

Sustainable development: Innovations in business

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5.

SUSTAINABLE AGRICULTURE: DEVELOPMENT OF ORGANIC FARMING. CASE STUDY OF THE CZECH REPUBLIC



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Abstract: Sustainability is a crucial topic in today's agricultural policy discussion. Agriculture faces 2 challenges—feeding increasing number of people, while being sustainable and reducing negative environmental effects. Agriculture will require “structural transformation” to meet goals of global society—the Sustainable Development Goals. Land management, bio-diversity and soil degradation are often correlated with farming practices. Thus, having sustainable agriculture requires transformation of farming practices, and organic farming belongs to potential directions. For over 3 decades, organic farming has gained on importance, market share as well as popularity among consumers, producers and policymakers. Health concerns, public support and market potential convinced farmers to introduce non-conventional farming practices. On the contrary, organic farming is often criticized for lower production potential, higher pricing and labour intensity. In the Czech Republic current organic production is rather extensive (on pastures), and products are not sold as organic due to the market oversaturation. However, slow but increasing trend in crop production, which could lead to improved farm economies is observed. The future of organic farming development as individual by side effects related to organic farming are considered to be of the key significance for long-term sustainability of agricultural activities. Organic farming is not a solution to current society issues, but it could be considered as innovative alternative approach for future generations.

Keywords: Czech Republic, European Union, innovation, organic agriculture, support, sustainability.

5.1. Organic farming and agricultural sustainability

Sustainable Development Goals (SDGs) introduced by the United Nations motivates governments and farmers to innovate farming principles as agriculture does not have only the production function, but it also serves as provider of environmental and social factors (Brožová, 2018). Agricultural sector struggles to follow growing global population and rising global demand. In addition, agriculture must reduce negative environmental effects such as land degradation, pollution, greenhouse gas emissions, water depletion or unbalanced nutrient cycles (Thematic Group on Sustainable Agriculture and Food Systems, 2015). Agriculture will require “structural transformation” to meet the goals of global society. Transformative systems (including also organic farming) are one of the two mostly discussed scenarios to stay within planetary boundaries. The second one includes the increase of efficiency in conventional agriculture while eliminating negative externalities (Eyhorn et al., 2019). Both include positive and negative aspects, which polarize the debate about sustainable farming practices.

Increased demand for food triggered innovations in agriculture. Development of science and new technologies supported production of high yielding varieties, use of chemical fertilizers, pesticides etc. (Savari, Ebrahimi-Maymand, & Mohammadi-Kanigolzar, 2013). However alongside with innovations applied, water pollution; soil degradation; disturbance of the biological balance of ecosystems; pest resistance; and new pests etc. occurred. Among those, farming sector contributes significantly to major Green House Gasses pollutants (GHGs): CO₂, CH₄, and N₂O (Johnson, Franzluebbers, Weyers, & Reicosky, 2007). According to many studies, agricultural activities contribute to between 10% and 14% of global emissions (Eurostat, 2018; Jantke, Hartmann, Rasche, Blanz, & Schneider, 2020; Smith et al., 2007), mostly from fermentation (methane), synthetic fertilizers (nitrous oxide), and tillage (carbon dioxide) (Field et al., 2012). All segments of agriculture have management options that can reduce agriculture’s environmental footprint (Johnson et al., 2007).

Eyhorn et al. (2019) classified 4 various policy interventions leading to more sustainable agriculture (see Figure 5.1). *Supporting and upscaling transformative systems* (i) is a combination of pull and push factors leading to improved performance. (ii) *Stimulation of demand for more sustainable products* fostered by increased consumer awareness, retail and caterers’ commitments. (iii) *Incentivizing improvements in mainstream systems* via payments to units providing public goods and taxation of farmers for their negative external costs. Such a system should stimulate all farmers to substitute unsustainable practices. (iv) *Raise of legal requirements and industry norms* is a command-and-control pragmatic policy approach, which deals with complex problem. All four intervention types move the bell curve to the right, promoting 3 main pillars or sustainability—economic, social and environmental.

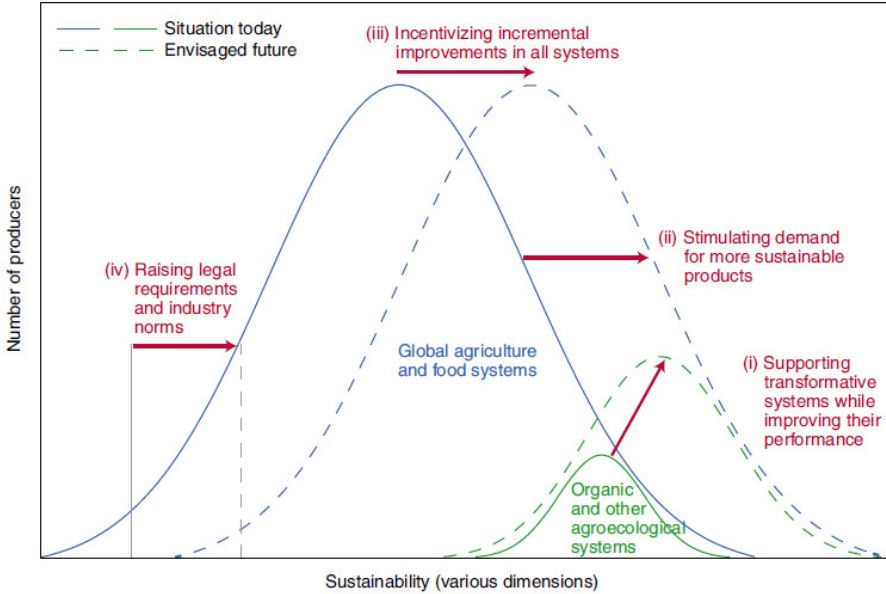


Figure 5.1. Policy interventions to drive sustainability in agriculture

Source: (Eyhorn et al., 2019, p. 253).

The organic production in comparison to other low-input methods is closer to the definition of a sustainable system (Hall, Baker, Franco, & Jolly, 1989). Sustainable development is understood as economic growth that can maintain utility from one generation to the next (Pezzey, 1992), this means sustainable agriculture has to avoid short-sightedness.

International Federation of Organic Agriculture Movements (IFOAM) defines organic agriculture as follows: “Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved” (IFOAM—Organics International, 2005).

Introducing organic agriculture might directly and indirectly contribute to many of 17 Sustainable Development Goals. Eyhorn et al. (2019) names the following targets to be addressed:

- SDG 1: No poverty;
- SDG 2: Zero hunger;
- SDG 3: Good health and wellbeing;
- SDG 6: Clean water and sanitation;

- SDG 12: Responsible consumption and production;
- SDG 13: Climate action;
- SDG 15: Life on land.

Benefits of organic agriculture are summarized by many authors, and they could be filtered into two basic categories: (i) social and economic, and (ii) environmental effects.

Social and economic benefits include higher labour intensity resulting in higher number of employees (Green & Maynard, 2006), literature does not conclude profitability. Haering and Nieberg (2001) concluded that organic and conventional farms have comparable income. Vlačicová and Náglová (2015) concluded that organic winemaking enterprises have higher profitability as well as solvency. On the contrary, according to Offermann and Nieberg (2010) profitability per hectare is generally lower on organic farms as well as material, energy, fertilizers and pesticides costs (Mäder et al., 2002). The costs related to wages and salaries are higher in organic farms (Aulová & Frýdlová, 2012; Offermann & Nieberg, 2010). Compared to conventional farms, organic farms performed greater yield variability. Organic farms thus fit to supply “win-win” strategy for environmental sustainability, while conventional farms fit to a “win-win” strategy for high crop yields promotion (Smith et al., 2019).

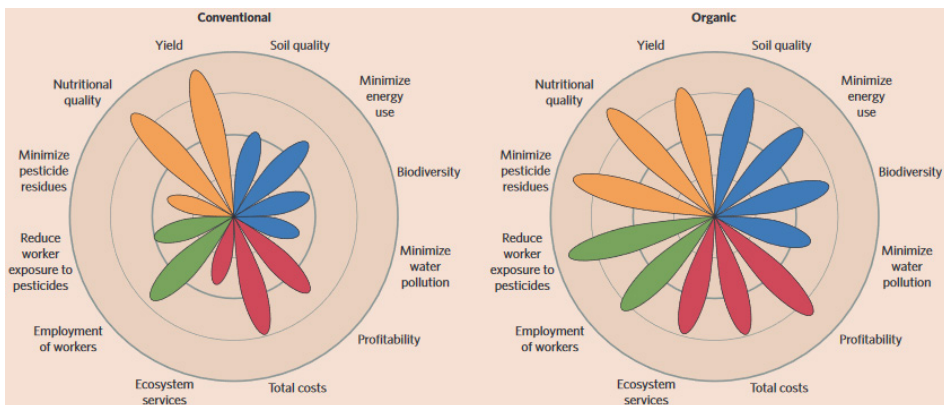


Figure 5.2. Assessment of organic farming relative to conventional farming in the four major areas of sustainability

Source: (Reganold & Wachter, 2016, p. 4).

From the environmental point of view we can assume the following (Häring et al., 2001): higher floral and faunal diversity; better biological activity, lower erosion probability, lower risk of nitrate leaching, lower GHGs emission; better nutrient, water and energy use. Human health is impacted by lower pesticide and antibiotics residuals. Positive effects are also observed in biotic abundance, biotic richness and soil carbon

(Smith et al., 2019). Both environmental and socioeconomic aspects are depicted in Figure 5.2. The four circles representing 25, 50, 75 and 100%. Orange petals represent areas of production; blue petals represent areas of environmental sustainability; red petals represent areas of economic sustainability; green petals represent areas of wellbeing. The length of organic petals illustrates that organic farming systems are better balanced from sustainable point of view (Reganold & Wachter, 2016).

The European Union farming sector is important from the three basic perspectives: food production, rural community development and environmentally sustainable farming. There are about 10 million farms employing more than 22 million people. In the countryside many more jobs are linked to farming in upstream (machinery, buildings, fuel, fertilizers) and downstream sectors (preparing, processing, and packaging food, as well as in food storage, transport and retailing). Prudent usage of natural resources allows us to maintain quality of life and food production. Farming is unlike other businesses and has the following specifics: i) farmers' income is around 40% lower compared to non-agricultural income; ii) agriculture depends more on the weather and the climate than many other sectors; iii) there is an inevitable time gap between consumer demand and farmers being able to supply (European Commission, 2020). Farming specifics and expectations to produce public goods contributed to the specially designed policy targeted on multifunctionality of agriculture, implementing a number of Community objectives beyond the traditional concept of functions of agriculture related to food production (Weiss & Bitkowska, 2014). The concept of Common Agricultural Policy aims at:

- supporting farmers and improving agricultural productivity, ensuring a stable supply of affordable food;
- safeguarding European Union farmers to make a reasonable living;
- helping tackle climate change and the sustainable management of natural resources;
- maintaining rural areas and landscapes across the EU;
- keeping the rural economy alive by promoting jobs in farming, agri-foods industries and associated sectors (European Commission, 2020).

The EU support is targeted to:

- support income through direct payments. It shall ensure income stability, and remunerates farmers for environmentally friendly farming and delivering public goods not normally paid for by the markets;
- market measures deal with difficult market situations such as a sudden drop in demand due to a health scare, or a fall in prices as a result of a temporary oversupply on the market;
- rural development measures with national and regional programmes to address the specific needs and challenges facing rural areas.

Those 3 support areas are financed by two main funds—the European Agricultural and Guarantee Fund and the European Agricultural Fund for Rural Development.

Annual support to agriculture reaches about 60 bn EUR, sharing roughly between 35 and 38% of the European Budget (European Commission, 2020). However, after Brexit and facing problems related to the Covid-19 pandemics, Agricultural support budget is expected to share not more than 30% for 2021–2027 budgetary perspective.

Table 5.1. Basic indicators of organic agriculture, Europe

	EU28: 2013	EU28: 2018	Top 3 EU countries: 2018
Organic farmland Out of which:	10.2 m ha	13.8 m ha	Spain (2.2 mln ha) France (2.0 mln ha) Italy (2.0 mln ha)
– Arable land	3.9 m ha	6.1 m ha	France, Italy, Germany
– Permanent grassland	4.63 m ha	6 m ha	Spain, Germany, France
– Permanent crops	1.16 m ha	1.5 m ha	Spain, Italy, France
Organic share of total farmland	5.7%	7.7%	Austria (24.7%) Estonia (21.6%) Sweden (19.9%)
Retail sales	22.2 bn EUR	37.4 bn EUR	Germany (10.9 bn EUR) France (9.1 bn EUR) Italy (3.5 bn EUR)
Per capita consumption [euros]	43.8 EUR	76 EUR	Denmark (312 EUR) Sweden (231 EUR) Luxembourg (221 EUR)

Source: The authors' own elaboration based on (Willer, Schlatter, Trávníček, Kemper, & Lernoud, 2020, p. 226; Willer & Lernoud, 2015, pp. 183–213).

The European Union supports organic farming as part of its environmentally oriented agricultural policy. The EU allows farms to make own decision on transformation related to organic farming. Total acreage under organic practices has been growing constantly over the last 3 decades and increased from about 300 thousand hectares up to 13.8 mln hectares (Willer et al., 2020; Willer & Lernoud, 2015), representing about 330 thousand producers and 7.7% of total EU farmland. In 2018, the largest amount of land dedicated to organic production is found in Spain, France and Italy where it represents about 45% of organic acreage of the EU. The largest land share dedicated to organic farming is found in Lichtenstein, Austria and Estonia (see Table 5.1). Also, in retail, the 3 most important markets have significant share in total demand for organic products. Out of the EUs 37.4 bn EUR organic sales, German, France and Italian consumers contribute about 60%. Average spending of the EU consumer was counted to be about 76 EUR in 2018, compared to 43.8 EUR in 2013. The importance of organic farming on total EU production is depicted in Table 5.2.

Significance of the EU organic market attracts attention of organic processors from the EU (72,000) and out of the EU (24,000) (Willer et al., 2020). Recent production and market trends show the importance that organics has gained over

the last decade. Production increased by about 70%, while consumption of organic products more than doubled. The EU accounts for about 37% of global organic food and drink market (37.4 bn EUR in 2018). Current EU legislation does not require the same rules to be applied on imported organic goods. Thus after 2021 the EU will introduce new legislation on organic production. Regulation will harmonize rules for all actors operating on organic market, imported goods will have to comply with the same production and control rules as applied in the EU.

Table 5.2. Share of organic production in the EU, 2018

Item	Unit	%	Item	Unit	%
Cereals	ha	3.9	Nuts	ha	26
Dry pulses	ha	18.5	Olives	ha	10
Green fodder	ha	9.3*	Temperate fruit	ha	8.5
Oilseeds	ha	2.5	Subtropical fruit	ha	11.4
Root crops	ha	1.2	Bovine animals	heads	5.2
Vegetables	ha	7.2	Sheep	heads	5
Berries	ha	22.2	Pigs	heads	0.7
Citrus fruit	ha	10.2	Poultry	heads	3.3
Grapes	ha	11.1	Milk	liters	5.3

* Share of permanent grassland.

Source: The authors' own elaboration based on the Willer et al., (2020, pp. 238–242);

5.2. Organic farming development in the Czech Republic

The first organic farms operating in the Czech Republic/Czechoslovakia were observed in 1990. Just after Velvet Revolution (1989), 3 farms were registered as organic and their acreage reached 480 hectares. Since then the positive development is observed. In 2018, 4,606 organic farms managed almost 540 thousand hectares, i.e., 14% of utilized agricultural land (UAA). The increase of land converted into organic is highly correlated to support provided (see Table 5.3).

The first financial support measures were released between 1990 and 1992. However, the first comprehensive subsidy program was the one supporting non-productive functions of agriculture being in force between 1998 and 2003. The first comprehensive support resulted in significant increase of acreage. Between 1997 and 1998 the acreage of farmland under Organic agriculture more than doubled from 20 to 71 thousand hectares (see Figure 5.3). After joining the European Union in 2004, support for organic farming was included in the so-called agri-environmental measures. Since 2007, support for organic farmers has been covered within Axis II financed from European Agricultural Fund for Rural Development. As mentioned above,

logics of Common Agricultural Policy is to compensate the economic losses caused by regulated organic farming system. The payment is provided for the area of organically farmed land with differentiation according to the use of areas—crops cultivated.

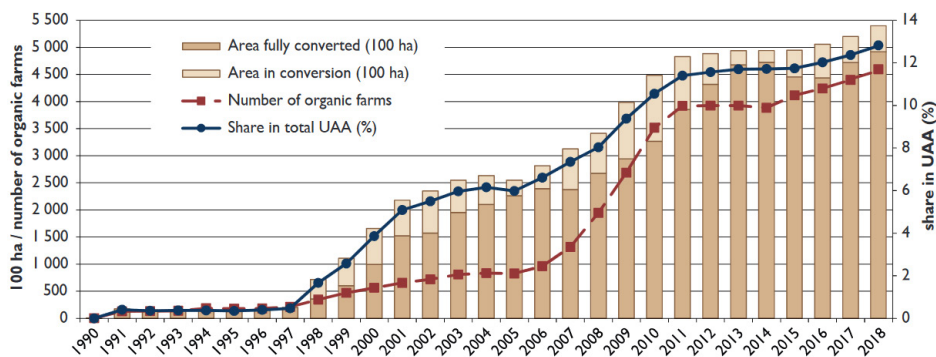


Figure 5.3. Development in total OF acreage, number of organic farms and share of total agricultural land.

Source: (Ministry of Agriculture of the Czech Republic, 2019, p. 58).

Table 5.3. Total value of support provided to organic farms, Czech Republic

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Million EUR	1.30	2.28	2.50	4.93	6.85	7.26	9.75	10.24	10.59	19.45
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
27.75	37.43	45.99	50.43	50.84	48.59	46.20	48.46	49.28	52.83	53.94

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

Total support for organic farms to be distributed increased over time. As seen in Table 5.3, in 1998 total support sourced by organic farms exceeded 1 mln EUR. After the EU accession, continuous increase in the number of farms and their acreage resulted in increased value of support provided. In 2010 total value of support exceeded 50 mln EUR and since then it has increased only slightly. The values expressed in Table 5.3 do not accurately present continuous increase, but presented values are influenced by volatility of Czech currency. In 2018, the Ministry paid out aid in the amount of almost 54 mln EUR, while organic farming produced a gross volume of agricultural production of more 253.5 mln EUR, which represents a share of total agricultural production in the Czech Republic of almost 5% (Ministry of Agriculture of the Czech Republic, 2019).

As seen above (Table 5.1), arable land and permanent grassland have comparable share in the EU. Both land categories cover about 40% of land used under organic production. However, in the Czech Republic (Table 5.4) majority of organically managed land is permanent grassland representing more than 80% of organic

acreage located mostly in mountainous border regions. Other land types under organic management have low significance. Positive trend is observed among arable land as its share increased from 8 to 15% between 2005 and 2018 and total acreage almost quadrupled. Distribution of land types informs about farming management—organic farms are focused on extensive farming practices rather than on intensive production. However, increasing share of arable land is a positive sign for further increased intensive farming practices. An average organic farm manages about 117 hectares, but the value is continuously decreasing.

Table 5.4. Land types under organic management, Czech Republic

Land use Czech Republic	2005	2018	2005	2018
	Hectares		Share (%)	
Arable land	20,766	80,939	8.14	15.04
Permanent grassland	209,956	435,287	82.34	80.87
Permanent crops	820	6,164	0.32	1.15
Other	23,440	15,834	9.19	2.94

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

Table 5.5. Organic food—indicators (2007–2017), Czech Republic

	07–09 average	10–12 average	2013	2014	2015	2016	2017	AAGR
Total turnover with organic food, incl. exports (mln EUR)	67.7	89.9	104.7	115.9	136.7	155.0	216.5	15.8%
Organic food consumption (mln EUR)	59.8	67.3	75.1	73.4	82.5	94.3	126.5	10.5%
Consumption per person per year (EUR)	5.8	6.4	7.1	6.9	7.8	8.9	11.9	10.1%
Share in organic food turnover according to outlet (%)								
Supermarkets / hypermarkets	70.2	68.6	67	57.4	60.9	61.8	58	-1.5%
Independent retail	2.3	1.3	1.6	1.7	4.2	2.9	3.0	1.8%
Farm gate sale, direct sale	2.4	4.9	8.9	6.7	7	7.3	5.4	10.4%
Gastronomy	0.6	0.8	1.4	2.9	3.2	3.4	3.0	19.6%
E-commerce	×	×	×	3.4	7.8	6.7	14.1	60.7%*
Share of product category on total consumption (%)								
Meat and meat products	7.0	8.4	6.9	8.2	6.9	5.1	5.9	-0.5%
Fruit and vegetable	7.5	12.7	16.1	13.7	12.6	21.3	22.5	15.3%
Milk and dairy products	21.4	21.5	18.2	22.0	20.0	23.0	17.5	-1.8%
Mill and starch products	6.1	9.5	11.7	8.2	7.5	4.8	4.9	-2.0%
Bakery, confectionery and other flour products	4.9	9.0	9.2	9.4	7.3	6.2	5.9	13.9%
Other processed foods	43.7	34.1	33	33	37.1	33.2	36.4	-3.0%

* Growth rate of e-commerce measured between 2014 and 2017.

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

The share of organic food consumption in the Czech Republic is around 1.2%. While the market in Denmark was about 13.3%, Sweden and Austria were close to 9%, and France, Germany and Netherlands close to 5%. This only presents the market potential of organic value-added production. As observed below (Table 5.6), certain commodities do not have the potential yet to be sold as organic (goat, lamb, beef, grapes, leaf vegetable, oilseed, etc.) while other are already well accepted and demanded by the consumers (eggs, cow milk, honey). Also, as presented in Table 5.5, there is an increasing trend in organic *fruits and vegetable* consumption (+15% annually) and in *bakery, confectionery and other flour products* (about 14% annual increase). We observe the potential for increasing sales in other marketing channels, not only in supermarkets and hypermarkets. While between 2007 and 2009 the most of organic products were sold in largest outlets, over the decade later, their importance declined. Increasing the importance of organic food outlet is expected to be observed in gastronomy, independent retail, e-commerce and direct farmgate sales.

Table 5.6. Utilization of organic food, 2017

	Sold as organic		Sold as organic
Cereals	80%	Pears	74%
Legumes	57%	Grapes	46%
Potatoes	60%	Beef meat	41%
Oilseeds	49%	Lamb	24%
Herbs	57%	Goat meat	3%
Cruciferous vegetables	35%	Pork	69%
Leaf vegetables	51%	Poultry	88%
Fruit vegetable	85%	Cow milk	95%
Root vegetables	98%	Eggs	95%
Apples	58%	Honey	100%

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

Insufficient utilization of organic commodities, in many cases processed and sold as conventional products, is mostly caused by the lack of processing capacities and still lower demand. Comparing average Czech per capita consumption (about 11 EUR/year) with EU average (76 EUR per capita), Czech market is still below its potential. Also, the fact, that organic producers are able to sell part of organically produced crops and livestock for conventional prices and still be profitable (in 2016 96% and in 2017 95% of organic farms were profitable), shows its further potential.

Profitability of organic farms is mostly given by positive support mostly provided from Rural Development Funds (presented in Table 5.7). Those are being provided to farms certified as organic and to farms being in transition period from conventional farming to organic farming (2 years for arable lands, 3 years for permanent crops like hops, vineyards, orchards). The difference in supportive values

is mostly explained by labour and technological requirements related to organic agriculture. Permanent crops are supported the most, while grasslands and fallow lands are supported the least.

Table 5.7. Supporting organic farming, per hectare values, Czech Republic, 2018

Commodity type		Transitional period (EUR/ha)	Organic farming (EUR/ha)
	Permanent grassland	84	83
Arable land	Vegetables or herbs	536	466
	Strawberry	669	583
	Grass for seed	265	180
	Other crops	245	180
	Grassland	79	69
	Fallow land	34	29
Permanent crops	Orchard—intensive	825	779
	Orchard—other	419	417
	Vineyard	900	845
	Hops	900	845
Another permanent culture with an ecologically significant element of landscaping		165	165

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

Other supportive measures are related to innovations, diversification of activities, supporting rural tourism, young farmers, and cooperation among farmers to share machines and facilities (Table 5.8). In all those cases organic farmers are given bonus for project evaluation. This bonus increases chances for success in project selection process. Financed projects submitted by organic farms represented about 32% of all financed projects, granted totally more than 28 mln EUR.

Table 5.8. Additional project support provided, Czech Republic, 2018

	No. of projects	EUR (mln)
Investment in agricultural holdings	568	14.63
Processing and marketing of agricultural products	61	2.57
Aid for setting up of young farmers	100	4.68
Investments in non-agricultural activities	49	2.42
Support for rural tourism	27	2.68
Cooperation for development of new products, processes and technologies	1	0.98
Cooperation among small operators in organizing joint work processes and sharing facilities	4	0.54
Total	810	28.48

Source: The authors' own elaboration based on the (Ministry of Agriculture of the Czech Republic, 2019).

Economy of the Czech family organic farm is described in detail in the Table 5.9, also compared with the Czech average family conventional farm. As presented above, organic farms have certain specifics, which are also confirmed by the authors below. At first, in the Czech Republic, organic farms are larger and also own more land. However, due to their extensive orientation (see Table 5.4, and also confirmed by the value of land in data presented by Institute of Agricultural Economics and Information (2020b, 2020a)), per hectare production is much lower (about a half of conventional). On the contrary, lower production is balanced by lower costs of production, where organic farms mostly do not have to buy fertilizers and plant protection products, spend also less on seeds, feed and labour. In general, Czech farms eliminated livestock production to great extent, while in organic farming such a trend is not observed. In organic farming, combination of livestock and crop production is balanced. Organic farms, also as presented above, are eligible to receive higher number of operating grants and subsidies. From the economy point of view, conventional farms are able to achieve balance between income and production (+9 EUR/ha), while organic farms are fully dependent on public support. Without support, farms would be in loss of 182 EUR from each hectare. But subsidies are present and in general economic status of organic farms in the Czech Republic is rather successful. They are not much indebted, returns on sales (ROS) is calculated to be about 80%, while conventional family farms reach 40%.

Table 5.9. Selected information on production, costs and income of conventional and organic average family farm, Czech Republic, 2018

Unit	Unit	Conventional	Organic
Utilized agricultural area	ha/farm	64.9	83.9
Utilized leased agricultural land	%	75.9	55.5
Total production	EUR/ha	1,053.2	564.4
Total crop production	EUR/ha	731.2	215.8
Total livestock production	EUR/ha	226.2	296.1
Other productions	EUR/ha	95.8	52.5
Total cost	EUR/ha	1,074.1	792.2
Direct costs	EUR/ha	425.0	267.8
Other direct living costs production	EUR/ha	24.4	37.5
Other material costs	EUR/ha	324.7	262.2
Depreciation	EUR/ha	191.0	167.2
External factors	EUR/ha	133.5	95.0
Total operating grants and subsidies	EUR/ha	426.2	629.9
Taxes and fees	EUR/ha	11.0	7.4
Investment subsidies	EUR/ha	41.4	52.8
Gross value added	EUR/ha	718.6	656.9
Net value added	EUR/ha	527.7	489.7
Income from agricultural activity	EUR/ha	435.6	447.6

Unit	Unit	Conventional	Organic
Net value added / AWU	EUR/AWU	18,389.7	19,755.7
Income from agricultural activity / FWU	EUR/FWU	18,661.8	21,345.0
Total assets	EUR/ha	3,653.9	3,182.4
Liabilities	EUR/ha	389.4	364.5
Equity	EUR/ha	3,264.5	2,817.8

Source: The authors' own elaboration based on the (Institute of Agricultural Economics and Information, 2020a).

Yet at the end of this chapter, let us summarize the potential of Organic Agriculture to be a driver of sustainable and innovative farming. As mentioned above, farming and sustainability is closely related. Land management, bio-diversity and soil degradation are often correlated with farming practices. Thus, having sustainable agriculture requires transformation of farming practices, and organic farming belongs among potential directions. For over 3 decades, organic farming gained on importance, market share and popularity among consumers, producers and policymakers. Health concerns, public support and market potential convinced farmers to introduce non-conventional farming practices. On the contrary, organic farming is often criticized for lower production potential, higher pricing and labour intensity. But in reality, those aspects are seen as challenges, which international community will need to meet. Innovative practices will be required to increase productivity without genetic modifications, practices have to be invented to tackle pests and weeds, and many others.

In the Czech Republic, and possibly in many other eastern European countries, organic production still has potential for further growth. As proven above, extensive farming focused on pastures and cattle production is possibly not the perfect path. A lot of produced beef is not being sold as organic, as market is oversupplied. On the contrary we observe slow but increasing trend in crop production, which has the same significance in the EU as extensive pastures. It is obvious that Czech consumers still do not spend as much on organic food as consumers in western European countries, but rapid future increase is expected. Farming newcomers still can find their niche market and succeed. Transformation from conventional to organic practices is simplified by available subsidies and grants.

5.3. Case study—Organic farm in Milinov, Czech Republic

The history of the farm (Farma Moulisových) begins with Josef Prokeš in 1902. After World War I, he returned to the farm and devoted all his energy to the farm restoration and development. In 1931, he handed over the farm to his son František, who married Bohumila Moulisová, a predecessor of today's owners (Farma Moulisových, 2021).

Socialist collectivization also occurred in village Milín's. Despite all the disagreement, František Moulis had to hand over the animals and fields to the cooperative in which he worked until the end of his life. In 1976, František's nephew Jaroslav Moulis and his wife Boženka came to the farm. After the fall of communism regime, he resumed private farming, taking back the land and cows for milk production from a collectivized cooperative. He started to make fundamental changes on the farm. In 2001, he stopped breeding dairy cows and, on the contrary, focused on the grazing method of breeding cows for meat. In the autumn of 2001, Jaroslav suddenly suffered a heart attack, and his work was continued by his youngest son Pavel Moulis, farmer and director of the farm.

Already in 2002, Pavel abolished the time-consuming management of arable land, which he transferred into permanent grasslands. He followed his father's path of raising cows without marketable milk production and gradually expanded the land from the original 22 hectares to about 150 hectares. In 2004, the farm became certified organic, and in the same year, the conversion of the barn into guest rooms began. The farm breeds about 35 cows of the basic herd, i.e., about 100 cattle stock. In 2017, Farma Moulisových was awarded the Czech Agritourism Farm of the year.

Since the European money started coming to the Czech Republic, the owners have been trying to use the most of EU investment subsidies, i.e., subsidies from the Rural Development Program.

Subsidies helped them to acquire the mechanical equipment, enabled to reconstruct the stable for breeding beef cows, build a boarding house and develop new products the farm offers. The farm started to keep horse—some own and some have their owners in the cities. As presented in Table 10, Moulis family farm still tries to use the investment support measures focused on farm investments and agritourism. Among those, the farm receives support for environmentally friendly agriculture, support for organic farming, direct payments (SAPS, greening, etc.) and support for meat-type calf.

Table 5.10. Received investment support (EUR) from Rural Development Programme (2017–2020)

Measure	2017	2018	2019
Investment in agricultural holdings	129,186	18,307	19,478
Support for rural tourism	N/A	N/A	118,377

Source: The authors' own elaboration based on the National Paying Agency (Statní zemědělský a intervenční fond, 2020).

Today, the farm stands on three pillars—agriculture, organic production (beef) and agritourism. Agritourism is not based on subsidies, while providing a relatively stable income.

The farm offers the following products: vegetables, fruits, milk, meat, eggs, seeds, herbs, spices, flowers, feed, grain, nuts. But the farm mainly specializes in cattle breeding, meat breed Simmental. The meat is processed into vacuum packages and the sale takes place in the form of an ordering system in the e-shop for registered customers once a month. During the coronavirus crisis, about 400 customers welcomed the possibility to be delivered products to their place of residence. The crisis has increased sales by 20 percent compared to normal.

The non-agricultural pillar includes accommodation associated with adventure tourism. The farm specializes in children's pedagogy and practically introduces visitors to life on a farmstead. The weekend offers sleeping in the hay in the barn; children can prepare almost all their meals themselves, experience cow-milking simulator, beat the grain, which they grind into flour, bake bread, etc. They can also ride a horse, learn a little about livestock, learn what organic farming is. The results of the Moulis family's efforts were reflected in the farm's popularity. Usually in May and June, a bus full of children visits the farm every day. In addition to these activities for children, the farm offers the organization of seminars, a festival (Hay Festival), trainings, corporate parties, family celebrations, weddings, etc. Smart investments, high-quality service and products together with a mixture of public support increases economic sustainability and viability of Moulis farm.

The development of the farm helped the whole village. Not only has the whole character of the village improved through investments in buildings that were otherwise in a desolate state, but also visitors coming to the farm help to maintain for example the local pub and shop. All the activity of the Moulis Farm has another dimension. Organic farming is gentle on the soil and landscape. Applied practices reduce the risk of erosion, retain water in the landscape and improve the biodiversity of the landscape around the farm, thus contributing to the creation of public goods that benefit all residents and visitors to the region.

5.4. Final remarks

Finally, organic food has a big growth potential in consumer demand. Once thought to be the preserve of the wealthy or eco-eccentrics, organic food is going mainstream with many people from across the spectrum wishing to purchase organic food (Pettinger, 2019).

Organic farming avoids the use of artificial fertilizers and pesticides but relies on more traditional methods of fertilization and pest control, such as crop rotation, barrier nets and natural pest control. It is minimizing external costs, available resources are managed more efficiently, soil and environment are better utilized and protected etc. On the other hand, there are also several negatives—due to the public incentives some organic farms could be purpose-driven, i.e., they would not

be established otherwise), organic farming is suffering because of yields variability/fluctuation, it is also labour and land intensive in comparison to conventional agriculture, organic food is rather expensive, and it is still considered as luxury product.

Despite the fact that the demand for organic food is growing strongly, there is only a limited number of organic farms all around the world. Organic farming has been representing only minor market niche. Although the volume of global demand is steadily increasing, the demand of individuals is extremely low. Individual consumers consider organic food demand only as supplement. The unit price of organic products is considered as rather expensive. For many people, there is no rational difference between organic food quality and conventional food quality.

Many people consider organic farming as only some kind of lifestyle, as new trend. Consumers consider organic products as special or even exclusive. But organic farming must be understood as New Innovative Approach to sustainable farming/sustainable human society activity. Farming is a traditional and extremely important activity. It feeds almost 8 billion people, and the number of consumers is constantly increasing. Agriculture has affects not only stability of human society, but because of its massive acreage it has impact on the environment, biodiversity, etc. Agriculture is seeking the possibility to find compromise between the needs of current human society, the needs of the future generations and the needs of the environment.

Conventional agriculture provides enough food for global population and allowed civilization to increase in size of population. On the contrary, its current way of performance is on the edge of long-term sustainability. There before it is necessary to find some alternative approaches which could cover the human needs and long-term living environment sustainability. Organic farming is considered as one of those alternatives. Maybe, it is not the best one, but it is relevant for balancing environmental and human society issues.

Even more, organic farming is not only about agricultural production itself, but it is also connected to many externalities. Their character could be considered both positive and negative. But the prevalence of positive ones is highlighted. Especially, value of positive externalities' must be understood as extremely important factor determining the future of organic farming. Externalities are seen as by side effects related to organic farming and they are considered to be the key for long-term sustainability of agricultural activities (with respect to available level of technology).

Organic farming is not a solution to current society issues, but it could be considered as innovative alternative approach for future generations.

Questions / tasks

1. What are the problems related to conventional agriculture? Which problems address organic farming?

2. How has organic farming developed in EU over the last 30 years? What rationale stands behind financial support for organic farming?
3. Do you think organic farming is sustainable? Why?
4. What is the situation of organic farming in your country? What support is available?
5. Shall support be as important source of income for farmers as it is in the Czech case?
6. What might be the future of the case farm? Might the farm face some challenges, problems or opportunities? How can any business prepare for unexpected circumstances?

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