GLOBAL THREATS IN THE ANTHROPOCENE:

FROM COVID-19 TO THE FUTURE

Leonardo Mercatanti - Stefano Montes (Editors)

Foreword by Paul Stoller

IL Sileno Edizioni

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Geographies of the Anthropocene

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Leonardo Mercatanti

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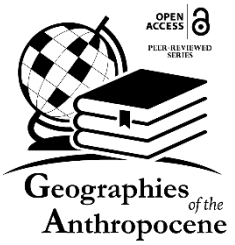

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The book series "Geographies of the Anthropocene" edited by Association for Scientific Promotion "Il Sileno" (Il Sileno Edizioni) will discuss the new processes of the Anthropocene epoch through the various worldviews of geoscientists and humanists, intersecting disciplines of Geosciences,

Geography, Geoethics, Philosophy, Socio-Anthropology, Sociology of Environment and Territory, Psychology, Economics, Environmental Humanities and cognate disciplines.

Geoethics focuses on how scientists (natural and social), arts and humanities scholars working in tandem can become more aware of their ethical responsibilities to guide society on matters related to public safety in the face of natural hazards, sustainable use of resources, climate change and protection of the environment. Furthermore, the integrated and multiple perspectives of the Environmental Humanities, can help to more fully understand the cultures of, and the cultures which frame the Anthropocene. Indeed, the focus of Geoethics and Environmental Humanities research, that is, the analysis of the way humans think and act for the purpose of advising and suggesting appropriate behaviors where human activities interact with the geosphere, is dialectically linked to the complex concept of Anthropocene.

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The volume proposals can be presented in English, Italian, French or Spanish.

The choice of digital Open Access format is coherent with the flexible structure of the series, in order to facilitate the direct accessibility and usability by both authors and readers.

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11. Italian agriculture in the shade of a pandemic. New and old dilemmas

Giorgia Iovino[1]

Abstract

The pandemic emergency highlighted the strategic value of the Italian agriculture, but at the same time, it revealed its vulnerability. Reduction of farmland and number of farms, increasing foreign food dependence, land concentration and land grabbing, abandonment of internal areas, land market rigidity, unsustainability of agro-industrial practices are some of the main challenges that the agriculture will have to face in the next years. The paper addresses these critical issues, with the aim of describing and interpreting the main barriers that hinder an ecological transition and the implementation of "a sustainable food chain that works for consumers, producers, climate and the environment", as stated by the EU *Farm to Fork Strategy*. The issue of how, in the current scenario, the large financial resources, expected for the recovery can be an opportunity towards the organization of a diversified food system is also investigated.

Keywords: land concentration, family farming, entry denial, ecological transition, Italy

1. Introduction

In Italy the pandemic emergency unveiled the strategic value of the agricultural sector, but at the same time it revealed its weaknesses. The lockdown imposed has made clear the centrality of food security and the importance of promoting short supply chains, both from a functional and spatial point of view.

In this perspective, critical issues concern the land access problem and the growing difficulties of small family farms. The obstacles that young people and aspiring farmers encounter in entering this sector (as well as to remain in it) are numerous and attributable to market, information and cultural barriers and to economic and financial constraints (Iovino, 2018a).

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Land fragmentation, poor profitability of agricultural activity and under-supply of services represent the main causes of the *entry denial* (Borras *et al.,* 2013) in internal rural areas, especially the more peripheral ones (CREA & Comitato Aree interne, 2016), while in flat and peri-urban areas the greatest impediments depend on land concentration and urban sprawl, driving up the price of the asset to level inaccessible to potential entrants.

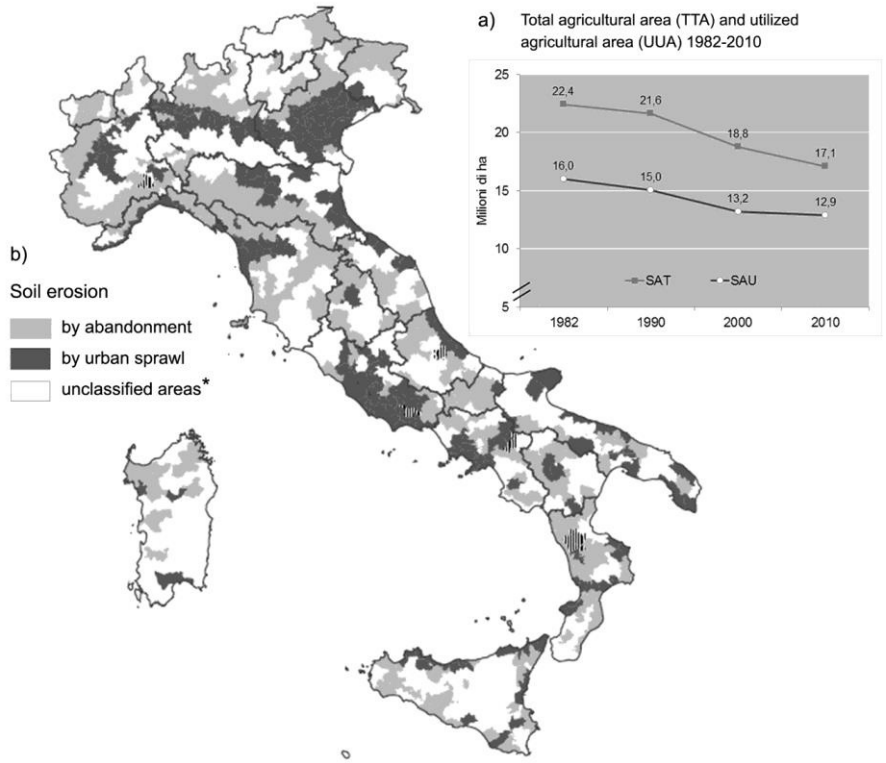
The rigidity of the land market hampers the already weak generational turnover and fosters the transition from a model of peasant agriculture based on diversified food systems to a profit-driven agro-industrial model. A transition that caused in most cases serious socio-environmental impacts, such as soil degradation and depletion, loss of biodiversity, water pollution and dissipation, increase of greenhouse gases (IPBES, 2019).

The work focuses on these critical issues with the aim of highlighting the great challenges that Italian agriculture will have to face in the next years. The paper is organized as follows: section 2 looks at the Italian agricultural system in a diachronic perspective, in order to bring out the main trends in the sector; section 3 and 4 examines respectively the entry denial problem and the unsustainability of the agro-industrial model, with a focus on the flaws of the EU agricultural policy; section 5 finally investigates the effects of the Covid 19 emergency on the agri-food chain, examining possible and/or desired post-pandemic scenarios.

2. Macro trend of the Italian agriculture in the long run

In the last thirty years Italian agriculture has been affected by great transformations. The analysis of diachronic census data produced by ISTAT integrated by other information sources (MiPAAF, INEA, CREA, ISPRA, etc.) allow us to isolate the main macro trends.

The first one concerns *the reduction of the agricultural area and the increase of food dependence.* The graph (Fig. 1) show the unequivocally steady contraction of agricultural land: in 1982 the *total agricultural area* (TAA) represented about two thirds of the national territory (74,1%), the share dropped in 2010 to 56,5%, with a particularly pronounced negative trend in the decade 1990-2000 (-12%).



* Areas affected to an insignificant extent or completely free from the two phenomena

Figure 1 – *Losses in agricultural area*. *Source*: Author's elaboration on ISTAT data (a) ISTAT, 2015 (b)

The loss of TAA (5,4 million ha) is attributable both to urbanization processes and to land abandonment and re-naturalization phenomena, as shown in figure 1 (ISTAT, 2015)[2]. Indeed, the latter have taken on a greater weight in the last decade than the former: the agricultural regions affected by land take or soil sealing are 21,6% on a national scale, (were 19,5% in 2001) with generally higher values in the Center-North[3], while the abandonment concerns 35,4% of the total farmland, against 27,8% in 2001

[2] Istat (2015) classifies the approximately 800 Italian agricultural regions (groups of contiguous municipalities, belonging to the same province and altitude area, homogeneous by agricultural land value) on the basis of two indicators: a urban sprawl indicator and a land abandonment indicator. For further details see Istat, 2015.

[3] Urban-rural competition is highest in Veneto, where agricultural erosion linked to land take has affected 50% of the regional agricultural area (ISPRA, 2018a; Iovino, 2015). High values are also found in Lazio (45,4%) and Liguria (31,8%).

(Baldacci & Sabbadini, 2013; ISPRA, 2018a, Onorati, 2013). However, it should be noticed how, while the abandoned areas mainly concern mountainous and high-hill areas (respectively about 40% and 33%, compared to 25% of the lowland areas) with a marginal agriculture, the areas affected by urbanization (Fig. 1) tend to be active agricultural areas of considerable value in terms of productivity: "fertile, easily workable and accessible land, such as urban fringes, coastal and flat areas" (MiPAAF, 2012a, p. 3).

Compared to the total agricultural area, which decreased by almost 24% in the period 1982-2010, the actually *utilized agricultural area* (UAA) shows (Fig. 1) a more contained reduction (-18,8%), with a consequent increase in its relative weight, from 70,2% to 75,3%.

The biggest losses occurred in the internal areas, especially in those defined as type D (Fig. 2) "areas with development problems" in the national classification of rural areas[4]. As shown in Figure 2, they are mainly concentrated in the Apennines and the Alps and in mountain and hill areas of the Southern and Island regions.

[4] It is an official classification used in the National Rural Development Plan (2014-2020 programme), also adopted by the National Observatory for Rural Landscapes. All the Italian municipalities are divided into four distinct types: A. Urban and peri-urban areas with highly intensive agriculture; B. areas with intensive and specialized agriculture; C. Medium intensity areas with diversified agriculture; D. Low intensity areas with development problems. See https://www.reterurale.it/areerurali

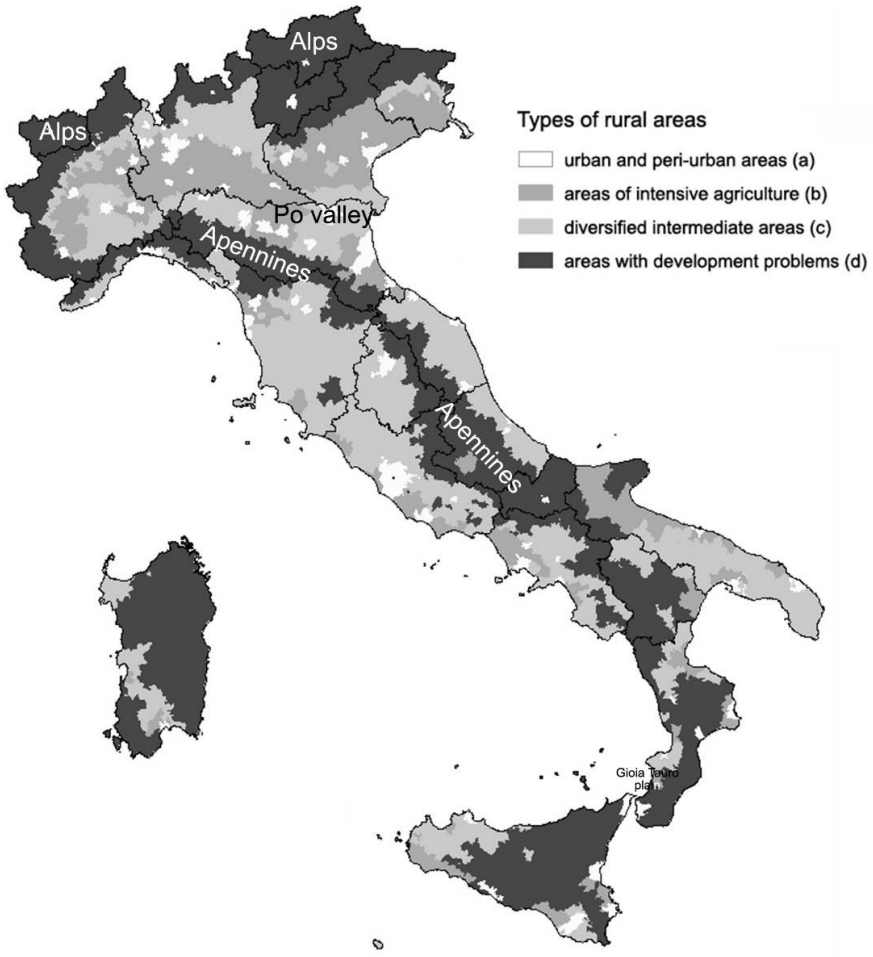


Figure 2 – *The national classification of rural areas*. Source: PNSR, 2020.

This farmland contraction has encouraged an intensification of agricultural activities on the remaining land, in order to increase productivity per hectare, mainly in areas with greater land capability (type B in figure 2). However, in recent years the increase in land input no longer seems able to translate into an increase in the crop yield.

In the period 2008-10, the self-provisioning index was well below self-sufficiency for many products, with values between 30% and 33% for oilseeds, sugar and legumes, and between 64% and 73% for milk, honey, potatoes, butter, meat, cereals and olive oil.

According to estimates by the Ministry of agricultural, food and forestry policies (MiPAAF, 2012a), Italian food production covers currently about

80-85% of the country's needs. Italy consumes more than it is able to produce. This is evident when we consider the *land import*, an indicator developed by the Sustainable Europe Research Institute (SERI) in Vienna. The index measures the difference between the agricultural land utilized and the land theoretically necessary to produce food, textiles and biofuels consumed on a national scale (Lugschitz *et al*., 2011). Italy has an agricultural land deficit of around 48,7 million hectares, as it would need over 61 million hectares of farmland (instead of the actual 12,9 million) to meet the food demand of its population. In Europe, only Germany and the United Kingdom have a greater deficit.

A second macrotrend that emerges from the diachronic analysis of the data is related to *the concentration of land ownership.*

In the 1982-2010 period, the number of farms almost halved, from 3,1 to 1,6 million, with a particularly strong downsizing (-32.4%) in the last inter-census interval (2000-2010). Due to a more contained decline in farmland (-2,5% between 2000 and 2010) the average farm size has considerably increased, passing from 5,5 to 7,9 hectares in the decade. A value still far from the European average (14,3 ha) which shows significant regional fluctuations (from 15 ha in the north-west to 5 ha in the southern continental regions).

Figure 3 shows the demographic dynamics of farms in the period 2000-2010. A negative correlation emerges: the smaller are the firms, the greater is their mortality.

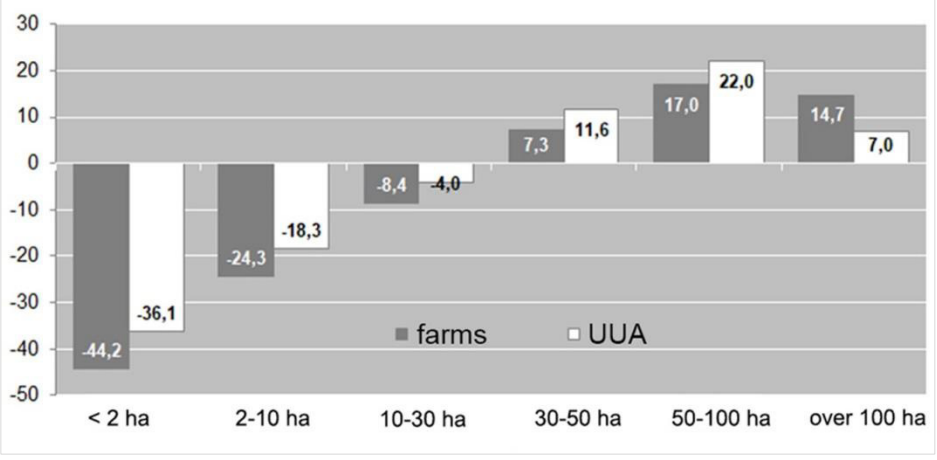


Figure 3 - *Farms and utilized agricultural area (UUA) by dimensional class (ha). Percentage change 2000-2010*. Source: Author's elaboration on ISTAT data, Census of agriculture.

Micro-farms, those with a size of less than 2 ha, recorded the largest loss (-600 thousand units), followed by farms with a size between 2-10 hectares, which also fell sharply (-188 thousand units). Overall, over 786 thousand agricultural firms below 30 hectares disappear in a decade, with a decrease of UAA of 58,5%. On the contrary, landholdings above 30 hectares raise both in number (+ 11 thousand) and in UAA (+ 743 thousand ha).

A strong polarization of the production structure resulted: approximately 85% of the total farms have less than 10 hectares and less than 25% of the total UAA, while the large farms, over 30 hectares account for 6,6% of the total and occupy more than half (53,8%) of the agricultural area. The gap at the extremes of distribution is even stronger: 1,3% of landholdings (100 hectares and more) have about 26% of the national UAA, while farms with less than 2 ha (which are almost equal to 50 % of the total companies) control just 5,7% of the UAA.

This means, in other words, that smaller farms are progressively pushed out of business and/or relegated to marginal land, while the active surface of these farms is taken over by larger companies (as evidenced by the fact that farms decreased by 32,4% in the decade, while the UAA only by 2,4%).

What are the causes behind these dynamic patterns? In our view these processes of land concentration, common to most European countries, are guided by market dynamics, but also supported by the policy choices made at European and national level.

On the one hand, the liberalization of the European market, exposing Italian agricultural products to competition from other EU (and often non-EU) countries, has compressed farmers' profits, especially the smaller ones who cannot take advantage of economies of scale, pushing them to bankruptcy[5].

On the other hand, the Community agricultural policy (CAP), has, maybe unintentionally, rewarded land rent since the 2000 reform, with the introduction of direct payments decoupled from production and related to the farm agricultural area. As highlighted by several studies commissioned by the European Union (Agrosynergie, 2013; Davidova & Thomson 2014; Hennessy 2014), the subsidy scheme used (the Single Area Payment Scheme) has benefited large companies, "not because the latter (large farms) are necessarily more efficient in farming, but because they are definitely more efficient in capturing subsidies" (Borras *et al*., 2013, p. 14). From this point of view, Italy represents an emblematic case, as the concentration of

[5] Half of the European utilized agricultural area (EU27) is in the hands of large holdings (> 100ha), which represent just 3% of European farms, while 80% of the farms are less than 10 ha in size and control just 12% of the farmland (Kay *et al*., 2015).

aid reaches very high levels: in 2013, 26,3% of CAP direct payments went to 0,8% of farms (Kay *et al*., 2015, p. 32). Nor has the situation improved with the new programming cycle (2014-2020): currently there are 492.000 Italian farmers who receive less than 500 euros a year compared to 3.240 large companies that benefit from annual contributions between 100.000 and 500.000 euros. The Union's energy policies have also been a driver for land grabbing. By incentivizing the production of renewables, they have indirectly encouraged green grabbing, i.e. the acquisition of land to be used for energy purposes[6]. An acquisition made by large companies "in the name of the environment" (van der Ploeg *et al.,* 2015).

The analysis of the legal forms confirms the process of land concentration in progress: individual firms shrinked (-36,9% compared to 2000), even though they still represent 96,1% of the total. On the contrary, a significant increase of companies is recorded (+ 48,2%). In this group, limited liability companies increased by 123,5%, while partnerships and cooperatives recorded more moderate increases (+ 43% and + 56% respectively)[7].

A third long-term trend concerns *the farmers ageing*. Italy is one of the European countries with the highest incidence of the elderly and the lowest incidence of young people in the agricultural sector: just 5% of farmers are under 35 and over 37% are over 65 (61 % if we consider 55 years), against a European average of 7,5% for young people and about 30% for the elderly (> 65 years).

Figure 4 compares the distribution by age classes of agricultural holders[8] in the 2000-2010 census interval. In percentage terms there are no major changes, the losses concern all classes with a slight shift in the age class 20-29 and a contraction of the classes under 20 and between 30 and 40 years. However, if you look at absolute values (Fig. 3b) young people under the age of 40 passed from 250 thousand to about 150 thousand, with a decrease of 40% in the decade.

[6] Onorati and Pierfederici (2013) reconstruct the "robbery" that took place in Narbolia in Sardinia at the expense of the farmers and the local population: 1.600 photovoltaic greenhouses built by EnerVitaBio, an Italian controlled farm of the Chinese giant Winsun Group, on a total area of 64 hectares before destined to irrigated crops.

[7] Due to the privatization processes implemented to reduce public debt, the "other legal forms of companies", consisting mainly of properties owned by public agencies (state, regions, municipalities), also decreased.

[8] According to ISTAT, the holder (*conduttore*) is the legal and economic manager who bears the risk of business management, while the farm manager (*capo azienda*) is the one who ensures the daily management of the farm.

This age structure poses a serious problem of generational turnover (ISTAT, 2013). The aging index calculated as the ratio between the number of holders under 40 and those over 55 years is 15,9%. This means that for every 100 holders over 55, there are fewer than 16 young (under 40 years[9]. This value rises to 26, if we consider those over 65. Obviously the lower the ratio, the more the turnover between new and old generations is compromised.

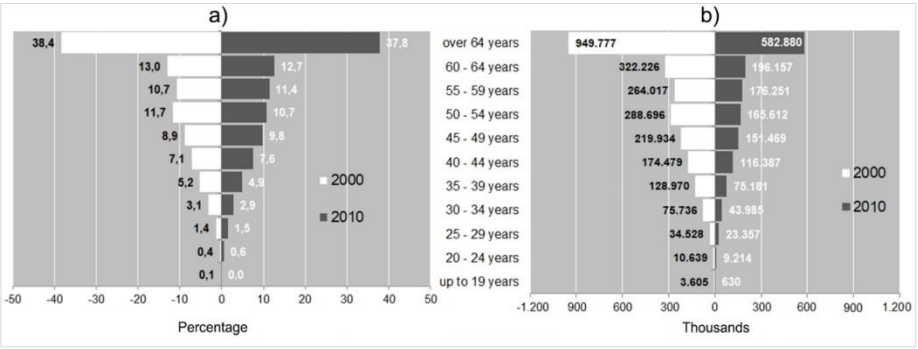


Figure 4 - *Distribution by age classes of farmers in 2000 and 2010: percentage values (a) and absolute values (b)*. Source: Author's elaboration on ISTAT data, Census of Agriculture.

Analyzing the mobility between different age groups in the last census interval, the National Institute of Agricultural Economics (INEA and MiPAAF, 2013) has calculated the replacement rate of young people. According to the Institute, just 50% of the over 40 farm managers have been replaced by new entrants. By narrowing the analysis down to the holders only, the situation is even worse: every thousand holders there were 375 exits from the sector, replaced by just 77 entries.

This weak generational change will negatively affect the future evolution of the sector, especially if we consider that about a quarter of the UAA and a fifth of Italian agricultural production are currently "dependent" on holders over 65[10]. Looking ahead, if measures aimed at facilitating the insertion of young people and aspiring farmers without land are not implemented, Italy

[9] This choice appears consistent with the main support tool of the CAP for the setting up of young people, which identifies the 40-year-old as a threshold value for accessing funds. As regards the 55-year threshold, it was a baseline indicator to benefit from the benefits of measure 13 of the Rural Development Plan (RDP) 2007-2013.

[10] Their presence, which is largely prevalent (about 40%) in small economic farms, tends to decrease progressively with the growth of the company's economic dimension.

will run the risk to lose the 3 million hectares managed by this category and/or to accommodate further land concentration.

The presence of young people could also guarantee greater innovative and managerial capacity, as well as greater attention to the quality and sustainability of agricultural activities and production. Data show how young people are experiencing higher levels of schooling and profitability than other age groups (EIP-AGRI, 2016). About 10% of drivers under 40 have a degree, 47% have a secondary school diploma and just 0,03% have no qualifications. In the 40-55 age group, over 60% do not have a high school diploma, while in the 55 and more-year-old class almost 60% have only a primary school certificate or no educational qualification.

The profitability levels achieved by young farmers (measured in terms of net income and added value) are also higher, according to the analysis carried out by INEA (INEA and MiPAAF, 2013) on the RICA (Agricultural Accounting Information Network)[11] farm sample in the 2008- 09 (about 22 thousand companies, 15% of which run by young people under 40).

3. The entry denial problem

In the Italian agriculture there is currently a great problem of access to land by young and aspiring farmers without great financial resources[12]. This "return to land" is hindered by a multiplicity of factors of different nature.

Figure 5 schematically illustrates the main causes of the "entry denial" (Borras *et al*., 2013, p. 22).

Figure 5 - *Barriers to land access by perspective farmers. Source*: Author's elaboration.

In the context of market barriers, access to land is undoubtedly the main impediment to the admission of new subjects. The Italian land market is characterized by low mobility and a much higher cost compared to other

[11] The Agricultural Accounting Information Network (RICA) is a sample survey carried out in all the states of the European Union. It represents the only harmonized source of information on European farms.

[12] On this topic, see the two monographic issues of the journal *Scienze del territorio,* dedicated to "the return to land" (1/2013 and 2/2014). See https://oajournals.fupress.net/index.php/sdt

European countries, up to 10-15 times higher than France for instance. The price per hectare is around 20 thousand euros, with values over 60 thousand for the most fertile and accessible land, mainly located in the Po valley, as shown in Figure 6.

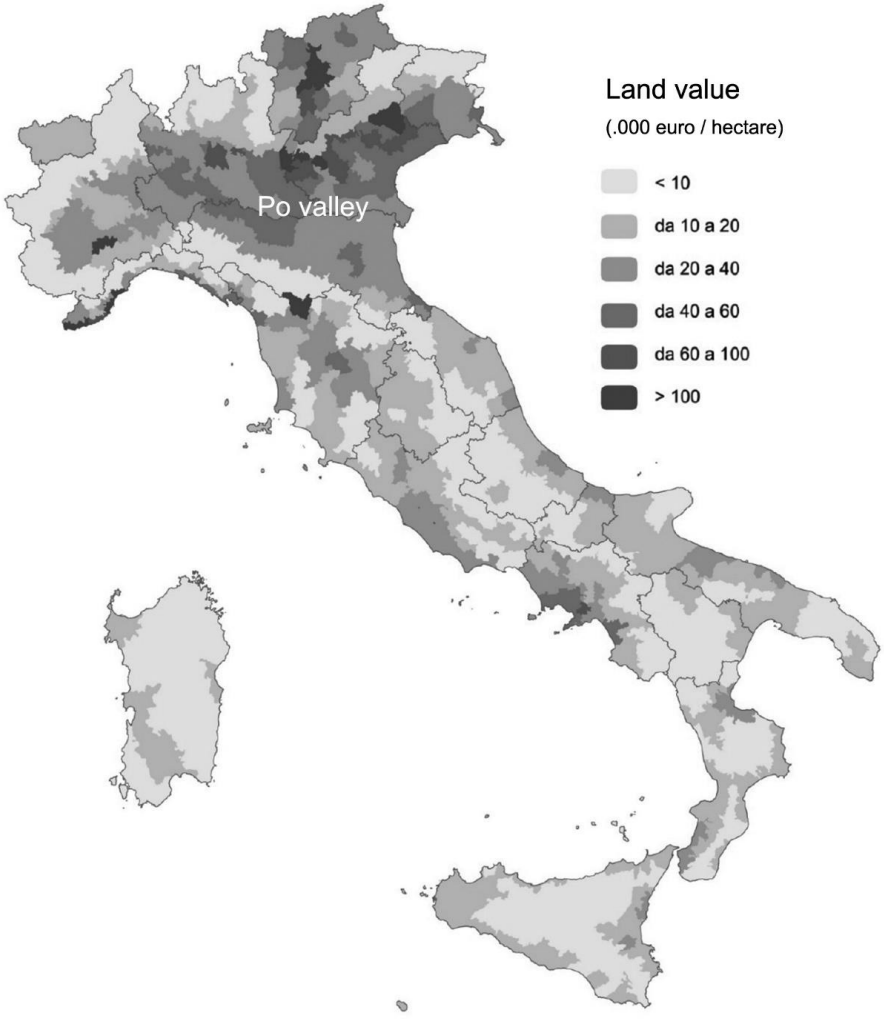


Figure 6 - *Average land value of land by agricultural region in 2017*. *Source*: CREA, 2018.

This explains the small amount of sales that in a year generally does not exceed 2% of the total agricultural area. The reasons for this rigidity are multiple and complex. A first explanation concerns the scarcity of the land

supply. In a country like Italy, characterized by a peculiar geomorphological conformation, high population densities and a massive settlement structure, the land (and more precisely "the good land") is a limited resource, subject to strong and conflicting interests (Iovino, 2015; MiPAAF, 2012b). Even when unused or underutilized, the owners, because of the urban deregulation, are very reluctant to sell it, pending a possible change of use that could increase its value and allow wider profits.

Such wait-and-see attitude is present both in the peri-urban areas subject to significant transformative pressures and therefore more exposed to soil artificialization processes, and (somewhat paradoxically) in the internal rural areas (see fig. 6 and 2b) where the demand is almost zero, due to the rapid depopulation processes[13].

According to Povellato and Osti (2013, p. 2) in the most remote areas «the desire to keep the plot of land with an annex, usually a farmhouse also broken up due to hereditary passages, has favored the formation of an army of small landowners, almost six million according to fiscal statistics». The result is a strong land fragmentation, which in many cases prevents the appropriate level of monitoring and maintenance of the territory, such as the prevention of fire risk or of landslide and geological instabilities. Most of the plots in these areas are made up of abandoned or "silent" land, i.e. territories whose ownership is unknown, as traces of the last heirs, often emigrated abroad, have been lost (CREA & Comitato Aree Interne, 2016; Iovino, 2018b). In the most valuable areas, the few lands for sale is made up of small-sized parcels with rural outbuildings, often deriving from dismemberments.

In extreme synthesis, while in peri urban areas access to land is hampered by the high price, in internal areas the greatest barrier to the entry is represented by the excessive fragmentation of the estate. Return to cultivate these lands would mean return to take care of these territories, and to allow the survival of many local production, which now risk extinction[14].

Another reason that has contributed to keeping up the pressure on the land at national level is linked to the economic crisis of 2007 and the decline of many productive sectors. These events have pushed a part of the business

[13] Of the 975 municipalities considered mountain, where about 2,8 million inhabitants live, 77% are affected by depopulation and 81% by crop abandonment.

[14] The National Biodiversity Registry established with Law 194/2015 collects over 1.800 "local resources", i.e. genetic resources of food and agricultural interest of vegetable, animal or microbial origin, subject to risk of extinction or genetic erosion. On this topic see the website of the Ministry of Agricultural, Food and Forestry Policies. See https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/14785.

class to seek alternative forms of investment. In this perspective, the CAP subsidy scheme and the renewable incentive system, mentioned above, have played a non-secondary role in attracting investors and encouraging land grabbing processes in the sense proposed by Borras *et al*. (2013)[15].

Other important market barriers include difficulties in credit access[16] as well as the inadequate training of farmers, both in relation to the acquired agronomic technical knowledge and in terms of business culture.

In the context of economic barriers, the low remuneration of agricultural activity constitutes the greatest obstacle to the entry of new subjects and the main cause of mortality of small farmers. Agricultural incomes are, in fact, lower than in other sectors in almost all European countries, but in Italy, due to the worsening terms of trade, they decreased by 36% between 2000 and 2009, against a growth in the 5,3% in the European Union.

In summary, a gap has opened between the costs faced by farmers for the purchase of intermediate goods (feed, energy, seeds, plant protection products, fertilizers, pesticides, etc.) and the selling prices of agricultural products. The former almost quadrupled in the 2000s, while the latter grew much more slowly, due to the increase in competition and above all because of the price compression policy pursued by the Mass Market Retailers and intermediaries.

Several studies have described the distortions induced by this production and marketing system, an inefficient and unsustainable system that sees farmers crushed between the prices imposed upstream of production by the large enterprises supplying intermediate goods and those imposed downstream by large retailers (Crocevia, 2019). It is the latter, who dictate the rules of the market, underpricing in order to catch wider profits. In many cases, the price stroke on the market cannot barely cover production costs. The result is that for many agricultural products (for example, cereals and milk), despite the substantial internal demand, it is not convenient to produce in Italy. Consequently, the country's food dependence grows, the

[15] According to Borras, the use of the term *land grabbing* in reference to Europe is justified by the presence of two distinctive elements: "the capturing of control of extended tracts of land and the construction of landholdings that represent a deep rupture with family farming and the associated farm sizes that have characterized European farming so far" (Borras *et al*., 2013, p. 17).

[16] The difficulties in accessing credit are confirmed by the ISMEA Credit Observatory (2016) which shows that between 2011 and 2016 the decrease in the stock of bank loans was matched by an increase in non-performing loans, almost doubled (from 7 to 13%). Noteworthy is also the growth of short-term credit lines for the ordinary farm management, given that it highlights the difficulties that have been affecting Italian agriculture for some years.

supply chain extends more and more, both in terms of space and functionally. From the field to the table the price of the products multiplies. Even when the final price is large enough to pay the production costs, the farmer, especially the small farmer, who cannot benefit from economies of scale, receives little, very little, less than 15 cents for every euro s pent by consumers[17]. The rest is divided between the processing industry and commercial distribution. In the supply chain, every step that stands between the producer and the consumer dissipates agricultural value away from the farmer, with serious effects on the sustainability of the sector, both in environmental and socio-economic terms.

Entry by new subjects is also hampered by information and cultural barriers such as, for example, legal/bureaucratic difficulties, low degree of knowledge of the measures supporting the sector, long and complex authorization procedures and, sometimes, even prejudices about rural life[18].

In more marginal areas, there are additional obstacles, context-dependent barriers, related to the backwardness of the territory and, specifically, to the under-provision of basic public services, such as schools, hospitals, transport, but also activities and places of leisure. According to the results of the European survey on the perception of rural areas by young people (MiPAAF, 2012b), the lack of recreational activities in rural areas represents the first critical issue for Italian young people, on par with the public transport[19].

4. The unsustainability of the agro-industrial model

The transformation of land ownership patterns that took place in the last twenty years in Italy represents a break within the agricultural structure that has historically characterized the national territory.

The transition from an agriculture based on small family farms to new forms of management oriented to a profit-driven model has involved, in most cases, profound changes, such as the introduction of monocultures and

[17] This was reported by Moncalvo, president of Coldiretti on the occasion of the agricultural G7 in Bergamo on the World Food Day organized by the FAO. https://www.coldiretti.it/economia/g7-euro-spesa-solo-15-cent-vanno-agli-agricoltori.

[18] In the survey carried out by the Italian National Rural Network (MiPAAF, 2012b) on young people's perception about agriculture and life in rural areas a fifth of respondents living in cities consider rural areas "places too isolated for the life of a family and a young person" and / or "closed communities where it is difficult to build relationships".

[19] At national level, the survey used a sample of 623 students in the 4th or 5th at high school (agricultural institutes) or in the Faculty of Agriculture.

intensive farming, the large use of fertilizers and chemical inputs, a push for mechanization based on the use of fossil fuels.

The result is an increase in production and productivity achieved at the expense of the environment and the rural landscape. Robust scientific evidence points out how industrial agriculture, especially those associated to factory farms, produced a net loss of ecosystem services provided by nature (IPBES, 2019). Intensive farming is among the leading causes of soil degradation and depletion, loss of biodiversity, water pollution and dissipation, increase of greenhouse gases (in particular methane and nitrous oxide), damage to animal welfare and health, loss of historical rural landscapes incompatible with highly intensified and specialized forms of agricultural management.

Some synthetic data can give the measure of the unsustainability of this production model. In Europe, 60% of wildlife species and 77% of habitats are classified as endangered and, according to the medium-term report of the *EU Biodiversity Strategy to 2020* (later implemented by the *EU 2030 Biodiversity Strategy*) "there has been no measurable improvement" in biodiversity status in agriculture (EC, 2015, p. 9) with the effect of making target 3 of the Strategy (Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity) unreachable. In Italy, the farmland bird index, a key indicator for measuring biodiversity, shows dramatic trends: since 2000 over 23% of bird species linked to agricultural areas have become extinct, with a much greater contraction (-44,6%) in the lowland areas dominated by intensive agriculture and a marked simplification of agroecosystems.

Another source of concern is related to data on the use of chemicals, responsible for soil and water pollution, as well as human health damage, direct (poisoning of farmers, for example) and indirect (development of specific types of cancer associated with nutrition). According to the EEA (2018) Italy is among the largest consumers of pesticides in Europe, in 2016 were sold for agriculture 125 million kg of pesticides, i.e. 5.7 kg/ha, against a European average of 3,8 kg/ha. The monitoring activity carried out by ISPRA (2018b) in the 2015-16 period highlights a widespread presence of pesticides in surface waters (found in 67,0% of the sample points) and in groundwater (found in 33,5% of the sample points), with an overall increase of chemical substances found in affected areas.

The impacts on human health also include diseases of zoonotic origin, such as bovine spongiform encephalitis, salmonella, avian and swine flu or the pandemic Covid19 virus that is currently afflicting the whole planet. Several studies reveal the connections between agricultural production

models and pathogens, although they cannot establish a causal relationship. In his book *Big Farms Make Big Flu* the American biologist Rob Wallace (2016) has clarified how capital-led agriculture has a larger impact on natural ecologies, favoring an environment where these pathogens can evolve the most virulent and infectious phenotypes.

On a national scale, a research conducted by the agricultural school of the University of Florence (Agnoletti *et al.,* 2020) found a correlation between the number of infections from Covid 19 and the types of rural landscape. According to the study, the provinces with 10% more type C and D areas (see fig. 2), marked by diversified agriculture and low energy consumption, have, on average, 10% fewer cases of contagion.

It is clear, in other words, that resilience is promoted by those agricultural practices based on the diversification of agricultural productions and landscapes, on the balanced use of available resources and on the consolidation of interactions between different species (IPES Food, 2016).

As Wallace (2020) states, "we must seriously ask ourselves how to return to a natural economy, preserving the ecosystem services that allow for clean air and water, fertile soil and reduce the possibility of epidemics. Small farmers and native populations show that for centuries we have used a type of regenerative and non-invasive agriculture and therefore we can go back to doing it, using the resources that would allow us to continue to provide the food the world needs without destroying the means with which we produce it"[20].

A vision that clashes with strong economic interests (large farms, big companies of fertilizers, seeds and pesticides, mass market retailers), often protected by the public authorities. The Community Agricultural Policy is a clear demonstration of the lobbying capacity of the agribusiness. The CAP has systematically encouraged large farms and the spread of the so-called green revolution in the European countryside. Reformed several times, it has introduced since the 2000s a series of corrective measures aimed, in principle, at reconciling food security (FAO, 1996), with environmental protection (greening and agroclimatic-environmental measures, support for disadvantaged areas, etc.). However, still today three quarters of the budget is allocated under the Ist pillar[21] to direct payments, regardless of the environmental quality of the farming.

[20] See interview in the newspaper *il Manifesto* on 1 April 2020 https://ilmanifesto.it/i-virus-figli-dellagro-business/.

[21] CAP has a "two-pillar structure" – consisting of Pillar I and Pillar II. These two pillars are the sub-headings of CAP, helping to divide the elements of the policy. Pillar I concerns direct payments and market measures for agricultural production. Pillar II is designed to

Admittedly some provisions were devised in the 2014-2020 EU program to favor "greening" in agriculture: about 30% of the first pillar budget was allocated to direct payments to farmers who adopt or maintain climate and environment friendly farming practices[22]. However, these provisions only had limited effect in Italy. The main reason is that they were made compulsory[23] only to firms above a certain size threshold and with specific types of crops. The result is that about 48% of the Italian farmers are not required to carry out crop diversification and more than 90% of the operating farms (equivalent to 57% of the farmland) do not need to safeguard a 5% of areas of ecological interests (EFA). Overall, more than 21% of the farmland has – de facto- been exempted from the enforcement of the "greening rule" (Coalizione #Cambiamo l'agricoltura, 2019).

Just 25% of the resources of the CAP budget are allocated to the second pillar, dedicated to rural development. In the 2021-2027 Programme, a cut in its budget is foreseen, in favor of direct payments. Yet rural development policy represents the most effective and innovative part of the CAP and above all the most ambitious from a social and environmental point of view. It provides a flexible and participatory approach to develop place-based programs, i.e. suitable for the local context. It also defends the collective interest, facing major challenges, such as the depopulation of internal rural areas, the problem of access to land, the difficulties of small-scale farming, the issue of the sustainability of agricultural practices.

For this reason 3.600 European scientists have signed an appeal addressed to the leaders in Brussels and to the parties involved in the negotiations for the next CAP to ask to reform the whole system radically, in order to fight the biodiversity and climate crises (Pe'er *et al*., 2020). Recognizing the agriculture as the main driver of environmental degradation in Europe, they demand to promote an ecological transition.

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support rural areas, in order to ensure the sustainable management of natural resources, to foster agricultural competitiveness and to achieve balanced territorial development of rural economies and communities.

[22] There are three types of green practices: 1) crop diversification (cultivating more than one crop), a requirement for farmers with over 10ha of arable land (up to 30ha, 2 crops; over 30ha, 3 crops); 2) maintaining permanent grassland (land that has been used to grow grasses or other herbaceous plants for 5 years or more) and protection of environmentally sensitive pastures strictly in Natura 2000 sites; 3 creating and/or maintaining an ecological focus area (EFA) of at least 5% of the arable land for helping biodiversity.

[23] Starting from 2017, non-compliance with green practices determines a penalty for the entitlement to direct payments.

5. The pandemic emergency as a driver of change?

The pandemic emergency represented an important test for the entire Italian agri-food chain, a chain that is currently worth over 538 billion euros.

The system held out overall: supplies have been guaranteed and consumption has grown, confirming the anti-cyclical nature of the sector (RRN, 2020). Nevertheless, some critical emerged issues.

On several fronts, the virus acted as a detonator, uncovering past fragility: primarily, the structural dependence on foreign countries of some strategic products, such as wheat[24], a raw material to produce essential goods (bread and pasta). The global trade downturn has made its import more difficult and expensive, resulting in a substantial rise in consumer prices for many basic foods.

A second critical front concerned the growing weight of seasonal work in the agricultural sector, over 1 million people, of which about 370 thousand from other countries. The lockdown has reduced the availability of laborers for harvesting, highlighting the dysfunctions of an archaic model of relations that still persists, especially in the South (Avallone, 2017). Here in many rural areas, such as the Gioia Tauro plain in Calabria, there are ghettos, where hundreds of undocumented immigrants live close to the fields in extremely hard conditions.

In addition to the food insecurity and the laborers emergency, the pandemic has increased the difficulties of peasant agriculture and micro and small-scale eco-agriculture. They were severely affected by the closure of economic activities within the so-called Ho.Re.Ca channel (an acronym of *Ho*tellerie, *Re*staurant, *Ca*fè), which represents about 36% of Italian consumption. It includes canteens, bars, restaurants, local markets, buying groups, agritourism activities, etc.

The suffering of small farms was exacerbated by the explosion of e-commerce and the changing government directives on safety and hygiene protocols (especially those issued in the first phase of the pandemic), which indirectly favored large commercial chains and large agricultural producers, the only ones able to have access to mass market retailers.

[24] The demand for durum wheat of the Italian pasta industry is around 6 million tons compared to a national production of 4. Between 2012 and 2017, the dependence on foreign durum wheat increased by 55% compared to a decrease productive by 6%, while that of soft wheat by 15%.

Nevertheless, the pandemic crisis can represent the right opportunity (or more likely the last chance) to initiate a transformation of the entire agri-food system, directing it towards sustainability objectives.

Thanks to the resources of the *Next Generation EU*[25], the new European fund for recovery, we could and should try to achieve that ecological transition of agriculture so widely brought up in the public debate.

To this end, a great help could come from the *Farm to Fork Strategy* (EC, 2020a) which is, together with the *Biodiversity Strategy* (EC, 2020b), at the heart of the European *Green Deal*[26].

As the European Commission (2020a, p. 2) points out, the COVID-19 pandemic "has made us acutely aware of the interrelations between our health, ecosystems, supply chains, consumption patterns and planetary boundaries".

The challenge is therefore to build a "sustainable food chain that works for consumers, producers, climate and the environment" as the EU *Farm to Fork Strategy* states (EC, 2020a, p. 4). This means pursuing 3 main objectives: a) ensuring that each phase of the food chain (which includes production, transport, distribution, marketing and consumption) has a neutral or positive environmental impact; b) making sure that everyone has access to sufficient, healthy and nutritious food that upholds high standards of safety and quality; c) increase the affordability of food, while generating more equitable returns in the supply chain.

In this challenge, Italy could play an important role, not only on a European scale. Over the last few years, a grassroots movement has emerged in the country which, in reaction to the increasingly homogenizing and degraded trend of industrial food, has questioned the dominant agricultural model, claiming the right to healthy and safe food, produced with environmentally friendly techniques.

The Slow Food association founded by Carlo Petrini and the *Terra Madre* initiative launched in 2004 led this movement, promoting a network of territorial presidia and peasant associations all over the world (Petrini, 2009; Petrini and Padovani, 2017). Thanks to their contribution and the work of many scholars from different disciplinary fields, a new awareness of the role played by agriculture as a producer of environmental and cultural

[25] The new European fund for recovery, approved by the extraordinary European Council of 21 July, has a budget of 750 billion euros (390 of grants and 360 of loans), 28% of the total is allocated to Italy that is 208,8 billion, of which 82 are grants and 127 are loans.

[26] Strongly advocated by Commission President Ursula von der Leyen, the plan sets 3 objectives to make the European Union climate neutral by 2050; dissociate economic growth from the use of resources; do not neglect any person and any place (EC, 2019).

values has emerged. As Bevilacqua notes (2018, p. 28) “Italy rediscovers (...) the amazing agricultural biodiversity linked to the diversity of habitats that make up the territorial mosaic of the peninsula and its millenary history, interwoven with infinite cultural contaminations” (our translation).

It is in this perspective that the many experiences and bottom-up initiatives carried out in many areas of the country should be placed. Molecular signs of a renewed interest in a quality agriculture that aims to recover the relationship with the territory and local food traditions, to bring the supply and demand system closer together through alternative food networks, (direct sales systems, groups of solidarity purchase, community supported agriculture, etc.), to experiment with associations between small farms to fight land fragmentation and encourage the recovery of uncultivated land. These processes are still in an embryonic state, “spurious returns” according to Poli (2013, p. 20), animated by the “desire for an all-round experience, not crushed on the logic of the market and on the forms of the European Union that in recent years have made farmers more like accountants than landscape producers” (our translation).

From this point of view, Italy has a considerable advantage over other European countries: despite the rampant phenomena of land concentration, it can still count on an extraordinary variety of habitats and rural landscapes and on a widespread presence of small diversified and multifunctional farms, backbone of the national agricultural system.

Encouraging signals come from the growing land demand registered in Italy by young and aspiring farmers who wish to work in the fields and live a dignified life, in harmony with nature. A desire which, although still hampered by numerous barriers, is now supported by the emergence of new consumption models (Fondazione Symbola *et al*., 2019).

The surveys conducted by Eurobarometer as well as the recent study by Nomisma (2020) testify the change. The purchasing choices of Italians during the first pandemic phase show the emergence of new trends. The origin of the products (with a clear preference for Made in Italy and neighborhood agricultural markets), the protection of the environment, the uniqueness of the territory[27] and the geographical proximity of the products reached unprecedented centrality in consumer preferences. In other words, it is the reprisal of typical, local and green Italian food.

The change in consumption patterns has driven the growth of “zero km” production, as well as the extraordinary expansion of the biological

[27] Italy, with 823 agri-food products, is the European Country with the largest amount of registered Geographical Indications (GI): more than one certified product out of 4 is Italian. See https://dopigp.politicheagricole.gov.it/en/home.

agriculture. Italy is now among the top ten producing countries of organic food worldwide, while in Europe it ranks first for the number of producers and third for farmland, almost 2 million hectares equal to 15,2% of the total (RRN, 2019)[28].

Nevertheless, much remains to be done. More attention undoubtedly should be deserved to the entry denial problem.

The entry into the sector of new players would allow an increase of occupation and an increase in the share of supplies produced by the country, with positive implications on the trade balance and food security, both nationally and globally. In this perspective, the issue of the aging of farmers connected to the need of generational renewal is of great importance, especially if we consider the high share of young NEET (Not in Education, Employment or Training) in Italy: 2,5 million, i.e 26% of young people between 15 and 29 years old.

Another good reason to promote "repeasantization" (van der Ploeg, 2008) of the rural world is related to environmental sustainability. The formation of a system of small family farms rooted in the territory and based on environmentally friendly cultural practices, represents, in fact, the only way to take care of the territory (at zero cost), to prevent problems of hydrogeological instability, preserve biodiversity, to stop the depopulation of large areas of the Italian territory. The European Parliament itself recognizes this when it affirms that the European model of peasant agriculture based on the diffusion of land ownership is "the best precondition for ensuring responsible land use and sustainable land management" (PE, 2017, p. 6). In other words, returning to work the land would allow us to move towards a family farm system based on short supply chains, a sustainable agriculture that generates rural landscapes of high quality.

[28] Organic farming, which in the 2014-2020 European Programme falls under measure 11 of the II pillar of the CAP, is rewarded much less than the more conservative and less sustainable practices included in measure 10. In Italy, the 21 Regional Development Plans of the current programming cycle allocate 9% of the total resources (1,6 billion euros) to organic farming.

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The COVID-19 pandemic offers food for thought and an opportunity for humanities and science scholars who research our global condition to collaborate. The 21st century society is facing an unprecedented challenge right now: what can we learn from this challenge? Will everything really return to what we used to define as 'normal' at the end of the emergency? Probably not. Structural changes from political, economic, social, and environmental perspectives are already occuring, and impacting the fields of health, education, commerce, governance and travel. Concepts of social space are being redefined and rethought at various scales. Our society, unprepared for a global health emergency of this scale, has been engaged only partially in practices of mitigation and sustainability and we now realize the fragility of our planetary existence. This volume collects 14 original chapters which analyse the new scenarios that could lie ahead in the aftermath of the COVID-19 crisis in an interdisciplinary context.

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