Lise Andreasen

ICROFS

Introduction to ICROFS:

International Centre for Research in Organic Food Systems

International Centre for Research in Organic Food Systems (ICROFS)

- What is ICROFS?
- From DARCOF to ICROFS
- Organic in Denmark
- ICROFS present and future international activities
- What is our driving force

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International Centre for Research in Organic Food Systems (ICROFS)

WHAT is ICROFS?

- A centre without walls funded by the Min. of Food, Agriculture and Fisheries
- A collaboration between universities
- Promoting and coordinating organic research nationally and internationally
- Disseminating organic research results and knowledge
- Collaborating with international funding bodies and research organisations interested in supporting development of organic food systems
- International board with members from Asia, Africa, America, Europe, IFOAM
- National Programme Committee

Organic eprints

www.orgprints.org

www.icrofs.org

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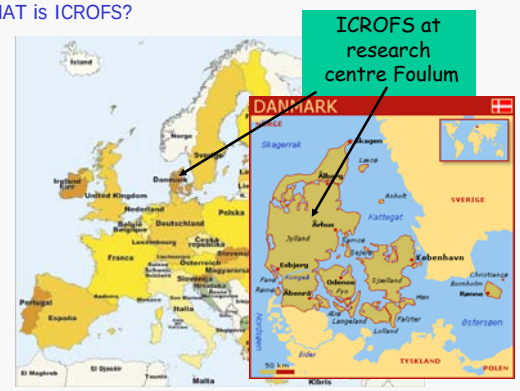
WHAT is ICROFS?



Organic eprints

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From DARCOF to ICROFS

From DARCOF to ICROFS
Ministry of Food, Agriculture and Fisheries

- Action Plan for Sustainable Development of Agriculture in Denmark 1991

- First national program of Ministry of Agriculture on organic farming 1993-97

- Danish Agricultural Research Center for Organic Farming (DARCOF) in 1996

To initiate and coordinate research in organic food and farming systems in Denmark
- for development of the sector and its integrity and efficiency of entire food chain
- to provide knowledge of contribution of OA to sustainable development

User committee with representatives from farmer organisations and NGOs

DARCOF 2008

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From DARCOF to ICROFS

Research programmes coordinated by ICROFS

1996	**DARCOF I** (19 mio USD)	Production and environment. Research development and communication (33 projects)		
2000	**DARCOF II** (43 mio USD)	Effective production Inherent and organic qualities of organic foods (44 projects)	CORE Organic I	11 countries. Pilot call on animal health, quality of foods, and marketing
2005	**DARCOF III** (38 mio USD)	International research cooperation and organic Integrity (15 projects)		
2010	*ØkoForsk Plus*	*Research in globalised ecology. Organics as (sustainability) reference*	CORE Organic II	*23 countries, larger joint funds, new research opportunities*

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Organic = Økologisk = Ecological

The four basic principles of organic agriculture
Endorsed by IFOAM, September 2005

Healthy soil Healthy crops Healthy livestock Healthy people	Agro-ecology Diversity Recycling	Ecological and social justice Fari Trade?	Precaution

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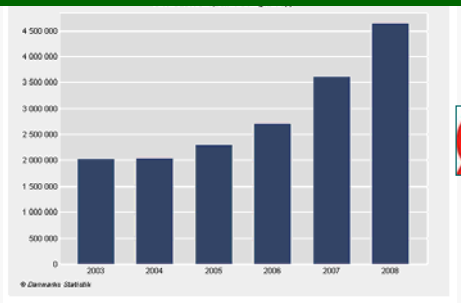
Total turnover of organic food in DK
(in 1000 DKK = 190 USD)



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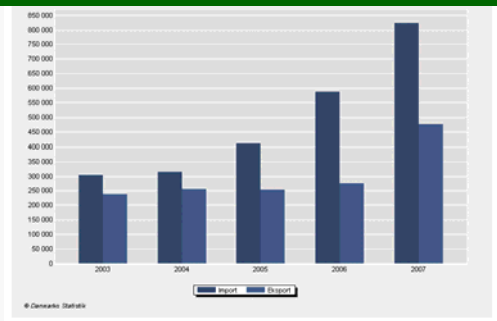
Import-Export of Organic Commodities
(in 1000 DKK = 190 USD)



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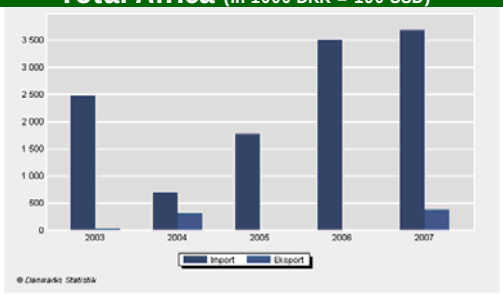
Import-Export Organic Commodities Total Africa (in 1000 DKK = 190 USD)



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Supermarkets use organic products to boost their image

Copenhagen, Sunday October 21, 2007

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ICROFS' international activities I

- New regional activities in Africa, Asia and Latin America
  - Africa - Workshop in Uganda integrated with the 1st African Organic Conference (22 May 2009)
  - Asia - Workshop in China with CAU (21-23 October 2009)
  - Latin-America - Workshop in Brazil with EMBRAPA (18-20 September 2009)
  - Coordination and implementation of research projects?
- European Activities
  - CORE Organic II (being negotiated with the EU)
  - CORE Organic I transnational research projects
  - European Technology Platform (TP Organics)
  - Coordination and participation in EU R&D projects

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ICROFS' international activities II

- International Horizontal Activities
  - BioFach Organic Exposition 19-22 Feb 2009 – organized 3 Technical Sessions
  - FAO Side Event on Organic Farming, held in Rome 22 April 2009 – collaboration with FAO and IFOAM
  - Organic Research Centre Alliance (ORCA), project document finalised July 2009 – FAO in collaboration with FIBL and ICROFS (www.fao.org/organicag)
  - COP 15 Side Event being planned together with american partners – December 2009
- Information and Communication (www.icrofs.org, Organic Eprints, Newsletters, Books, Publications, BioFach, Økologikongres, etc.)

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Challenges for Sustainable Agricultural Production and Farming Systems Dev.

- Abundant food insecurity (*FAO*, 2006)
- Demand for food will increase (*Evans*, 2009, and others)
- Unsustainable use of natural production factors such as soil, biological diversity and water (*Pimentel et al.,* 1995; FAO, 2003)
- 60 % of ecosystem services are degraded (*Millennium Ecosystem Assessment*, 2005)
- Intensive agriculture depends on high energy but could be energy self-reliant and could mitigate GHG emission considerably (*Smith et al.,* 2007)
- Agriculture is insufficiently prepared to cope with unpredictability and adaptation to climate change *(Lobell et al.,* 2008)

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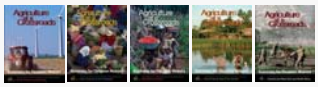
International Assessment of AKST for development (IAASTD)

IAASTD Executive summary (2009):

- Degradation of ecosystems limits or reverses productivity gains
- A fundamental shift in AKST is required to successfully meeting development and sustainability goals
- Recognition and increased importance to the multifunctionality of agriculture is necessary
- Accounting for the complexity of agricultural systems within the diverse social and ecological contexts
- Success requires increased public and private investment in Agricultural Knowledge Science and Technology
- An interdisciplinary and **Agro-ecosystems** approach to knowledge production and sharing will be important



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

From focus on increased productivity alone ➡ To holistic integration of Natural Ressource Management with food and nutritional security

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

Organic Agriculture contributes to eco-functional intensification

Potentials of OA:

- Competitive productivity in low input systems
- Improved farm economy (less costly inputs and premium prices in certified OA)
- Improved food security (availability, access, stability, utilization)
- Improved soil health (fertility, stability, water-holding capacity)
- Improved biodiversity and landscape preservation
- Reduced risk of pesticide toxication and residues in food
- Reduced nutrient lossess from intensive systems
- Climate change adaptation and mitigation

Development, Innovation, adaptation of agro-ecological methods is needed to obtain the full potential of OA

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
7. Mainly opportunity costs of own labour

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Organic Agriculture and soil quality

Results from different long term experiments:

- The organically treated soils were physically more stable, contained smaller amounts of soluble nutrients and were found to be biologically more active than conventional. (DOK trials, Mäder et al., 2002)
- Under organic farming the soil organic matter captures and retains more water in the crop root zone. Water capture in organic fields can also be 100% higher than in conventional fields during torrential rains. (Rodale Institute, 2008)

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Organic Agriculture promotes biodiversity

Scienific evidence.....

Meta analysis of comparative studies (Bengtsson et al., 2005):

- Species richness 30% higher in organic farms (n=32)
  - Birds, Plants
  - Predatory insects, carabidae
- Species abundance 50% higher in organic farms (n=117)
  - Weeds, Soil organisms (earthworms)
  - Predatory insects, carabidae
  - Not potential pest species!

Same picture in review Hole et al., 2005 (n=76)
Causes for higher diversity and abundance under organic farming:
- Non use of pesticides & fertiliser
- Friendly treatment of hedgerows and non-crop habitats on organic farms
- Preservation of mixed farming and diversified land use

Agro-ecological methods could also be used in non-organic
- but in reality is not!

Thank you for your attention !

ICROFS' Big Hairy Audacious Goal:

The principles of organic agriculture have become a global reference for sustainability in agriculture and food systems due to evidence based on research and adaptive management.

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Example: Science for development of agro-ecological methods

`vuta sukuma' = ***pull - push system***
for reducing stem borer and striga infestation'
in Maize and Sorghum in Eastern Africa

- **Trap crops to attract moths to reduced pest problems in crops: Napier and other fodder grasses**
- **Intercrops with repellant properties: legumes**
- **Striga control by intercropping with** Desmodium **species (legumes)**
- **"Opportunities for breeding and use of molecular genetics"**

Exploiting chemical ecology and species diversity: stem borer and striga control for maize and sorghum in Africa†

Zeyaur R Khan,[1] John A Pickett,[2]* Johnnie van den Berg,[3] Lester J Wadhams[2] and Christine M Woodcock[2]

OA is good for biodiversity and biodiversity is good for OA

Organic farmers use more *Agro-ecological methods*:

- Mixed crop rotations, intercropping, …
- Grasslands and green manure,
- Habitats and non-farmed areas
- Non-chemical pest management

Promoting *functional diversity* means enhancing and benefitting from *Ecological service functions*:

- Pollination
- Pest and disease prevention
- Biodiversity preservation,
- Soil quality
- Resilience
- In situ conservation of genes

Our driving force

The multi-dimensional challenges of OA

- Eco-functional intensification is knowledge intensive
- Develoment of agro-ecological methods
- Adoption of agro-ecological methods
- Value chain development for various markets
- Organic agriculture's place in development strategies
- Evidence for decision makers
- Global collaboration in research and innovation

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