Centre for Agroecology, Water & Resilience

Agroecology and the future of organic farming in Europe: Organic-PLUS

V International Conference on organic farming in Belarus
Organic and Sustainable Agriculture: Meeting the Global Challenges
22 February 2018 – Minsk, Belarus

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EXCELLENCE WITH IMPACT

Coventry University

Quick History

garden organic !

Our vision: ‘a healthy sustainable world that has embraced organic growing’ -

Nuestra visión: *‘Un mundo*

HDRA 1954

Founded over 60 years ago as Henry Doubleday Research Association (HDRA), a charity for research, education, empowering people to grow -

Fundado hace 60 años cómo Henry Doubleday Research Association (HDRA) una asociación sin ánimo de lucro para la investigación, educación y empoderamiento de las comunidades hacia el cultivo

Garden Organic Ryton, Coventry, Warwickshire CV8 3LG, UK

www.gardenorganic.org.uk

Registered charity no 298104 Garden Organic is the working name of the Henry Doubleday Research Association.

CAFS Team - Equipo CAFS

2011

Centre for Agroecology, Water & Resilience

2015

University Centre for Agroecology, Water & Resilience = CAWR

CAWR's five research lenses to understand and develop resilient food and water systems

Resilient food and water systems in practice

Fundamental resilience processes & dynamics

Community Self-Organization for Resilience

Policies & Institutions for resilient systems

<..... Peoples' Knowledge and Transdisciplinarity .....>

Policy influence

The UN High Level Panel of Experts on Food Security and Nutrition (HLPE)

- The HLPE is the science-policy interface of UN Committee on World Food Security (CFS)
- HLPE Reports serve as THE starting point of discussions and negotiations in CFS
- Policy recommendations and strategic advice to world governments and international community

Centre for Agroecology, Water & Resilience

2018

Largest
Research Centre
in the world
doing transdisciplinary research on the links
between agroecology
and food systems

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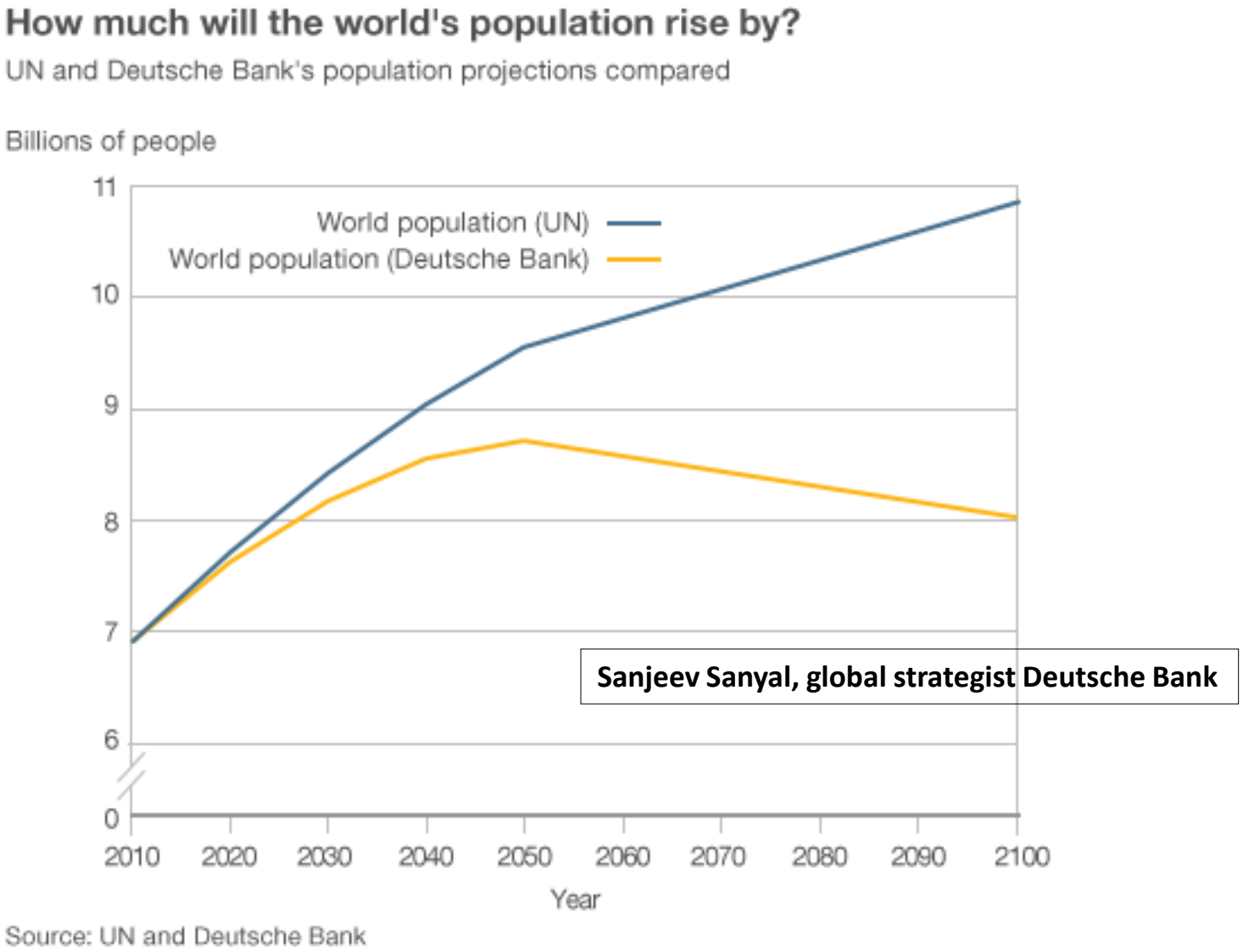
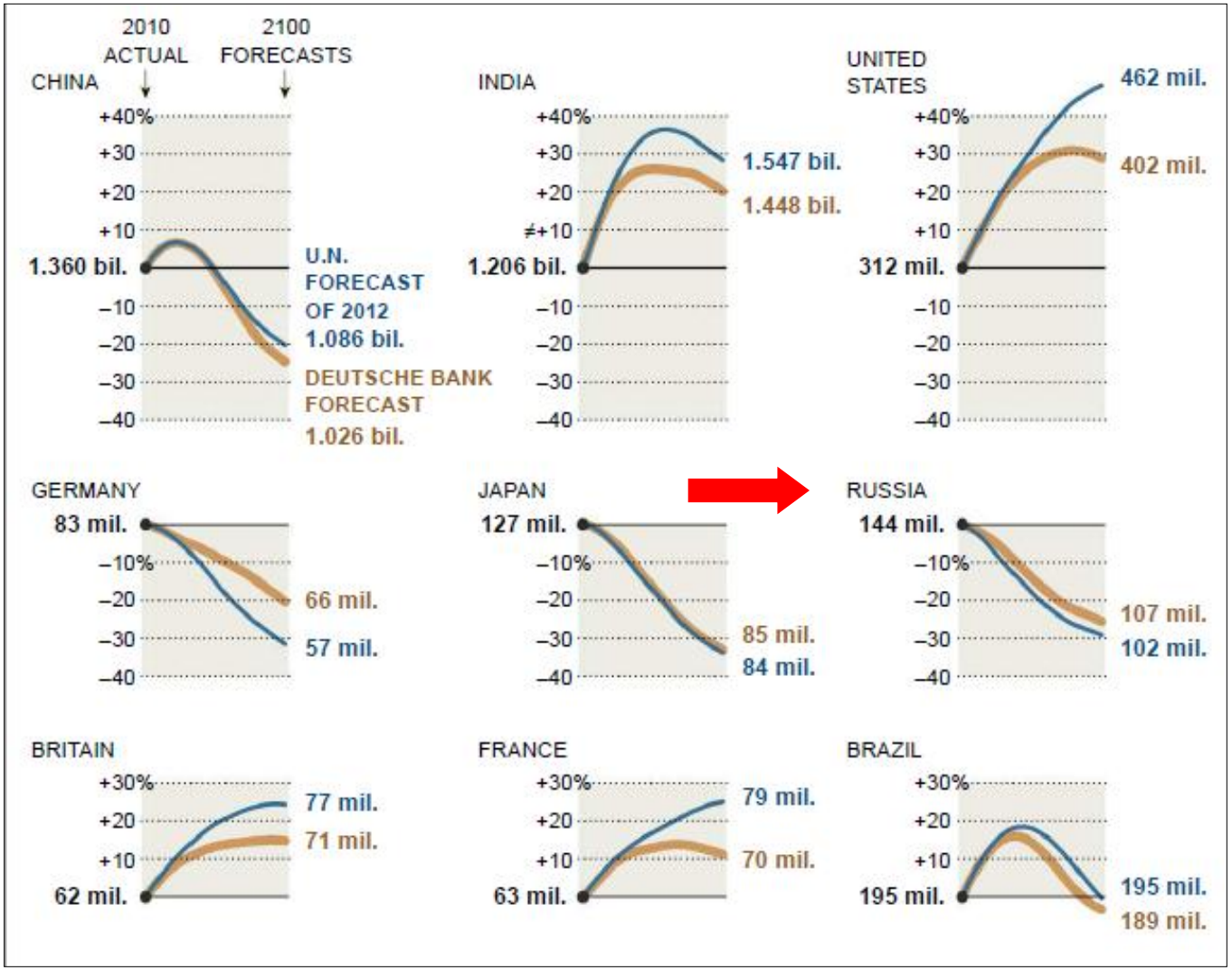
Framing the discussion



Source: BBC 29 September 2013, **Is population growth out of control?** www.bbc.co.uk/news/magazine-24303537

UN versus Sanjeev Sanyal (DB)



Mainstreaming Agroecology

Mainstreaming Agroecology: Implications for Global Food and Farming Systems

Discussion Paper

Foreword by
HRH the Prince of Wales

Coventry University

The Centre for
Agroecology and Food Security
Creating resilient food systems worldwide

garden organic

Definitions and scope of Agroecology

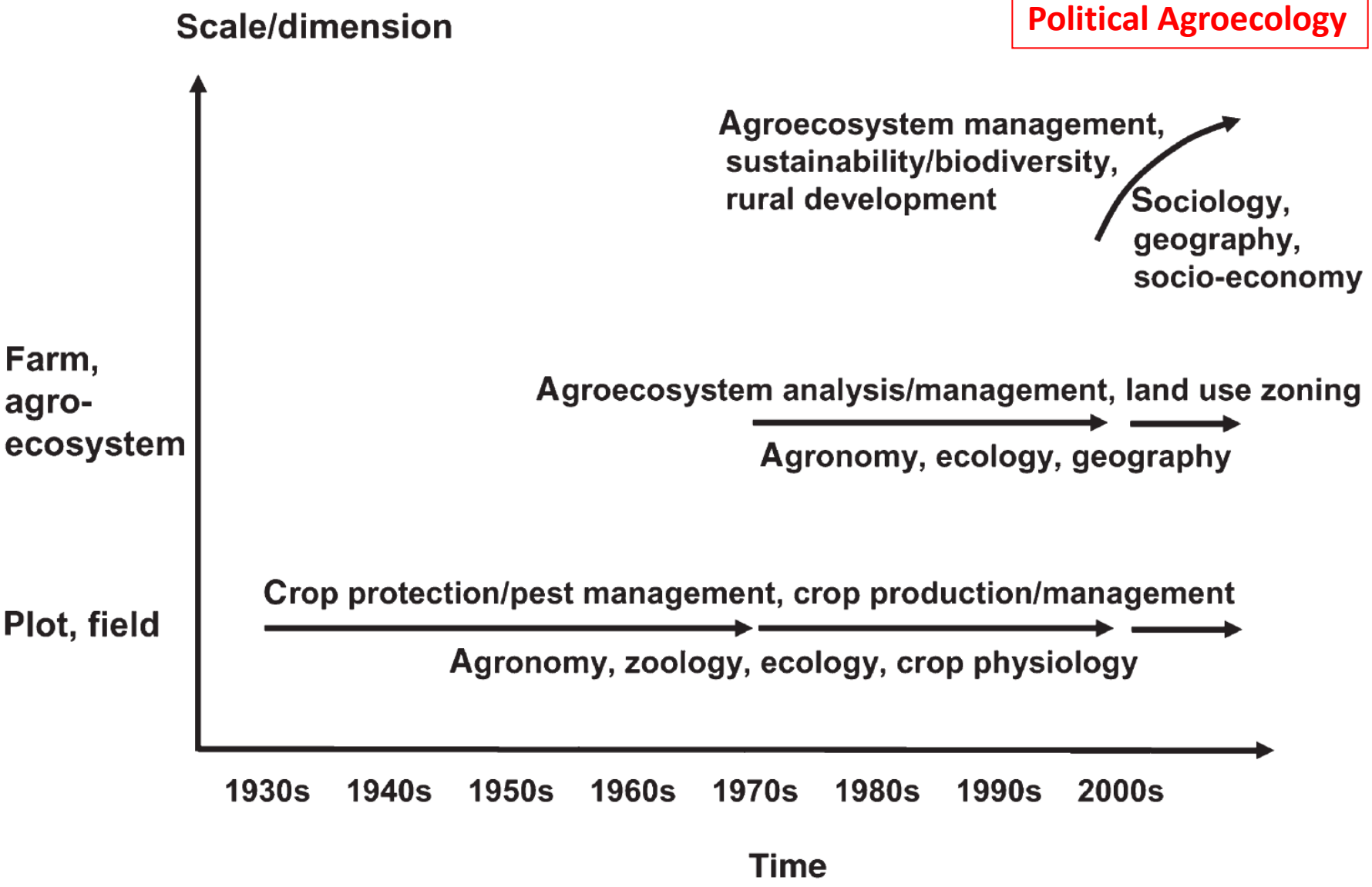
- Agroecology is *"the application of ecological science to the study, design, and management of sustainable agriculture"* (Altieri, 1995)

- *Agroecology: the ecology of food systems* (Francis et al, 2003)

- *Agroecology as a science, a movement and a practice* (Wezel et al, 2009)

Agroecology and Different Scales

Urban Agroecology
Political Agroecology



Source: Wezel and Soldat (2009) A quantitative and qualitative historical analysis of the scientific discipline of agroecology

Agroecological principles

- Adapting to the local environment - its constraints and opportunities
- Creating favorable soil conditions for plant growth and recycling nutrients
- Diversifying species, crop varieties and livestock breeds in the agroecosystem

Agroecological principles

- Enhancing biological interactions and productivity throughout the system

Agroecological principles

- Minimising soil and water losses

- Minimising the use of non renewable external resources and inputs

Agroecology at crossroads

Dominant agri-food model

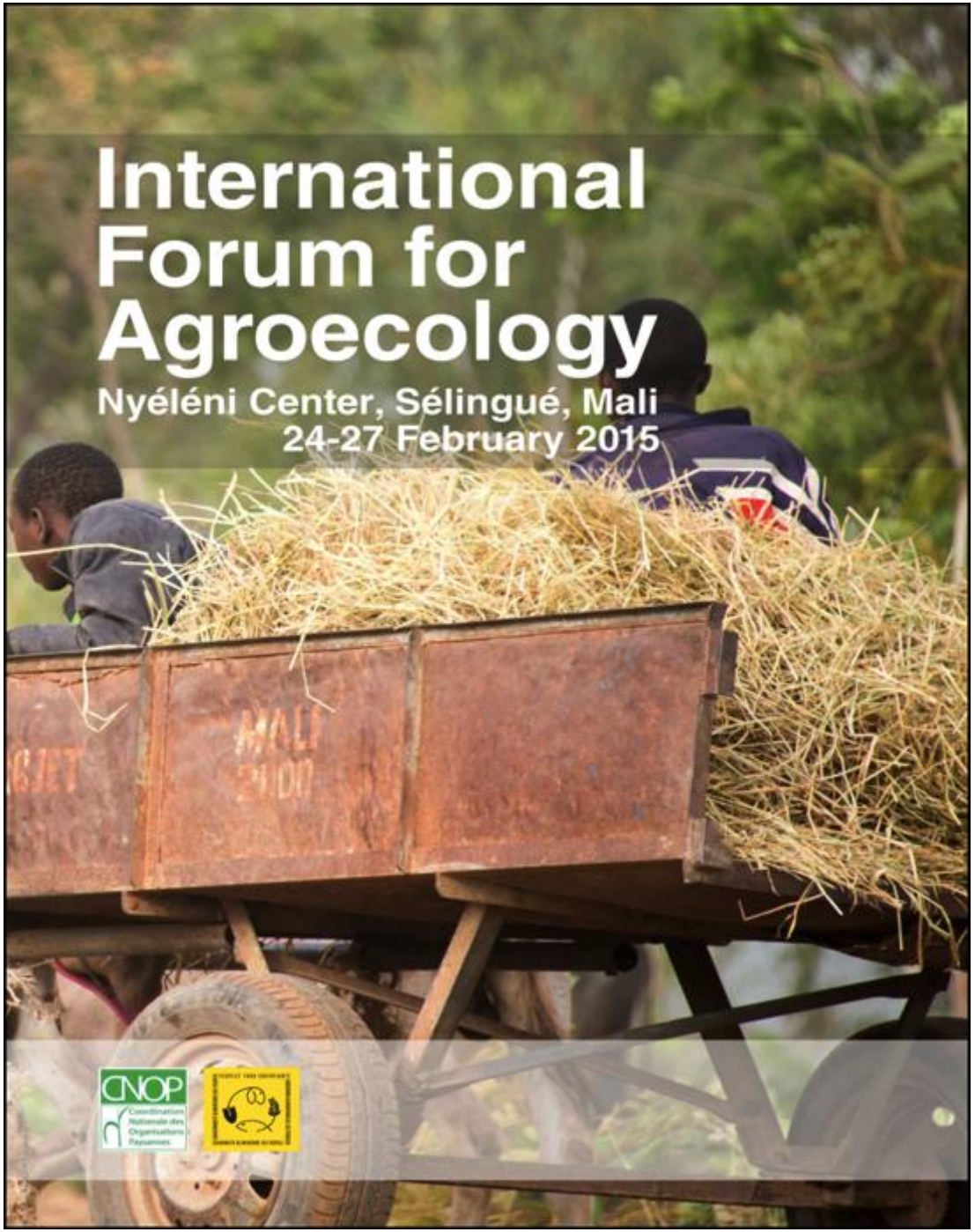
- Agroecology as part of Sustainable Intensification and Climate Smart Agriculture (e.g. GMOs)
- Emphasis on natural science
- Conforms to productivist model

Food sovereignty and other possible worlds

- Agroecology as a science, practice and social movement
- Emphasis on peasant agroecology as part of food sovereignty
- Transformation of dominant agri-food regime

International Forum for Agroecology

Nyéléni Center, Sélingué, Mali
24-27 February 2015



CNOP
Coordination Nationale des Organisations Paysannes

Agroecology as Food Sovereignty includes:

- the right of peoples to define their own food and agriculture policies

- rights of access and control over land, water, seeds livestock breeds, territories

- ecologically sustainable production and harvesting, artisanal fisheries based on bio-cultural diversity

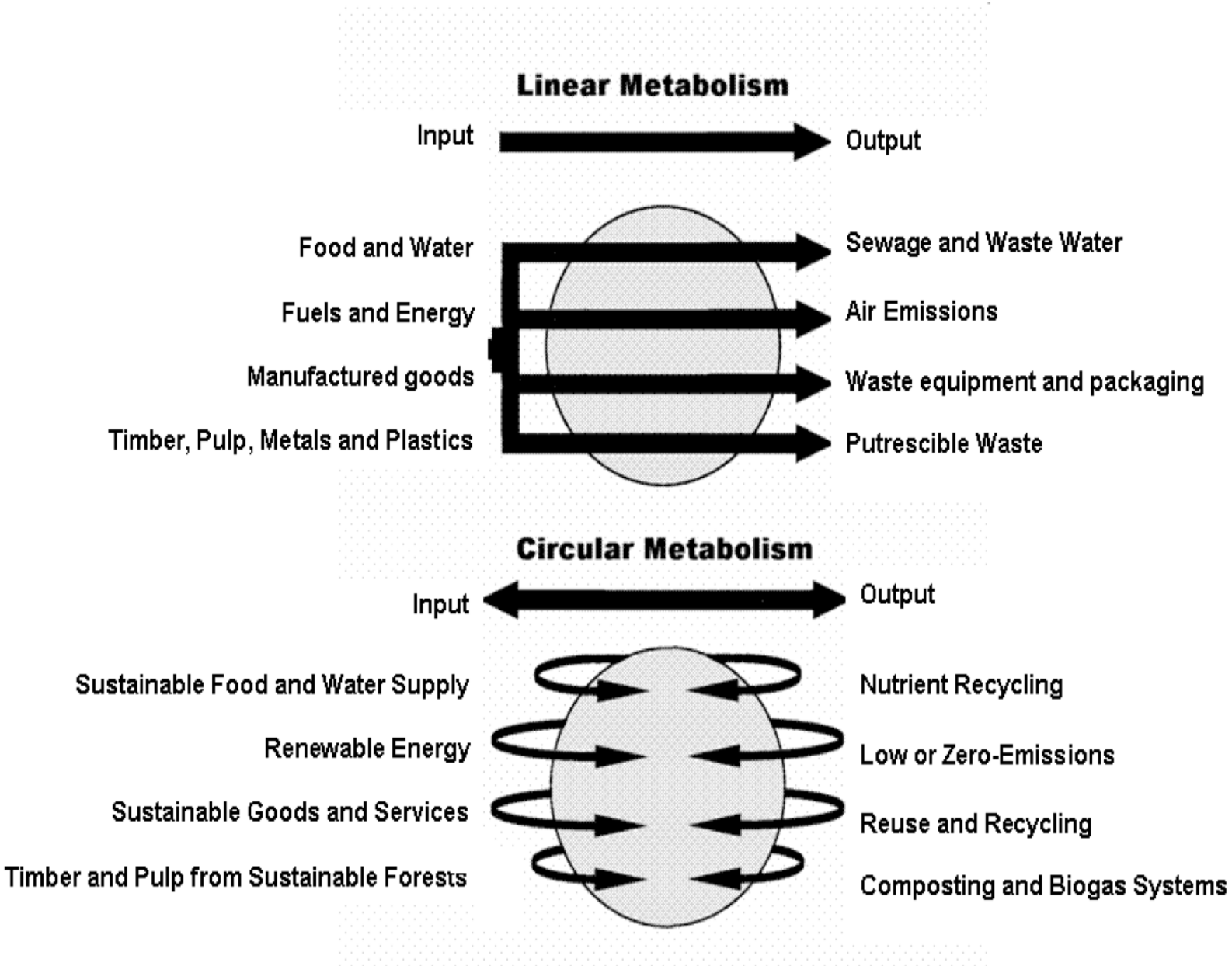
- right to protect and regulate domestic agricultural production and trade

Global industrial food system

- ***Concentration***: just 6 companies control 70% of global commercial market for seed; 4 companies control 72% of pesticide market
- ***Control & regulation***: by specifying the rules that govern food systems, monopolistic networks control people & resources
- ***Squeeze & dependency***: cost –price squeeze for farmers and consumer dependency of supermarkets

=> High social costs

A shift from linear to circular economy



French inter-ministerial study: *Départs précoces en agriculture. Analyse d'une situation peu connue* (ASP, 2016)

- 10 000 farmers *per* year leave farming before reaching retirement age – i.e. one third of total number of farmers who quit farming every year
- Young people unable to enter farming or find it hard to do so
- Retired farmers receive a very small pension

A decline in the number of farmers and farms in the EU

- number of farmers is decreasing every year by about 2%, - with more than 8% decrease in the Czech Republic, Hungary, Poland, Slovenia, Slovakia and the UK

- only 6% of farmers are under the age of 35 across the EU, and 34% of all farmers are over 65 years old (CEJA, 2011)

- as farmers and farms have declined in numbers, land and capital is concentrated into larger and larger farm holdings e.g. in Germany the average farm size has increased from 10 to 40 hectares in the last 40 years

Transforming agricultural research

Democratising science and technology research, with more funds for public research

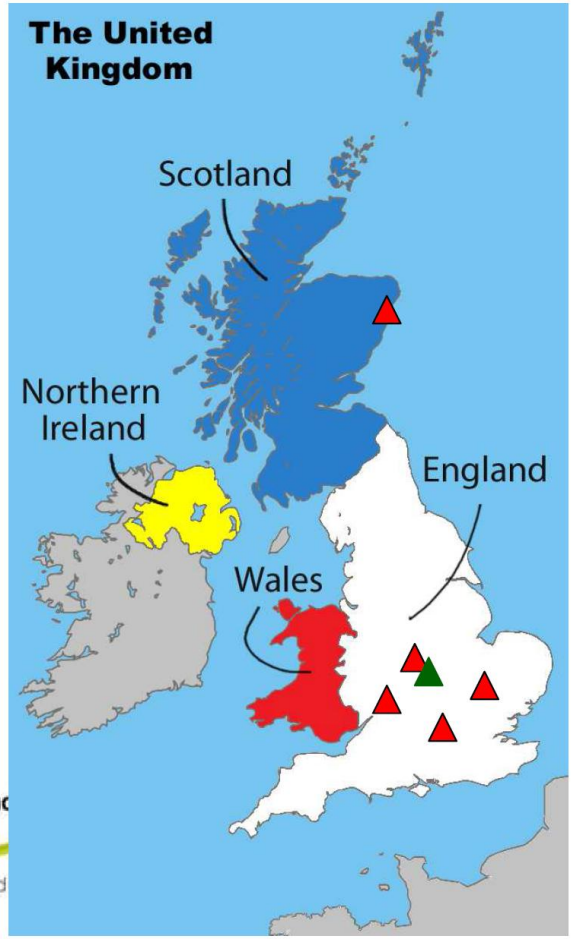
Agroecology contributes

Our research - examples:

UK Farming systems research

Defra project OF0386: 'To produce methodology for assessing the environmental, economic and social characteristics of (organic and non-organic) farming systems'- ´Producción de metodologías de evaluación de las características medioambientales,económicas y sociales de sistemas de producción (ecológicos y no ecológicos)

www2.warwick.ac.uk/fac/sci/lifesci/wcc/research/impact/farmingsystems



Project Duration 2009 to 2013 (Duración del Proyecto 2009-2013)

Project partners (socios participantes)

1. University of Warwick, Coventry
2. CCRI (The Countryside and Community Research Institute), University of Gloucestershire
3. Cranfield University, Cranfield
4. Garden Organic, Coventry
5. The Organic Research Centre Elm Farm, Berkshire
6. SRUC (Scotland's Rural University College)

Coventry University

The Centre for Agroecology and

Creating resilient food

Our research - examples:

Fertility building in organic systems

Fertility building crops

- Evaluation of species for growing as leys and short term winter or summer green manures
- Mineralisation patterns after incorporation and integration into rotations
- Computer modelling to aid farmer decision making

Use of compost and digestate

- Use of green waste compost in agriculture
- Methods for assessing the stability of compost
- Food waste anaerobic digestate – its use to promote energy crop production on brownfield sites

Members' Experiments (Citizen Science)

Members' experiment topics

Per year 200 members and locations across the UK:

- Novel crops: Shark's fin melon, Mango ginger, Tree spinach, Quinoa, Chickpeas
- Blight resistant tomato varieties
- Comparing old and new varieties of peas, tomato and lettuce
- Evaluating Russian comfrey
- The potential of winter salads
- Edible flowers
- The ecological footprint of gardens and allotments

Food growing for Health and Wellbeing

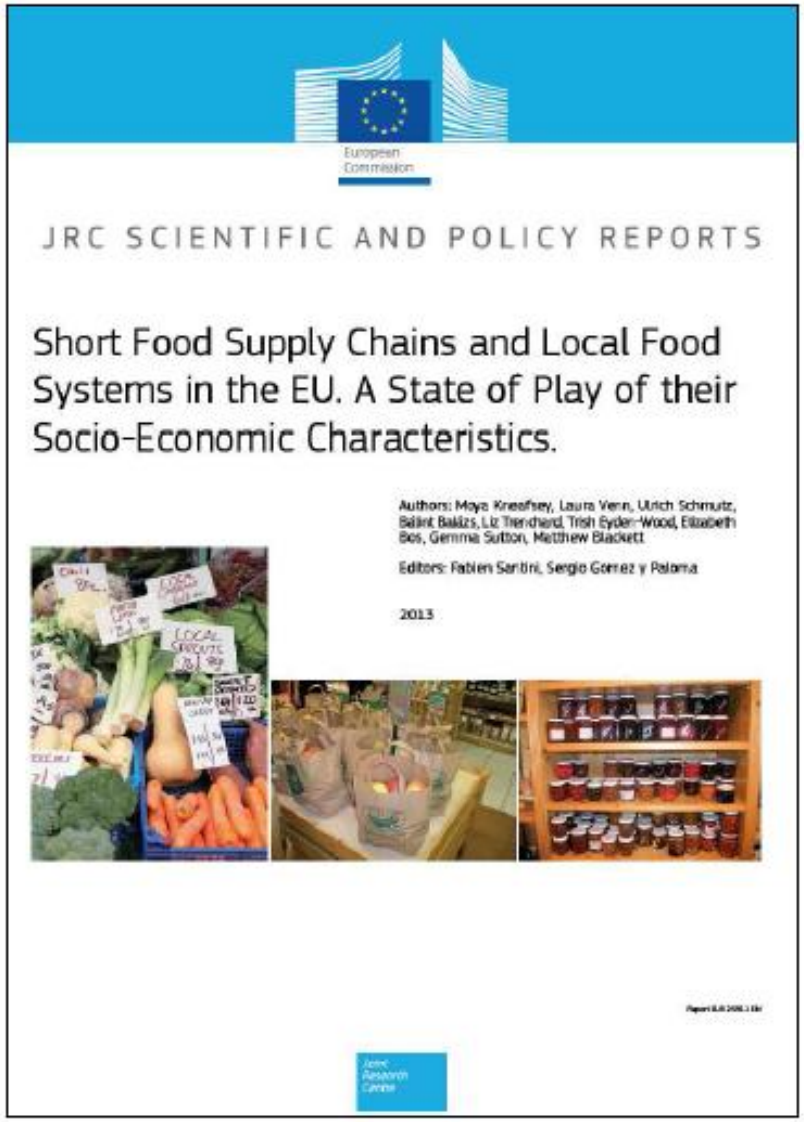
Growing Health

Food growing for health and wellbeing

Growing Health Project

- 2-year trust funded project
- Document evidence and measure outcome (Social Return on Investment)
- Identify barriers and solutions
- Get community food growing routinely used for health outcomes
- ‘Crack the NHS’ (National Health Service)

Short Food Supply Chains



European Commission

JRC SCIENTIFIC AND POLICY REPORTS

Short Food Supply Chains and Local Food Systems in the EU. A State of Play of their Socio-Economic Characteristics.

Authors: Moya Kneafsey, Laura Venn, Ulrich Schmutz, Bálint Balázs, Liz Trenchard, Trish Eyden-Wood, Elizabeth Bos, Gemma Sutton, Matthew Blackett

Editors: Fabien Santini, Sergio Gomez y Paloma

2013

Joint Research Centre

press release http://ec.europa.eu/dgs/jrc/index.cfm?id=1410&obj_id=17030&dt_code=NWS&lang=en&ori=MOR
full report http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6279

5 August 1888
an illegal act by a women together with her two children,
with fundamental, ongoing, consequences for local food systems worldwide

Our hero Bertha Benz: First shopping trip and petrol station

1888 a revolution → 2018 mainstream → 2088 ?

Urbanisation

FOOD METRES

Food Planning and Innovation for Sustainable Metropolitan Regions

Short food supply chains

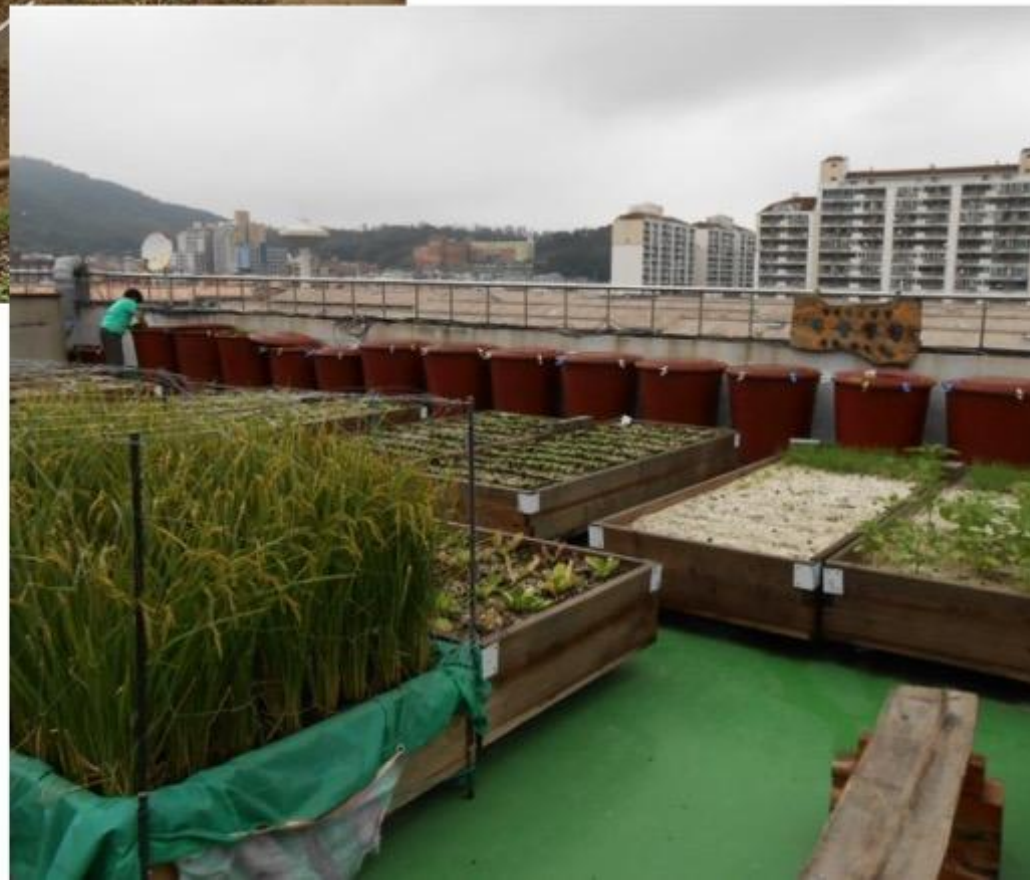
in

London, Rotterdam, Berlin, Milan, Ljubljana, Nairobi.

Urban horticulture Cuba, Latin America

Organoponicos – raised beds,
75% organic matter
25% soil

Urban horticulture Seoul, South Korea, Asia



Growing in soil – ‘not an option’ (London, Europe)

Patchwork Farm (in soil & out of soil) London, Europe

New spaces

The Urban Gardner's favourite tool

Why urban horticulture needs to be organic

Globally, urban horticulture plays a key role within urban/peri-urban agriculture. Globally, the population with **vegetarian/vegan** and meat exclusive (pig, beef) diets is growing faster.

=> Large demand for certification
but **clear differentiation to non-organic systems** needed
e.g. hydroponics or using synthetic fertilisers and pesticides within cities

Delivers fully to organic objectives and principles of **Health** (soil, plant, people), **Ecology** (ecosystems and recycling), **Fairness** (sharing and efficient use of resources, consumer interaction) and **Care** (social health and wellbeing outputs)

Organic standards for EU urban horticulture

Clear and robust rules for urban organic substrates
(as for organic mushrooms)

- biological active ecosystem, nutrient delivered through microbial activity

- conventional inputs currently allowed in organic are **excluded!**:
  No conventional straw (pesticides, GM-feed)
  No conventional manure from any system (veterinary residues, herbicides)
  No peat (fossil fuel, carbon, damage to natural environment)

- green waste, food waste, home compost & digestate from biogas allowed

The way forward in the EU and Europe

Urban agriculture is not a niche and it's important to **include it into certified organic standards for EU greenhouse production.**

Land, across the world, where 'growing in soil is not an option' should not be lost to organic production.

In cases where growing in substrate is necessary, it can be **inspected and certified as strictly as any other production system** (as done for organic mushrooms)

EU organic standards to include **novel organic certification systems** already successfully used outside Europe (group certification, participatory guarantee schemes, self-declaration of small-holders)

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BioGreenhouse

cost
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

COST is supported by the EU Framework Programme Horizon 2020

BioGreenhouse

Horizon 2020, EU COST, FA1105, 4 year 2012-2016, €0.7millon

5 WGs

27 COST countries (300+ experts)

EU, Switzerland, Serbia, Turkey, Israel, Jordan, Egypt, Canada…

Lead: Rob Meijer, Wageningen University, Netherlands

WG lead: Sustainability and standards, Garden Organic -> CAWR

COST is supported by the EU Framework Programme Horizon 2020

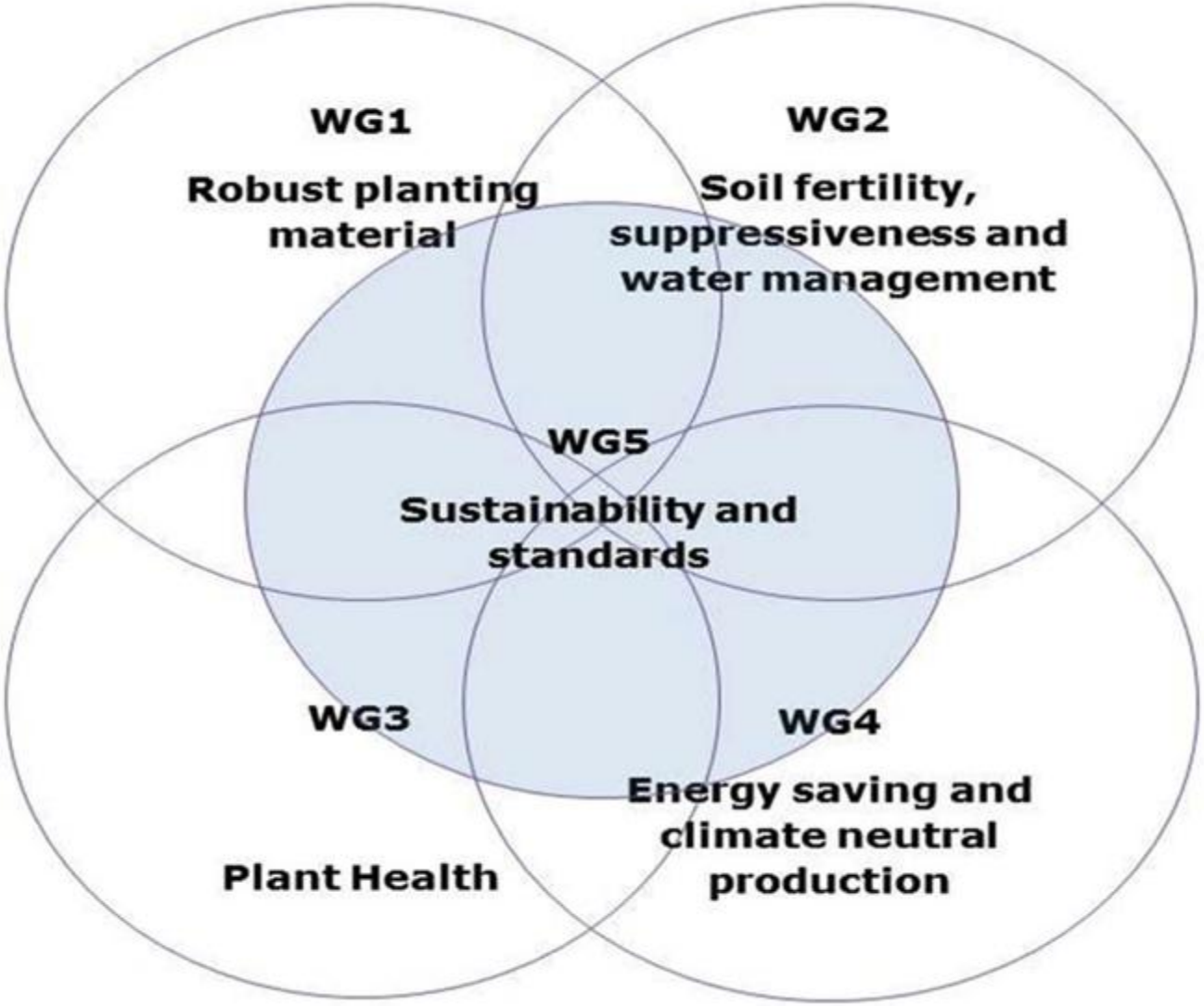
Building collaboration

- 2008 Modena: 16th IFOAM Congress

- 2009 Cologne

- 2010 Bleiswijk1st Symposium

Working groups



BioGreenhouse - Definitions: Polytunnel, high, unheated

Figure 1.2 *Polytunnels, either permanently covered (left) or with removable covers (right).*

Figure 1.3 *Temporary field coverings, either supported on hoops (left) or loose (right).*

Variety trials - participatory plant breeding

Figure 3.1 *Left, a lettuce variety trial; Right, evaluation of radish characteristics.*

Green manure in greenhouses

Figure 3.4 *Green manures: Red clover (left) and Sudan grass and brown mustard being mown in a polytunnel in Switzerland (right, picture by Agroscope Conthey, Switzerland).*

Biodiversity inside and outside the greenhouses

Figure 3.6 *Left, a border of host plants for beneficial insects; Right, sampling insects using a vacuum collector.*

Main crops: Tomato

Figure 4.1 *Tomato crop trials in Estonia.*

Main crops: Salads

Figure 4.14 *A lettuce variety trial in Austria.*

Perennial crops: soft-fruit strawberry and raspberry

Figure 4.22 *Strawberry production, on the right showing the use of raised mulched beds in England.*

Figure 4.23 *Raspberry fruit (left) and commercial production in polytunnels in Scotland (right).*

Perennial crops: top-fruit trees papaya and mango

Figure 4.24 *Papaya fruit (left) and commercial production in polytunnels in Spain (right).*

Figure 4.26 *Mango experiments, in a greenhouse*

Impact

Sustainability assessment

Tools described

Life Cycle Assessment (LCA) and Social-LCA

Social Impact Assessment (SIA)

Social Return on Investment (SROI)

SMART - Sustainability monitoring and assessment routines

Public Goods tool

Ecological and Carbon footprint calculators

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Thank you from Estonia

cost EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

COST is supported by the EU Framework Programme Horizon 2020

BioGreenhouse

Organic-PLUS

ORGANIC PLUS

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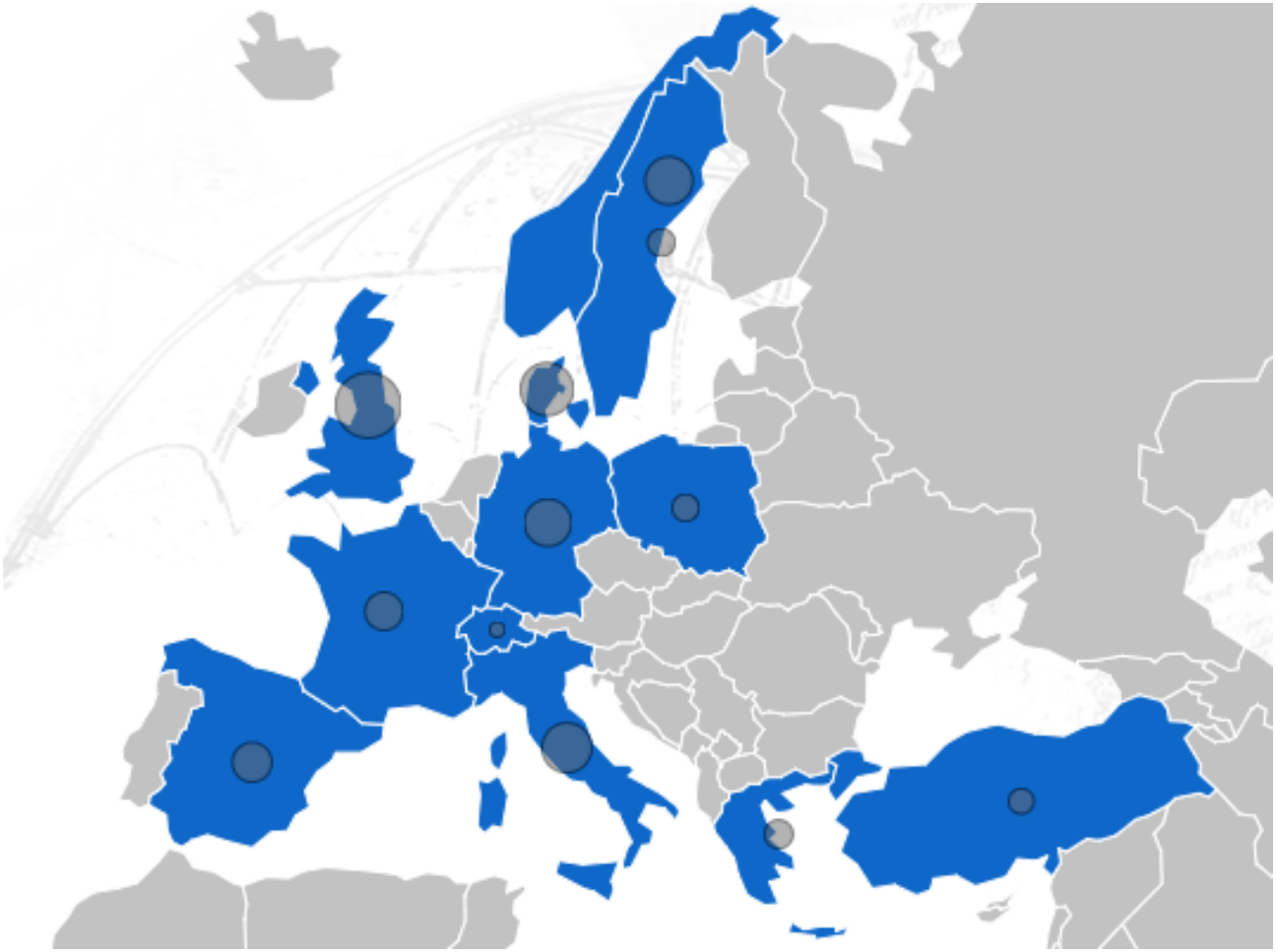

Numbers:

4 years, 4.1m Euro, 11 Universities, 14 other research & NGOs,
9 EU, 3 associated countries, > 50 supporting SMEs, NGOs

Organic-PLUS

"The overall aim of the 'Organic-PLUS project' is to provide high-quality, trans-disciplinary, scientifically informed decision support to help all actors in the organic sector, including national and regional policy makers, to reach the next level of Europe's organic success story."

Numbers:

4 years, 4.1m Euro, 11 Universities, 14 other research & NGOs, 9 EU, 3 associated countries, > 50 supporting SMEs, NGOs

Organic-PLUS

WP2 'IMPACT'
Public view of contentious inputs, Dissemination, Citizen juries, Organic standards & policies

WP3
'PLANT'

'Zero-Cu'
Mediterranean crops
&
potatoes

MINERAL Oils

WP4
'LIVESTOCK'

SYNTHETIC VITAMINS

HORMONS

'Agroforestry'
BEDDING

WP5
'SOIL'

'VEGAN' fertilisers

PEAT

PLASTIC

WP6 'MODEL'
Socio-economics models, LCA, phase-outs scenarios

WP1 'LEAD'
Coordination
International and Industry Advisory Boards

Research done to advance the TRL (Technology Readiness Level)

Innovations to replace or minimise contentious inputs in organic	Technology readiness level (TRL)										Research done	Impact		WP
	TRL	1	2	3	4	5	6	7	8	9		org.	conv.	
System solutions for minimising Cu in potatoes and other field crops	7										on-farm trials	o	c	2, 3, 6
Cu alternatives for greenhouse crops (tomato, aubergine)	6										replicated and greenhouse trials	o	c	2, 3, 6
Cu alternatives for Mediterranean tree crops (olives and citrus)	6										on-farm trials	o	c	2, 3, 6
Phase-out of mineral oils in plant protection and seeding production	7-8										on-farm trials	o	c	2, 3, 6
Phase-out of non-organic manure and straw into organic systems	9										only socio-economic and LCA modelling	o		2, 6
Anti-infective and immuno-stimulatory properties of plant molecules in organic dairy, beef, pig and poultry health and feed	5-6										replicated in-vitro and in-vivo trials, on-farm trials	o	c	2, 4, 6
Agroforestry supply chain products for animal bedding (conventional straw replacement) and peat and plastic replacement	5-6										processing lab trials, on-farm trials	o	c	4, 5, 6
Animal-free fertiliser (vegan) , peat growing media and plastic mulch replacement	6										replicated, nursery and on-farm trials	o	c	2, 5, 6
Average TRL	**6.7**										**Tailor-made research to the innovation's TRL: followed by socio-economic and LCA modelling**	**Impact delivered to organic and conventional systems**		

Cu alternatives for organic greenhouse & field crops potatoes, tomatoes...

Cu alternatives for organic tree crops

Agroforestry products as straw alternatives

Antibiotics alternatives

Vegan: Animal manure alternatives

VEGAN ORGANIC Farming and Growing

Green manures as vegan fertiliser

Liquid vegan organic fertilisers

Peat alternatives

Vegan, peat-free organic

Plastic mulch alternatives

Lets work together

Join Agroforestry research

Centre for Agroecology, Water & Resilience

thank you, please contact us

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