Is Organic Farming an Unjustified Luxury in a World With Too Many Hungry People?

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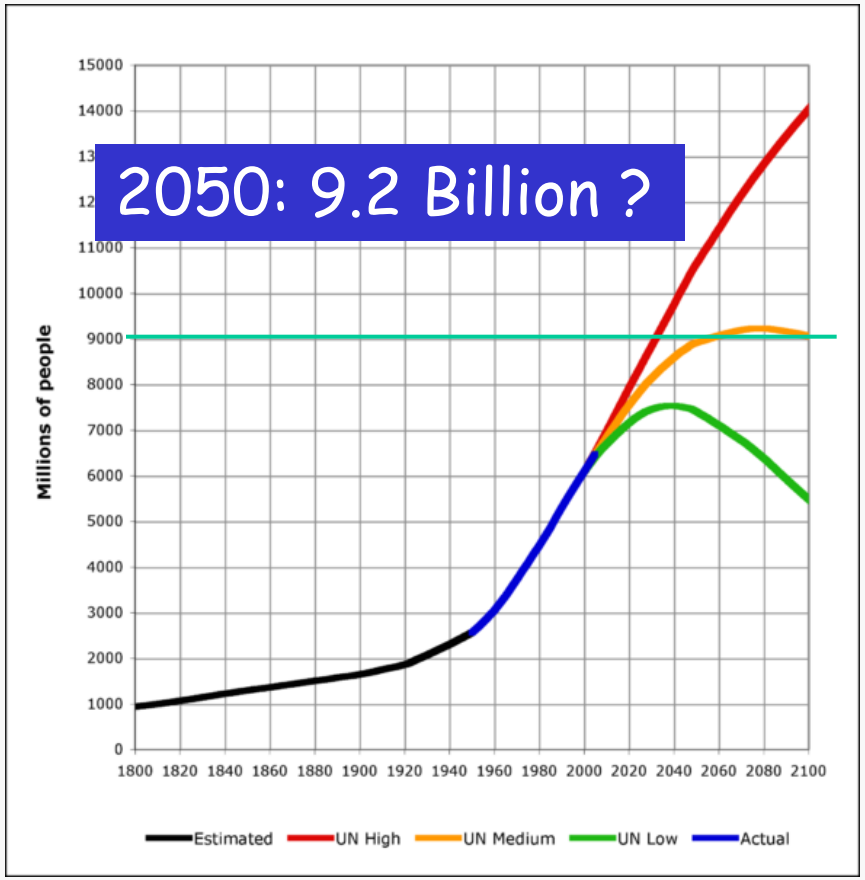
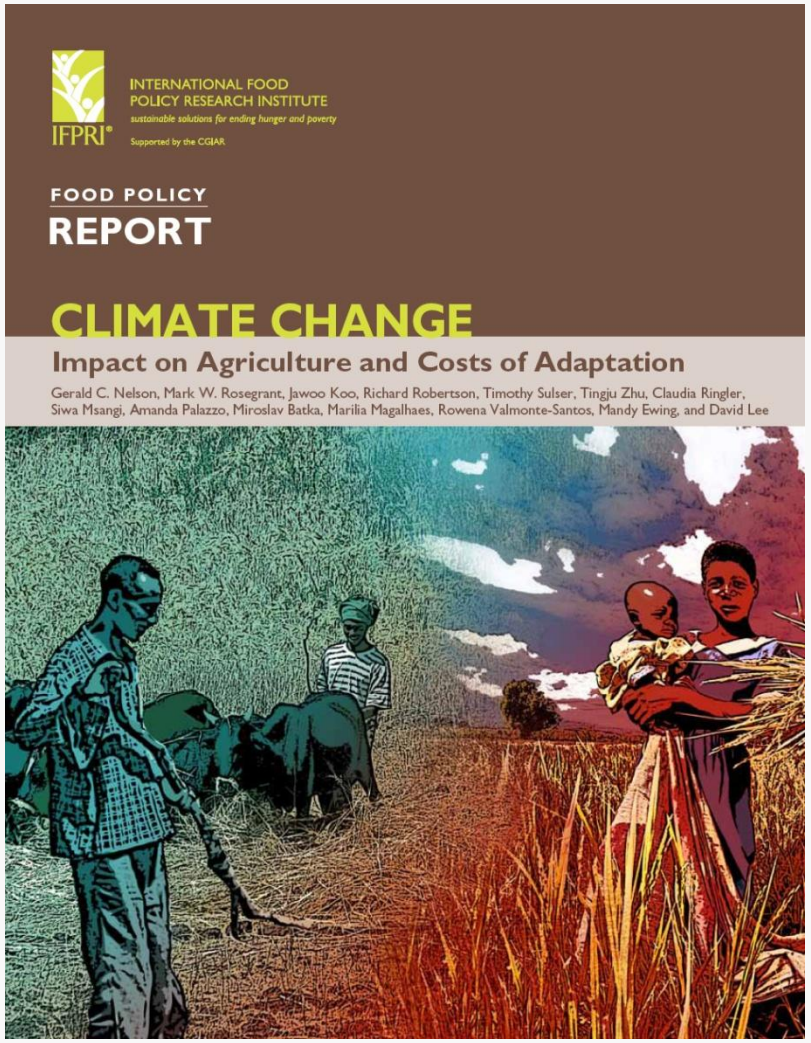
Major challenges for future food security





Plus: Degradation of the natural ressource base.....

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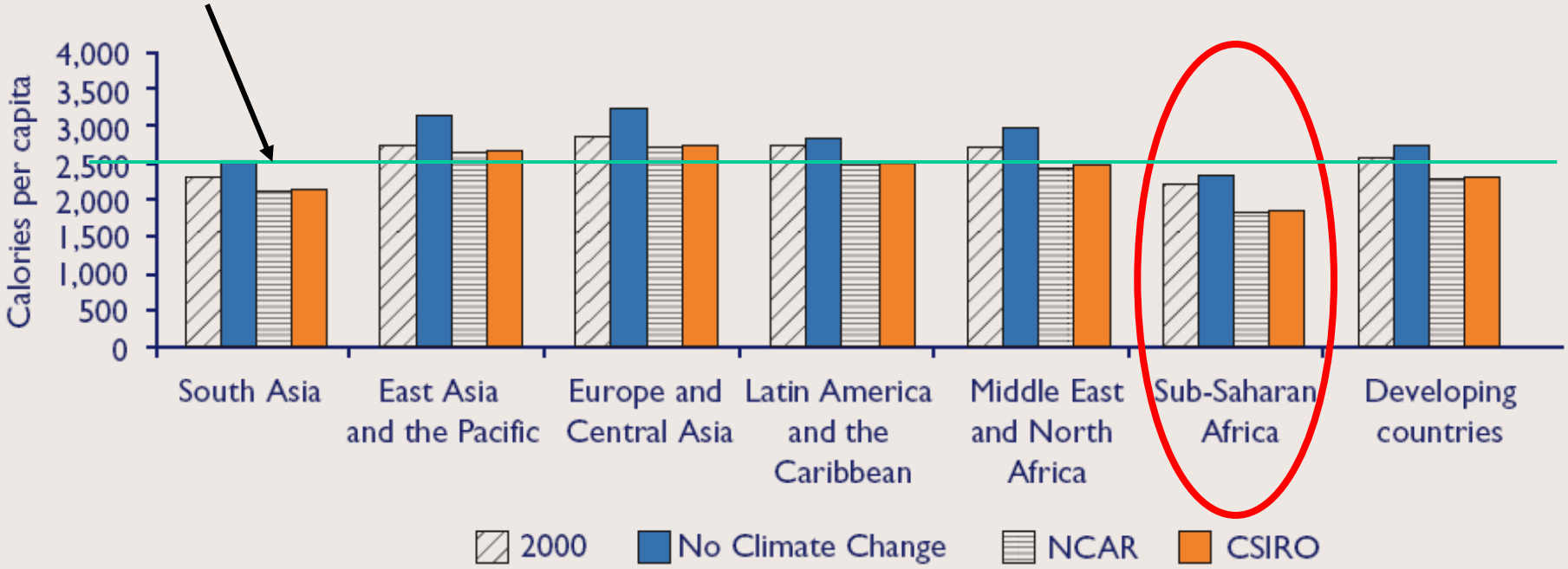
Figure 5—Daily per capita calorie availability with and without climate change

2500 Calories per capita per day in 2050?



Climate change projections

Source: Compiled by authors.

IFPRI, 2009

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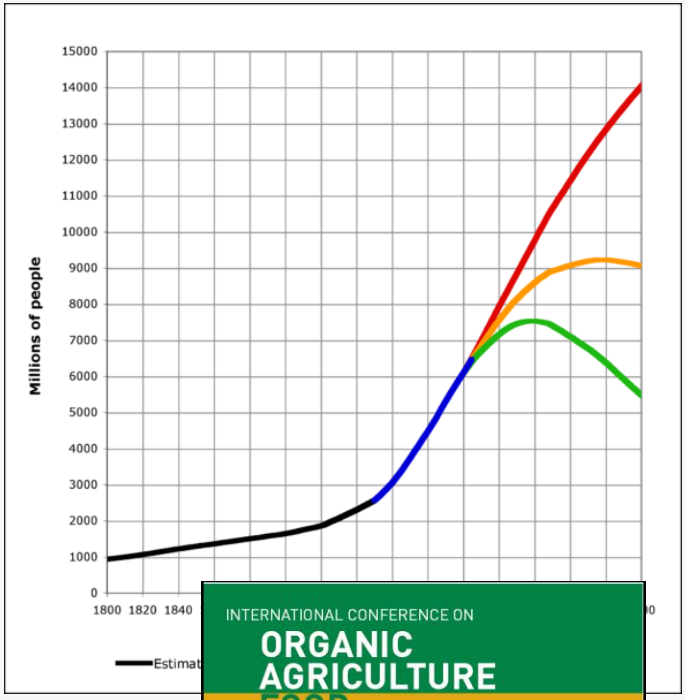
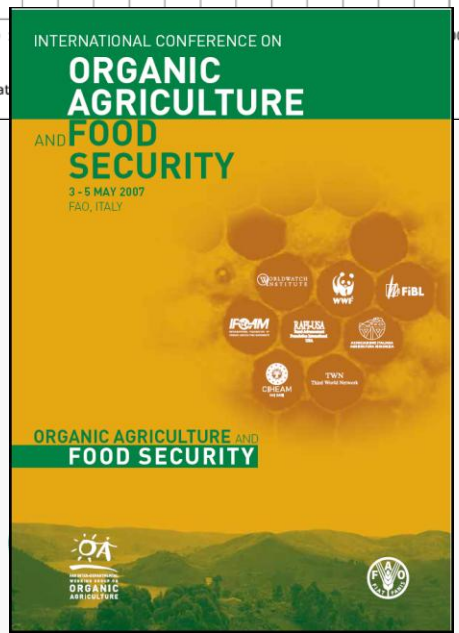
Food for 9 billion people in 2050

The "neo-classical" approach to relieving hunger:

- Intensive agriculture in high-productive regions and abolishment of environmental regulations
- A new Green Revolution for Africa based on chemical fertilizer, pesticides and hybrid seed





What is the relevance of OA in these two perspectives?

Main challenge (IAASTD): ”increased productivity of agri-culture in a sustainable manner”

Moving from focus on increased productivity

To holistic integration of NRM with food and nutritional security (IAASTD)

Organic principles may contribute to a valuable framework for a future sustainable agricultural production!

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The present situation: Abundance of food globally but still too many hungry people!

- The green revolution led to great increases in yields in Asia and improvements in food security
- The production of food worldwide has been sufficient to meet everybody's needs for energy and protein for many years
- Still 750-800 million food insecure (> 1 billion during crisis)
- Food insecurity: A question of access to food

Important distinction:

- *Food availability*
- *Food access*
- *Food stability*
- *Food utilisation*

Used by World Food Summit and FAO

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Two aspects of securing food for rural poor

1. Potential improvement of local food production, availability and access
2. Production for world market in high yielding regions (global food availability)

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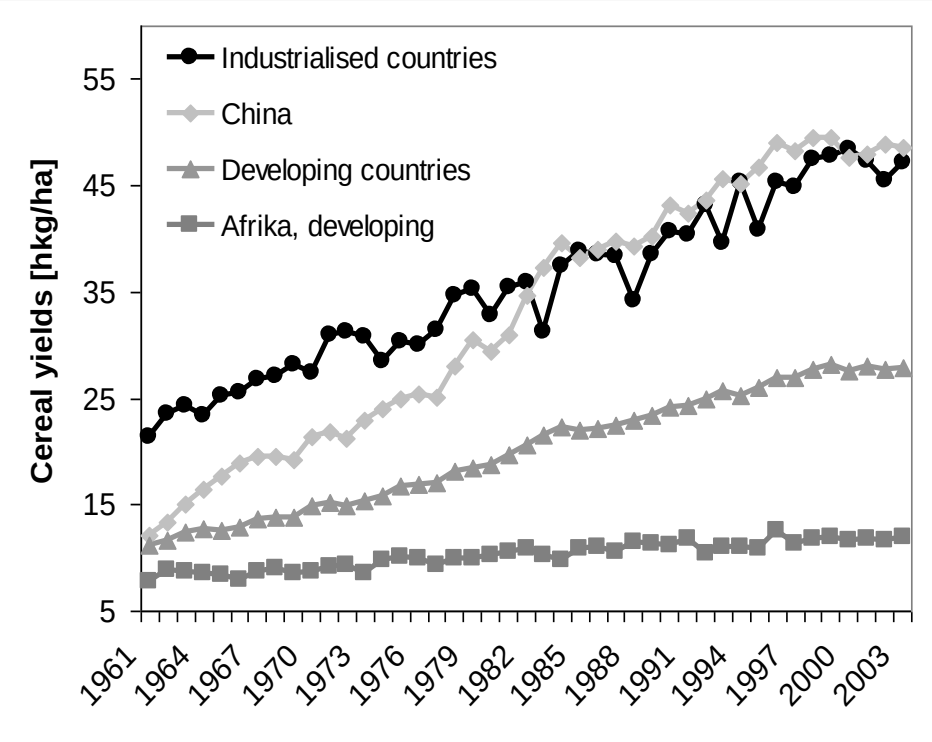
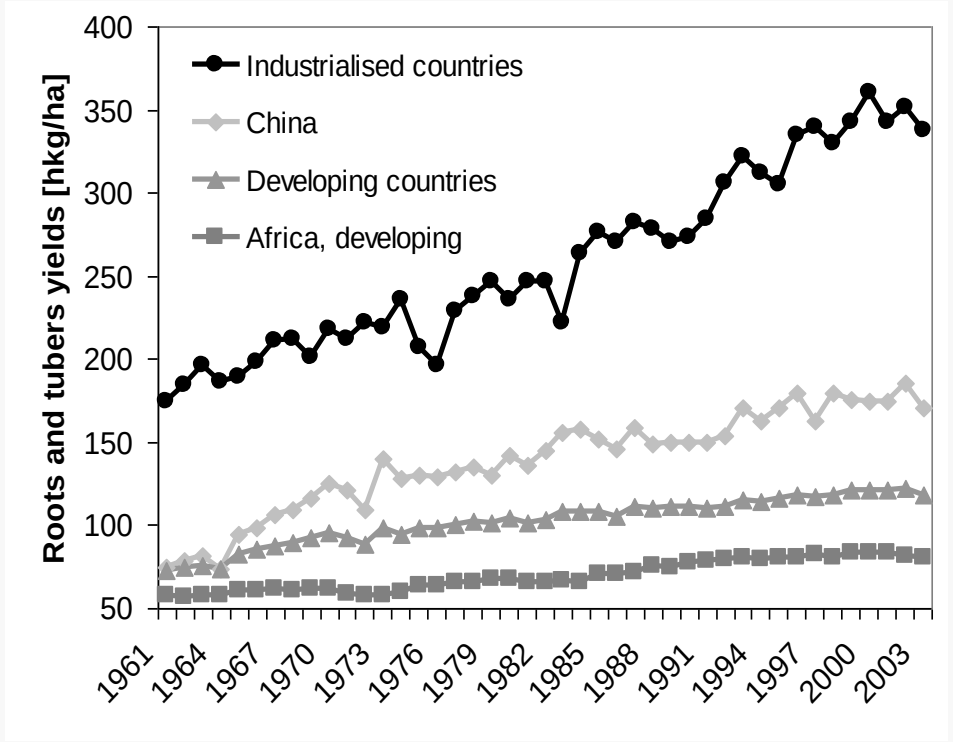
World yields of cereals and roots and tubers from 1961-2003 (hkg/ha)





Yields and fertiliser use have not grown significantly in Africa south of Sahara for 45 years

(FAOSTAT, 2004)

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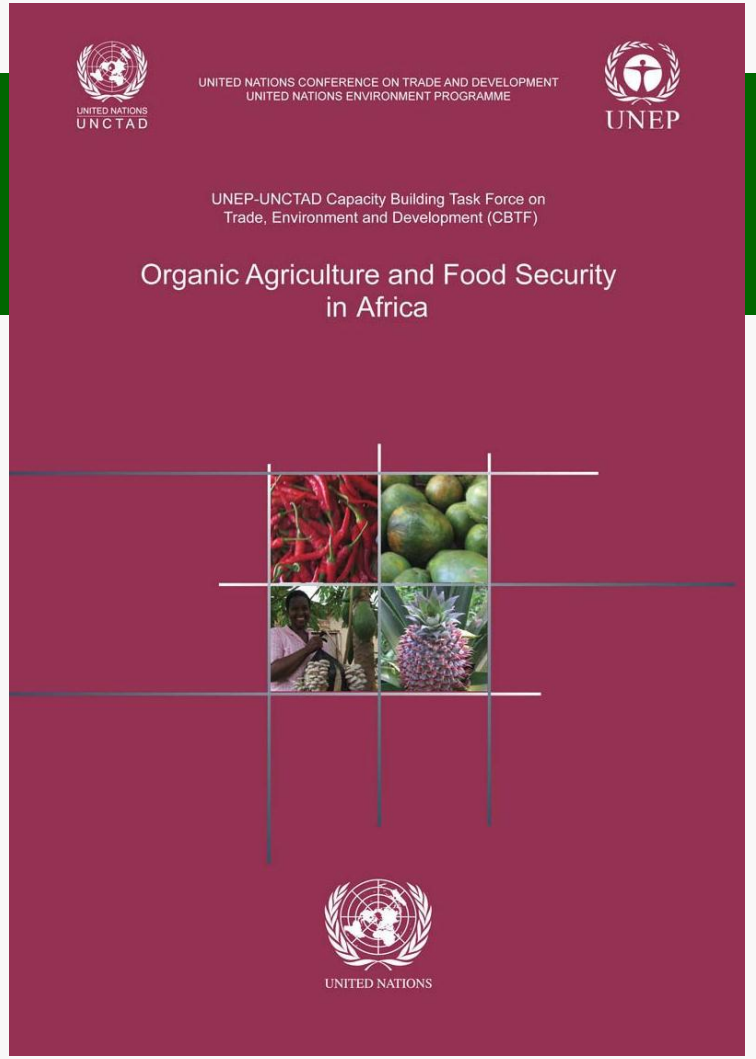
Organic Agriculture is a ”good option for food security in Africa”

"… organic agriculture can be more conducive to food security than most conventional systems, and .. it is more likely to be sustainable in the long term."
(UNEP-UNCTAD, 2008).



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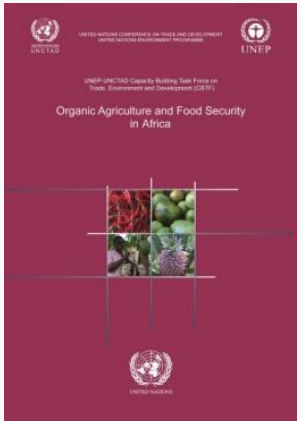
Agricultural productivity performance of organic and near organic agriculture in Africa

Region	Number of countries represented	Number of projects analysed	Number of farmers in projects (millon)	Number of hectares* million ha	Average change in crop yields** per cent
Africa***	24	114	1,900,000	2.0	+116
East Africa	7	71	1,600,000	1.4	+128
Tanzania	1	9	27,000	0.06	+67
Uganda	1	17	241,000	0.68	+54

* Organic and near-organic agriculture, million ha
** compared with beginning of projects, per cent
*** all countries with data

After Pretty et al., 2005



Self-reported, non-experimental results!

What is OA in developing countries?

Certified OA:

- Oriented towards products
- Focused on few high-value crops and quality
- Agro-organic methods used in varying degrees
- Gives access to the market and better prices
- Increasing market, globally
- Will remain a niche in the great number of small householders

Non-certified/informal OA:

- Agro-ecological farming systems
- Conscious use of organic methods
- Follows the principles or ideas of IFOAM,
- - but is not neccesarily certified

- Improving the soil fertility
- Using primarily local resources
- Using diversity in time and space
- Promote natural regulation and recycling
- Decreasing the use of limited ressources

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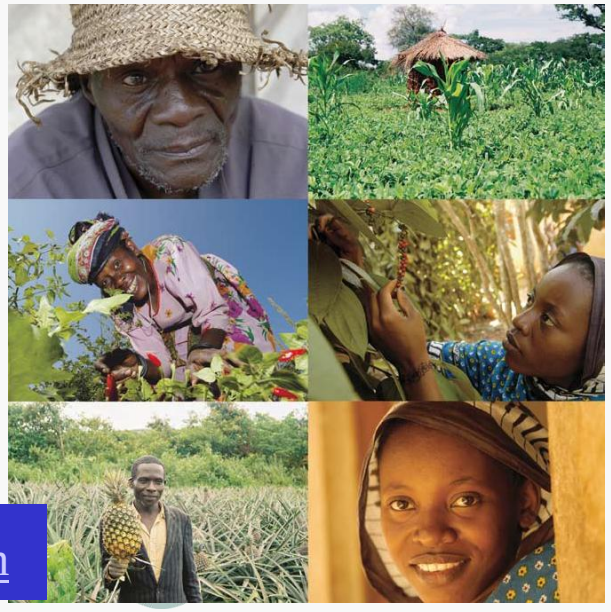
Organic Agriculture and Value Chains
The EPOPA Experience:

Organic Exports – A way to a Better Life?
Export Promotion of Organic Products from Africa

Pilot project in Eastern Africa
Cocoa, coffee, tea, fresh and dried fruit, cotton and spices
80,000 farmers involved and trained, 1997-2007
Price premiums and improved productivity
Farm gate value of certified cash crop production: 15 Mio US$ yearly

Local processing factories for drying, canning etc.
Total export value > 30 Mio US$ (last season)
Need for more innovation, uptake of agro-ecological methods and for institutional support

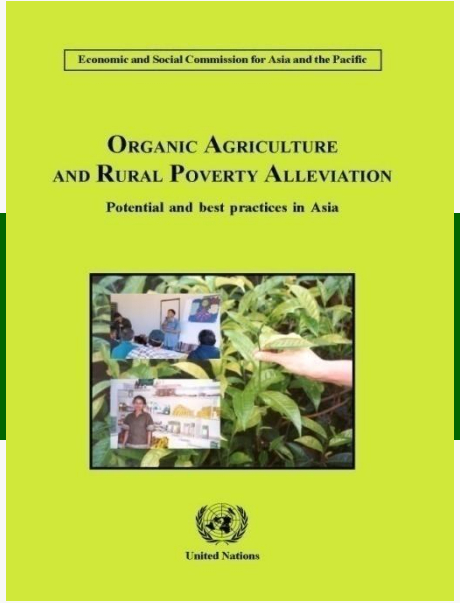


http://www.grolink.se/epopa/Publications/epopa-experience.htm

OA is a viable approach that can be suitable for smallholders.

- particularly useful in the more difficult environments. (IFAD, 2005)

OA can help raise the productivity of low-input agricultural systems



”There seems to be a strong indication that the proliferation of organic agriculture could be a viable strategy to improve livelihoods in Asia’s rural areas.” (ESCAP, 2002)

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Organic Agriculture and farm economy

Selected examples of comparisons between organic vs. conventional cash crop production in smallholder farms in Asia

	Rice, Philippines, 2000[1]		Soybeans, China[3]		Cotton, India[5]	
	Organic	Conventional	Organic	Conventional	Organic	Conventional
	USD ha^{-1}		USD ha^{-1}		Indian Rupees ha^{-1}	
Gross revenue	650[2]	564	1088[4]	713	33849[6]	26078
Cash costs	39	118	305	640	7796	9334
Indirect costs[7]	149	155			2369	2650
Net revenue	462	290	783[4]	72.5	23684	14094
Yields, kg ha^{-1}	3250	3520	3750	7500	1348	1283
Labour use, Man days ha^{-1}	49	52			190	181

1. Mendoza, 2004
2. A 25% price premium was obtained in certified organic
3. Giovannucci, 2005
4. Own calculations based on 2 years prices given in Giovannucci (2005)
5. Eyhorn et al., 2005. Numbers presented are averages of two years, own calculations
6. Includes value of pulse intercrop and a 20% price premium on organic

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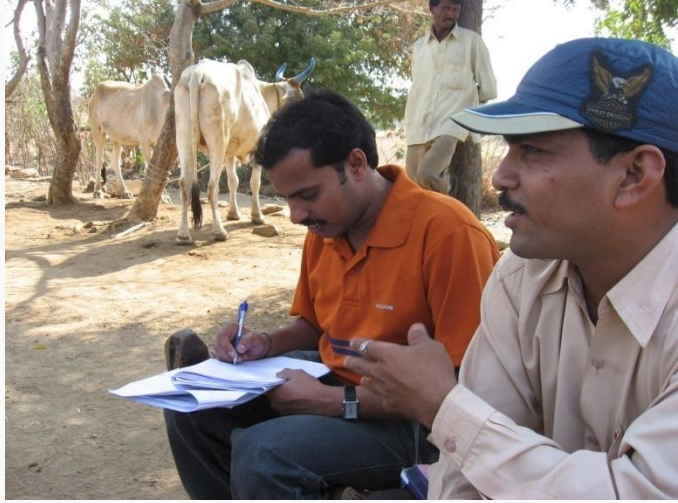
Food security of small holding farmers in relation to organic farming in India



	Tamilnadu (CIKS)	Madhya Pradesh (BioRe India)	Uttaranchal (Navdanya)
Organic products	Rice, Peanut, sorghum, banana, corn	Cotton, soybean, wheat, corn	Wheat, Mustard, millets, potato, rice
Market access	Domestic	Export	Domestic

Quantitative and qualitative data from household survey:40 organic and 40 conventional HHs per case area

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Intercrop yield (Uttaranchal region)

	Yield (kg/farm/yr)		Home consumed (kg/farm/yr)	
	CON	ORG	CON	ORG
Cereals	200(15)	390(24)	135	253
Pulses	125(13)	164(21)	59	90
Oilseeds	42(17)	60(19)	21	54
Others	104(10)	708(12)	60	225

Note:Values in ( ) number of farms out of 40

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CONCLUSION, case studies India

Comparison of organic farms with conventional farms

	UT	MP	TN
Food availability			
Total farm production	+		
Wheat / Rice yield		-	-
Maize yield		+-	
Intercrop production	+	+	
Food kept for home consumption	+	+	

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CONCLUSION, case studies India

	TN	MP	UT
Food access			
Lower Input cost food crops	+	+	
Higher net margin	-	+	+
Improved credit	+	+	+
Improved market access (cash revenue)	+	+	+
Food utilization			
More intercrops	+	+	+
Food stability			
Agro ecological methods	+	+	+

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CONCLUSION, case studies India

- Organic farming improved food security of smallholding farms by
  - *Increasing income*
  - *decreasing input cost and debts*
  - *producing more for home consumption, and*
  - *Adopting ecologically sustainable practices with locally available resources*

But, further improvement is needed in all dimensions of food security also in organic HHs

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Different pathways to improved food access in organic households

Food security dimension	Certified organic Agriculture
Food availability	Focus on cash crops, moderate change in management and food crop yields
Access to food	Price premium, increased household income reinvested in food,
Food stability	Reduced debts, economic resilience
Food utilisation	Diversified food purchases, little sensitisation about nutrition

After Hauser and Walaga, 2006)

Different pathways to improved food access in organic households

Food security dimension		**Non-certified organic agriculture**
Food availability		Focus on food crops, changed management, intensified land use, yield increases
Access to food		No price premium, little increased income, more homeproduced food
Food stability		Diversity in crops, improved soil fertility, resilience, Little capital building
Food utilisation	little sensitisation about nutrition	More diverse food crops incl. traditional food

Impact on Organic agriculture in High yielding regions on food security

Assumption:

Food security in poor countries will depend partly on import from high yielding areas for next 40 years

Question: if we convert large proportions of land to OA…

…- which yield levels and relative yield growth rates should OA achieve to avoid negative impact on food security?

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Modelling food security with IFPRI's IMPACT model

- **Baseline scenario for 2020:**
  - Assumptions on yield growth rates, economic development and food demand trends by regions
  - **Increasing dependance on food imports in developing countries**
  - **Increase in numbers of malnourished children in Sub-Saharan Africa, especially among rural poor**

Rosegrant et al., 2004.

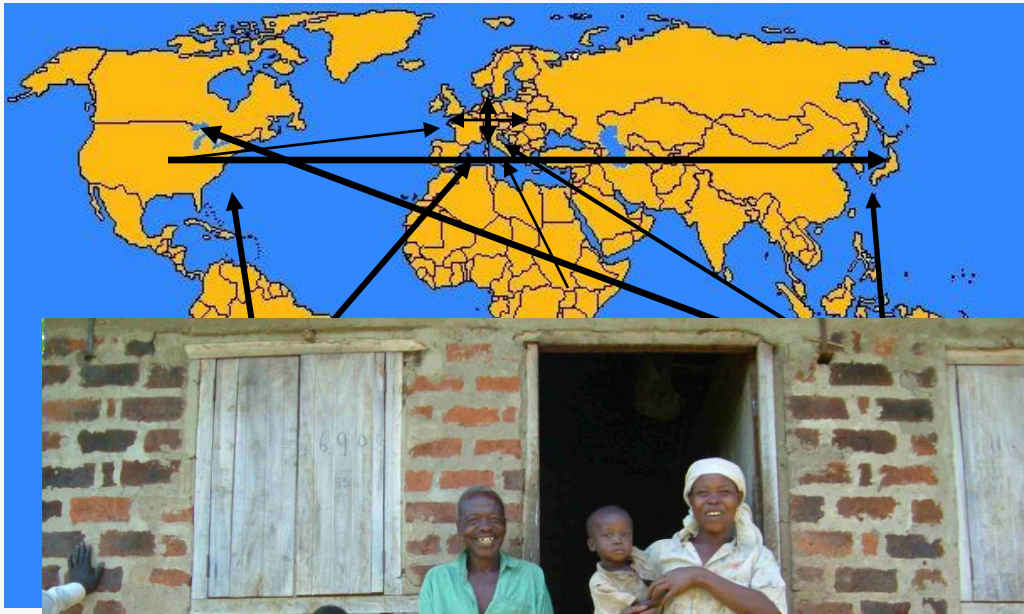
- Defining large scale scenarios for conversion to Organic farming in selected…
  - High input regions (Europe and North America)
  - Low input agriculture regions (Africa South of Sahara)

Halberg et al., 2006

Modelling food security with IFPRI's IMPACT model

- Modelling food projections to 2020 relative to baseline scenario

- **Response variables are changes in**
  - World trade in major food items
  - World market prices
  - Changes in demand by crops and by region
  - Changes in child malnutrition



Modelling food security with IFPRI's IMPACT model

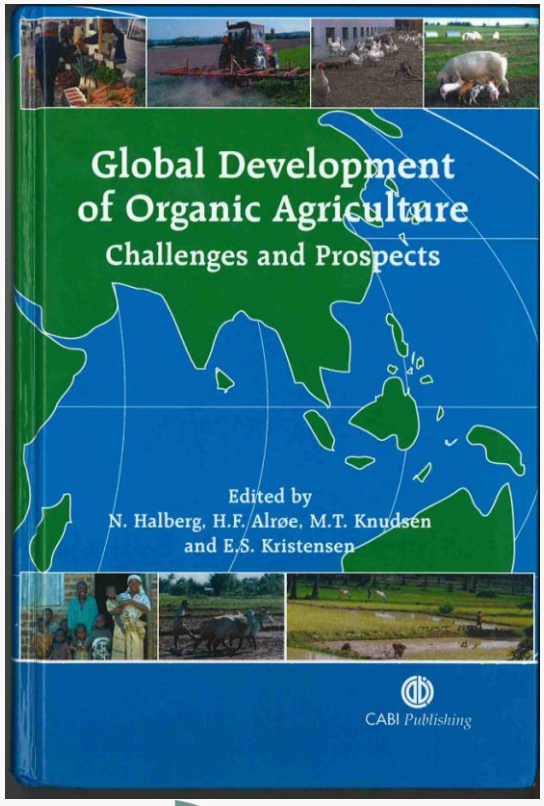
Mark Rosegrant, Timothy Sulser
International Food Policy Research Institute

- Modelling food projections to 2020 relative to baseline scenario

Conclusions in brief:

1. Possible to convert 50% of Europe and North America to OA without significant effects on food security in Sub-Saharan Africa

2. Converting 50% of Sub-Saharan Africa to OA can reduce needs for food import and improve local food access



New developments in land use for bioenergy not included!

Definition of scenarios for large scale conversion to OF in high input regions

Conventional = Intensive farming

Yield growth rates	**Conservative**	**Optimistic**
% crop area converted	40-60	40-60
OF Yields, percent of conventional	**60-100**	**60-100**
Relative yield growth rate, OF vs. Baseline, %	**100**	**125-200**
% OF Livestock, ruminants		
Dairy cattle	50-100	50-100
Beef cattle	50-100	50-100
Sheep & goats	50-100	50-100
% OF Livestock, non-ruminants	0	0

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Results 1: Relative production under large-scale conversion to OF in high input regions

Scenario	Intensive		
Relative Yield Growth Rate (% of baseline)	100	150	200
Projected Production in Europe and North America			
Wheat	92	95	97
Maize	90	92	94
Other Coarse Grain	92	95	97
Soybean	87	89	92
Projected World prices			
Wheat	111	107	103
Maize	112	109	106
Other Coarse Grain	113	109	105
Sweet Potato & Yam	114	110	106
Cassava	109	106	103
Soybean	108	106	104

Results 2: Relative food security under large-scale conversion to OF in high input regions

Scenario	Intensive		
Relative Yield Growth Rate (% of baseline)	100	**150**	200
Food Demand in SSA			
Wheat	94	**96**	98
Maize	97	**97**	98
Other Coarse Grain	96	**97**	98
Sweet Potato & Yam	100	**100**	100
Cassava	101	**101**	100
Soybean	95	**95**	96
Food Security in SSA			
Food Availability (Kcal/capita)	98	**99**	99
Total Malnourished Children	101	**101**	101

NB! Ambitious yield growth needed!

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The wider picture: Global comparisons of yields and development strategies

Comparative yields organic vs conv. : which assumptions? Trade offs between food /fibre vs other objectives

Eating the Planet: How can we feed the world without trashing it?

”There is huge potential to feed the planet using organic agriculture. ..wholly organic crop yields would only be feasible with massive land use change ..”

Interactions between land use and diet changes: Reducing meat consumption has multiple benefits

Friends of the Earth, Compassion in world farming, 2009

”Michigan” study on global organic food production

- Compared present global food production with 100% organic scenarios
- Relative organic crop yields, average of experiments
- in ”developed” world: 96% of conventional
- in ”developing” world: 213%

Results	Kcal/capita
Present global food availabilit	2785
Estimated global food avai	
I. All yields as in develop	2634
II. Higher yields in devel	4878

Assumptions disputed !

Badgley et al., 2006

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Conclusions: Organic agriculture and food security

- Global food production *(food availability)* not sufficient condition for improving food security
- Promoting local food production in food insecure regions better solution *(increasing food access)*
- Potential positive effect on local food security of large-scale conversion to OA in Sub-Saharan Africa
- Large scale conversion to OA in high input regions is possible without severe negative effects on global food availability
- Yield growth in OA should be significant
- Importance of diets: limit livestock production
- Policy initiatives necessary (no agricultural system can change much in itself!)

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Eco Functional Intensification

More research, innovation, adaptation of multifunctionality and agro-ecological methods needed to obtain the full potential of OA

- Improved ecological support functions
- Modern mixed farming via collaboration
- Appropriate and robust livestock production
- Green improvement of genetic resources
- Development and adaptation of novel technology

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Thank you!

More:

www.icrofs.org

WWW.Globalorg.dk

http://ecowiki.org/GlobalPerspective/Homepage

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