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Organic agriculture: a global vision and research strategy

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Strengths and weaknesses of organic agriculture

- Multi-functionality - the most characteristic feature of organic agriculture;
 - (Bio)diversity on organic farms;
 - Lower negative environmental impacts;
 - Stable soils – less prone to erosion;
 - Carbon sequestration;
 - Good nutrient use efficiency;
 - Adaptation to climate change (resilience).
- Yield gap;
 - Social, animal welfare and quality gaps;
 - Research gaps.

Yields: state-of-the-art of literature

- Temperate zones: The organic yields are between **75** and **80 %** of conventional yields (intensive farms):
 - Seufert, V.; N. Ramankutty and J.A. Foley 2012: Comparing the yields of organic and conventional agriculture. *Nature* 485, 229-232.
 - De Ponti, T.; B. Rijk and M.K. van Ittersum 2012: The crop yield gap between organic and conventional agriculture. *Agricultural Systems* 108, p 1-9.
- Entire crop rotations: The DOK trial running in permanence in Switzerland since 1977 (5 x 7 year rotation): **83 %** organic/conventional.
 - Mäder, P.; A. Fließbach; D. Dubois; L. Gunst; P. Fried and U. Niggli 2002: Soil fertility and biodiversity in organic farming. *Science* 296, 1694-1697.

Yields: state-of-the-art of literature

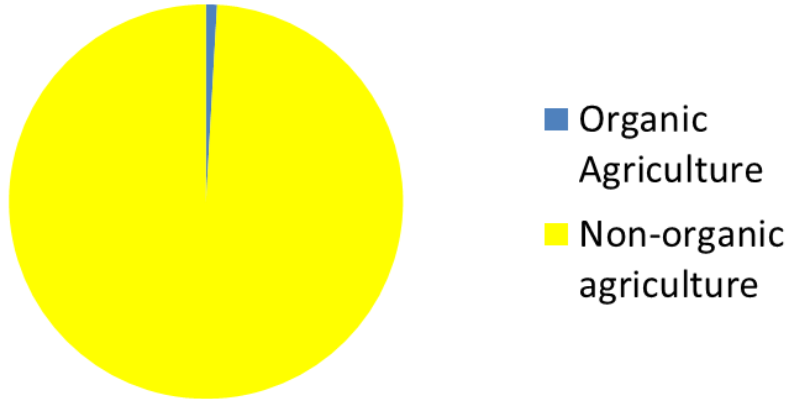
- Sub-Saharan Africa: Organic farming increased yields by **116 %** compared with subsistence farming.
 - UNCTAD and UNEP (2008). 'Organic Agriculture and Food Security in Africa', New York, Geneva, United Nations Conference on Trade and Development, United Nations Environment Programme.
- An older meta-analyses of global data: the average yield ratio “organic/conventional” was slightly **< 100 %** for studies in the developed world and **> 100** for studies in the developing world.
 - Badgley, C., Moghtader, J., Quinterio, E., Zakem, E., Chappell, M.J., Avilés-Vázquez, K., Samulon, A. and Perfecto, I. (2006). 'Organic agriculture and the global food supply'. Renewable Agriculture and Food Systems 22: 2, pp. 86-108.

Opportunities and threats

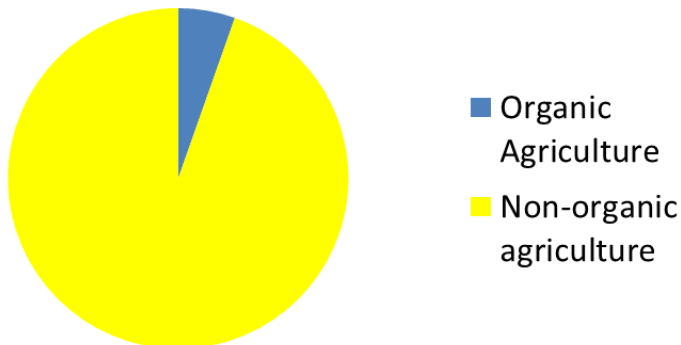
- Reducing trade-offs between productivity and sustainability;
 - Sufficiency in times of limited resources;
 - Improved multi-actor cooperation;
 - Active participation of farmers in co-innovation.
- Globally a tiny niche for wealthy consumers, not recognized as a relevant strategy for securing food supply;
 - Most steady growth in regions with direct payments to farmers (e.g. Europe); are they secured?
 - Best strategy towards sustainability could be others, more science and innovation-oriented pathways.
 - Other sustainability labels become much more important and accepted by the consumers.

Mainstreaming not achieved so far

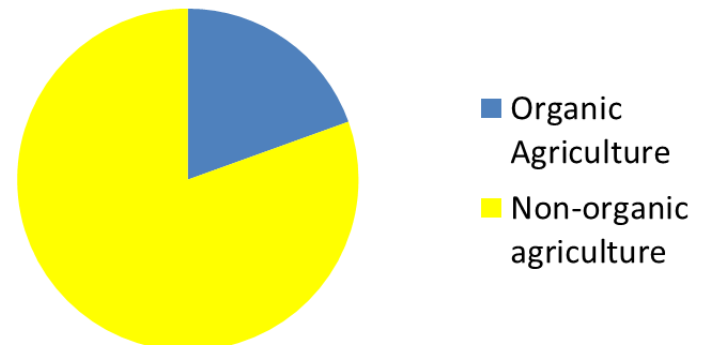
World



EU



Austria



Voluntary sustainability standards getting important

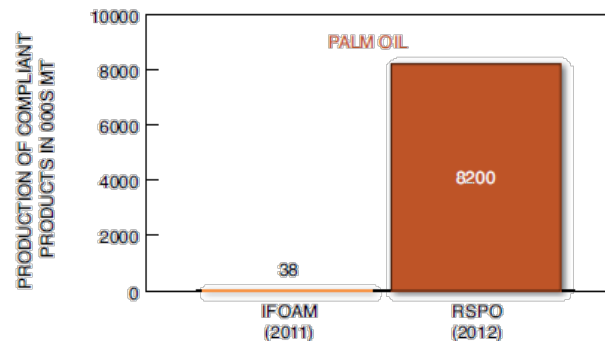
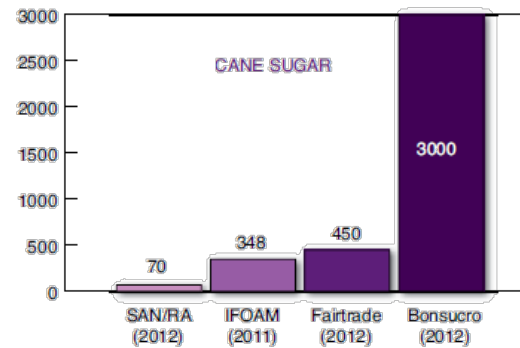
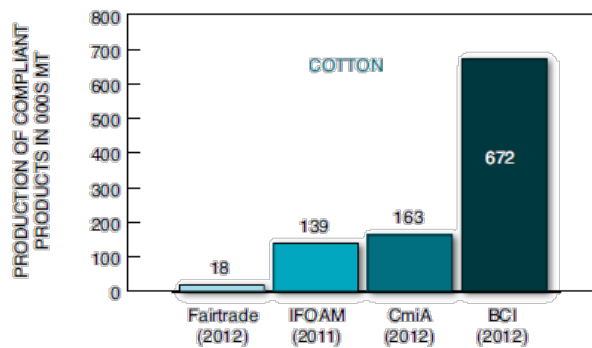
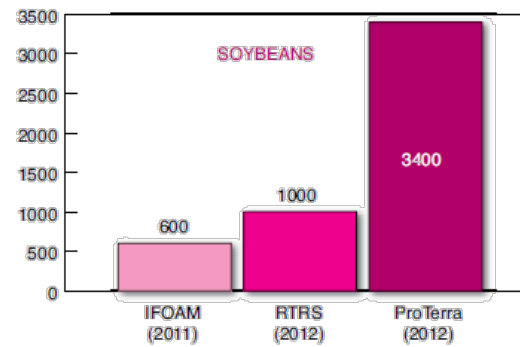
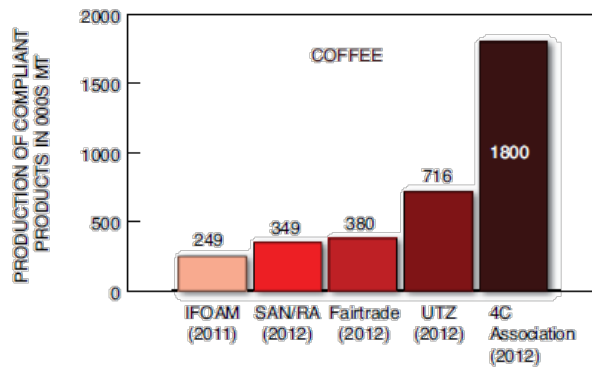


**VOLUNTARY
SUSTAINABILITY
STANDARDS**

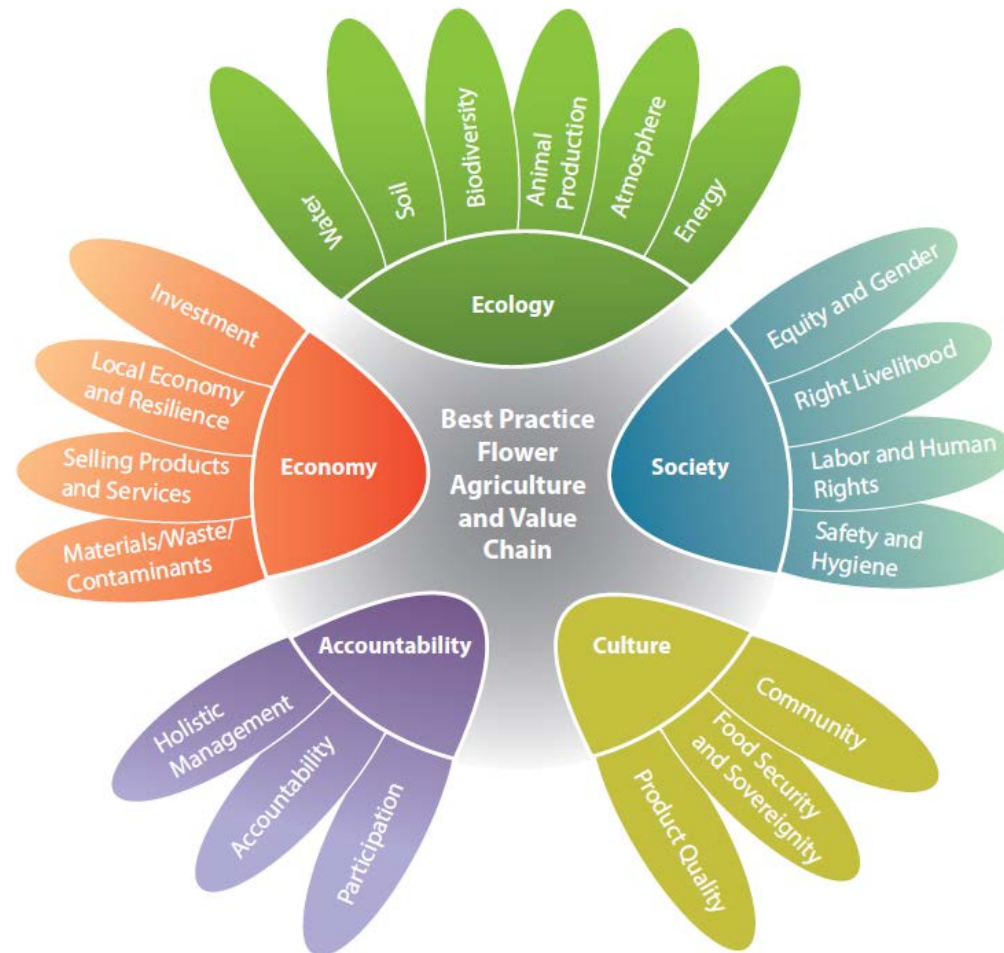
UNFSS

TODAY'S LANDSCAPE OF ISSUES
& INITIATIVES TO ACHIEVE PUBLIC
POLICY OBJECTIVES

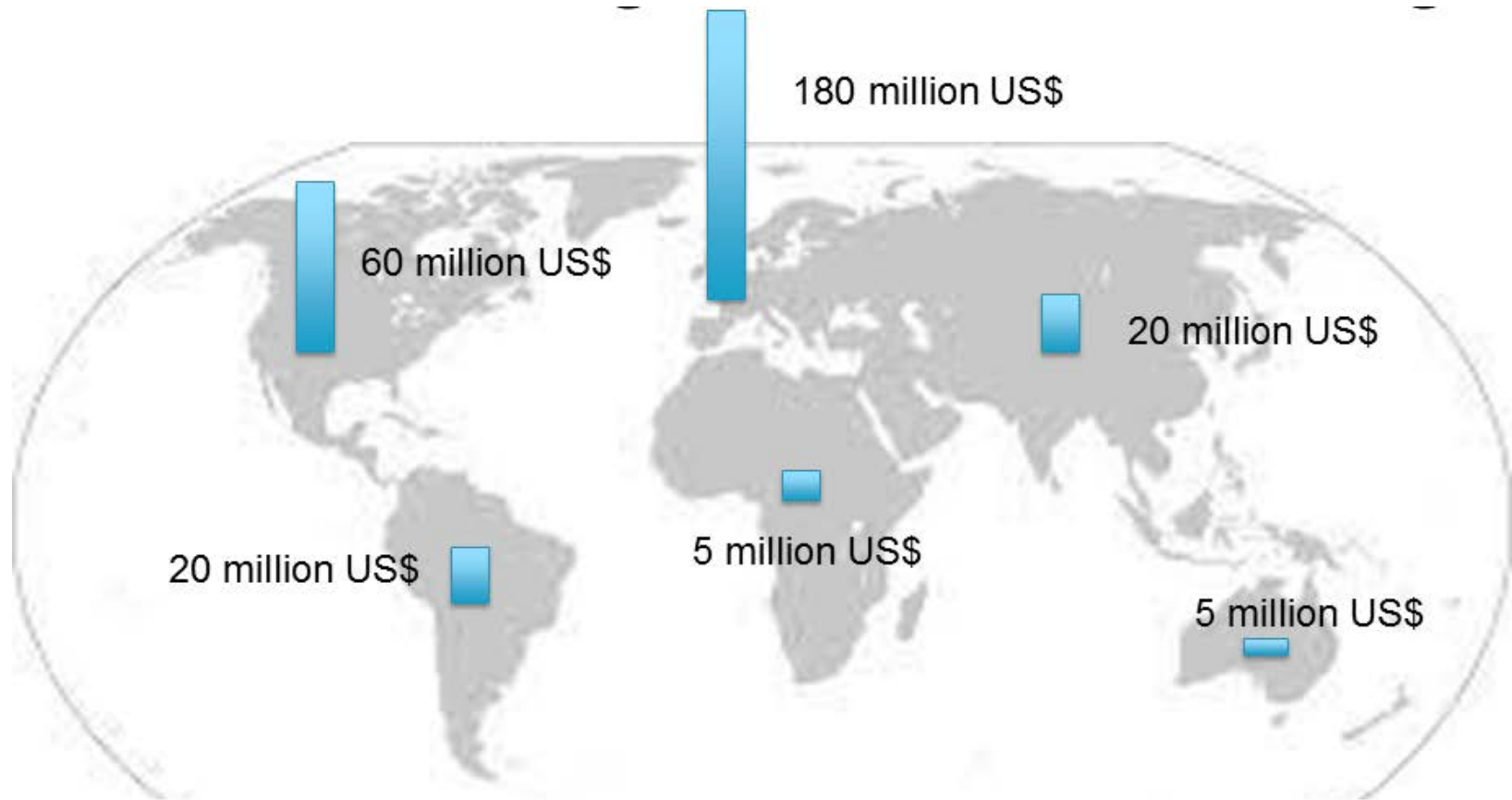
Production size of different voluntary SS



SOOAN is a major step forward: Looking at organic farming development with the help of sustainability indicators and metrics



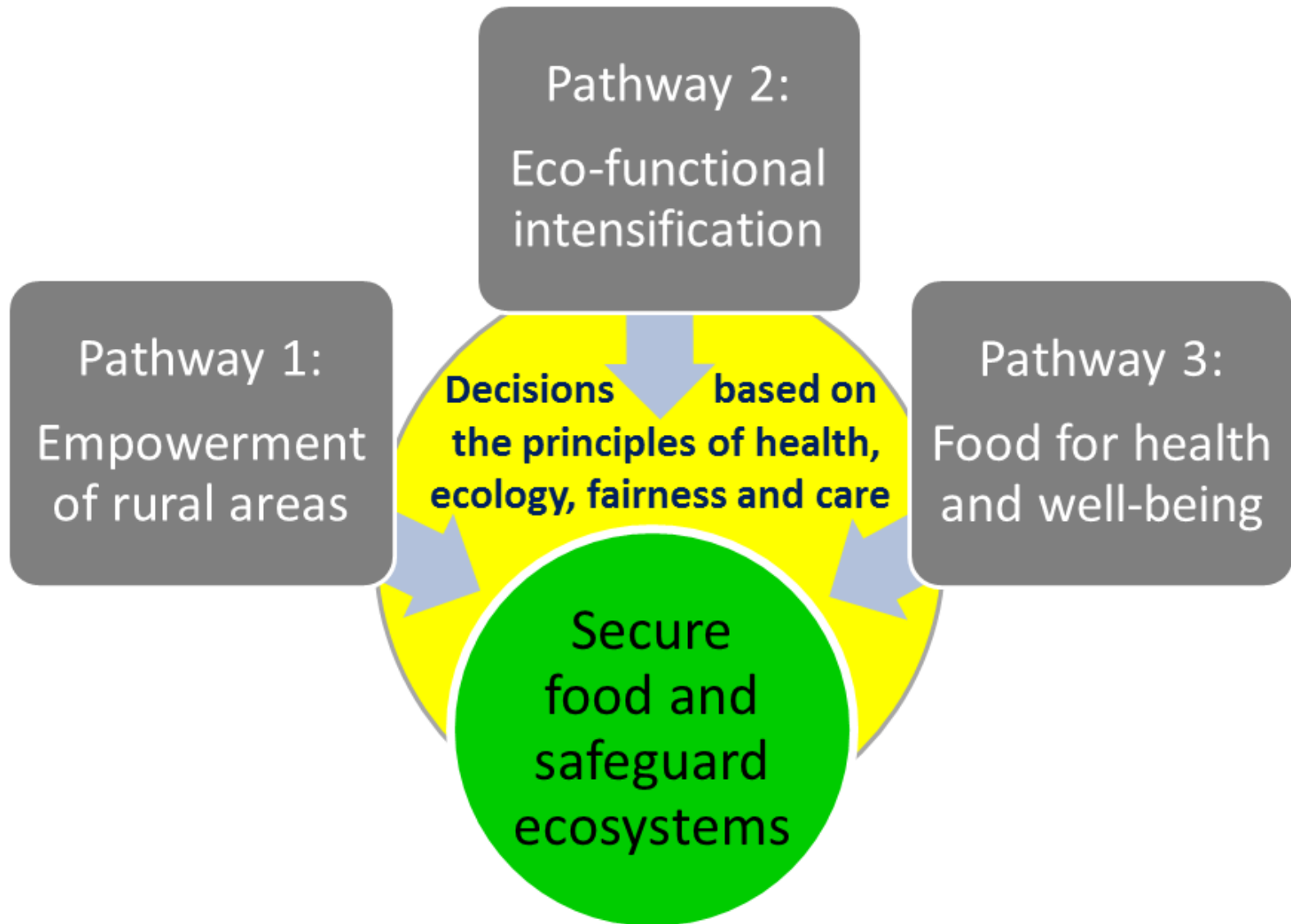
Annual spendings for organic research



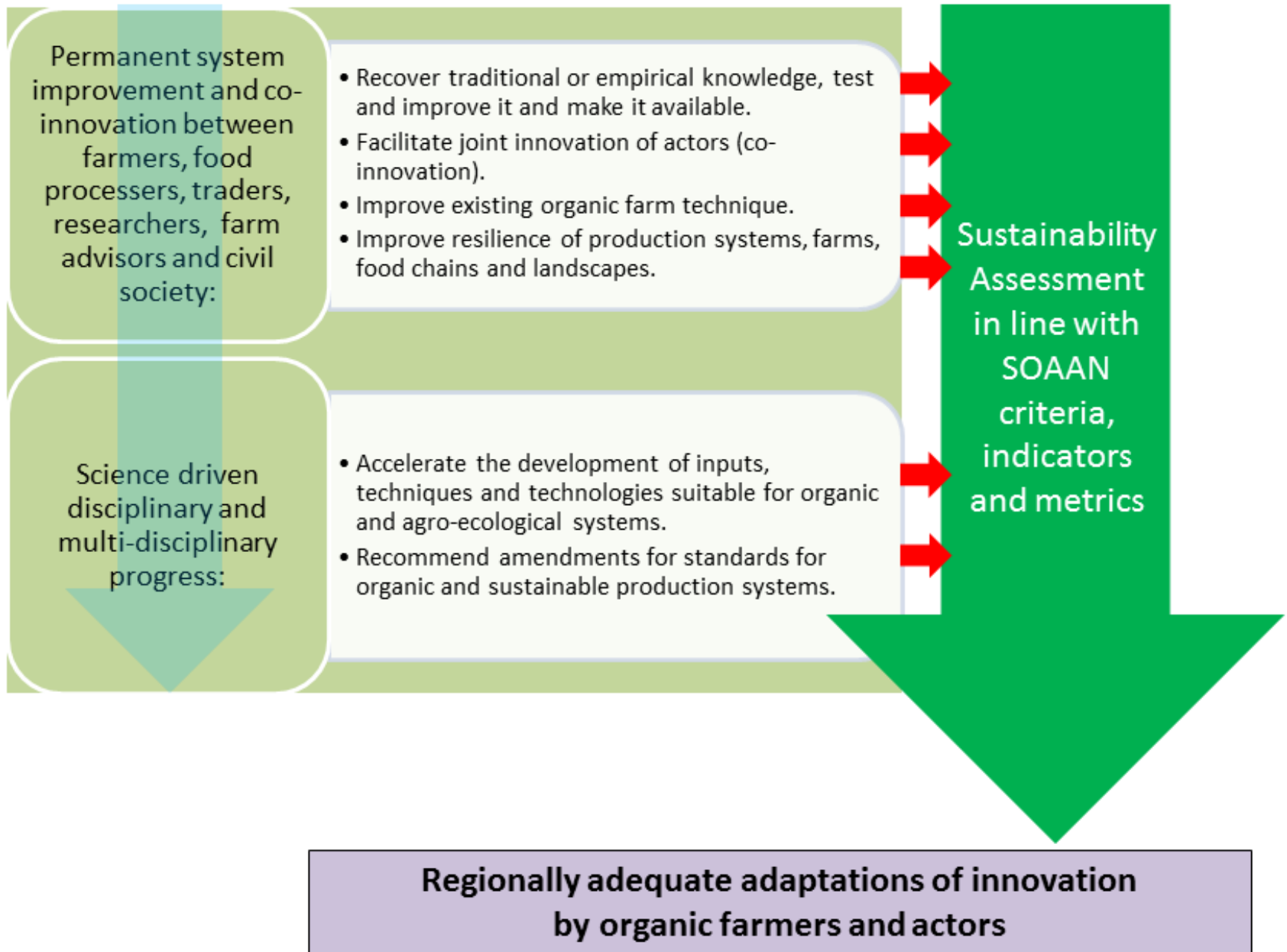
290 million = 0.6% of total research funding

Estimation of Urs Niggli, FiBL (2014)

Vision



Innovation pathway



Pathway 1: Organic farming and food systems crucially empower rural areas across the whole world and help to stop migration from the land.

«Organic agriculture, food processing and eco-tourism will become important drivers of the empowerment of rural economies. In many disadvantaged regions, organic agriculture will be the preferred land use model and become mainstreamed. A diversified local economy will attract people and improve livelihoods and will halt or even reverse migration from rural areas to urban centers. Organic farm practices, animal welfare and foods thereof will foster the dialogue between urban and rural populations leading to intensified forms of partnership between consumers and producers. Organic farming will motivate and reunite actors of sustainable food chains and will contribute to the attractiveness and unique quality of the world's landscapes. It will be a powerful intensification strategy on marginal sites and for subsistence farm making best use of the nature, the human and the social capital in agriculture».

Pathway 2: Securing food and ecosystems by eco-functional intensification.

«The availability of food and the stability of food supply will be noticeably increased through eco-functional intensification, and access to food will be considerably improved thanks to revitalized rural areas. Food productivity based on non-renewable resources and off-farm inputs will become partly obsolete. Knowledge among farmers about how to manage ecosystem services in a sustainable way will be much greater, and animal welfare and environmentally sound farming will be state-of-the-art in food production. Organic farms will demonstrate how negative trade-offs between productivity and sustainability can be minimized. It will be the benchmark for the responsible and precautionary use of the scientific progress in food and farming systems. Organic farmers will become models for ecosystem managers, co-researchers and in- and output optimizers».

Pathway 3: High quality foods – a basis for healthy diets and a key to improving the quality of life and health.

«In the future, people will have more healthy and balanced diets. Food and quality preferences will have changed: fresh and whole foods will be the ultimate trend and processing technology will produce foods with only minimal alterations to the intrinsic qualities. The specific taste and its regional variation will be more appreciated than artificially designed. **This trend towards a higher quality of foods, a more knowingly and less wasteful consumption of food and the renaissance of authenticity of traditional foods will be spearheaded by organic farmers and food processors and distributors. Cooperative and participative models of transport, safe and traceable food systems will prevail and the organic actors will be the most innovative ones».**

The challenge

“The challenge of reversing the degradation of ecosystems while meeting increasing demands for their services can be partially met under some scenarios that the Millennium Assessment has considered, but these involve significant changes in policies, institutions, **and practices that are not currently under way**. Many options exist to conserve or enhance specific ecosystem services in ways that reduce negative trade-offs or that provide positive synergies with other ecosystem services”.