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Change along the way? Balancing systems approach and comparability when adapting long-term experiments

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Abstract

SysCom was initiated to provide evidence for the performance and viability of organic agricultural cropping systems in the tropics. While case studies and long term studies were available for temperate zones, little scientifically backed-up evidence was available to assess the potential of organic agriculture in sustainable development in countries within the tropical climate. Thus in 2007 long term trials in India, Bolivia and Kenya were established, comparing in each country two organic systems with two conventional systems based on locally relevant cropping systems and main crops (cotton, cocoa, maize). Combining the existing practical examples and recommendations from local agricultural institutions organic and conventional treatment were designed, putting high emphasis on the local relevancy and prevalent practices. After the systems established it became clear that organic systems in our long-term experiments (LTEs) were lacking behind in profitability and productivity, not offering a valuable approach for local farmers to sustain their livelihoods. In our analysis we had to realise that often a mere copy of conventional practices, substituting conventional with organic inputs would not suffice to provide solid evidence on the potential of organic agriculture in the tropics.

Using the example of the SysCom program, we want to discuss the challenges and opportunities of adapting LTEs, confronting questions on how to adapt the three LTEs implemented in different countries to still be in nexus to each other, how to balance systems approaches to optimise the different compared treatments while still being comparable to each other and finally how to meet the golden mean of innovative and optimised farming approaches while being realistic and relevant to local contexts. The adaptations realised in the annual cropping system LTEs, such as changing input levels and seed material, introducing more complex intercropping patterns and crop rotations are proving to be valuable additions to our experiments. The positive impacts on productivity and profitability, especially on the organic systems can serve as a examples of sustainable locally adapted production systems, allowing also smallholder farmers to sustain their livelihood also in the future on farming.

Keywords: Annual cropping systems, cotton, India, Kenya, long-term trial