

Sustainable Organic Agriculture: Win-win Measures for Climate Change and Food Security

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- **CLIMATE CHANGE AND AGRICULTURE**

- **OA and MITIGATION**

- **OA and ADAPTATION**

- **OA and Food Security, Rural Livelihood**

- **Policy Challenges**

- **Way Forward**

Climate change and Agriculture

- Agriculture = Contributes to and is impacted by Climate change
- Agriculture accounted for an estimated emission of 5.1 to 6.1 GtCO₂-eq/yr in 2005 (10-12 percent of total global anthropogenic emissions of greenhouse gases)
- Agriculture accounts for about 58% of N₂O and 47% of CH₄ of global anthropogenic emissions

Climate change and agriculture



- Agricultural production, including access to food in many African countries, is projected to be severely compromised, adversely affecting food security and exacerbating malnutrition
- By 2020, in some African countries, yields from rain-fed agriculture could be reduced by up to 50%

Climate change and agriculture

- The area suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease in Africa
- can adversely affect food security and malnutrition



Climate change and Agriculture

- A Need to reduce emission
- And a Need to Adapt
- Questions: can farmers adapt? Can emission from agriculture be reduced?
- How?

- Evidence is emerging to indicate that small-scale, sustainable agriculture may be the answer to both questions.
- Organic Agriculture may be the answer for multiple crisis: climate change mitigation, adaptation; food security and rural livelihoods.

Ecological agriculture and climate change mitigation

- Emissions: NO_2 from fertilizers; CH_4 from enteric fermentation, rice production etc.; CO_2 from production of fertilizers, transportation, energy intensive production, land use change --> chemical intensive, large scale agric.

a. ENERGY EFFICIENCY AND REDUCTION

Studies indicate OA reduces energy use up to 200 times (Rodale Inst) due to less synthetic input especially nitrogen fertilizer

Energy efficiency in organic apples, milk and barley production, overall about 26% in UK.

b. LOWER GHG EMISSION

About 48-66% lower per ha in studies in Europe.

Conversion to Organic can reduce nitrous oxide by two third due to no external N fertilizers, recycling of livestock and crop waste, planting legume crops.

Shifting from grain-fed to grass fed of livestock may reduce methane --> need research

c. **Building up carbon in the soil**

Organic carbon content increases in OA farms, in California up to 28% more than conventional systems

In Rodale Inst, organic matter in soils are 30% more in organic systems after 22 years--> restoring soils, and their Carbon sequestration functions.

Organic soils have higher water holding capacity --> more resistant to climate extremes

Organic agriculture and climate change adaptation

- High degree of diversity
 - Respond better to change, pest and diseases
- Multiple cropping or polyculture systems
 - Greater yield stability and less productivity declines during drought
- Use of traditional and locally-adapted drought and heat-tolerant varieties and species
- Agroforestry systems and mulching
 - Protect crops against extremes, inhibit moisture loss, reduce heat stress

Organic agriculture and climate change adaptation

- New knowledge, applied with farmers' participation can also be effective adaptation
- E.g. organic System of Rice Intensification (SRI) --> in Indonesia reduce water use up to 46% with yields 10-12 tons per ha.
- Sharing of knowledge and technique is important

Food Security and Rural Development

- In developing countries yield is 80% more than conventional systems, 116% in Africa
- Studies indicate productivity increases 79%
- Focused on food production
- hypothetically can produce enough food on global per capita basis

Policy Challenges

- DATA AND DOCUMENTATION DEFICIT
 - Lack of data in developing countries but many farmers practice organic agriculture and manage climate change
 - OA often not considered priority
 - OA: diverse methods in diverse climate zones, ecosystems

Policy Challenges

- **NEGLECT OF AGRICULTURE and THE NEED FOR NEW PARADIGM → SUSTAINABILITY**
- **Policy Deficit → OA not recognized as a potential development strategy, and climate change mitigation and adaptation strategy**

Policy Challenges

- Policies often sectoral, while challenges are multiple. Need integrative, holistic policy approach to tap the potential of OA to address climate change and food crises.
- Need to give voice to farmers; support for farmers' knowledge on mitigation and adaptation

Policy Challenges

- Incentives for farmers to practice OA, to adopt mitigation and adaptation practices.
- Incentives should form part of development policy – the financial requirements are low
- Need institutional arrangements and public financing instead of market incentives

Policy Challenges

- These challenges can be overcome
- Key: investing more resources, research and training into, providing appropriate policy support to, and implementing national, regional and international action plans on sustainable agriculture

A woman, Ms. Im Sarim, is standing in a lush green rice field. She is holding a large, healthy rice plant with a well-developed root system. The field is filled with similar rice plants, and the background shows a rural landscape with palm trees and a thatched-roof structure. The text 'KNOWLEDGE AND APPROPRIATE TECHNOLOGY IS KEY' is overlaid in red on the right side of the image.

**KNOWLEDGE AND
APPROPRIATE
TECHNOLOGY IS
KEY**

Ms. Im Sarim, Takeo, Cambodia, with rice plant grown from a single seed, using SRI methods and traditional variety -- yield of 6.72 t/ha (uphoff)

Way forward

- More research and action on adaptation measures in agriculture needed, especially in developing countries, in order to assist farmers
- Action plans for mitigation measures for agriculture should be urgently researched and implemented
- Financing assistance for adaptation and mitigation measures in the agriculture sector in developing countries should be prioritized
- Arrangements for sharing of experiences and transfer of good practices in agriculture that can constitute mitigation and adaptation

Way forward

- a 'win-win-win' scenario for agricultural development is possible!!
- The key is phasing out chemical-intensive agriculture, phasing in small scale organic sustainable agriculture!
- The choice is clear!!

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Thank you!