



SHERPA

Rural Science-Society-Policy  
Interfaces

Working document

Overview of a sample  
of existing foresight  
and scenario studies  
carried out at EU and  
global levels



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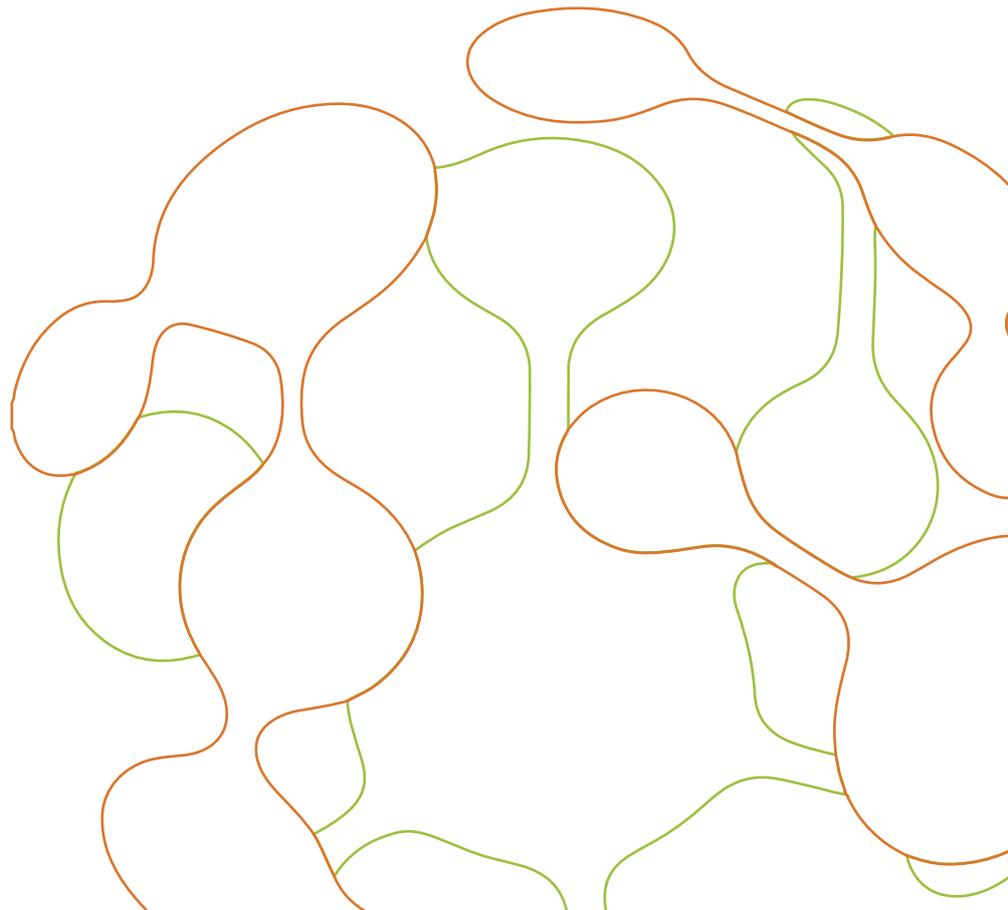
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Written in July 2020

Sustainable Hub to Engage into Rural Policies with Actors (SHERPA) is a four-year project (2019-2023) with 17 partners funded by the Horizon 2020 programme. It aims to gather knowledge that contributes to the formulation of recommendations for future policies relevant to EU rural areas, by creating a science-society-policy interface which provides a hub for knowledge and policy. Find out more on our website:

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## CONTENTS

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Executive Summary .....	2
Introduction .....	4
1.1 Background.....	4
1.2 Summary of changes due to COVID-19 .....	4
2 Foresight and Scenario Exercises Reviewed .....	6
2.1 Projects reviewed.....	6
2.2 Scenarios developed or adopted.....	8
3 High-level Megatrends.....	20
4 Trends, drivers and impacts of particular relevance to rural areas .....	22
5 Conclusions.....	26
5.1 A synthesis .....	26
5.2 Principles of a vision for rural areas .....	26
6 Acknowledgements .....	30
7 References .....	30

## LIST OF TABLES

---

Table 1. Overview of projects with foresight or scenario exercises reviewed .....	7
Table 2. Scenarios identified by selected projects.....	8
Table 3. Targeted (2040) scenarios .....	17
Table 4. Selected scenarios for rural strategies.....	26

## LIST OF FIGURES

---

Figure 1. Four main marker storylines (red) and their deviations positioned across global/regional and adoption of sustainable lifestyle axes .....	11
Figure 2. Draft structure of scenarios being developed in the H2020 SoilCare project .....	15
Figure 3. World Economic Forum Top 10 risks over the next 10 years (2020 to 2030) .....	20
Figure 4. Four parameters for rural development.....	27

## EXECUTIVE SUMMARY

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This document provides an overview of a sample of existing foresight and scenarios studies carried out at EU and global levels identifying possible futures and scenarios for rural areas for time periods up to 2050. The studies were carried out between 2009 and 2019, drawing on projects dating from approximately 2004 to 2019.

The COVID-19 outbreak can be expected to impact on the short to medium term of the pathways required to progress towards potential alternative futures of 2040 and beyond. Such impacts would relate to economic conditions, human health and well-being, connectivity and international aid.

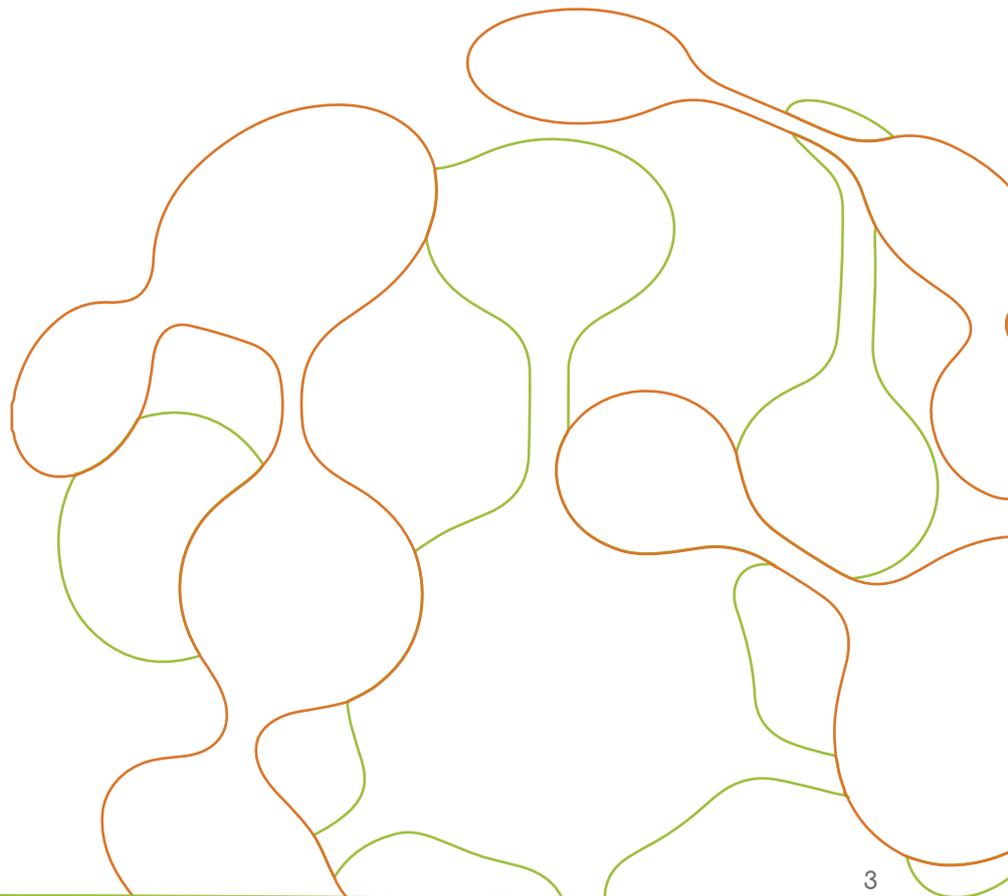
The document unfolds in three main sections: the review of foresight and scenario exercises, high-level megatrends and trends, and drivers and impacts of particular relevance to rural areas. The first section of the document includes a summary of consulted foresights and relative domains through means of a matrix synthetically reporting the main trends and dimensions considered by the consulted foresights.

In the next two decades the EU will be affected by a number of phenomena that will produce their effects differently in urban and rural areas. Population ageing and migrations, the urbanisation processes, climate change, digital connectivity, the health system and the governance of territorial transformations are the main dimensions that will generate impacts on the future of rural areas. Their persistence, scope and entity depend on some decision-making points – the gamechangers – on which the EU is today forced to provide answers. The foresights pose a particular emphasis on how new technologies will affect rural areas. Indeed, technological change presents a threat and an opportunity in equal measure to rural areas. The constraining factor is not technological availability, but institutional factors such as awareness, administrative capacity and political will.

This document considers two groups of reports: foresights from EU and international research, and EU-funded projects. The latter have been particularly suitable for looking at the scenario exercises. A significant element in foresight studies relates to the identification of trends and the underlying drivers of change. The analysis of such drivers is often used as a key tool in foresight processes. The document takes into consideration scenarios for rural areas with different reference periods: from 2030 for EDORA to 2050 for SALSA, SoilCare and TRANSMANGO. Though the projects considered have/had different aims – from land use to small farmers – it has been possible to extrapolate some interesting aspects, challenges, and topics that pertain to rural areas. The scenario exercises mix all the elements that have been detected as megatrends for rural areas and propose different possible/plausible situations on the basis of various variables. Besides the projects mentioned above, the review analyses H2020 projects VOLANTE and LEI Wageningen's meta-analysis "Alternative futures of rural areas in the EU".

Acknowledging that rural areas provide most essential ecosystem services and are key to mitigating climate change, the document contains a section with a summary of take-away messages for the future of EU rural areas, summarised as follows:

- Rural areas are different and have specific needs: the diversified economic and well-being performances have been recognised by the OECD classification based on their relationships and proximity to Functional Urban Areas (FUA). Urban-rural linkages will be crucial for the future of rural areas, in consideration of the migratory flows, commuting, provision of public services and access to environmental resources. These differences and trends need to be tackled with targeted policies which take into account the different degrees of remoteness of rural areas and their economic performance.
- The diversity of rural areas reflects on opportunities and constraints: the richness of natural, social and cultural capitals needs to be maintained and improved through a systemic combination of technologies, business models and governance models. Rural areas close to a FUA mainly struggle with urban sprawl and impact on quality of life and natural capital; the different conditions that regard rural areas close to a FUA need to be evaluated through their capacity to valorise their environmental, social and cultural assets; the remote rural regions have to cope with abandonment and depopulation: agriculture will remain as the crucial sector, yet its success depends on the capacity to find a niche in the global markets.



# 1 INTRODUCTION

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## 1.1 Background

This document provides an overview of a sample of existing foresight and scenarios studies carried out at EU and global levels which identify possible futures and scenarios for rural areas for time periods up to 2050. The studies were carried out between 2009 and 2019, drawing on projects dating from approximately 2004 to 2019.

Five of the projects were funded by the European Union (FP6 to H2020, and ESPON), international organisations (OECD, World Economic Forum). As of June 2020, one project, H2020 SoilCare, is in the process of developing a set of scenarios. These studies were carried out to anticipate and prepare for potential challenges or opportunities emerging from global trends, not exclusively focusing on rural areas, but with significant contributions from impacts on rural areas.

## 1.2 Summary of changes due to COVID-19

The timing of the foresight exercises reviewed precede the COVID-19 pandemic, or are based on data collected and analysed for time periods prior to the outbreak of COVID-19. This creates a new context for some probable or plausible futures. They do not change all assumptions or forces that shape the long-term future, and thus the basis of most foresight or scenario exercises. However, it could change the short- or medium-term pathways towards those futures.

To date, no foresight or scenario that considers the consequences of COVID-19 specifically, has been published. However, the OECD has published an interim economic assessment (OECD, 2020a). Some of the summary headlines are repeated below to provide insight into the potential change in the early years of the pathway to 2040 for rural areas, where they are of most relevance to Europe:

- On the assumption that the epidemic peaks in China in the first quarter of 2020 and outbreaks in other countries prove mild and contained, global growth could be lowered by around ½ percentage point this year relative to that expected in the OECD Economic Outlook of November 2019.
- Annual global GDP growth is projected to drop to 2.4% in 2020 as a whole, from an already weak 2.9% in 2019, with growth possibly even being negative in the first quarter of 2020.
- Provided the effects of the virus outbreak fade as assumed, the impact on confidence and incomes of well-targeted policy actions in the most exposed economies could help global GDP growth recover to 3.25 % in 2021.
- A longer lasting and more intensive COVID-19 outbreak, spreading widely throughout the Asia-Pacific region, Europe and North America, would weaken prospects considerably. In this event, global growth could drop to 1.5% in 2020, half the rate projected prior to the virus outbreak.

- Adverse consequences of COVID-19 include the immediate interruption of global production chains, lower final demand for manufactured products and services, and decreases in international tourism and business travel.
- Restrictions on travel, required to contain transmission of the COVID-19, would disrupt the transport and distribution of food and other vital products, increase shipping times, and limit the supply of the most essential food items.
- Rising levels of food insecurity and lack of access to health care, either due to restrictions on movement, strained health systems or falling incomes, are likely to increase malnutrition rates, particularly amongst children, pregnant and lactating women, and elderly people<sup>1</sup>.
- Rising unemployment and underemployment are expected to significantly reduce the purchasing power of individuals. Urban communities, especially regular wage earners in the informal economies and workers in the service sector, are increasingly at risk of losing their sources of income as a result of legislation and guidelines relating to social distancing, and policy restrictions to reduce transmission of the COVID-19.
- COVID-19 could pave the way for social and political unrest. Uncertainty of the future impact of the pandemic, combined with restrictions on movement, rising unemployment, limited access to food and the erosion of already fragile livelihoods can lead to discontent, fuelling violence and conflict.
- The outbreak is likely to have significant repercussions on the delivery of humanitarian aid. Resources will be redirected to assist activities at COVID-19, impacting aid budgets and priorities.

These summary points sourced from OECD (2020) "Interim Economic Assessment Coronavirus: The world economy at risk" and from FSIN (2020) "Global report on food crises. Joint analysis for better decisions."

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1        Regarding food security, there are also urgent concerns for the nutritional status of children in families that rely on school feeding programmes to fill gaps in food provision.

## 2 Foresight and Scenario Exercises Reviewed

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### 2.1 Projects reviewed

The studies reported used: i) foresight approaches, to analyse thinking about the future, and explore factors that could give rise to possible and probable future characteristics, events and behaviours (United Kingdom Government, 2017). They gather intelligence from a range of sources, systematically, to come to a fuller understanding of the forces shaping the long-term future which should be taken into account in policy formulation, planning and decision-making (Coates, 1985); and ii) scenarios, “*plausible descriptions of how the future may develop, based on a coherent and internally consistent set of assumptions about key relationships and driving forces*” (Nakicenovic & Swart, 2000). They are not forecasts, predictions, projections or plans of the future for a given time period. They can be described in terms of destinies, because current state and development pathways set limits on possible futures, and choices, which will influence the differences between potential futures (Ringland, 1998).

One study, by Jansson and Terluin (2009), undertook a comparative analysis of scenarios of alternative futures for Europe, developed in EU projects. They note that disruptive events such as a global financial crisis should be considered in a set of possible rural futures. One such disruptive event is the outbreak of COVID-19.

The set of projects with foresight or scenario exercises reviewed, and their main trends and dimensions, is summarised in Table 1. The rows represent the main trends and dimensions considered by the foresight exercises, and the columns refer to the foresight exercises reviewed and the time periods covered (“N/A” refers to “not available”). The level of significance each report attributed to the individual trend topic is shown in the cells of the table.

Table 1. Overview of projects with foresight or scenario exercises reviewed

	Foresights from EU and international research					EU-funded projects				
	WEF (2020>2030)	ESPAS (2019>2030)	OECD Regional Outlook (2019>N/A)	OECD Rural 3.0 (2019>N/A)	LEI (2009>2035)	SOILCARE* (2019>2050)	SALSA (2018>2050)	EDORA (2012>2030)	TRANSMANGO (2016>2050)	VOLANTE (2012>2040)
<b>Environmental</b>										
Climate change	++	++	+	+++	+	+++		++	++	++
Energy consumption	+	++		+	+			+		+
Natural resources use	+	++		+		++	++	+		++
Land use change and soil					+	+++		+		+++
Food systems and agriculture	+	+				++	+++		+++	++
<b>Social</b>										
Demography	+	+		++	+++			++		++
Ageing	+	+	+++		++					
Migrations	+	++	+++	++	++	+		+		
Poverty and inequalities	++	++	+++	+				+	++	
<b>Economic</b>										
Economic growth	+++	+++			+++		+	++		
Markets			++				+	+	+	
Employment	+++	++	++	+		+	+	++		
Finance and tax	++	+	+	++				+		
<b>Technological</b>										
Connectivity	+++	+++		+++	+		+	++	+	
Digitalisation	++	+	++	+++	+			++	+	
Access to ICTs	+	++		+++	+				+	
<b>Political</b>										
Geopolitics	++	+++								
Domestic politics	+	++				+	+	++		
Democracy	++	+++						+		
Conflicts management	++	+++								
<b>Territorial</b>										
Urban-rural relationships	++	+++	+++	++	+	+		+++	+	++
Urbanisation	+	++	++					++		
Rural settlements		+	+	+++	+++	++	+	+++	+	++

Note: \* Scenarios in the H2020 SoilCare project are in the middle of development as of June 2020. So, the relative significance of the elements is indicative and subject to change once the scenarios are finalised.

## 2.2 Scenarios developed or adopted

In the EU-funded projects reviewed, and the meta-analysis of LEI, 17 scenarios were identified, with two of a baseline or Business as Usual (SALSA). These scenarios are listed in Table 2.

Table 2. Scenarios identified by selected projects

Projects	Scenarios
SALSA	Business as Usual
	Mirror
	Enabling
	Disrupting
TRANSMANGO	Fed-up Europe
	The price of health
	Retrotopia
	The Protein Union
EDORA	Gradual response to climate change - low levels of State/EU support (divestment)
	Gradual response to climate change - high levels of State/EU support (investment)
	Rapid response to climate change - low levels of State/EU support (divestment)
	Rapid response to climate change - high levels of State/EU support (investment)
LEI study of EU projects	Baseline
	Competitiveness
	Cohesion
	Clustered Networks
	Lettuce surprise U
	Big Crisis

In addition, four scenarios are currently being developed in the [H2020 SoilCare](#) project which are: Local Sustainability, Under Pressure, Race to the Bottom, and Caring and Sharing. A summary of the scenarios developed follow for each of the H2020 SALSA, FP7 TRANSMANGO, FP7 VOLANTE, H2020 SoilCare and the cross-project comparison carried out by LEI.

The H2020 SALSA project (Arnalte-Mur et al., 2019) considered 4 scenarios, with a particular focus on assessing the role of Small Farmers (SF) and Small Food Businesses (SFB) in regional food systems, summarised below:

- **Business as Usual (BAU):** Highly concentrated food chains which operate in liberalised world markets and facilitate both food imports and exports. Public policies in the agri-food sector are pervasive through strong public regulations despite low public sector budgets and expenditure. Environmental degradation continues, exacerbating difficulties of access to natural resources. Managerial and technical innovations (research outcomes, knowledge) are accessible by Small Farmers and Small Food Businesses. Depopulation continues in rural areas, and poverty (although at low levels) tends to concentrate in urban areas. Consumers are aware of nutritional and environmental implications of their food habits, but do not demonstrate great social values in terms of solidarity and awareness about the problems of small farms.
- **Mirror:** Low level of concentration of food chains, together with a low level of openness of international markets. Higher public expenditure in the agri-food sector and legal requirements conditioning the activities of Small Farmers and Small Food Businesses are relatively weak and flexible. Good access to natural assets but difficulties for small farms to access managerial and technical innovations. The population has high levels of poverty, with an increase in population in rural areas. Collective action and advocacy of social values are common and practised throughout the society, but consumers are not aware about the nutritional and environmental implications of their food habits. The impact in rural areas is growing rural poverty and food insecurity. In some cases rural population inflows are motivated by the impact of climate change in urban areas or higher urban poverty and unemployment due to the dismantling of export-oriented industry.
- **Enabling:** Low level of concentration of food chains and a low degree of openness of international markets. There is high public expenditure in the agri-food sector, with weak legal requirements for Small Farmers and Small Food Businesses. In some cases, this weak regulation is understood as a risk for the environment. Access by Small Farmers and Small Food Businesses to natural assets and managerial and technical innovations is very good. In comparison to the BAU and Mirror scenarios, the population in rural areas increases and overall levels of poverty decrease. This is due to a dynamic rural economy and thriving rural communities, in some cases linked to the spread of multi-functional activities in farms, with more people working in rural areas in a diversified agri-food sector. Collective action and advocacy of social values are common and practised throughout society, with consumers being aware of the nutritional and environmental implications of their food habits.
- **Disrupting:** Food chains are highly concentrated, with a high degree of openness of international markets for both exports and imports. Small Farmers and Small Food Businesses are required to adhere to strong legal requirements, with low public expenditure in the agri-food sector. Access to natural resources and to managerial and technical innovations is poor and difficult for Small Farmers and Small Food Businesses. The urban population grows and the rural population declines, with poverty in rural areas. Consumer awareness is low regarding nutritional and environmental implications of food habits, with greater concerns over accessing food. This low level of awareness reflects low levels of solidarity and other social values in respect to the problems faced by small farms, representing a minor concern for society. In some remote rural areas, there is a use of informal or illegal food markets. New forms of small-scale urban and peri-urban agriculture

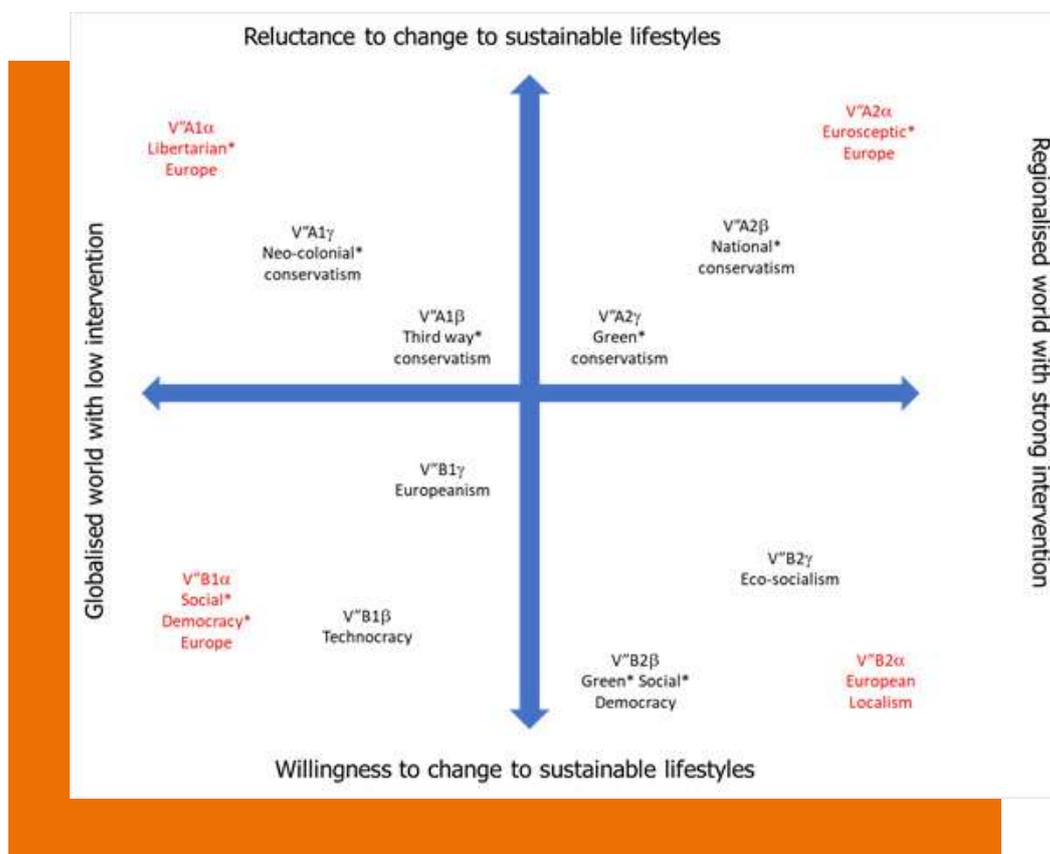
appear, informally, in some areas. However, more farmers are attracted to farming in remote areas where the effects of climate change are lower and enable production, showing that small farms can be resilient due to their flexibility, adaptive capacity and creativity.

The FP7 project **TRANSMANGO** studied the effects of global drivers of change on European and global food demand and raw material production, using scenario-guided transformation pathways for European food futures (Vervoort *et al.*, 2016; Brunori *et al.*, 2017; Hebinck *et al.*, 2018). Exploratory scenarios were developed with key EU stakeholders of future food systems that change in the context of global drivers by 2050, and key processes and events were identified that could form part of the pathways from the present day to each hypothetical scenario. The scenarios were framed in terms of eight factors: Consumption patterns, Environmental degradation, Poverty and economic inequality, Social and technical innovation, Urban and rural population dynamics, Power and market concentration, Trade agreements, and Basic resource availability (water, energy, raw materials). The overviews of the four scenarios developed are provided below:

- **Fed-up Europe:** a scenario of inertia in the food system under global pressures. *"Fed Up Europe is a story of inertia in the food system under global pressures. Practices and business models leading to unhealthy diets and negative environmental impacts continue. The power of EU and national policy makers to change these trends decreases over time with a combination of decreasing funds and decreasing popular support. There is a lack of leadership in the face of climate and migration crises. Consumers' incomes are enough to avoid food insecurity, but many lack the knowledge, incentives or budgets for healthy life styles. In governments and in the private sector, there are minorities interested in changing the trend, but they are fighting an uphill battle"* (Vervoort *et al.*, 2016).
- **Retrotopia:** a scenario of waves of immigration, terrorist threats and increasing impacts of climate change trigger social movements and policies that aim to keep global problems out of Europe, along with a nostalgia-fuelled sense of natural heritage and rural custodianship. Racism becomes more accepted; migrants are kept out, creating employment problems in greying societies, which are partly solved by robotisation of work; fear of migration from Europe's southern to northern countries due to climate change prompts European policy-makers to help make Mediterranean countries more climate resilient. Environmental concerns drive down consumption of animal products; otherwise, the improvement of diets is not a priority amid concerns of European security and self-reliance (Vervoort *et al.*, 2016).
- **The Protein Union:** a scenario of a highly proactive response by the EU and its Member States, led by governments but supported by the private sector and civil society, to the challenge of changing European diets and ways of production. The focus is on creating new sources of protein, including mainstreaming insect consumption and the production of artificial quasi-meats, supported by new, more integrated means of food production and processing, at the expense of the livelihoods of smaller farmers (Vervoort *et al.*, 2016).
- **The Price of Health:** a scenario that sees many Europeans returning to rural lives, out of necessity due to global pressures, because of changing social norms, and facilitated by technological advances in communications. These changes are supported by strong government policies regarding self-reliance and sustainability. Not everyone, however, is happy to be returning to the land, and the wealthiest do not have to follow suit (Vervoort *et al.*, 2016).

The FP7 **VOLANTE** (Visions of Land Use Transitions in Europe) project produced a scenario framework for interpreting and refining storylines for land use change at the European scale obtained from the Special Report on Emissions Scenarios (IPCC, 2000), see Figure 1.

Figure 1. Four main marker storylines (red) and their deviations positioned across global/regional and adoption of sustainable lifestyle axes



Source: VOLANTE project

Four of those storylines are relevant to rural areas by 2040:

- **Libertarian Europe:** in a context of global free trade policy with little interventionist or obstructionist trade policy, dramatic consequences for European agricultural models occur: many small farms go out of business and are incorporated into major industries. Increased mechanisation, productivity and economies of scale produce larger average field sizes and a reduction in the area of land used for agriculture. In southern Europe, the driver is climate change, while in the north, increased pressure from the farming lobby results in conversion of some semi-natural habitats to large farm units. Rural policy is focused on maintaining food production even if subsidy support is removed. Less strict planning laws in many EU countries result in an increase in housing and of rural industries, even if the rural population is in decline due to lower opportunities for employment. Similarly, trends towards intensification affect forest management in Europe.

Alternative storylines of the scenario are: i) "Third way conservatism", of a more compromised vision and balance between libertarian free trade principles and government regulation and interference in the market and society, resulting in a Europe where free trade is still the dominant force, but Europe seeks to prevent some imports. ii) "Neo-colonial conservatism",

in which Europe repositions itself as a more aggressive trade partner with less-developed countries around the world. European food production declines in the face of imports from other countries, and the economy is more heavily driven by secondary and tertiary industries. This vision has the highest overseas ecological footprint of all the storylines. Governance has a large paradigm shift too, with far higher influence from the private sector.

- **Eurosceptic Europe:** There is no attention to Research and Development in agriculture and a more sluggish acceptance of technical advancements. Sustainable management strategies are being given more importance as Europe tries to preserve its own land and water supplies. National rural policy determines sustaining food security by grant funding (nation-based) and extension programmes. There is more emphasis on sustainable management techniques as Europe seeks to protect its own soil and water resources. Superfast internet connectivity enables many individuals to work from home or in industrial or commercial sites in rural areas. Tourism is a big force of much of Europe's economies and many regions are overcrowded. Locally produced food for local markets is becoming normal within Europe. Protein from crop-based sources increases at the expense of meat production (which becomes more expensive). More agricultural products are produced in large, climate-controlled polytunnels. New areas of outdoor and leisure activity are increasingly being built, and additional recreational areas are created (as a response to climate change).

Alternative storylines of the scenario are: i) "National conservatism", with a stronger appreciation of rural traditions that dominate rural land management, and a very different approach to self-sufficiency within each European nation. Respect for traditional, family-based customs is paramount, reflected in the preservation of small, family farms; also, wildlife and biodiversity is respected and maintained under a stewardship ethic. The resultant differences are mainly seen through a more heterogeneous landscape which includes (native species) woodlands as well as mixed farms. ii) "Green conservatism", in which society is more radical, adopting some trade barriers (mainly to unsustainably produced commodities), is federalist, and tries to sustainably manage rural land through state subsidy and regulation. Agriculture is less family-oriented but adopts technology and sustainable practice to protect the environment.

- **Social Democracy Europe:** This scenario has a regional scope whilst also prioritising economic growth, social justice and the protection of biodiversity. Climate change is a significant concern, and by 2040 climate mitigation and adaptation should be the focus of several policies. An updated Common Agricultural Policy is designed to compensate farmers for the delivery of public goods through a suite of ecosystem services which are location specific. The area of agriculture is declining slightly although productivity is increasing mainly due to improved agronomic practices, animal husbandry, and high yield crops. There is an increase in the area of forestry on land obtained from agriculture.

Alternative storylines of the scenario are: i) "Technocracy", which presents a radically different system of governance that adopts technocrats and other experts as leading politicians and policy-makers. It is strongly federalist and deliberative in decision making; advancement in society is truly merit-based and based on egalitarian principles. The strong basis in science and education of most aspects of society means that environmental problems are challenged rationally (and hence successfully); the adoption of ecosystem services is fully inherent and contrasts with the overall scenario (e.g. the optimal mix of ecosystem service delivery of a habitat may not necessarily lead to the conservation of all species). ii) "Europeanism", in which the federalism of Europe is the strongest and most coherent. However, it is also more socialist

in outlook, and the government, as well as being large, influences people's lives considerably. Although environmental sustainability is very important, the degree of bureaucracy can sometimes hinder achievement. The ecosystem services concept is practiced in much of rural land management but there is still a bias towards maintaining food security that at times threatens biodiversity conservation and recreation. Because this storyline is more focused on food security and self-sufficiency than the other two V-B1 storylines, it has kept CAP support for production.

- **European Localism:** There are two major characteristics of the storyline: environmentalism and localism. Agriculture becomes more regionalised and less specialised; small, mixed farms are more common and sustainable management is a central part of food production. Multifunctional landscapes are a key element of this storyline. Food production is fundamental to the lives of many people. Food travels shorter distances from field to point of sale. Member States are actively implementing measures for preserving soil quality and structure, farmers and foresters recognise the value of soil protection. Biodiversity conservation is an important part of rural life, with people having a strong interest and pride in local wildlife and habitats.

Alternative storylines of the scenario are: i) "Green Social Democracy", which is less locally oriented and more regional than the Localism storyline. Governance and markets work at a regional scale which often crosses old national boundaries (e.g. a pan-country Alpine economic block); this helps to share, promote and focus on regional identity and products. Trade between regions is strong although international trade is lower than the A1 and B1 scenarios. Average farm size is bigger and there is more specialisation. ii) "Eco-socialism" represents a rise in a new socialism that adopts a green agenda as well as the traditional aspects of socialism. Unlike the Localism storyline, in this one, farms are owned by the workers and everyone shares the profit. Farms can be much larger and also specialised; however, sustainable techniques and technology are heavily adopted. Land use can be quite homogenous, at least more so than the two V-B2 storylines.

The **European Development Opportunities for Rural Areas (EDORA)**, funded through the ESPON programme, aimed to achieve greater understanding of the possibilities of growth, and problems confronting rural areas in Europe over a 20-year timeframe. It assumed that climate change was the most likely and most powerful potential 'shock' to rural settings, with a further significant shock being the effects of the financial crisis in 2008 and the subsequent credit shortage. The focus of the foresight techniques was to provide a set of alternative scenarios for rural areas in Europe (listed below). These would provide a basis for consideration of how the opportunities, and impacts, of climate change could be accommodated in future Cohesion policy.

The analysis of Future Perspectives noted that the incremental processes of change of the meta-narratives are likely to be subject to exogenous 'shocks' of direct and indirect impacts of climate change. These were expected to have effects on the opportunities available to rural Europe, through the rapidity and magnitude of climate change impacts, and model of economic governance used to structure the response. A significant issue identified is the importance of "... *local context, resources or assets, in determining the capacity to respond positively to ubiquitous meta-narratives of change, which is the principal determinant of differentiation between regions*" (Copus et al., 2011).

Scenarios developed:

- S1: gradual response to climate change - low levels of State/EU support (divestment).

A 'business as usual' scenario, that brings a continued increase in regional differentiation and a specialisation of agriculture on bioenergies and associated industries.

- S2: gradual response to climate change - high levels of State/EU support (investment).

Climate change has significant impacts upon economic activity and quality of life in rural Europe, resulting in intensified out-migration from agrarian and sparsely populated regions. Reduced consumer spending and shortage of capital inhibits the expansion of the tertiary sector.

- S3: rapid response to climate change - low levels of State/EU support (divestment).

Rapid and disruptive climate change attaches a premium to land as a basic resource underpinning both adaptation and mitigation measures. Food prices rise, renewable energy production and biotechnology industries expand rapidly.

- S4: rapid response to climate change - high levels of State/EU support (investment).

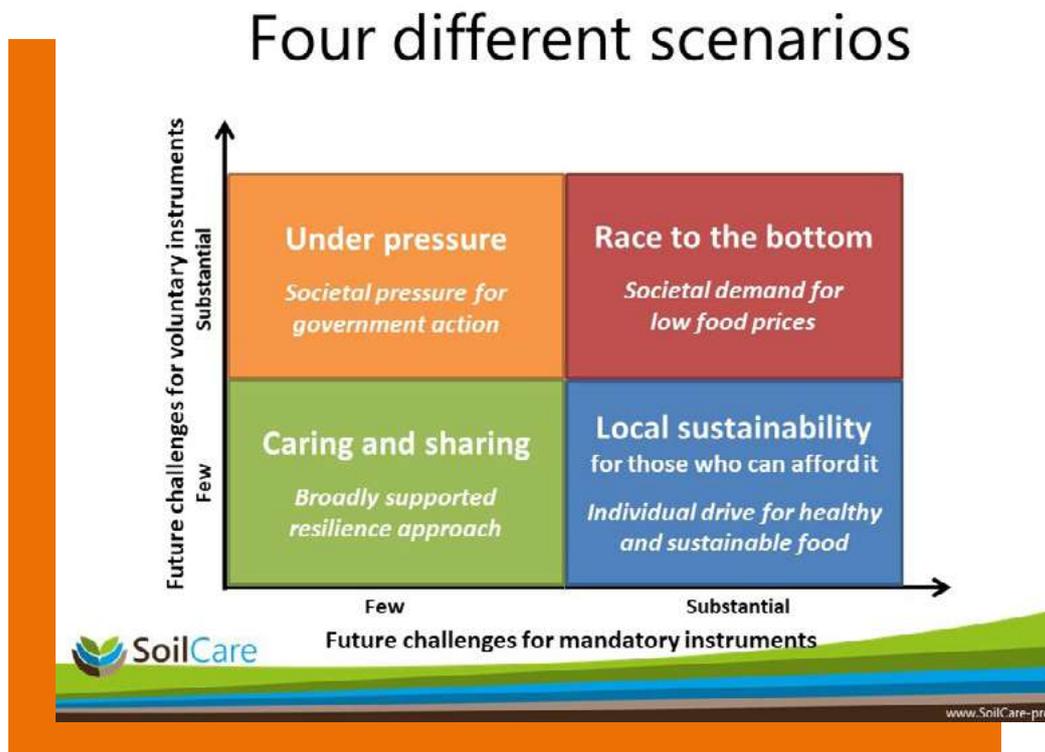
Fossil fuel use is reserved for food production, whilst cropping is also regulated to reduce the production of GHGs. The primary and secondary sectors are reinvigorated by the public policy response focused upon sustainability.

EDORA report also suggests that increasing spatial differentiation is principally a consequence of micro-scale (localised) differences in the capacity to respond to external drivers. This highlights the need to provide local communities with appropriate intervention tools – starting from an increased strategic capacity - within a coherent European policy framework.

The H2020 [SoilCare](#) project is currently developing possible scenarios for the future of agriculture in Europe. The framework for the draft scenarios is provided in Figure 2.

These scenarios have been developed along two axes, related to different types of policy instruments: future challenges to mandatory instruments (e.g. regulations) and future challenges to voluntary instruments (e.g. subsidies).

Figure 2. Draft structure of scenarios being developed in the H2020 SoilCare project



The draft scenarios are summarised as:

- **Local sustainability**, for those who can afford it represents individual drivers for healthy and sustainable food. It reflects the ever-increasing share of society valuing locally sourced, high quality produce, which leads to a larger share of European food being produced sustainably to cater for the healthy eating habits of those willing and able to pay for it. This sees a large part of the agricultural sector transforming into a more boutique style of farming with a regional focus, and a reduction in food imports from across the world. Mainstream farmers using conventional practices continue to make up a significant proportion of the sector. Not everyone can afford the premium prices of high-quality food.
- **Under pressure**, represents societal pressure for government action. European citizens are increasingly concerned about climate, environmental and health issues, but feel unable to affect change. Governments are pressured to play a leading role in finding solutions and take action, agreeing that food standards can only be met by ensuring more sustainable production.
- **Race to the bottom**, represents societal demand for low food prices. Continuation of existing agricultural practices results in further environmental degradation and impacts on profit margins, due to the costs required for the increasing amounts of inputs needed to maintain production levels. Worsening environmental quality requires quick and more structural solutions to meet the ever-increasing demands from internal and external markets.
- **Caring and sharing**, represents a broadly supported resilience approach. Confronted with a series of disasters, such as droughts, floods, pests, and animal and plant diseases, there

is widespread societal awareness that an urgent change in behaviour is needed to avoid future food shortages. Strong, visionary leaders step up and propose drastic changes that would not have obtained support until recently.

In 2009, LEI Wageningen (Jansson and Terluin, 2009) published a study which aimed at exploring alternative futures of rural areas in the EU. This study produced a comparative analysis of seven scenario studies of rural areas in the EU (ESPON, **EUruralis**, **JRC SCENAR 2020**, FP6 **SEAMLESS**, FP6 **SENSOR**, European Environment Agency **PRELUDE** project and "Agriculture in the overall economy").

The comparative analysis considered factors of population, globalisation, climate change, policies, agriculture, agricultural land use, landscape, nature and biodiversity, and territorial disparities in rural Europe. From these, six alternative futures were identified:

- 1 **Baseline**, in which globalisation has a strong and accelerating influence on the process of job creation and destruction. Metropolitan regions with advanced technologies benefit. Population stabilises in the EU; however, remote rural regions face depopulation. Drought has led to agricultural abandonment in southern Europe. The production of biomass and energy crops gives a new impetus to agriculture. Agricultural production in 2020 needs 91% of the agricultural land used in 2000/2002.
- 2 **Competitiveness**, in which all efforts are concentrated on increasing global competitiveness. The economy flourishes with a high level of technological innovation. Territorial disparities increase between metropolitan areas and other areas. There is rapid and radical liberalisation of CAP. Agriculture intensifies, becomes high-tech and concentrates in areas that are optimal for production. Agricultural production in 2020 needs 86% of the agricultural land used in 2000/2002.
- 3 **Cohesion Support**, which is directed at technological development and is concentrated to less-favoured regions. Non-metropolitan areas benefit. There is net migration from the most densely populated urban areas towards peripheral regions. Ambitious policies on environmentally sustainable regional development and minor CAP reforms (mainly modulation). Farming is high-tech and increasingly organic. Agricultural production in 2020 needs 96% of the agricultural land used in 2000/2002. As PRELUDE does not start from the degree of policy intervention, three rural futures according to disruptive events are also distinguished.
- 4 **Clustered Networks**, in which migration away from polluted urban areas is encouraged. Fourteen new medium-sized cities outside the main urban centre are created. These generate changes in infrastructure, employment opportunities and activities in peripheral regions. Globalisation propels economic growth. Deepened international trade relations lead to marginalisation of agriculture and production continues only in the most favourable areas. Due to large scale land abandonment, the amounts of crop land and grassland have decreased by about one third in 2035.
- 5 **Lettuce Surprise U**, a major food security crisis hits Europe in 2015. As management during this crisis fails, faith in central government and in food security decreases strongly. Political decentralisation becomes prominent and policy focuses on enhancing the quality of life. Environmental awareness grows, as does demand for sustainably produced food. Due to technological innovations, new crop varieties are invented that enable higher yields with

lower inputs. Agriculture in core production regions becomes high-tech, clean and relatively small scale. Due to increased productivity in agriculture, the amount of crop land (-40%) and grassland (-20%) decreases by 2035.

- 6 **Big Crisis**, in which a series of environmental disasters in 2015 highlights Europe's vulnerability and inability to adapt effectively. After these crises, policies focus on a movement of population from the urban centre of Europe to its periphery. There is widespread support for sustainable and regionally balanced development at EU level. Agricultural intensity is low. The main focus is on landscape stewardship. The use of crop land and grassland remains more or less stable.

A key observation of the study was the significance of the role of public policies in shaping the futures of rural areas. It notes that challenges represented by a *"dichotomy regional development policies of efficiency versus equity"* require new approaches, and that rural Europe *"... emerges from the interplay of global market forces and local responses by entrepreneurs, consumers and policy makers."* It also echoes an assumption of the PRELUDE project, when referring to the financial crisis of 2008/09 that disruptive events should be considered *"among the set of possible rural futures"*.

In addition to foresight and scenario-based projects which have direct implications for rural areas, the EC BOHEMIA project carried out a foresight exercise in support of the future research and innovation policy of the European Union (Weber *et al.*, 2018) that identified 19 scenarios (see [Bohemia](#)). Some of the scenarios are relevant to rural areas as they are for all society (e.g. organ replacement, precision medicine, reframing work, smart mobility defeating communicable diseases), or have footprints that overlap rural areas (e.g. security and defence). Some scenarios are of specific relevance to rural areas, notably those on Nature Valued, towards a More Diverse Food Supply System, the Bioeconomy, Cheap Renewable Energy, and the Low Carbon Economy.

Table 3. Targeted (2040) scenarios

Targeted Scenario	Summary of 'It is now 2040...'
Assisted Living	For the ageing population of Europe, but also abroad, the demand for assistance in daily living has more than tripled over the last 25 years. New service concepts combining automation, robotic assistance, digital helpers, virtual trainers and small exoskeletons have transformed care, assistance and the relevant industries.
The Bioeconomy	Bioeconomy promises to be a major contributor to European economic growth and re-invention with impacts on all sectors. Technological advances are set out to replace finite resources and conventional industrial processes, with processes and components that are biologically derived. In the long term, bioeconomy will be a major contributor to climate mitigation and to the transition to a circular economy.
Cheap Renewable Energy	Renewable Energy is available at competitive prices. More than half of the electricity used for transport, housing and industry comes from renewable sources. A pan-European smart grid coupled with local micro-grids, with adequate storage facilities, ensures reliability of electricity supply. Hydrogen and biofuels complement the system. The sector is expanding to novel cultivations, such as algae and bacteria.

Targeted Scenario	Summary of 'It is now 2040...'
Continuous Cyberwar	With the rapid growth of Internet of Things, cybersecurity hacks proliferate, putting citizens and infrastructures at risk. EU governments strengthen collaboration with citizens and industries to build up a response based on both social participation and cutting-edge technologies.
Ubiquitous Expert Systems	There is an abundance of advice based on collected experience, using simulations, data analytics and learning systems. With just-in-time data available all around, expert systems are used routinely in the prediction and management of complex situations, as well as for organisational and individual activity.
Defeating Communicable Diseases	Communicable Diseases (viral infections as well as biotic diseases) that reduce the quality of life of people and cause huge economic losses are being defeated. The number of people dying from Communicable Diseases is steadily decreasing. New approaches, including replacing antibiotics and ways to avoid infections have been developed in international collaboration.
Emotional Intelligence Online	With emotional markers from diverse sources widely available, and 'emotionally transparent generation' has been ushered in. The flow of emotions is woven into the social, economic and political fabric. Governments aim to learn continuously from feedback gathered from the flow of emotions – as do corporations and individuals. Techno-pessimistic and techno-optimistic ideologies clash around the question of the future prospects of the 'emotional generation'.
Human Organ Replacement	Most human organs and tissues can be replaced. The majority of organs and tissues are bio-printed, produced by additive manufacturing or breeding (e.g. organoids). Human organ or tissue replacement is accessible and affordable for all European citizens so that the average life expectancy increases.
ICT-Based Security and Defence	Globalisation and ICT solutions have changed the nature of threats faced by the EU. A combination of preventive and response measures are implemented in coordination by security and defence forces with the aid of computers. The role of the anticipatory crime units is rising, together with the diffusion of unmanned aerial vehicles and military robots with Artificial Intelligence features. These are used in external military actions as well as to secure national territories in cooperation with security units.
Low Carbon Economy	The EU has slashed the release of greenhouse gases in the atmosphere, invested heavily in carbon sinks and has become carbon neutral including for energy intensive industries like steelmaking. Energy and transport sectors have radically changed through low carbon electricity, cities' sustainable mobility and CO2 storage opportunities. Carbon capture technologies, together with renewed environmental actions, enlarge artificial and natural carbon sink, reversing carbon emission trends.

The overall challenge identified is in “*making transformative change in Europe through EU R&I policy*”. To address this challenge, several recommendations are set out, of which the first is to “*Step up the ambitions of European R&I policy to become the engine of European and global transitions*”. It recognises the need for the EU to maintain a strong economic and political role in the world and to be able to co-shape “*the future Europeans want*”, and for EU R&I policy to simultaneously address four transitions that will move the world towards the UN Sustainable Development Goals (SDGs). The transitions concern:

- Social needs: Providing for the needs of people;
- The biosphere: Safeguarding a hospitable planet;
- Innovation: Harnessing the forces of change;
- Governance: Joining forces for a better world.

All of these transitions have a locus in rural areas. Most of the scenarios presented link to the themes which emerged in the projects reviewed, summarised in Table 1. However, four scenarios do not fit easily into those categories, which relate to human health and well-being, biosecurity, medicine, and security and defence. The BOHEMIA reporting notes that the “*transitions represent clusters of UN Sustainable Development Goals that respond to sets of challenges posed by the superposition of global megatrends.*”

### 3. High-level megatrends

Megatrends are defined as “those developments already underway and nearly impossible to change over the coming decade”, framing all the subsequent possible futures (ESPAS, 2019). They operate at a large scale, affecting a large proportion of the population and a significant number of countries or regions. Their impacts can be global and operate over long-term timescales.

The World Economic Forum (2020) identified risks which arise from an unsettled geopolitical landscape. The top 10 risks for the coming decade (to 2030) are shown in Figure 3.

Figure 3. World Economic Forum top 10 risks over the next 10 years (2020 to 2030)



Source: World Economic Forum

High-level megatrends with potentially and particularly significant relevance to rural areas are summarised below.

- 1 Pressures on the **global economy** from macroeconomic fragilities and financial inequality continued to intensify in 2019, increasing the risk of economic stagnation, with the highest risks for 2020 of 'Economic confrontations' and 'domestic political polarisation'. Prior to the COVID-19 outbreak, projections for economic growth were at approximately 3% per year in the decade to 2030. Europe was projected to grow at 1.4% per year, which is probably not sufficient to significantly improve rates of employment, levels of investment in the integration of young people into the labour market. Amongst other factors likely to be of significance, particularly in the recovery from COVID-19 are the high levels of public debt. A further potentially significant factor is the global trade disputes which could lead to destabilisation of the global economy.
- 2 **Demography:** The age profile of the world's population gets older. By 2030, 12% of the total population will be older than 65, up from 8% in 2019. In Europe the estimates are that by 2030, 25.5% of the population will be older than 65 (up from 19% in 2017). Changing societal,

environmental, demographic and technological patterns are threatening the improvements in wellness and prosperity that health systems have achieved over the last century.

③ **Urbanisation:** By 2030 two-thirds of the world's population will live in cities. The population of small and medium-sized cities is increasing at double the rate of the megacities that often dominate discussions. Many Europeans now live in urban centres of population sizes from 100 000 to 1 million, and only 7% of the EU population live in cities with a population greater than 5 million.

④ **Climate change and the loss of biodiversity** are accelerating and impacting ecosystem services and human well-being. Across Europe, summers will become hotter, leading to an increased number of droughts and wildfire events. Extreme natural events are becoming more intense and more frequent. This worsens a planetary emergency which has led to the loss of human life, social and geopolitical tensions and negative economic impacts due to impacts on agriculture, food productions and liveability in urban and rural areas.

In 2017, weather and climate related disasters cost €290 billion. Climate-related decisions and actions will determine the future of economies and societies, and humankind as a species. Challenges for the European Union are on achieving the goals it has set for itself, and how to provide leadership as a key player in the field, and not to 'export' emissions to other areas of the world.

⑤ **Digital technologies** have multiple dimensions to their potential impacts, depending on their availability, access and use. By 2030, 90% of the total population will have the opportunity to read documents online; 75% will have access to a mobile network; 60% will have access to broadband. Economic and societal benefits accrue to much of the global population, but significant risks are created by unequal access to the internet, a lack of a governance framework for global technology and cyber insecurity. Issues arising include also the potential of Artificial Intelligence.

⑥ **Energy consumption:** Electricity consumption will increase by 1.7% a year. Demand will predominantly increase in non-OECD countries, particularly in India and China, and decrease in Europe and other western countries. Europe is a leader in the energy transition. The target of the European Union is to generate 32% of energy demand from renewable sources.

⑦ **Geopolitics:** By 2030 influence will be exercised by nations, and by towns, territories, corporations and transnational movements. It will not be only measured by traditional metrics such as population size, GDP, and military expenditure.

## 4 Trends, drivers and impacts of particular relevance to rural areas

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In a more complex, dynamic and challenging environment, a number of global shifts are likely to influence how rural areas can succeed (OECD, 2019a). A short description follows of megatrends which are most likely to impact on rural areas.

**Population ageing and migration:** In predominantly rural regions, approximately 44% of the population are of working age, with over 19% of the population aged 65 or over. A major demographic change in many OECD countries is of an ageing population, the general trend of which is forecast to continue, being more significant in rural regions. The capacity of rural communities to successfully create and deliver attractive prospects for, and integration of, newly arrived migrants will shape their scope for addressing the challenge of population that is aging and shrinking. Increasing digital connectivity and transforming to a sharing economy can lead to new, innovative ways of community-led solutions to addressing the types of societal challenges being faced.



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Migration creates opportunities for most OECD countries. Citizens will continue to migrate from rural to urban regions within nations, resulting in a demographic pattern of a decrease in the population of many rural areas, and a commensurate increase in the population of some urban areas. Most people who move to a large city do so when they are young, contributing to a growing age gap between rural and urban areas.

Rural communities with a larger proportion of senior residents and a smaller working-age population will face more labour market shortages and costs of providing services (e.g. higher rates of care for the elderly, particularly in later years of people's lives) (OECD, 2017).

Population ageing will tend to shift the political balance within countries towards metropolitan areas, away from rural remote regions. Political dissatisfaction could increase amongst people who feel they are being left behind and not listened to. National governments require frameworks and mechanisms that ensure the inclusion of rural interests in decision-making, and for those rural areas to be able to foster urban-rural linkages.

**Global shifts in production:** The development of products and services spread rapidly across countries as multinational corporations transfer operations overseas, re-shore, and outsource. In order to succeed in the global economy, rural regions need to strive to develop, and to concentrate on key areas in which they have a competitive advantage. This means increasing the competitiveness of rural areas in OECD countries by encouraging innovation and investing in skills. Openness to foreign investment and fostering linkages between local start-ups and Small and Medium-Sized Enterprises (SMEs) and Multi-National Enterprises (MNEs) can enhance the development and outputs of various sectors.

### Rise of emerging economies:

Emerging economies are expected to contribute to two-thirds of global growth by 2030 and be major global trade centres. Globally, demand will increase for raw materials, food and technologies from rural areas due to an increase in the number of people with disposable wealth. As a result of the rise of living standards in some areas of the world, emerging economies will have an increasing interest in the use of digital technologies to



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expand the productivity of agriculture and energy, and the sustainable management of land and water resources. Exporting technological skills and knowledge to developing markets may be a crucial factor for the development of rural economies. More investment could come from emerging markets, and more tourists from those countries, creating financial, social and cultural links which are likely to be important for the development of rural areas.



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**Climate change and environmental pressures:** The United Nations Paris Agreement (United Nations, 2015) sets targets for reducing anthropogenic emissions to limit the increase in global temperatures to 1.5°C above pre-industrial levels. Future population and economic growth are likely to bring further environmental pressures (for example, it is estimated that by 2050 60% of the global population will face problems relating to water). More emphasis will be placed on resource efficiency, and the development and dissemination of technologies that can enable this outcome. Collaboration between the public and private sectors will be required to enable the deployment of carbon and waste-reducing technologies.

Climate change will present particular challenges for both rural and urban regions. Rural areas can take advantage of these changes by increasing investment in clean energy-related technology and the circular economy. Policy responses will need to be tailored to regional resources and characteristics.

**Environmental adjustments** are driven by human effects on the natural environment. Climate change is the predominant concern globally, with different effects regionally and locally.

There is a broad variety of developments in the **agricultural sector** that have the potential to dramatically improve the way food, fibre and biofuel are produced and processed. These developments offer the prospect of achieving more resilient, productive, and sustainable farming and food systems, as well as enabling comprehensive traceability from farm to fork. The recently published European Union strategy on Farm to Fork (European Union, 2020)



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sets the context for a new comprehensive approach to how Europeans value food produced sustainably, providing an opportunity to improve lifestyles, health and the environment.

To date, four main developments have been established as part of farm digitalisation and automation: 1) adoption of development processes; 2) data-driven decision-making; 3) competition from conventional suppliers and new business entrants; and 4) elimination of knowledge

asymmetries across various players (OECD, 2018). Governance and control of agricultural data would be essential to ensure that agricultural technology can support rural communities (OECD, 2019a). The benefits for farmers of data-intensive equipment is uncertain unless data ownership is well-defined.

**Technological breakthroughs and transition:** Economic trends, new technologies and demographic and environmental changes will affect urban and rural regions in fundamentally different ways. The OECD (2019a) places a particular emphasis on how new technologies will affect rural areas, identifying their potential to be a threat as well as an opportunity for rural areas.



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Threats to rural areas will be through an ongoing or accelerating shift to a knowledge-based service economy. However, many new technologies can help rural regions to overcome economic challenges they currently face, mitigating some of the disadvantages inherent in low density populations and long distances to access services.

Prospects for changes in the sources and manufacturing of products, and the potential for associated new enterprises, are created by innovations in digitalisation, mechanisation and computerised reasoning, distributed computing, the Internet of Things, and nanotechnology. Such innovations are likely to lead to changed requirements for labour, and new and added value products in the primary industries of agriculture, forestry, mining and fishing. They will lead to new business opportunities such as those offered by 3D printing for localised small-scale manufacturing, and the transportation of goods by drones. Advances in communications technologies and digital literacy will open up new ways of accessing services which can overcome challenges of distance. The effects of many of these emerging innovations will be used in domestic life as well as work, so their effects will extend beyond the economy.

The adaptation of policies to new technologies will require reforms across a range of policy areas including taxation, labour markets and regulation. Regional development policies may be heavily affected, many of which have a significant spatial dimension and specific focus on rural areas. Constraints to the uptake of technologies include institutional factors such as awareness of their capabilities, administrative capacity and political will. The challenge is

to ensure that the distance-mitigating possibilities offered by technology are realised, which requires considerable investments in technological infrastructure, and complementary policies such as education and skills training.

In coming decades, other new opportunities will emerge for rural areas, encouraging governments to respond at all stages through an **integrated framework for rural areas** (OECD, 2019a). Modern and evolving innovations are leading to de-concentrated distributive and distribution networks that can reshape the geography of commercial activities and their support for rural areas. Concurrent threats are:

- i) climate change, in particular, the increasing frequency of extreme weather events and their wide-ranging effects on ecosystems, natural resources and biodiversity;
- ii) pressures on societies to respond to the significant and ongoing phenomena of population ageing. The evolution of rural policies towards a more multidimensional view of rural development requires effective forms of governance at national and regional levels, within government ministries and departments. Policies should be integrated horizontally within a given level of government, through management arrangements and development plans between sectors, services, and agencies.

Over the medium term, the **tax base** of some regional and local governments could fundamentally change as a consequence of new technologies, demographic changes, and changes in the labour market. Expectations are that in the near to medium term there will be no dramatic adjustments in tax rates, so digitalisation and population shifts are expected to place a strain on tax revenues in certain countries and regions. For example, population ageing and outmigration from remote rural areas can dramatically erode income tax bases. If this continues, less stable areas may be increasingly reliant on payments from central government and other revenues.

## 5 Conclusions

### 5.1 A synthesis

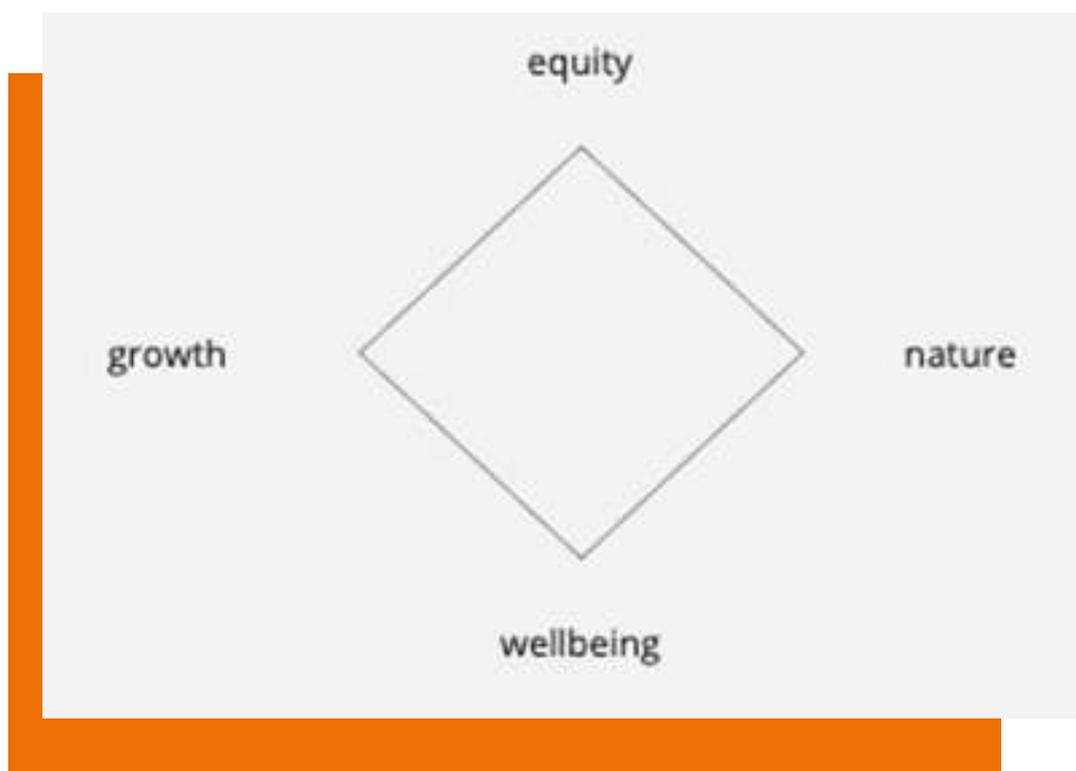
Table 4 reports the most relevant 'sustainable' scenarios for rural areas identified in our review. The variables considered in the storylines are citizens'/consumers' awareness, state intervention and diversification of rural economies. These scenarios are taken into consideration as input for the concluding remarks.

Scenario	Project	Description
Enabling	SALSA	Thriving rural communities with high numbers of small farmers and small food business.
The price of health	TRANSMANGO	Europeans returning to rural lives, encouraged by improved communication technologies.
European Localism	VOLANTE	Agriculture is more regionalised and less specialised. Multifunctional landscapes as key elements.
Lettuce surprise u	LEI Wageningen	Environmental awareness grows, as does demand for sustainably produced food. Agriculture in core production regions becomes high-tech, clean and relatively small scale.
Clustered networks	LEI Wageningen	Migration away from polluted urban areas is encouraged. New medium-sized cities outside the main urban centre are created.
Local Sustainability	SoilCare	A large part of the agricultural sector transforming into a more boutique style of farming with a regional focus, and a reduction in food imports from across the world. Not everyone can afford the premium prices of high-quality food.
Caring and sharing	SoilCare	Widespread societal awareness that an urgent change in behaviour is needed. Strong, visionary leaders step up and propose drastic changes .

### 5.2 Principles of a vision for rural areas

Each of the above-illustrated scenarios identifies trade-offs and/or synergies between four main variables: nature, growth, well-being, equity. Different rural areas perform differently on them, and the processes of change affect them differently.

Figure 4. Four parameters for rural development



Source: SHERPA, 2020

Considering that the UN Sustainable Development Goals – further specified into the European Green Deal – are now the frame of reference for all foresight scenarios, some of the issues that will be prioritised in the future agenda are identified here.

**Rural areas are different and have specific needs.**

- Although population ageing is a common occurrence in the OECD, the average age of people living in predominant rural areas of most OECD countries is greater than that of predominant urban ones. According to the OECD, the gap in GDP per capita, productivity levels and service delivery between rural areas and metropolitan cities widened since the 2008 global financial crisis (OECD, 2020).
- Rural areas in Europe have a diversified economic and well-being performance. While some rural regions fall within the category of high-performing regions in terms of productivity, many others lag behind.
- Rural areas perform well on a number of dimensions of well-being. Rural health is equivalent to urban well-being in some main indices (e.g. housing and environment, see OECD 2018). A high quality of life in rural areas can compensate for lower wages and attract and retain workers and their families.
- Proximity and urban-rural linkages have a very significant effect on rural areas. Such links are in the form of population migration, bi-directional labour market flows, and the provision of public services and access to environmental resources. Integration with urban labour markets is one of the most relevant predictors of economic development of rural areas.

- This raises the question of whether the category 'rural' is too generic for policy purposes. OECD (2019) proposes a classification based on integration of rural areas within 'functional urban areas', the boundaries of which are defined by the commuting patterns. This classification considers 'rural areas within a FUA', 'rural areas close to a FUA', 'remote rural regions'.
- While for the first two categories the economic performance is related to the economic performance of their FUA, the remote rural regions have specific problems that need specific attention and dedicated resources. They are the most vulnerable to shocks, from climate change to economic crisis, and population decline, leading to shrinking economies and further depopulation.

#### The diversity of rural areas reflects on opportunities and constraints.

- The competitive advantage of rural areas relies on some specific assets, such as their natural, social and cultural capital, which need to be properly maintained and improved. The most successful development strategies focus on these assets and adopt with technologies, business models and governance patterns that allow their valorisation.
- If, as the OECD states, the economy of rural areas depends principally on relation with the FUAs, the three typologies have different needs and different problems. For rural areas integrated within a FUA, one of the biggest problems is urban sprawl and its implications for quality of life and the environment. In this case, depending on infrastructure and housing, they may become residential neighbourhoods or marginalised peripheries.
- In the areas of the second category, demographic problems are limited, and differences may depend on conditions of mobility, housing, services, social integration, and spatial planning. For them, local specialisation could be related to their capacity to diversify their economies and defend their natural, cultural, and social capital, creating value through activities linked to tourism, quality food, and ecosystem services. Among the scenario above listed, 'Lettuce surprise u', 'Local sustainability for those who can afford it', 'The Protein Union' and to a certain extent 'European Localism' and 'Enabling' could apply.
- The third category needs a deep rethinking of the models of development. The primary sector is key to this model, but high-tech, high specialisation agriculture-based scenarios can hardly revert the trend to decline. The best examples of successful specialisations of these areas are related to their capacity to find a niche in the global markets, as in the case of eno-gastronomic districts.
- However, as the scenario 'Local sustainability for those who can afford it' implies, there is the risk of increasing inequalities and further marginalisation of local people in the transition. Alternative scenarios for these areas could be 'Caring and Sharing', focusing on resilience and mobilising local resources, and 'Enabling' scenario of SALSA. However, these development models can hardly thrive without a clear commitment of public administrations to provide adequate infrastructures and services to these areas.
- Rural areas can contribute significantly to national stability and well-being throughout OECD countries. They provide most essential ecosystem services for life and are key to the mitigation of climate change.

Rural-urban connections are the keys to thriving rural areas.

- If the level of integration of rural with urban areas is the key to development, the direction of the efforts for rural development should be focused on the potential related to the multiple flows that occur between urban and rural areas. This means starting to recognise the value of the services that rural areas provide to urban areas and to recognise their true cost.

This principle can be turned into local economies and business models based on the

- virtuous link between biological, cultural and economic diversity. The higher quality of life that characterises many rural areas can become a selling point for new residents, either commuters, retired people, or distant workers, provided that there are enough services and infrastructures to guarantee a comfortable life.

This process should be sustained by a set of specific incentives to attract businesses and

- residents. Moreover, this process would benefit from new urban models that reshape urban metabolism so as to give new opportunities to rural products and services, to open new markets for diversified rural products, and to encourage innovation through an intensified exchange between rural and urban populations.

## 6 Acknowledgements

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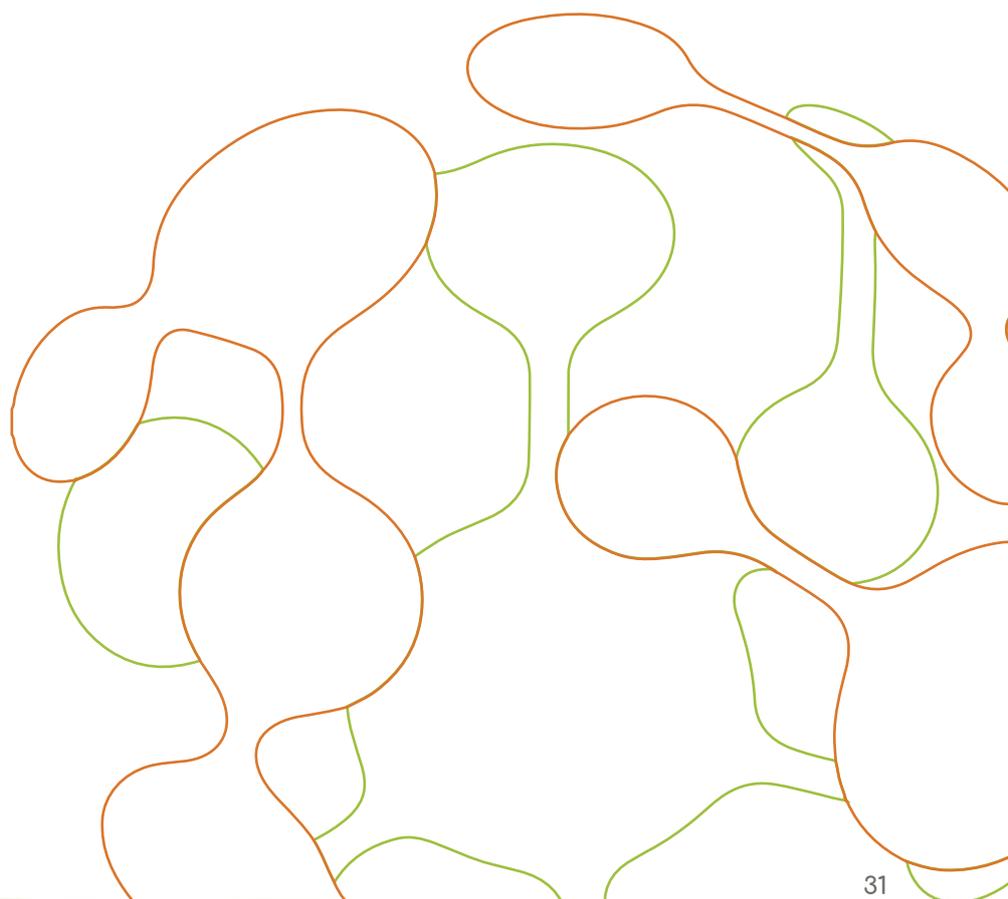
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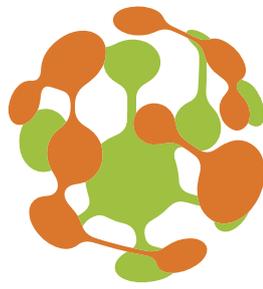
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