SOLMACC Workshop: Developing policy recommendations to address the challenge of climate change in agriculture

Brussels: November 27, 2017

Agriculture's contribution in mitigating climate change:

Results from the SOLMACC farms

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Agricultural GHG Emission der EU

Currently around **10 % of direct GHG emissions** from the EU derive from the agriculture (Danila et al., 2016)

The food system: around **33 – 50% of total GHG emissions** via the production, processing, transportation, consumption and food waste (Muller et al., 2016)

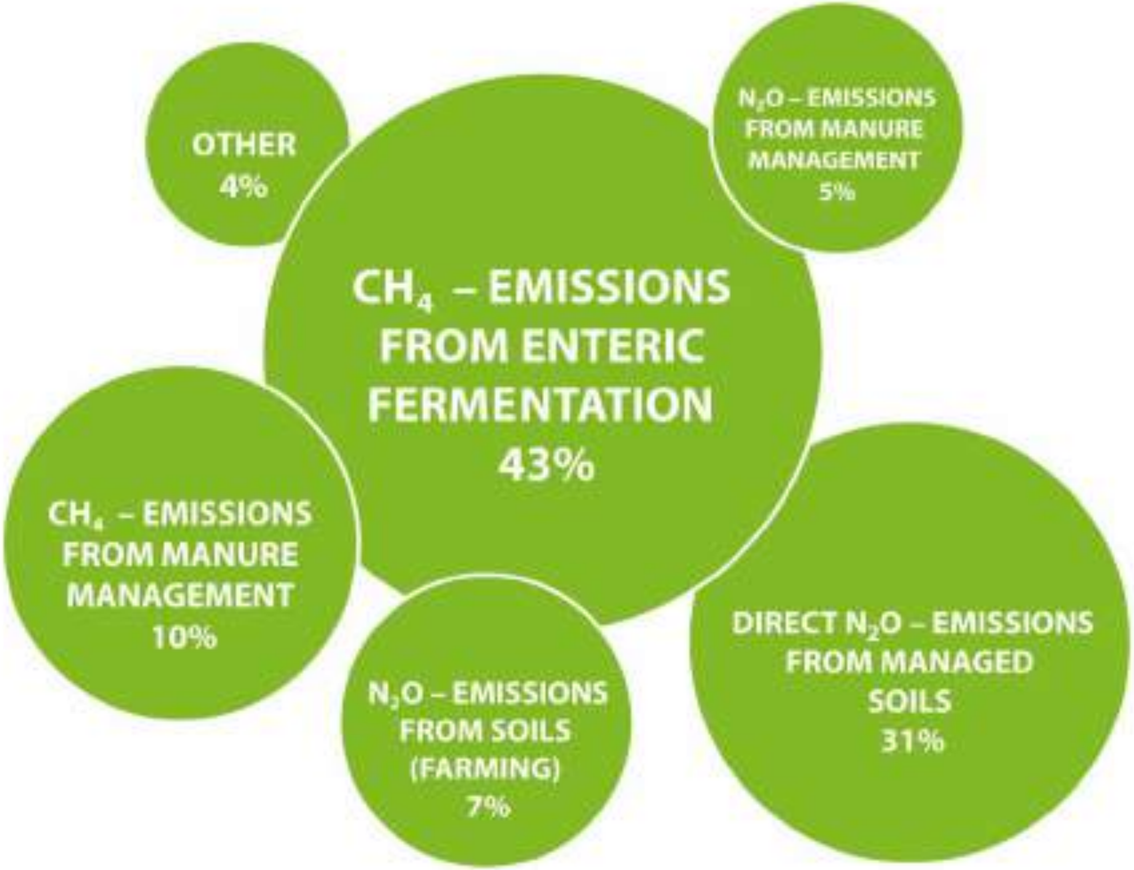


Figure: GHG emissions of the EU- agriculture sector (based on Danila et al., 2016)

Agricultural Vulnerability

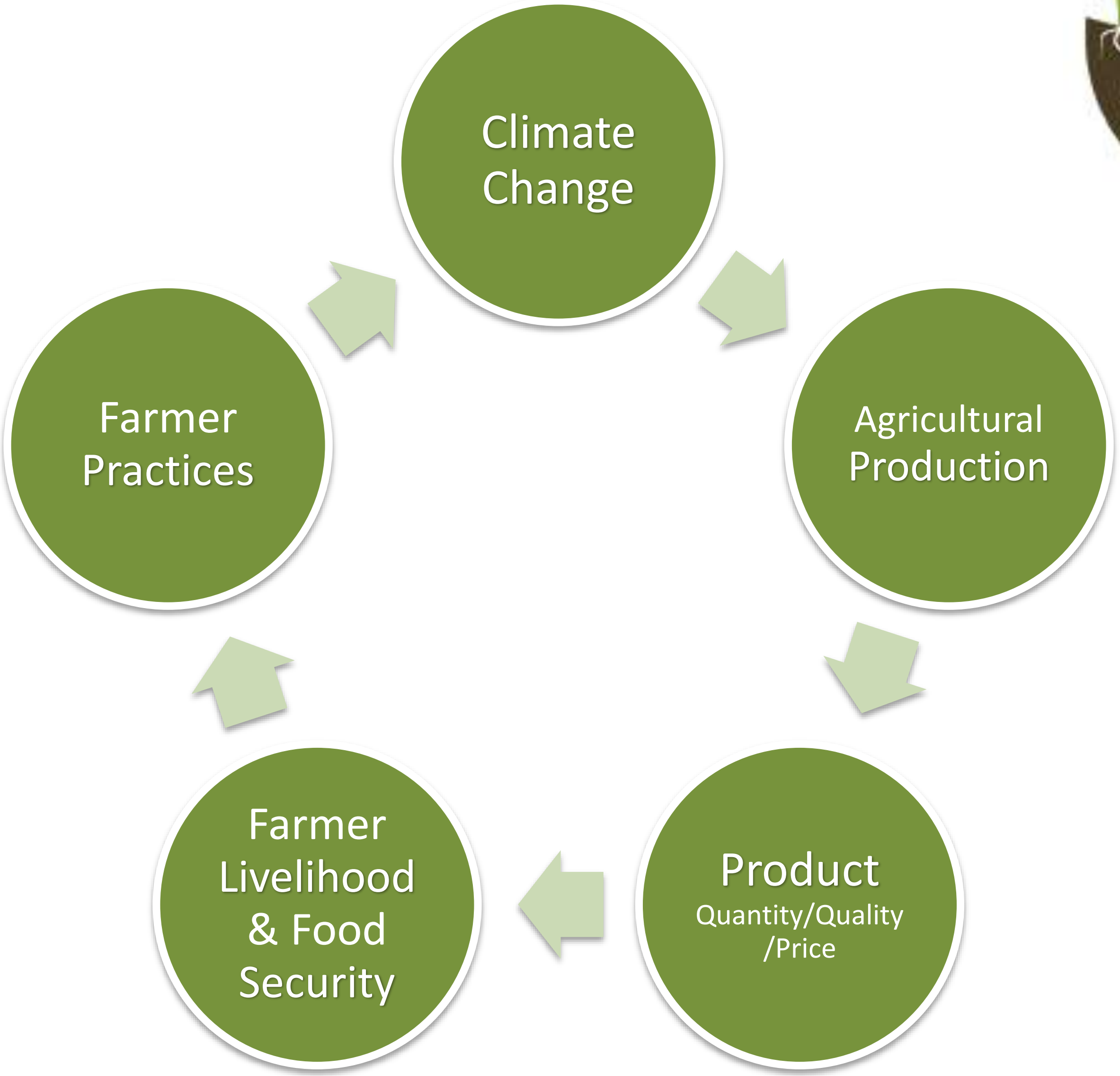


Figure: based and adapted from FAO, 2016

The Potential of Organic Agriculture

- no synthetic fertilizers (production, transport, utilization)
- reduced emissions from livestock feed
- higher carbon sequestration (Gattinger et al., 2012),
- lower N2O emissions per hectare (Skinner et al., 2014)

➢ around 17% of agricultural GHG emissions could be reduced (Muller et al. 2016)

Co-benefits of Organic Agriculture

At the same time, organic agriculture offers co-benefits:

- climate change adaptation
- biodiversity
- aquatic systems
- human health
- animal welfare

Strategies for **O**rganic- and **L**ow-input-farming to **M**itigate and **A**dapt to **C**limate **C**hange **(SOLMACC)**

PROJECT LOCATION: DE, IT, SE, Brussels

DURATION: Start: 01/09/2013 - End: 30/09/2018

PROJECT'S IMPLEMENTORS:

- Coordinating Beneficiary: Ekologiska Lantbrukarna, SE
- Associated Beneficiaries: IFOAM EU Group (Day-to-day Coordinator), Brussels; AIAB, IT; Bioland Beratung GmbH, DE; FiBL, DE

Demonstration Network

- promote **wider adoption** of innovative practices
- GHG emissions **reduce**
- farmer's **resilience** improve
- **co-benefits** are demonstrated
- **knowledge shared** with interested stakeholders

The 12 SOLMACC demonstration farms in Italy, Germany & Sweden

48 SOLMACC Practices

Pictures (from top): © Gut Krauscha: Turning of the compost piles ©Daniele Fontanivse – Cabbage field at Caramadre,Alföldi, FiBL,© Kjell Sjelin in Hånsta Östergärde

Optimized Nutrient Management

- composting
- MC treatment
- biogas production and/or utilization
- mobile livestock systems

Photos (von links): © S.Griese, Krepold, ©Sötåsen, © Hånsta Östergärde

Farmyard Manure Composting*

Farm	Amount Farmyard Manure (DM kg)	Reduction (total in kg CO2-eq.)		
		Minimum	Average	Maximum
Fontanabona (IT)	40	2 360	13 160	16 880
Kreppold (DE)	115	6 773	37 769	48 446
Gut Krauscha (DE)	215	12 700	70 817	90 836
Relevant mitigation potential		**- 9%**	**- 49%**	**-63 %**

*preliminary results. Calculations 2017

Mobile chicken stall: Hånsta Östergärde, SE

CO2 mitigation by:

- Reduced transport of manure
- Reduced transport/production of feed

Photos: © Hånsta Östergärde

Optimized Crop Rotation

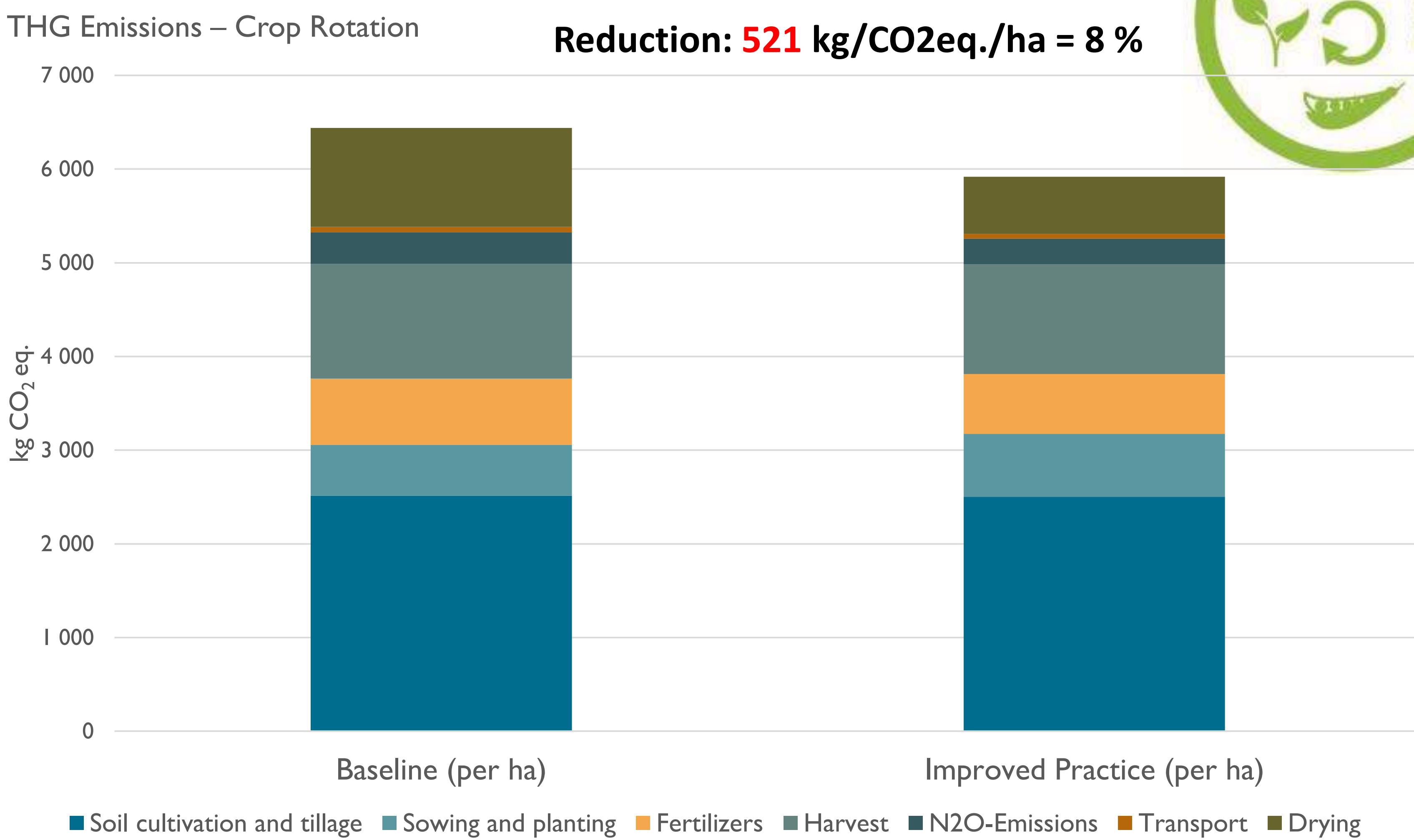
- Introduction and/or increasing percentage of grain and/or forage legumes
  - Stabilisation of soil fertility, N-fixation (Leithold et al., 2015)
  - Average C-sequestration of 0.32 Mg ha^{-1} a^{-1} by cover crops (Poeplau & Don, 2015)



Photos (von links): © Gut Krauscha, ©**Körslätts Gård** © Fontanabona

Optimized Crop Rotation: Kreppold (DE)*

Reduction: 521 kg/CO2eq./ha = 8 %



*preliminary results. Calculations 2017

Reduced Tillage

- Reduced frequency
- Reduced depth
- No tillage

Reduced Tillage

Advantages for climate change mitigation

- Reduced fossil fuel consumption (depends on machines, soil types/texture and farm size)
  - up to 20 kg C ha^{-1} $year^{-1}$ (Johnson et al., 2007; Ricosky & Archer, 2007)
- Potential carbon sequestration
  - 143 g m-2 (Cooper et al., 2016)

Agroforst and Landscape Elements

Implementation of different agroforestry systems:

- Boundary hedges
- Buffer stripes
- Alley cropping
- Silvopasture (lifestock integration)

Photos (von links): © Hånsta Östergärde © Kreppold, © Haus Holte

Agroforst: Kreppold (DE)*

8 ha: (boundary hedges: 1 ha, forest: 7 ha)

C-accumulation in tree biomass (above and below-ground): 5,1 – 7,8 t/ha/year = 35.7 - 54,6 t/year

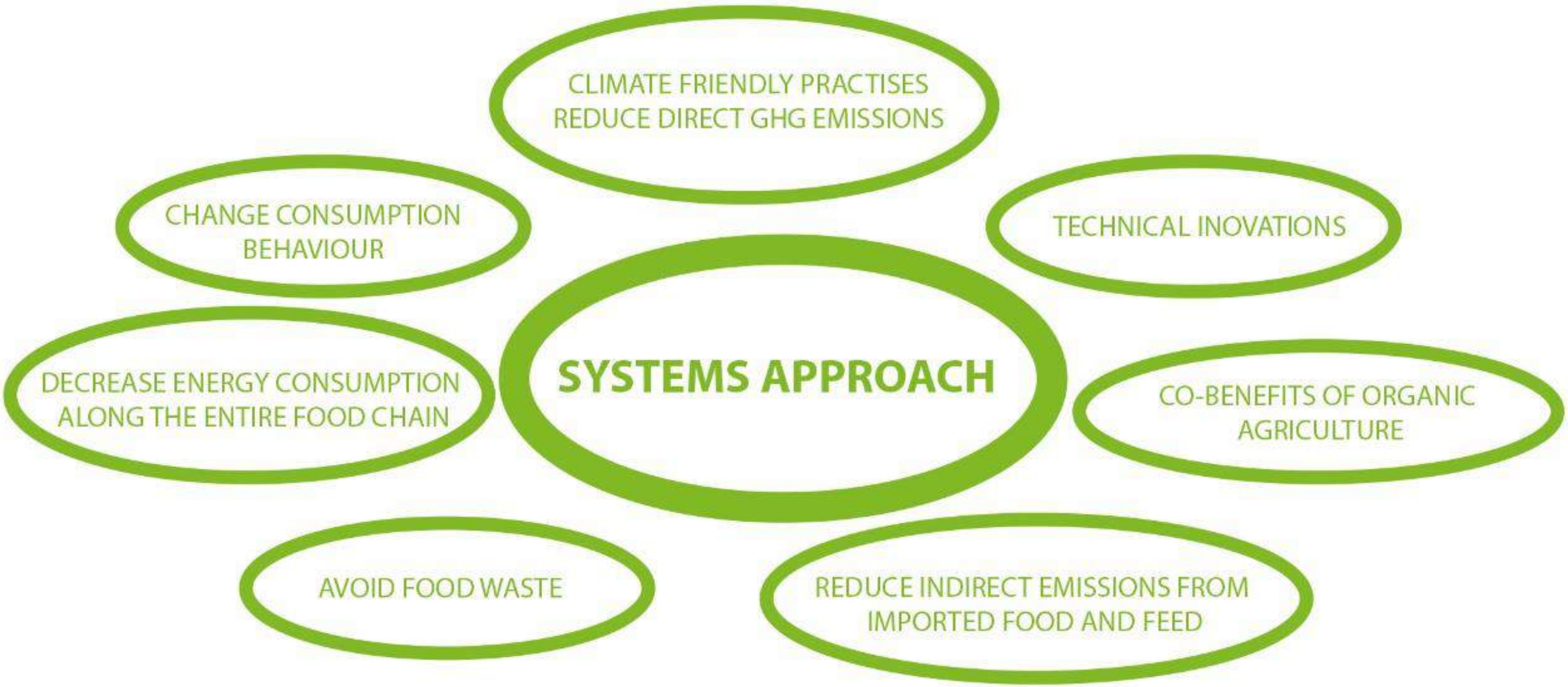
C hedge biomass (above-ground): 1,64 – 4,8 t/ha

C-sequestration soil: 0,455 t/ha/year = 3,64 t/year (based on Schrumpf et al., 2014)

*preliminary results. Calculations 2017

Summary and Conclusions

- Agriculture system has to achieve many goals
- Organic agriculture has a high potential for synergies



Thank you very much for your Attention!