Project statement

This study will demonstrate that the economic environment in which farmers operate is distorted by significant externalities, both negative and positive, and a lack of awareness of dependency on natural capital, by providing a comprehensive economic evaluation of the ‘eco-agri-food’ systems complex.

Smallholder farmers represent over 500 million of the world’s 570 million farms.

Agriculture employs 1 in 3 people of the world’s economically active labour force, or about 1.3 billion people.

For the 70 per cent of the world’s poor living in rural areas, agriculture is the primary source of income and employment.

In much of the developing world, smallholder farmers produce over 80 per cent of the food consumed.

Agriculture and food systems use 70 per cent of the water resources we extract.

Crop and livestock farming produce between five and six billion tons of CO₂ equivalent in greenhouse gas (GHG) emissions each year.

Eighty per cent of agricultural lands have replaced tropical forests since the 1980s.

Around 805 million people in the world are hungry, the vast majority of which (98 per cent) live in developing countries.

Food production systems produce 2,800 calories per person per day, enough to feed the world population.

2 FAO (2014) State of Food and Agriculture (SOFIA) 2014, Rome, Italy.
3 FAO (2011), FAO in the 21st century, ensuring food security in a changing world, Rome, Italy.
5 FAO/UNEP (2013), Smallholders, food security and the environment, Rome, Italy.
6 FAO (2014), Agriculture, Forestry and Other Land Use Emissions by Sources and Removals by Stocks, Rome, Italy.
7 FAO, IFAD and WFP (2014), The State of Food Insecurity in the World (SOFI) 2014, Rome, Italy.
The ‘eco-agri-food’ systems complex

HUMAN (economic & social) SYSTEMS
- Irrigation
- Fertilizer
- Pesticides
- Bio-Technology
- Labor
- Breeding
- Machinery
- Energy Appropriation
- Health Impacts

AGRICULTURAL & FOOD SYSTEMS
- Pollution (air, land & water)
- GHG / Climate
- Climate
- Air

SEED
- Nutrients
- Soil substrate
- Genetic variability
- Water purification
- Soil creation
- Erosion prevention
- Secondary production
- Nutrient recycling
- Pollination
- Carbon fixation

PLANT
- Genetic variability
- Moderation of extreme events
- Pest control
- Decomposition

YIELD
- Loss of ecosystem complexity
- Habitat encroachment
- Species reduction
- Soil erosion
- Other (i.e. unknown impacts)

Biodiversity & Ecosystems

The above schematic provides a unifying point of reference for the overall study. At the centre of this complex are ‘agriculture and food systems’, which are inextricably linked to ‘human (economic and social)’ systems and biodiversity and ecosystems through their impacts and dependencies.

Alexander MÜLLER
Study leader

‘Agriculture is arguably the highest policy priority on today’s global political agenda, in recognition of its widespread impacts on food security, employment, climate change, human health, and severe environmental degradation. This study will build on the earlier successes of TEEB by drilling into the heart of these issues and exploring the latest evidence to paint a global picture of our agricultural and food systems. This body of work will provide a detailed look at their dependency on ecosystems and biodiversity, their impacts on human and ecological well-being and health, and the underappreciated role of small-scale farmers. I truly see this as being one of the most timely and important research initiatives in the field of sustainable agriculture, and am honoured to be a part of it.’
INTERIM REPORT
To set the stage and provide new and compelling evidence from both primary research and meta-analyses, including findings from a number of ‘feeder’ studies on ‘externality-heavy’ sectors including livestock, rice and palm oil.

SCIENTIFIC & ECONOMIC FOUNDATIONS REPORT
To address the core theoretical issues and controversies underpinning the evaluation of the nexus between the agri-food sector, biodiversity and ecosystem services and externalities from agriculture on a global scale.

POLICIES, PRODUCTION & CONSUMPTION REPORT
To focus on the evaluation of different agro-ecological production systems in different socio-economic contexts, taking into consideration food policies, including those targeting food waste and food safety along the entire food chain, from production to final disposal, and food quality in nutritional terms.

SYNTHESIS REPORT
To produce clearly articulated key messages and recommendations arising from the findings and outcomes of the core reports.

The Economics of Ecosystems & Biodiversity

The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on “making nature’s values visible”. Its principal objective is to mainstream the values of biodiversity and ecosystem services into decision-making at all levels. It aims to achieve this goal by following a structured approach to valuation that can help decision-makers to recognize the wide range of benefits provided by ecosystems and biodiversity, demonstrate their values in economic terms and, where appropriate, capture those values in decision-making.