Sustainable Food Systems

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Eating is essential to all people on the planet. Food maintains life, health and wellbeing. Most of us do not produce our own food, but depend on others for our food supply. This food can come from near or far and can be heavily or lightly processed. The ingredients, which are the raw materials for food, have to be produced somewhere and we, the consumers, often have little or no idea about whether the ingredients are produced in a sustainable way.

People are ever more concerned with how their food is produced and processed. These concerns are driven by reports in the media about healthy and unhealthy food, scandals about food safety, and also by scientists. Steffen et al., the IPCC, the IAASDT and Rockström et al. among others have all been sounding the alarm that the global ecosystem is in a precarious state.[1] They have identified key processes that regulate stability and resilience, and all are relevant to the provision of clean, affordable and accessible energy and an adequate supply of food.[2] Increased greenhouse gas emissions, pollution of soils and waters, and loss of soil fertility and biodiversity put this in danger. Industrial agriculture production of food, feed, fibres and, increasingly, energy (biofuel and biogas) is one of the drivers of the anthropogenic pressures on the global environment.[3] These industrial agricultural systems depend on external inputs, such as synthetic pesticides, fertilizers, precision technology and information to maintain their productivity for a price that is acceptable on the international markets.[4]

1 | Steffen et al.: 2015; IPCC (2013): Climate Change: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge/New York; IAASTD (2009): International Assessment of Agricultural Knowledge, Science and Technology for Development, in: *Agriculture at a crossroads: Global Report*, Washington, D. C.; Rockström et al: 2009.

2 | Steffen et al.: 2015.

3 | IAASTD (2009): International Assessment of Agricultural Knowledge, Science and Technology for Development, in: *Agriculture at a crossroads: Global Report*, Washington, D. C.

4 | Murphy et al.: 2012.

Despite stable, or even increased productivity, the current form of industrial agriculture is not sustainable: not only for its negative environmental impact but also because it is failing to healthily nourish the people in both developing and developed countries.[5] The human health results are problems related to malnutrition such as obesity or stunting. To understand this, we need to have a closer look at the current global agri-food system. We see four categories of actors: the input suppliers, the international grain traders, the food processors and the food retailers. Consumers and farmers are buyers and therefore do not belong to the system.

In addition to the grain traders, almost all of the actors in the agri-food systems are well known international companies, such as Syngenta and Monsanto (input suppliers); Unilever, Nestlé, and Kraft (processors); and Aldi and Tesco (retailers). In the shadow of these companies, the trade with commodities is dominated by four big traders – Archer Daniels Midland (ADM), Bunge, Cargill and Louis Dreyfus, collectively referred to as 'the ABCD companies'.[6] They are key players in the countries exporting wheat, soybean, maize, rice or palm oil, which are Argentina, Australia, Brazil, Canada, China, Indonesia, Malaysia, Russia and the USA. These companies are highly diversified and integrated vertically. As a result, they not only trade grains, but also provide the external inputs to produce the crops, such as fertilizer, pesticides and seeds. Their size and power give them access to investments and, more and more, access to land.[7]

The ABCD have a long history of being the bridge between producers and the world's largest food processors and retailers.[8] In such a market, the competition among the companies is low and it is difficult for new actors to enter the market. The established companies control the prices, the access to farmers, and distribution. They appear to be stable and secure. Even if they were to disappear, the unsustainable way of food production could survive along with the idea, that farmers and consumers should be segregated from each other as far as possible.

To become more sustainable, the current system has to take into account, that farmers, including small holders, actually nourish 80 percent of the world population. This point was expressed in the International Assessment of Agricultural Science and Technology for Development (IAASTD) with the words, 'Business as usual is not an option anymore'. The United Nations Conference on Trade and Development (UNCTAD) put it even more dramatically in the title of its *Trade and Environment Review*: 'Wake up Before it is Too Late: Make Agriculture Truly Sustainable Now for Food Security in a Changing Climate'[9] or in Felix zu Löwenstein's book, 'The Food Crash': "Either we will feed ourselves organically in the near future,

5 | Hilbeck/Oehen: 2015.

6 | Murphy et al.: 2012.

7 | Ibid.

8 | Ibid.

9 | UNCTAD: 2013.

or we will not eat at all anymore".[10] In addition, these smallholder farmers are managers and guardians of an agro-ecological system whose long-term functioning and environmental health is imperative for sustained productivity and food supply.

Food from small holders is mainly traded local or regionally in short supply chains. Some of these farmers have maintained traditional and local seed varieties, which are well adapted to local conditions and are often ingredients in the regional cuisine.

However, a paradigm shift concerning eating is taking place. In a world, where food is perceived as unnatural; food production as destructive; food trade as unfair; and food processing as distrusted, producing and processing own home-grown food has become trendy. Cooking and eating authentic, traditional food has become a more and more important topic. New forms of cooperation between consumers and farmers in short supply chains have been developed. Of course the motivations might be different. For some, it is a way to transform the current systems and become independent from the food industries. Others want to be reconnected with nature or reconnected with their culture. These initiatives survive because the large players have no access to niche markets. Furthermore, they transmit additional values such as tradition, sustainability, fairness and, as should not be underestimated when food is discussed, health, pleasure, and taste. Perhaps the most interesting aspect is that farmers see the consumer as partners rather than just as buyers. Examples of such initiatives can be found in many countries, including Greece and Portugal, which have been hardest hit by the financial crisis, and China.[11]

A lot of know-how has been generated on the production side, and many methods for an alternative, sustainable forms of agricultural production have evolved. These alternatives include organic farming, conservation agriculture, agroforestry, permaculture, and integrated pest management. This rich body of expertise continues to grow. Pimbert sees a new form of agricultural production in these steps toward more regionalised agri-food systems: based on autonomy, prudent use of resources, and cooperation along the agri-food chain.[12] There are also changes on the consumption side. Safety, authenticity and quality are major consumer requirements when buying food and represent key issues for the European agri-food industry. Pingali points out that rapid urbanization and economic and income growth in Asia, combined with globalisation in which the urban middle class are increasingly connected worldwide, has led to unprecedented knowledge of what others are eating: at regional, national and international scales.[13] This change has led to new levels of experimentation, but also new expectations for quality and safety and an interest in the origin, authentic, and trustworthiness of food. The widespread knowledge means

10 | Löwenstein: 2011.

11 | Hilbeck/Hilbeck: 2015.

12 | Pimbert: 2009.

13 | Pingali: 2007.

that trends spread faster and wider than ever before, and can achieve a critical mass.[14]

Local and regional agri-food systems play a key role in creating spaces in which consumers and producers can interact face-to-face at markets, stores and in restaurants. They produce an arena of exchange that is imbued with more social meaning than conventional food retail and consumption spaces. However, these systems have to include all actors along the supply chain; from the farmers and how they produce up to the consumers and how they cook and eat.

A step that is often ignored in discussions about more sustainable and resilient food systems is the importance of cooking skills. In a similar development to farmers having come to completely depend on the inputs and information from the large agribusinesses, consumers are in danger of losing the skills needed to produce, choose, and cook food. Cooking needs teaching and training as much as do gardening and farming. When consumers are unsure of specific cooking techniques, or lack the confidence to cook certain foods, the easy option is to turn to convenience food.[15] Hartmann et al. investigated whether cooking skills are related to the frequency of consumption of various food groups, with results confirming what was suspected. Competence with cooking skills correlated positively with weekly vegetable consumption and negatively with weekly convenience food consumption.[16] To gain skills in cooking means to learn about food, so we can assume that this correlation may be causal and that cooking skills may help people to make healthier food choices by eating more vegetables.

Food is absolutely central to human life, but eating and cooking are about much more than just nutrition. The culinary turn goes beyond cooking and appreciating. The choices we make have implications on global sustainability, on our health, and on our autonomy.

14 | Ibid.

15 | Caraher et al.: 1999.

16 | Hartman et al.: 2013.