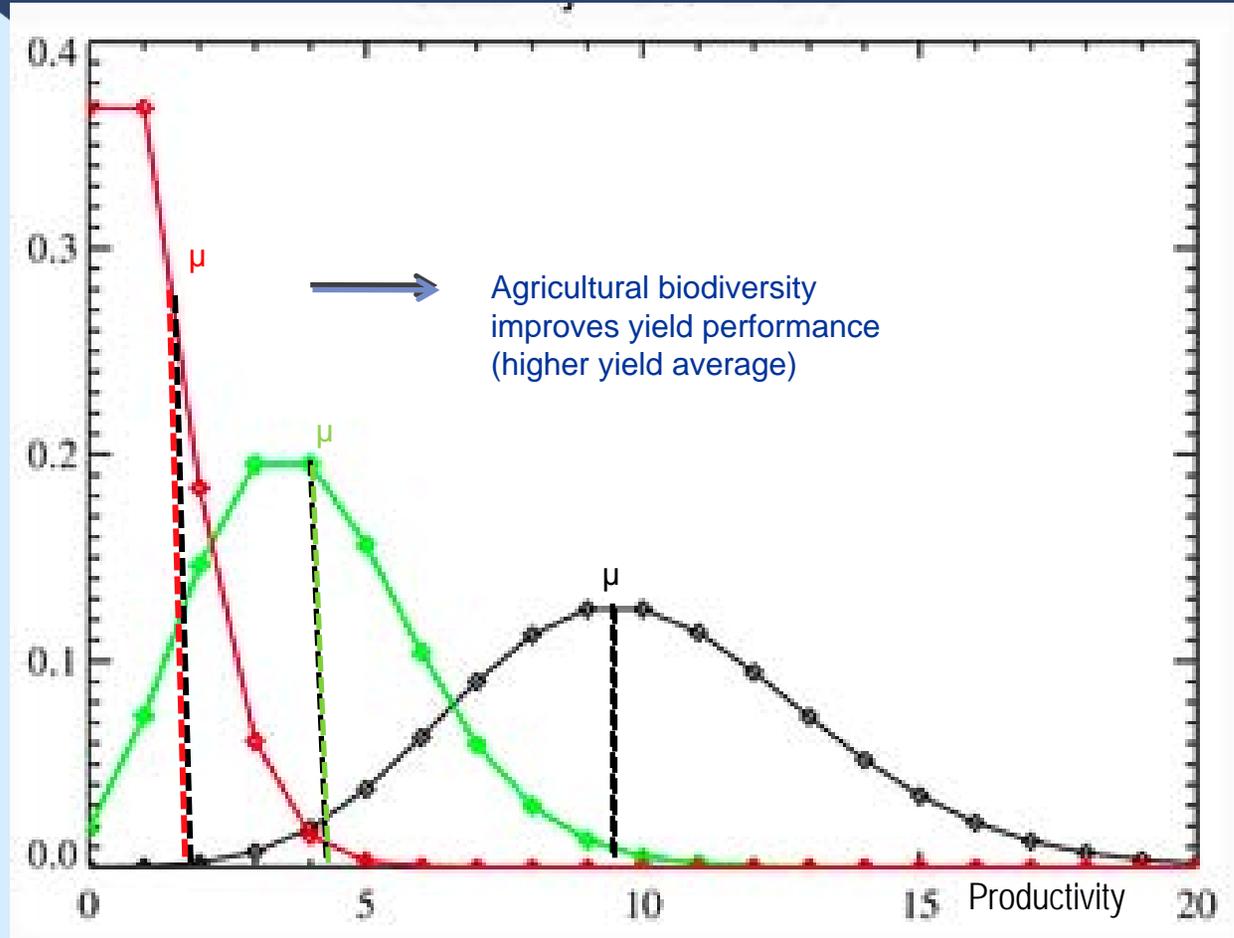
Yield performance

Yield stability

Nutrition

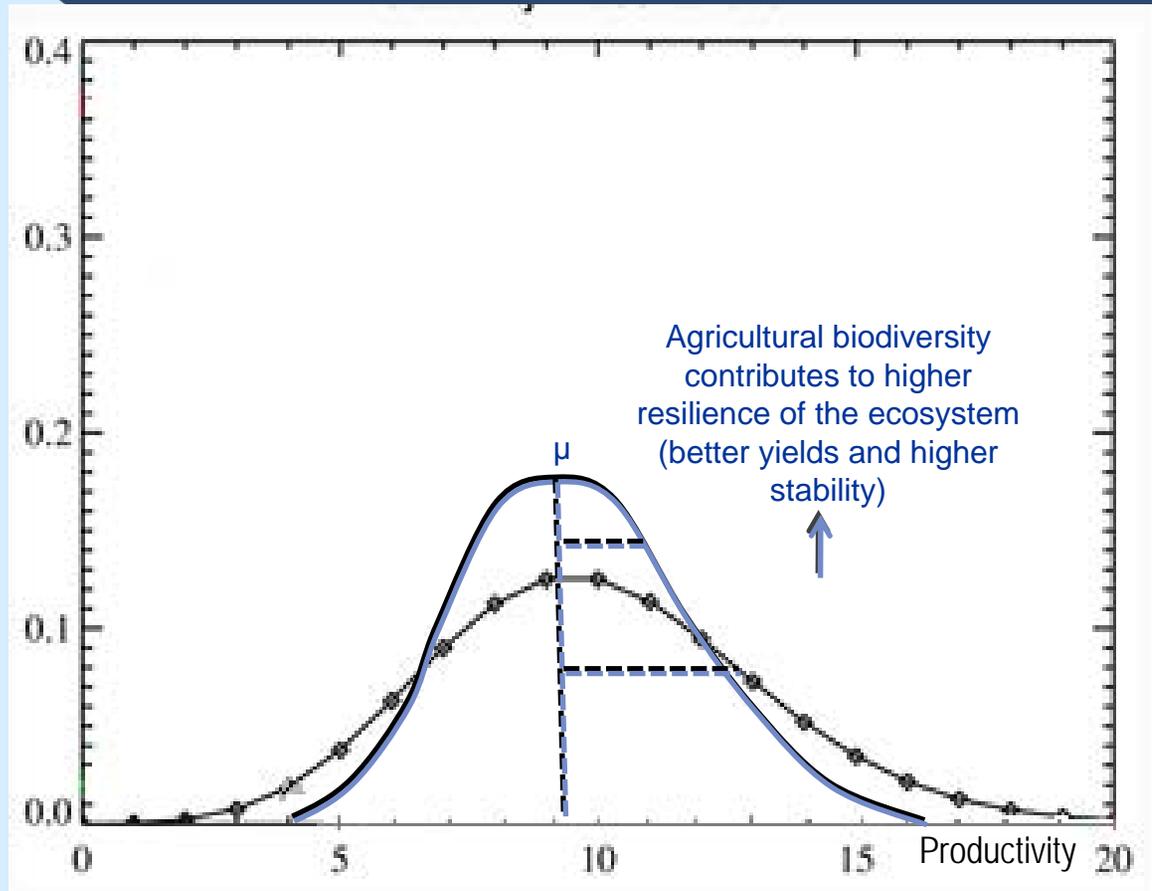
Agricultural Biodiversity

Food Production



1. Di Falco and Chavas 2006, crop genetic diversity can increase farm productivity, wheat, Italy
2. Kwikiriza et al. 2010, contributes to reducing yield losses caused, but also has a significant but negative impact on yields, banana, Uganda

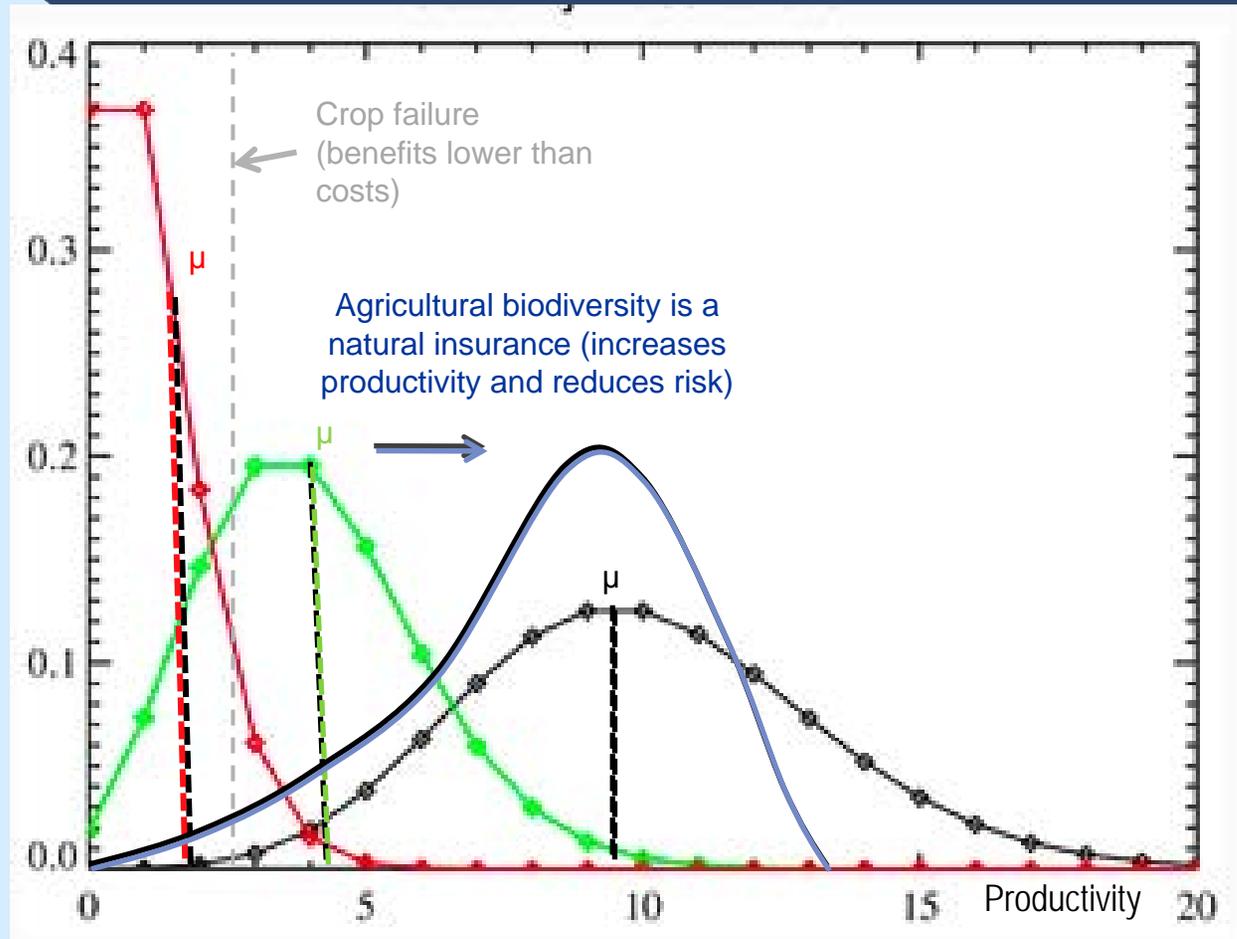
Food Production



Smale et al. 1998, in rainfed environments but not in irrigated environments, wheat, Punjab of Pakistan

Di Falco and Chavas 2006, only if pesticide use is low, wheat, Italy

Food Production



Di Falco et al. 2007, with high levels of diversity, wheat, Ethiopia

Van Dusen and Taylor 2006, Smale 2006, Birol et al. 2006, specially with higher distance to markets



Food Production: Related Work

- ◎ Non market value of agricultural biodiversity
 - › Smale 2006, Birol and Rayn-Villalba 2009, several varieties because of specific production and consumption attributes that no single variety can provide
- ◎ Markets for diversity
 - › Edmeades and Smale 2009, increase cash flows to households through market sales and diversification of products, banana, Uganda
 - › Astudillo 2007 strong international demand lead to a rapid development of value chain but detriment of local diet, quinoa, Bolivia

Food Diversity



Mouille and Ruel, 2003, high correlation between dietary diversity and nutrition adequacy

Johns and Eyzaguirre 2006, altered cropping patterns affect traditional diet diversity through the erosion of local crops

Frison 2006, household dietary patterns moved towards high energy, low nutrient foods

Ekesa et al. 2008, positive and strong relationship to dietary diversity, preschool children in Kenya



Concluding Remarks

- Agricultural biodiversity contributes to food security via increasing food production and nutrition (health)
 - › Yield performance and yield stability (resilience)
 - › Dietary diversity of household farm / community
- Economic proof of this contribution but attention to details



Concluding Remarks

- To have more food security policies based on agricultural diverse systems:
 - › Understand links, what, how, where and when it works
 - › A clear/convincing message
 - › Bring the message to decision makers and civil society



Concluding Remarks

- Contribution of agrobiodiversity to food security can be modeled but it is a complex exercise:
 - › Go beyond partial evaluations
 - › Develops methods and tools for system analysis
 - › Time series data collection, dynamic effects
 - › Across environments
 - › Budget constraints

Thank you

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