Can organic agriculture contribute to sustainable development in the tropics?

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The Research Institute of Organic Agriculture (FiBL), Switzerland is running a 'Long-term Farming Systems Comparison in the tropics (SysCom)' programme in Kenya, India and Bolivia, since 2007. The main aim of the SysCom programme is to enhance know-how on potentials and limitations of different agricultural production systems in tropics, thereby contributing to sustainable agriculture. To achieve this aim, sound scientific evidence is obtained primarily from four long-term experiments (LTE) that compare different agricultural production systems (mainly organic and conventional). The scientific findings of SysCom are expected to address global challenges of nutrition security and environmental sustainability by informing the policy process at regional and international level. Started in 2007-08, together with local partner institutions, the LTEs capture long-term changes and monitor the effects of contextual developments through observation of agronomic, economic and ecological parameters over time.

The findings from a decade of experimentation shall be shared in this presentation. Results suggest that organic agriculture and agroforestry systems have considerable potential to enhance sustainability of agricultural systems, especially with regard to soil fertility and biodiversity conservation, while maintaining productivity and profitability in most cases. Higher returns on investment and higher labour productivity make organic and agro-forestry systems interesting for resource poor small-holder farmers. Yet, for full exploitation of the benefits of organic agriculture, major efforts are needed to tackle agronomic/ technological challenges (lack of suitable inputs, pest management), capacity development of farmers (technical know-how) and institutional/governance challenges (markets, agri-business).

Some concrete results in brief are:

- Yields of maize and soybean in Kenya and India are similar in organic and conventional systems.
- Yields of wheat and cotton in India are about 20% lower in organic systems but gross margins are comparable due to lower input costs.
- Yields of vegetables in organic systems (in Kenya) are particularly lower due to pest damage.
- Organic carbon in the soils of organic systems is higher compared to conventional.
- Density and biomass of earthworms in organically managed soils is higher than in conventionally managed soils.
- In cocoa full sun systems yield in conventional is higher than in organic full sun, in agro-forestry systems there is no difference in yield of cocoa nor in total system yield.
- No difference in workload between organic and conventional cocoa growing.
- No difference of economic return per labour day between organic and conventional, in agroforestry systems the economic return per labour day is nearly double than full sun
- Agroforestry systems have higher bird species richness.
- Agroforestry systems offer diverse nutrition and higher total calorie production than monocultures.

Further information and publications available at: https://systems-comparison.fibl.org/