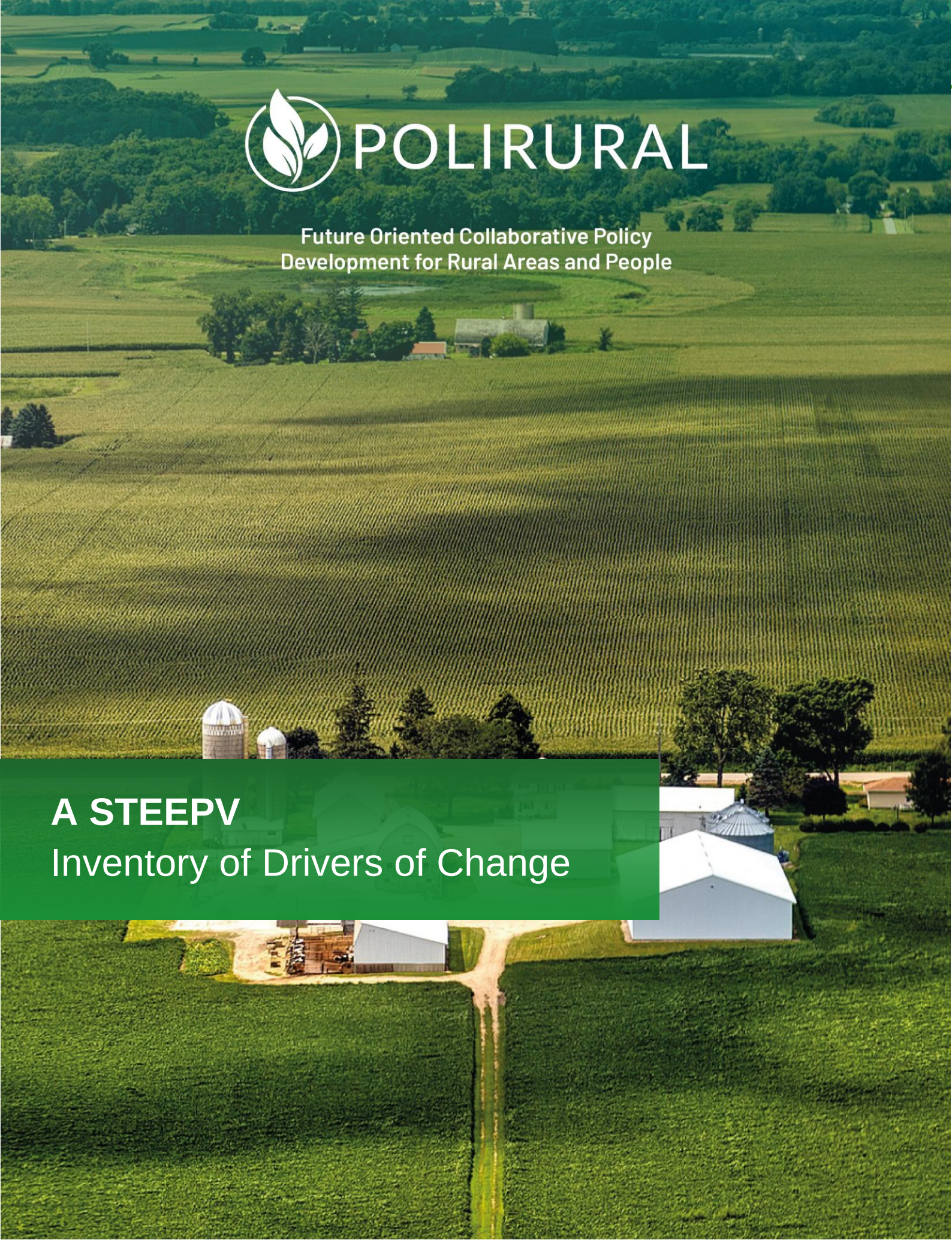

A STEEPV
Inventory of Drivers of Change

Internal deliverable of the EU funded PoliRural project, Grant Agreement No. 818496,
"Future Oriented Collaborative Policy Development for Rural Areas and People"

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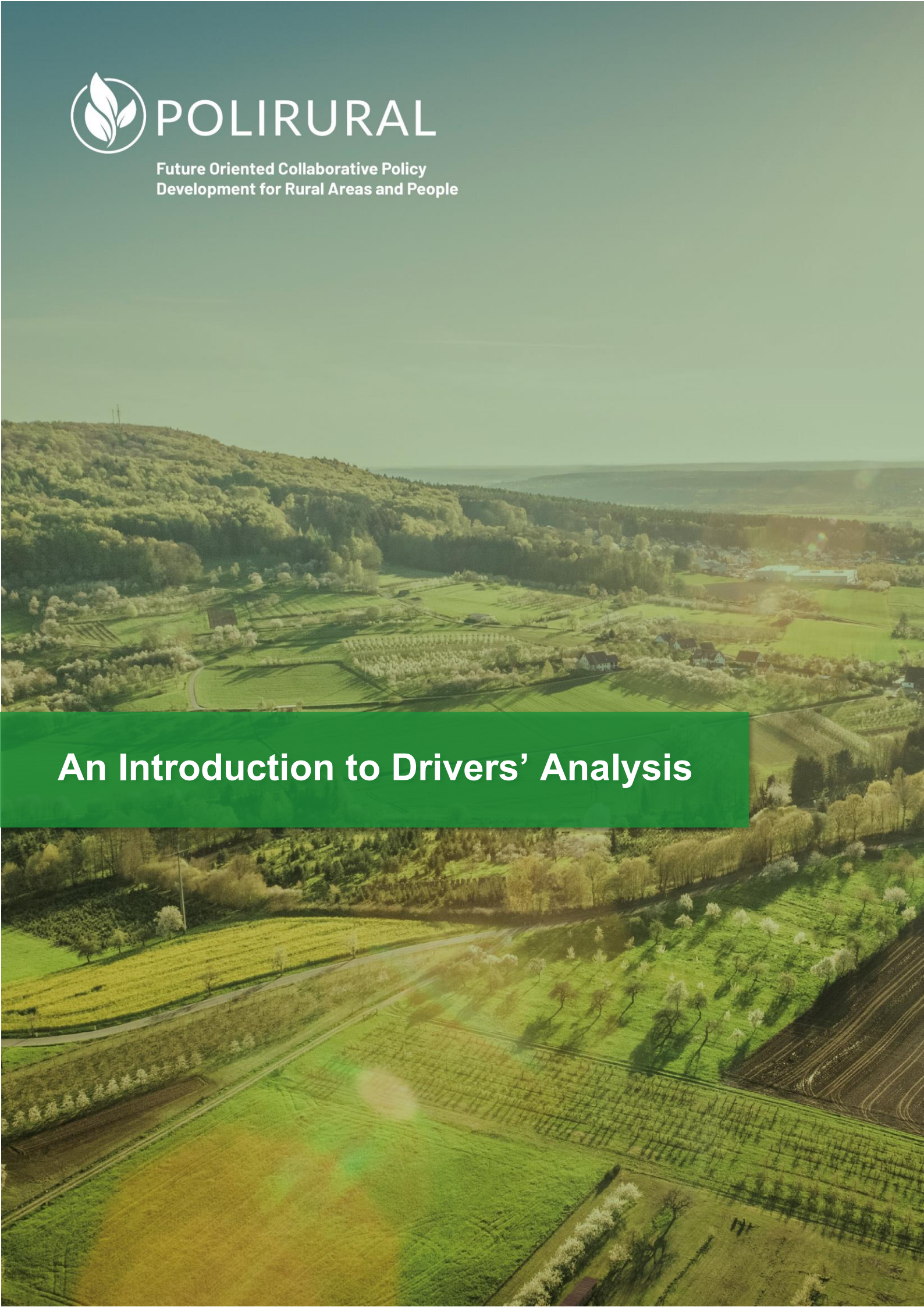
POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People



An Introduction to Drivers' Analysis

An Introduction to Drivers' Analysis

When we talk about drivers of change, we are really talking about trends and the forces behind them. The terminology is ambiguous in the sense that trends often act as drivers, and drivers may themselves be considered as trends. For this reason, we can also refer to these phenomena as 'factors' and count among them, not only trends and drivers but barriers. Again, all of these terms are to some extent inter-changeable. Education for example, can be seen as a driver of personal ambition, economic progress, and high-quality jobs. It can also be a barrier to all of these things. if the subjects taught are inappropriate, if the skills acquired are poorly matched to the needs of employers or badly aligned with new and emerging areas of opportunity, then education is no longer a driver or enabler of progress, but a barrier to prosperity because it causes people to spend their time and money in pursuit of futile goals, and creates confusion and frustration through unrealized hopes and dreams.

Other concepts that arise in trying to understand how the future unfolds, include

- mega-trends, meso-trends and microtrends
- fads, trends that do not last very long
- weak-signals, events that stand out as being new or different, which may develop into trends
- game-changers, phenomena that introduce new dynamics
- trend breaks, sudden departures from busines as usual

The meaning of these terms is fairly intuitive. But always bear in mind that the analysis of drivers is not an exact science. Trying to be "rigorous" is not always a good idea. There is not much point getting hung up on definitions. The overall goal of the drivers analysis is to understand how change is happening now, the kind of changes that are likely to have an impact on your region, their interlinkages and dependencies, their importance, and the possibility of being able to influence them based on policy choices. Some trends are very powerful and act out over long periods of time. They can be very hard to change. Other trends may change on the short- and medium-term, with appropriate action from the public sector. The goal of public policy is to "break" with existing trends such as high levels of unemployment in a region. Policies are designed to "change the game" based on new legislation, flows of investment or encouragement to entrepreneurs.

The STEEPV Method for Enumerating Drivers of Change

So, one of the first major tasks in a Foresight exercise is to make lists of factors that may shape the future. These can then be discussed with a diverse group of people in order to complete the list and then rank the factors on the basis of their perceived relevance and importance for the region. Usually, time and resources are scarce, and an important concern is to make sure that the coverage is as complete as possible, that all important factors given adequate consideration, and that no important factor has been left out. The standard approach is very simple. It is based on the STEEPV mnemonic and consists of the creation of separate lists under six headings as follows.

- **SOCIAL Factors:** These will include demographic trends, the evolution of the age-pyramid, issues related to gender, families and how they are organized, and any persistent or emerging phenomenon related to how society operates.
- **TECHNOLOGICAL Factors:** These include all major technologies that will have an impact on work and leisure, what we consume and the way we consume, the services that make our lives easier, more interesting, or more fulfilling. These include infrastructure issues, such as road, rail, and airport but also communication infrastructure such as high-quality internet and rural broadband.
- **ECONOMIC Factors:** These include everything that has an impact on our ability to get a job or earn a living, support a family, setup a business. It includes the quality of work and the cost of living, the burden of renting, the ability of young people to buy a house or save for the future. Taxation, the burden of debt-service, private and public sector borrowing. The cost of looking after old people, the distribution of wealth, income inequality and wage stagnation. Trends related to public-private partnership and the cost of basic services such as energy, water, education, and healthcare. Record amounts of money going into VC and PE, the emergence of decacorns (as opposed to unicorns) as well as an accelerated shift away from coal and oil towards more sustainable sources of energy.
- **ENVIRONMENTAL Factors:** These included everything to do with weather and climate, CO2 emissions and what is generally referred to as natural capital. This includes stocks of good quality soil and water catchment areas, pollution, access to water for drinking and domestic use, industry, and irrigation, mineral resources such as metals and rare-earth elements for mobile phones, computers, wind turbines and PV panels, as well as for batteries. It includes biodiversity such a populations of winged insects, native species, nature reserves and everything required to maintain robust eco-systems. Diseases and parasites of plants, trees, crops, animals, and humans.
- **POLITICAL Factors:** These include policies, institutions and initiatives including new legislation at international EU or member state level. At EU level, there is the impact of BREXIT, the new commission with its new priorities and budgets, ambitious plans for the Green Transition, and facilities for the post-COVID world. There is the latest wave of CAP reform. Finally, there is a changing international order, in which the roles of superpowers such as the US and China have evolved considerably, trade wars are looming and new regions have gained I significance, in particular Africa.
- **VALUE Related Factors:** One of the most powerful forces shaping human behaviour is the set of 'values' that inform how individuals see the world, and how they make decisions as consumers and as citizens and as voters. So, this category includes things such as the rise in student and employee activism, concern for the planet, new food movements, interest in cooperatives, concern for personal privacy and distrust of big-tech companies (such as Facebook).

In the POLIRURAL project we divided up the work of exploring these 6 categories among 6 teams, each more or less corresponding to two of the POLIRURAL pilot regions. This resulted in the selection of 64 "drivers" which are inventoried in this document.

The resulting 'inventory' contains 64 drivers across the 6 categories. It is not by any means exhaustive. But it provides a useful starting point for the 'drivers analysis' activity in each of the 12 regional Foresight pilots.

How to Use this Inventory

This inventory provides a starting point for developing useful inputs to various forms of group work that make up part of the Foresight process. Reaching a collective understanding, an understanding that is broadly shared by the participants in the regional Foresight initiative, an understanding of...

- How change happens in your region
- The changes that are happening right now
- The changes that are likely to happen in the future
- Their order of importance and your ability to influence those changes

The inventory is incomplete, and the accompanying texts are highly perfectible, but it provides a starting point for strategic conversations about the "drivers of change."

It is up to each regional Foresight team to decide on the details of the process, on the basis of

- The overall mission or goals of the Foresight initiative,
- The level of knowledge and expertise available among the participants
- The time available in which to complete the exercise, providing timely inputs to on-going policy processes
- The human resources available for related desk-force and for the organization and animation of groupwork

The ideal "driver's analysis" process might proceed as follows.

The animator circulates the inventory to the participants and asks them to read it and reflect on the changes that are happening or will happen in their region, and their significance with respect to the theme of the foresight exercise, and the forces driving those changes. They should be encouraged to not feel restricted by the list, but to extend and enrich it based on their own experience and insights, based on what they know from their work, independent reading, or casual observation of what is happening around them. They should think in terms of trends, enablers, and barriers to change. In particular new and emerging factors that are not yet fully understood and may require attention at the level of the group in order to be better understood.

The animator or core team of the Foresight group has an important role of play in shaping this discussion. In the early stages the focus should be on 'casting the net wide', extending and enriching the list, with a view to not missing out on issues which may be unfamiliar to some participants, but which may ultimately prove to be significant.

Some of the issue raised may require closer inspection. For example, by way of a DEEP DIVE workshop, that taps into locally available expertise. Other issues, in particular the so-called 'mega-trends' which feature in the international press and which are addressed by international bodies, may require 'localization.' They may need

to be interpreted locally, so that their real significance is apparent, and so that they do not get dismissed as 'someone else's problem' or 'something that happens elsewhere.' A good example here is climate change, which many may think of as global warming, but few may connect to an increase in coastal flooding, looming water scarcity, landslides due to heavy rain or crop loss due to unseasonable weather. The use of deep dives can help to put these factors in perspective. Rural broadband is another factor that might require a deep dive. The general idea might be known from the press, but less so what it really means in terms of how it access to rural broadband may transform the way people live and work, the opportunities for jobs and the connectedness of remote areas to urban centers. This is worth dwelling on and explaining in terms that are meaningful to local people, and especially in view of the experience of remote working and living due to the COVID lockdown.

At some point, to be decided by the animator or Foresight team, the participants in the Foresight process will have absorbed most of the lessons about how change happens. At this point and the mood can shift to deciding priorities. The challenge is to move from a long list of factors, to a priority list of key trends. There are many techniques for doing this, based on

- simple ranked lists,
- 4-squares raking based on plotting options on a two-axis table[1]
- more complex multi-criterium approaches supported by software such as Criterium Decision Plus by Info Harvest.

A list of priorities can be drawn up containing 2 to 5 trends[2] using one or more of these techniques, based on some form of-interactive group work. Once again this is not an exact science, the techniques provide ways to tame complexity and structure a collective learning process that arrives at a result that can be justified, based on evidence from the literature and debate involving local experts. It is good to retain some flexibility. The list should get a final review to make sure that something important is not missing. The final step in this is to summarize all of this in a document with a title along the lines of "2020 Drivers Analysis for XXX Foresight Initiative" that

- Describes the process and lists those who were involved,
- Describes intermediate results to demonstrate the level of hard-work and diligence that lies behind the results
- Describes those final results referring to
    - The priority list of trends
    - The forces driving those trends (drivers, enablers, barriers)
    - The impact that those trends may have on the region,
        - The challenges they will create
        - The opportunities they will create

[1] There are many ways to choose the axes. The animator can decide perhaps based on a discussion with the participants. One approach could be to use 'relevance' and 'impact.' Another could be 'relevance' and 'time-scale' or 'actionability.'
[2] The animator can decide the number, but certainly not 15 or 21. If there, are too many topics then it will be impossible to make progress on policy options later on, and nothing will ever get done.

Moving from Drivers' Analysis to the Next Step, Vision Building

The next step in the process is to build upon all of the work done so far to develop a shared vision for what the region should become at some point in the future, say 5, 10 or even 50 years hence. The choice of a "landing place" is important and will depend on

Depending on the detailed mission of the Foresight initiative, and the nature of the challenge it attempts to address, the time horizon for the exercise, its landing place, may differ considerably. Major projects such as the construction of highways, ports and airports, the re-forestation of vast tracts of land, often aim at goals to be achieved over a period of up to50 years.

Initiatives that address more immediate issues such as high levels of unemployment, persistent flooding at related loss of property, life or economic productivity may require quicker action and shorter time scales, of the order of 5 to 10 years for example.

Whatever the landing place, there is need to describe what this new and better world will be, using an easy to remember and easy to understand narrative, that helps all of those involve visualize the result of the various policies and measures that will need to be put in pace. A typical "vision" comprises a vision statement, perhaps 10 lines long. This can be qualified by adding further paragraphs to elaborate on this vision, based on normative scenarios or vignettes, that enrich the message from the point of view of different groups of stakeholders. For example, from the point of view of those who live in a region, those who work in the region, those who run businesses, those who visit it for business or leisure.

There is no hard and fact rule. There is great scope for being creative. You could go the Wagnerian route and write an opera about it. Or you could wear a gold medallion and rap about your region in 2030. Whatever you do, bear in mind that the vision is both a communication tool and a management tool. A good vision will provide motivation for the roadmap and action plan, which will come next in the Foresight process.

Once the regional Foresight process has worked through the drivers of change, identified and agreed upon a list of challenges and opportunities, the next step is to decide what kind of a region you want to live in, in say 10 years-time, based on these realities. There are many ways of constructing a vision. This vision however is a response to the opportunities and challenges that are provided by the major trends acting upon the region in both direct and indirect ways. The local Foresight teams will decide on how best to do this, given their own skills and experience, as well as the expertise, time, and resources available for them to complete the task.
Whatever approach is used it, it should draw upon the work done in the Foresight exercise to date. That is the results of any

- The SWOT analysis
- The lists of local needs
- Issues analysis that has been carried out,
- The results of the driver's analysis

The chosen method should bring to the table all of what has been learned about the region, the world and how it is changing, in order to producing a vision statement, knowing that the next step in the Foresight initiative will be to connect the analysis to the vision, with nan action plan and roadmap, composed of measures that the public sector will integrate into its overall program of policies related to the development of the region.

A typical vision initiative might start with a workshop where

- All of the preliminary results are presented and discussed
- The anatomy or structure and purpose of the vision is discussed and agreed
- Breakout groups work on different aspects of the anatomy
- These are then discussed and edited
- Homework is assigned and the group disbands until the next and usually the final workshop where the final or near final text is agreed

Depending on the skill and know-how of the organizers, the complexity of the job at hand and the various practical constraints with which they have to work, the process might involve sessions where the group or groups discuss

- Key concepts or words that should appear in the final vision
- Key 'values' against which a final text might be judged as being more or less compatible
- Important 'principles' that may under pin a final version of the vision

It is vital to assign capable people to key tasks related to drafting texts and animating the working groups sessions.

Whatever the final result, it should be clear that this is a result that flows from the Foresight process and builds upon all of the work that has gone before. The result of this exercise is captured in a shared vision document that is unique to that regional Foresight exercise with a title that looks something like "XXX Foresight Vision for YYYY," where YYYY is of course the landing point for the exercise. The document should

- Describe the 'vision process' and list those who were involved,
- Describe the previous work and resources upon which the vision is based
- Elaborate the vision in terms of
    - A short summary statement or paragraph
    - A series of qualifying statement that further elaborates the vision from the point of view of key groups of stakeholders

Exploring the Application of Text Mining in Foresight

The ultimate goal of the PoliRural project is to explore the use of innovative tools for Text mining and System Dynamic modelling in the context of a regional Foresight project. Various use-cases have been provided by CKA to guide the work of the partners working on the development of these tools. One of the most important expected benefits of the use of such tools, is a reduction in the effort required to scan and process a large number of documents on a large number of issues, that may qualify as drivers of change.

The PoliRural project intends to use the production of this "inventory" as a practical laboratory foe exploring the use of TM tools to shorten the work of regional Foresight teams, in the creation of documents such as these, based on extensive desk research.

Exploring the Application of System Dynamic Modelling in Foresight

A second high-level goal of the PoliRural project is to explore the use of system dynamic modelling in the context of a regional Foresight initiative. It seems most natural to start by exploring how the use of SDM may fit in with a traditional drivers' analysis, the analysis of the forces that are diving change (driving, enabling, mitigating et.). The relationship is more complex than originally envisaged. The picture that is currently emerges is one where the drivers' analysis, which is very qualitative in nature, complements in an important and fundamental way, work that might be done using formal techniques of SDM. In this sense SDM more closely resembles a new tool to add to the Foresight toolbox, rather than a way of extending the capability of an existing tools, on the basis of automation and machine learning.

The Research Teams and Authors

Regional Foresight is a strategic conversation that culminates in a shared vision, roadmap, and action plan for measures to achieve that vision. It is a carefully structured social process whose success depends on adequate and effective engagement with key stakeholders. It involves a mixture of one-on-one engagements with actors and other stakeholders, well organized and animated groupwork, as well as adequate preparation involving high quality deskwork and the drafting of key documents.

I emphasize the preparation because it is easy to under-estimate the effort (and talent) required to do this well. This effort is needed to help those that take part in the Foresight process understand the way the world is, how it is changing and what it could be, by looking abroad, by looking into the future and by learning about a wide range issues which may be alien to their normal interests or far from what they know from their daily business. The provision of the 'STEEPV Inventory of Drivers of Change' is part of the preparation needed to successfully execute a regional Foresight exercise, preparation needed for running a drivers' analysis activity, eventually leading to the elaboration of shared vision of the future of the region concerned.

In the PoliRural project we have decided to share the work of drafting this inventory, amount 6 teams, one for each letter of the STEEPV mnemonic. Each teal has a team leader who organizes the drafting of a series of short articles under one of the STEEPV categories. In the end we explored 64 topics, based on scanning available, reliable texts on subjects of general relevance for the development of the rural region of Europe. The relevance or relative importance of each topic will differ from region to region. This kind of work is never complete. We could have added more topics and we could have improved the treatment of the topics we did select. But we had to stop at some point, and the inventory as it stands, is comprehensive enough to start a series of strategic conversations in the context of the 12 regional Foresight initiatives that are the bedrock of the PoliRural projects.

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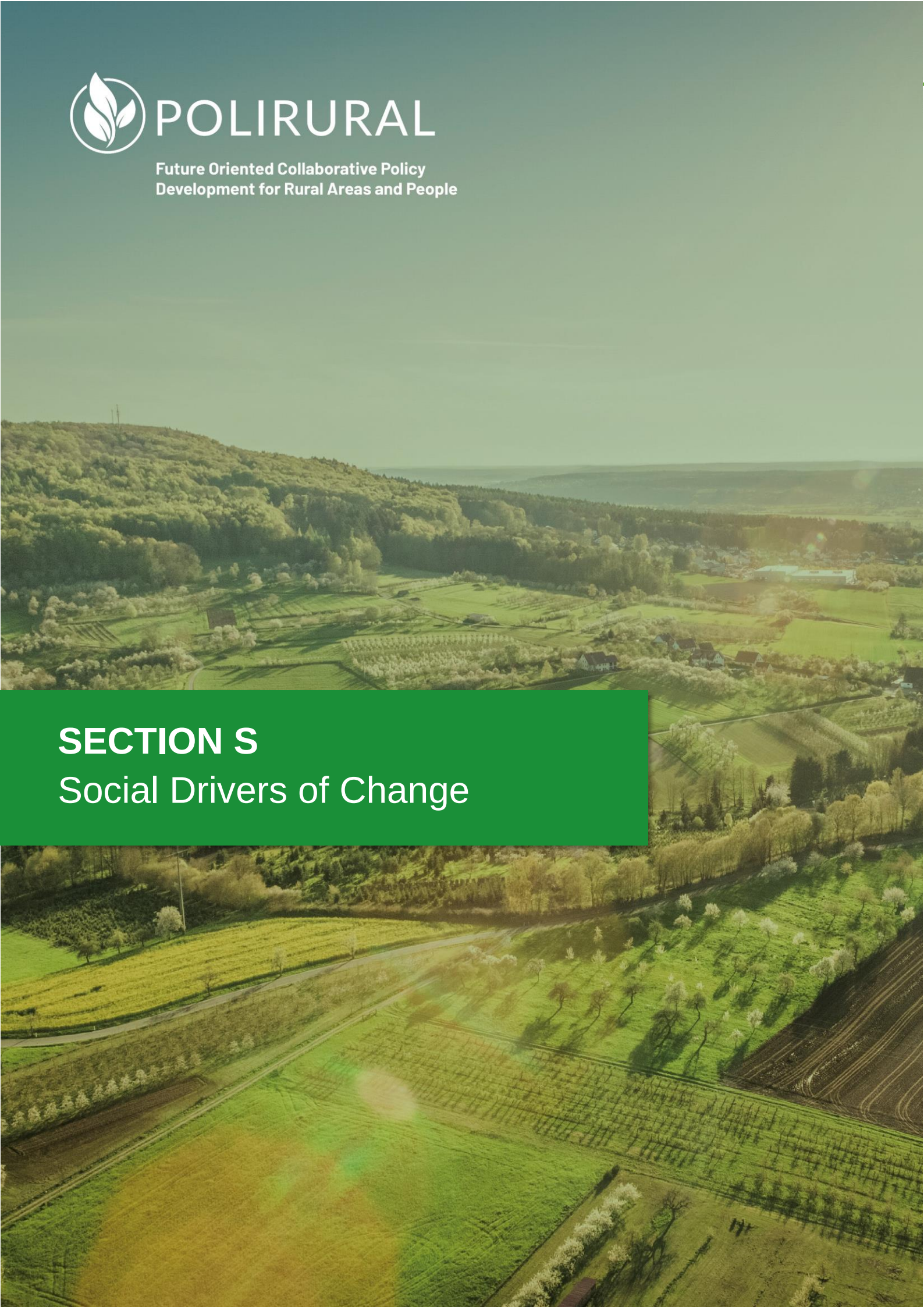


SECTION S

Social Drivers of Change

SECTION S: Social Drivers of Change

The exploration of social factors ranges over demographic trends, the evolution of the age-pyramid, issues related to gender, families and how they are organized, and any persistent or emerging phenomenon related to how society operates.

The following short descriptions of related topics are intended to help launch strategic conversations that will contribute to the overall regional Foresight process and help those taking part to construct a vision for the kind of region they would like to live in. Launching and managing these conversation is not an easy task and success will rely on the creativity and skills of the animator and their ability to manage the conversation towards a useful conclusion.

One of the most important drivers or categories is demographics. As the old saying goes "demographics is destiny." But care is required to interpret population statistics and it is very helpful to involve a local expert in your regional drivers' workshops, someone who can talk about the reality behind the numbers and expose the real dynamics of population flows. A region might have a relatively stable over-all population curve, showing little variation from on year to the next. But this might hide the fact that there is a significant trend of people leaving the region and people coming in. A casual look at the statistics might tempt one to conclude that not much is happening whereas in fact, great changes are underway.

- Household incomes and family prosperity often include the incomes of several people, from several activities, some of which may be seasonal in nature.
- Many of those who live in rural areas, may work in neighbouring towns and vice-versa. Many of those who live in neighbouring towns may work in the countryside. These include various service providers, machinery operators, drivers of milk wagons and advisors.
- A recent trend in some parts of Europe, driven by increasingly high rents in larger cities has been the creation of rural co-working spaces, and business hotels, with companies in areas such as software locating to the countryside in order to keep both rent and salaries at a more competitive level. For now, these are not full-blown trends, but it may be useful for some of the pilot regions to examine these and their local drivers and the kind of opportunity such trend may represent for the region.
- Many of those who work in rural areas may come for seasonal work, not only at harvest time, but at other times of the year to do more skilled work such as pruning, planting, or transplanting and the viability of a business might depend on the ease of access of seasonal workers which may include locals, emigrants and or refugees.

In writing about society, sociologists often refer to 'cohorts' and popular media to 'generations.' This is a reference to people who were born at around the same time and who experienced similar or shared events that shaped their sense of who they are and their sense of identity, not to mention their expectations about the future, what they see as acceptable behaviour in others, their ideas about the good life or a good career and the values they express as citizens and as consumers. The differences between one generation and another are real and often result in tension. There is talk about what one generation owes another and most recently this is

reflected in concepts such as sustainability. This can be seen in the rise in activism and the harsh criticism that young activists such Greta Thunberg have levelled at ruling elites.

When doing Foresight or some other form of long term thinking it is useful to look around and what will people be doing in 10 years' time. One can ask if it is right that those who will have retired in 10 years' time, should decide now on issues of importance for those who will be in mid-career or positions of responsibility or starting families by then. This is an important structuring thought for those who are running a Foresight initiative, closely linked to the process of stakeholder analysis and a reflection of the reality that not all stakes are the same.

Whereas many past generations are associated with great wars or social revolutions, and are linked to concepts such as the 'beat generation,' the 'hippie generation,' the 'latchkey generation,' the 'Woodstock generation,' the 'summer of love' or the 'class of 68,' more recent generations are identified with technological progress such as the creation of Facebook, Tik Tok and Instagram, or concepts such as selfies or digital natives.

In reading or talking about society and how it is changing, it is therefore useful to recall some of the terminology being used by scientists and social commentators and to understand the differences between them. In order to complete the following list, I have copied shamelessly from Wikipedia[3] and the usual caveats apply.

- The 'lost generation' refers to those born in the period 1883-1900. The name is a reference to Gertrude Stein in her writing about those who fought in WWI.
- The 'greatest generation' was born between 1901 and 27 and is named after a book by the American journalist Tom Brokaw, which refers among other things to veterans of WWII
- The 'silent generation' refers to those born in the period 1928-45.
- The 'Baby Boomers' also called the 'Me Generation' are those born in the period 1946-1964
- Generation X is that born between 1965 and 1980, the first generation to grow up with computers and the first to start blogging about their lives.
- Generation Y also known as the 'millennials' were born between 1981 and 1996. They are the subject of endless YouTube jokes about recruitment[4] and workplace attitudes[5]. Allegedly they hate the Boomer generation[6] and are considered by some to be the unluckiest generation in history[7].
- Generation Z are those born between 1997 and 2012. They are avid users of Tik Tok and Instagram and are often discussed in the general press.
- Generation Alpha refers to those born between 2012 and up to about 2025

The experience of western Europe and the US of course is very different from that of people in China or japan. Perhaps also for EU countries that were once a part of the Soviet Union and went through their own revolutions,

[3] https://en.wikipedia.org/wiki/Generation
[4] https://www.youtube.com/watch?v=Uo0KjdDJr1c
[5] https://www.youtube.com/watch?v=TNssrVX-WKc
[6] https://nypost.com/2020/08/08/why-millennials-distaste-for-baby-boomers-is-justified/
[7] https://www.youtube.com/watch?v=ikp0Qfgxmkc

sometimes in velvet sometimes singing. So, it is an interesting question if and to what extent there has been a convergence to a European model of the most recent generations.

There are many social phenomena that could have featured in this list of social drivers. Others that come to mind include the 'Karen phenomenon,' 'Woke culture' the 'snowflake phenomenon,' the '#MeToo movement' and 'BLM.' We have not included these as it is not immediately obvious that these are of immediate relevant for rural development. They may be of great relevance for Foresight initiatives dealing with other issues, for example in relation to the design of new commercial products and services.

In any case, those who organize the PoliRural pilots will need to stay vigilant in case there is a need to include drivers that have so far not been listed.

Rural Demographics

Description

Europe's rural communities are ageing. More than 17% of the EU rural population is over retirement age. Based on population density, rural areas represent 93% of the territory in the EU. 20% of the population live in predominantly rural areas and 38% live in significantly rural areas. These areas are experiencing widespread change in many parts of Europe.

One of the most important is demographic change. Current trends combine rural exodus, selective out-migration of women and young people and the arrival of newcomers, including migrants, highly skilled former urban dwellers, and retired people. The challenge is particularly acute in the farming sector. With 6% of farmers under the age of 35, as opposed to 55% who are above 55, the ageing of farmers is one of the biggest threats to food security, farming systems diversity, biomass provision and rural vitality in the coming decades. The situation is similar for small forest owners. A new generation needs to be empowered to take over. Beyond young farmers, who are supported by the common agricultural policy (CAP), a broader group of people referred to as "new entrants into farming" could contribute to generation renewal while bringing new approaches to farming and rural areas. This could happen provided they can overcome the many obstacles they face, such as access to land.

Long-term trends and changes are likely to increase disparities between rural areas faced with various constraints. Mountainous areas, which represent 15% of EU utilised agricultural area and are particularly supported under the Common Agricultural Policy (CAP), are likely to be more strongly impacted by climate change, as well as by increased economic competition, due to geophysical conditions which limit productivity, production choices and adaptability.

Only 10% of Europe's farm holders are younger than 35 years old. On the other hand, the continued restructuring and modernisation of Europe's agriculture is placing a heavy burden on many rural areas. According to a Communication from the Commission (COM 2006 857) it is estimated that in EU-15 some 2 million workers on a full-time basis left the sector by 2014. In addition, 1-2 million full-time workers left the sector within the ten New Member States, and 1-2 million workers in Bulgaria and Romania. Particularly those rural areas which are most remote, depopulated, or dependent on agriculture face strong challenges as regards growth, jobs and sustainability in the coming years.

In addition to these direct impacts, rural demographics include very many more subtle drivers such as the youth bulge, the brain-drain, rural-urban flows and counter-flows, adult children living with their parents, parts of the population being over-educated but under-employed, increasing average age of land-owners, the transmission of farms to younger people, the owners' children being too old to take them over, etc.

Some policies intended to encourage young people into farming, may in fact be counterproductive. For instance, in Ireland tax and support incentives to encourage parents to hand over their farm, requires that their son or daughter must return to education to earn an agricultural certificate to be eligible to farm the land. Which in the Irish pilot prompted the following very telling response in one case "There is no money in farming today. I may

go get the certification for tax relief, but if farming continues to be unprofitable then I may not farm because I would also have to work off the farm. I could see myself planting or renting the land." The difficulties in accessing sustainable employment opportunities is encouraging the ongoing trend of migration away from many rural areas, as well as increasing rural crime and rural depopulation.

Rural depopulation has also been an aggravating factor in the rise of social isolation in some rural areas. The ongoing challenge of young people migrating to cities and overseas means a loss of talent and potential entrepreneurs in rural communities. It deprives some rural areas of a section of the population that would act as a key driver of commerce for many years to come.

Justification

Rural demographic factors affect issues that are the focus of policies, things like demand for jobs, income, the size of the labour pool, the demand for services, housing, clinics, public transport etc. they also affect the perception of a place as being attractive to investors, tourists, returnees or new entrants. These will need to be considered in the context of all Foresight exercises.

A deeper understanding of how rural communities, territories and businesses will evolve is needed to design new policies that would protect rural areas from the existing threat of decline and help them seize opportunities. For instance, in each rural region, the number of people coming up for retirement and the hectares of land that will need to be transferred in the coming years can be readily estimated from statistical sources. However, policy will help to provide tools on how this "land mobility" can be best implemented – collaboratively or through commercial sales, leasing, or other (as is done in Ireland), and if the land is bought by other farmers, younger new entrants or as commercial investments by banks and other private institutions. Alternative approaches may include public sector organizations acquiring the lands to create land banks to provide concessions to new entrants to rural areas. Such "land banking" has been used extensively in Central Europe.

References

1. "Statistics on rural areas in the EU" Eurostat, 2017, available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_rural_areas_in_the_EU
2. The impact of demographic change on European regions, report, CoR, 2016. https://cor.europa.eu/en/engage/studies/Documents/The%20impact%20of%20demographic%20change%20on%20European%20regions/Impact_demographic_change_european_regions.pdf
3. "Shrinking rural regions in Europe - Towards smart and innovative approaches to regional development challenges in depopulating rural regions", Policy Brief, ESPON, 2016, available at, https://www.espon.eu/sites/default/files/attachments/ESPON%20Policy%20Brief%20on%20Shrinking%20Rural%20Regions.pdf
4. "The Challenge Of Rural Depopulation: Facing The Scenario Of Demographic Deserts In The EU", Ana Garcia Valdivia, Forbes, 2018, available at https://www.forbes.com/sites/anagarciavaldivia/2018/12/22/the-challenge-of-rural-depopulation-facing-the-scenario-of-demographic-deserts-in-the-eu/#4d74a7a81295
5. "Land Mobility – Working towards a shared Future", 2020, http://landmobility.ie/
6. "Land banking and Central Europe: future relevance, current initiatives, Western European past experience", Terry van Dijk and Diana Kopeva, Land Use Policy 23(3):286-301, 2006, available at https://www.researchgate.net/publication/223355701_Land_banking_and_Central_Europe_future_relevance_current_initiatives_Western_European_past_experience

Population Flows

Description

In 2015, 28.0% of the EU's population lived in rural areas. From 2010 to 2015, there was a gradual increase in the number of people living in rural areas across the EU, with their relative share of the total number of inhabitants rising by 1.7%. The increase in the share of the population living in towns and suburbs was even greater (rising by 4.7%), while the share of people living in cities declined (especially in inner cities). These patterns may possibly reflect the trend of Europeans leaving inner city areas in search of more (affordable) space in suburbia, towns, or the countryside. Cities are indeed attracting people, but because of the high costs of urban living, these same people may settle as new entrants in nearby towns, suburbs, or small urban/rural areas.

There are several advantages that may attract people to live in rural areas. These include lower housing and living costs, more available space, a less polluted environment and a less stressful lifestyle. For instance, according to Eurostat, when it comes to housing, the EU-28 housing cost overburden rate (where housing costs are more than 40 % of disposable income) in 2015 was lowest in rural areas (9.1 %), with a slightly higher rate recorded for people living in towns and suburbs (10.6 %), and a peak among those living in cities (13.3 %).

Nevertheless, not all rural areas saw an inflow of population. Rural areas that are closer to cities/urban centres tend to benefit more, whereas remote, border areas tend to suffer from population decline. Several issues may force rural inhabitants to leave their areas or discourage others from moving into such areas. These issues include fewer local education or job opportunities/choices, difficulties in accessing public services or transport services, inadequate health coverage or a lack of cultural venues/leisure activities. These drawbacks affect the long-term prospects of certain regions, as economic and social development requires adequate infrastructure, including fast broadband services and a modern transport network – things that are sometimes lacking in them. In particular, certain rural areas that suffer from depopulation may enter into a 'vicious circle of decline', as more people will need to migrate in search of better job prospects and provision of public/private services. In addition, some of these areas may face issues of inadequate health coverage, as public health provision tends to decline and private health service practitioners find operations in these areas unprofitable, thus moving to other areas.

Current trends combine rural exodus, selective out-migration of women and young people and the arrival of newcomers, including migrants, highly skilled former urban dwellers and retired people. The challenge is particularly acute in the farming sector. With 6% of farmers under the age of 35, as opposed to 55% who are above 55, the ageing of farmers is one of the biggest threats to food security, farming systems diversity, biomass provision and rural vitality in the coming decades. A new generation needs to be empowered to take over. Beyond young farmers, who are supported by the Common Agricultural Policy (CAP), a broader group of new entrants into farming could contribute to generation renewal while bringing new approaches to farming and rural areas. This could happen provided they can overcome the many obstacles they face, such as access to land. Long-term trends and changes are likely to increase disparities between rural areas faced with various constraints. Mountainous areas, which represent 15% of EU utilized agricultural area and are particularly supported under the CAP, are likely to be more strongly impacted by climate change, as well as by increased

economic competition, due to geophysical conditions which limit productivity, production choices and adaptability.

Finally, employment opportunities for women tend to be concentrated in towns and cities. Consequently, women in work tend to live in, or relatively close to, towns and cities. Part time farming, or a farmer's spouse working off the farm provides additional income support. This leads to people commuting to a nearby village or town.

Justification

Population flows greatly impact regional policies and need to be considered in all Foresight exercises, by considering issues such as:

- Employment in rural communities is declining due largely to their heavy reliance on declining employment sectors,
- For rural areas that are distant from or less accessible to larger towns and cities, the absence of jobs encourages outward migration and discourages immigration of younger people.
- For other rural areas, particularly those close to larger towns and cities, the concentration of employment in these places has resulted in substantial population increases.
- For people who can do remote work, they may have the possibility to work in rural areas, such as their summer cottage in rural area.

References

1. "Statistics on rural areas in the EU" Eurostat, 2017, available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_rural_areas_in_the_EU
2. "European Development Opportunities for Rural Areas Applied Research (EDORA) Final Report", ESPON, 2011, available at https://www.espon.eu/sites/default/files/attachments/EDORA_Final_Report_Part_C_WP1-22.pdf
3. "Making rural areas more attractive for young people", European Network for Rural Development (ERDN), Brussels, 2018 available at https://enrd.ec.europa.eu/sites/enrd/files/w27_rural-youth_meeting-highlights.pdf

New Entrants

Description

Rural areas with strong agri-food economies or other sectoral clusters, are transitioning from an agrarian based economy to increasing dependence on the services sector and new employment opportunities. These new entrants are having a major impact on rural communities and society across Europe.

Current trends combine rural exodus, selective out-migration of women and young people and the arrival of newcomers, including migrants, highly skilled former urban dwellers, and retired people. The challenge is particularly acute in the farming sector. With 6% of farmers under the age of 35, as opposed to 55% who are above 55, the ageing of farmers beyond their productive years is one of the biggest threats to food security, farming systems diversity, biomass provision and rural vitality in the coming decades. A new generation needs to be empowered to take over. Beyond young farmers, who are supported by the Common Agricultural Policy (CAP), a broader group of people referred to as "new entrants into farming" could contribute to generation renewal while bringing new approaches to farming and rural areas. This could happen provided they can overcome the many obstacles they face, such as access to land and credit. Finally, long-term trends and changes are likely to increase disparities between rural areas faced with various constraints.

Mountainous areas, which represent 15% of EU utilised agricultural area and are particularly supported under the CAP, are likely to be more strongly impacted by climate change, as well as by increased economic competition, due to geophysical conditions which limit productivity, production choices and adaptability.

Justification

A significant part of PoliRural's activities are dedicated to rural newcomers and new entrants into farming, improving the understanding of their human, social and professional characteristics and of their role in generation renewal, in innovation and in rural development in general. The issue of access to land and credit, including the impact of such aspects as legal and policy arrangements and land market trends, need to impact regional policies and be included in the context of the project's foresight exercises.

References

1. "The EU farming employment: current challenges and future prospects", AGRI Committee, Policy Department for Structural and Cohesion Policies Directorate-General for Internal Policies PE629.209, European Parliament, 2019 available at https://www.europarl.europa.eu/RegData/etudes/STUD/2019/629209/IPOL_STU(2019)629209_EN.pdf
2. "Social innovation and social entrepreneurship in rural areas", Connecting Rural Europe, European Network for Rural Development (ENRD), 2017, available at https://enrd.ec.europa.eu/publications/social-innovation-and-social-entrepreneurship-rural-areas_en

Rural Employment Opportunities

Description

Farming has become much more like managing and running a business, particularly the administrative overhead of reporting for regulatory purposes and subsidies. Particularly as subsidies such those from the CAP are major constituents of maintaining the viability of smaller family farms and communities. This increases the administrative burden on farmers and their support organisations. While this is OK for the staff of larger farms, such as those in the Czech Republic, it is not easy for small family farms, such as those in Ireland. The administrative paperwork impacts on the quality of life of many such farmers. On the other hand, this also opens up new rural employment opportunities for entrepreneurs in rural areas to provide consultancy, compliance certification, IT services and software applications to support the farmers in their administration work.

Farming collaborative arrangements can provide new rural opportunities. These typically involve two or more farmers working together in a formal arrangement for the mutual benefit of all those involved in the arrangement. The main benefits of a collaborative arrangement are

- Economic: a collaborative arrangement can offer farmers increased returns through the ability to achieve scale at a lower capital cost; the reduction of costs which are duplicated between farmers; and risk sharing.
- Skills: The possibility of sharing best farming and business management practice.
- Social: Joint farming ventures can help to address the social challenge of the 'one-man farm' model making farming a more attractive occupation.

While small family farms are the bedrock of many rural communities, they struggle to be economically viable. This is leading to part-time farming and the growth of dual income rural households.

- Employment opportunities for women tend to be concentrated in towns and cities. Consequently, women in work tend to live in, or relatively close to, towns and cities.
- Part time farming, or a farmer's spouse working off the farm provides additional income support. This leads to people commuting to a nearby village or town.

Justification

New farming collaborations, part-time farming, female employment, and rural entrepreneurial opportunities are very relevant for new entrants to rural areas and need to be considered in the context of any foresight exercises and regional policies.

References

1. "Family Farming in Europe: Challenges and Prospects", European Parliament's Committee on Agriculture and Rural Development, Directorate-General for Internal Policies, Policy Department B: Structural and Cohesion Policies, 2014, available at https://www.europarl.europa.eu/RegData/etudes/note/join/2014/529047/IPOL-AGRI_NT(2014)529047_EN.pdf
2. "Gender statistics", Eurostat, 2020, available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Gender_statistics
3. "Collaborative Farming Arrangements", Rural Economy, Farm Management, Teagasc, 2020, available at https://www.teagasc.ie/rural-economy/farm-management/collaborative-farming/

Transition to a Rural Society 5.0

Description

Artificial Intelligence (AI), new technologies and data are being utilized to create a society where people lead diverse lifestyles and pursue happiness in their own ways. In the future, humans will require imagination to change the world and creativity to materialize their ideas. Rural Society 5.0 will be an Imagination Society, built on and involving many facets such as:

- Concepts like Smart Cities/ Smart Villages/ Smart Regions as a basic principle of the sustainable development or rural areas.
- Digitalization, high speed internet as a key condition for the digital transition
- Human centred approach/ wellbeing
- New technologies as a part of human lives
- Support of Community life/place identity
- Localization, decentralization, individualization in rural areas.
- Decentralization in the energy sector (prosumers)
- Supporting of local economy/ shortening of supply chains
- Boosting the resilience of rural areas

Rural Society 5.0 is inspired by Artificial Intelligence (AI), the Fourth Industrial Revolution (4IR) and Industry 4.0. While the 4IR describes a broad range of technologies that fuse physical, digital and biological worlds into "cyber-physical systems", Society 5.0 envisions what society in general, and rural society in particular could look like in the 4IR. People will need to cope in this disorienting environment in many ways including:

- High Touch Geography, human interaction, and "heartware" would matter more than ever in an increasingly dislocated, digital, and capitalistic world.
- Synchronicity and Deceleration - In a frictionless world, more would choose synchronous media and/or rituals to seek group belonging, and deceleration to encourage long-term thinking and wellbeing. The COVID-19 epidemic illustrates how fast and effective this can be.
- Participation - Participatory Governance, such as citizen engagement and participatory foresight to help multiple narratives exist in a state of "resilient heterogeneity" where disagreement is strength and no one story needs to "win".

Justification

Societal changes related to the technology transition are – and will be – enormous. How should we deal with digitalisation and new technologies (following Industry 4.0)? How to maximize benefits (not only economic) and prevent risks (e.g. fake news)? Society 5.0 is able to ensure sustainable development and wellbeing, to develop and use new tools and policies and to respect all social needs of human beings. Localization, decentralization, and individualization are a strong phenomenon of current times. All of them have a big potential to support the

resilience of rural communities and attract new entrants. Localization is an opposite of globalization with all related benefits. Decentralization is a crucial in the energy sector and could be implemented in many other key infrastructural sectors. Individualization is a part of many policies (following participative design) that needs to be considered in the context of a foresight exercise. Society 5.0 will be a strange new world for some, but for the younger generation growing up in this age of technology the transition will be relatively easy. How do we keep technology from taking over? More importantly perhaps how do we keep a few from manipulating the masses?. How individual societies and governments respond to the demands of COVID-19 may with hindsight, provide some insights into Rural Society 5.0. This may be our collective crash course.

References

1. "Society 5.0 Strategy in Japan", EU-Japan Centre for Industrial Cooperation, 2018, available at https://eu-japan.eu/tags/society-50
2. "Society 5.0 - Co-creating the future ", Ms Naoko Ogawa, 14/11/2018, available at https://www.eesc.europa.eu/sites/default/files/files/ms_ogawa_keidanren_14_nov_panel_1_20181114society_5.0english.pptx
3. "Foresight Conference 2019 Report Society 4.0", Centre for Strategic Futures Prime Minister's Office, Singapore, 2019, available at https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/society%204.0.pdf
4. "Europe catching-up or falling behind in the age of Industry 4.0 and Society 5.0", European Economic and Social Committee, 2019, https://www.eesc.europa.eu/en/agenda/our-events/events/europe-catching-or-falling-behind-age-industry-40-and-society-50
5. "The Evolutionary Journey to Society 4.0", Michael Haupt, Society 4.0, 2018, available at https://medium.com/society4/evolution-of-societies-93a5f0f9b31
6. "Society 4.0", Social Innovation Research Institute, Swinburne University of Technology, 2019, available at https://www.swinburne.edu.au/research-institutes/social-innovation/society-4/
7. Smart Villages", European Commission, The European Network for Rural Development (ENRD), Smart and Competitive Rural Areas, 2020, available at https://enrd.ec.europa.eu/enrd-thematic-work/smart-and-competitive-rural-areas/smart-villages_en
8. "EU support for Smart Villages" European Commission, Strategy, Shaping Europe's digital future, April 2019, available at https://ec.europa.eu/digital-single-market/en/news/eu-support-smart-villages
9. "From Consumer to Prosumer", D4.3 Synthesis Report, ENABLE.EU (Enabling the Energy Union), 2016 , available at http://www.enable-eu.com/wp-content/uploads/2018/10/ENABLE.EU-D4.3.pdf
10. "The future of individualization in Europe: changing configurations in employment and governance", Nikolai Genov , *European Journal of Futures Research*, volume 2, Article number: 46, 2014, available at https://link.springer.com/article/10.1007/s40309-014-0046-5
11. "What Policies for Globalizing Cities? - Rethinking the Urban Policy Agenda", OECD, Madrid City Council and the Club of Madrid, 2007, available at http://www.oecd.org/cfe/regional-policy/49680222.pdf

Public Services and Security

Description

Decline in traditional industries combined with a general inability to retain or attract enough population has denuded the critical social and economic capacity of some rural areas. It has left them with relatively weak industrial structures, exposed them to consolidation of various economic sectors, with high levels of persistent unemployment and emigration. This is also leading to a growth in rural crime, lack of rural security services, and increasing mental pressures on rural dwellers. All decreasing the attractiveness of rural living.

The reducing population and isolation are factors that favour impunity for criminals in rural areas, where security services are not always as close as would be desirable. Rural society shows in surveys that this is one of its concerns. Farming families or single farmers are isolated due to the poor financial position of small farms and a lack of off farm employment. This is further aggravated due to a lack of public transportation. Imbalances of physical and mental health reduces retention of working capacity, so the people of working age tend to periodically lose their work capacity. The COVID-19 pandemic has introduced new insecurities to rural society, communities, and economy, that will only appear in the coming months. However, this may also be positive driver for the attractiveness of rural living.

As the populations of rural towns and villages and their environs have diminished, so too has the demand for services such as local post offices. As capital investment is to some extent driven by population projections, this too has meant that investment in rural road, rail and other infrastructure has not taken place in some areas and has hindered their capacity to compete for industrial investment and other employment opportunities.

In addition, a decline in traditional rural communities leads to ageing populations, loss of young people, leading to loneliness and isolation, and loss of farming tradition and inheritance. Resulting in an age-based and infrastructure-based Digital divide. The Digital Divide is growing among elderly people and young people, as well as among people based on their location. Rural areas are not covered with appropriate infrastructure to reach them via systems developed and mainstreamed for society.

Lack of job opportunities and career prospects as well as underperforming local economies may also have a detrimental effect on the personal development and well-being of the rural population. In 2015, just over one quarter (25.5 %) of the rural population was at risk of poverty or social exclusion, while relatively lower shares were recorded for people living in cities (24.0 %). According to Eurostat figures from 2016, this trend had deepened further, and now a higher proportion of the EU population living in rural areas (compared with urban areas) faced the risk of poverty or social exclusion.

Areas suffering from depopulation may also see a decrease in transport services and a closure of public services (e.g. schools). Certain trends in some rural areas may hamper the opportunities available to their population. People living in rural areas are generally more inclined to leave education or training early. The share of young people (aged 18 to 24) who were living in rural areas of the EU and were neither in employment nor in further education or training, was 3.7% higher than for their peers in the cities (Eurostat, 2015). In addition, according

to the same source, for all but three of the EU Member States, the lowest proportion of people making use of the internet daily was recorded in rural areas. However, new cost-efficient forms of Information and Communications Technology services using the Internet, broadband communications, wireless networks, digitalization etc. are providing teleworking, eHealthcare, eTraining, eCommerce, eServices and social media communities. This is being particularly accelerated during the COVID-19 pandemic lockdown.

Justification

This driver is relevant for all rural regions. However the impact on regional policies and how it might be deemed in the context of a Foresight exercises, depends on the particular situation in each region. For instance, is the provision of infrastructure and services driven more by population projections or does lack of infrastructure lead to depopulation? Or is it both?

References

1. "Statistics on rural areas in the EU" Eurostat, 2017, available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_rural_areas_in_the_EU
2. "A better future for Europe's rural areas", Report CG33(2017)16, Congress of Local and Regional Authorities, Council of Europe, 2017, available at https://rm.coe.int/a-better-future-for-europe-s-rural-areas-governance-committee-rapporte/168074b728
3. "Revitalizing Rural Areas through Business Innovation", European Network for Rural Development (ENRD), Brussels, 2017, available at https://enrd.ec.europa.eu/sites/enrd/files/s4_rural-businesses-factsheet_digital-hubs.pdf
4. "Energizing Ireland's Rural Economy - Recommendations", the Commission for the Economic Development of Rural Areas (CEDRA), 2013, available at https://www.teagasc.ie/media/website/rural-economy/List_of_Recommendations.pdf
5. "Realizing our Rural Potential - Action Plan for Rural Development", Irish Government, 2017, available at https://www.chg.gov.ie/app/uploads/2017/01/162404-rural-ireland-action-plan-web-2-1.pdf
6. "7 examples of the Digital Divide", John Spacey, Simplicable, https://simplicable.com/new/digital-divide
7. "Rural Crime and Community Safety", Vania Ceccato, Routledge, 2016, ISBN13: 978-0-415-85643-0, available at https://www.routledge.com/Rural-Crime-and-Community-Safety-1st-Edition/Ceccato/p/book/9780415856430
8. "Fighting the rise of Countryside Crime", Rural Crime Report, NFU Mutual, 2019, available at https://www.nfumutual.co.uk/farming/ruralcrime/
9. "Farmers warn of far-reaching COVID-19 effects on EU agriculture", Natasha Foot, EURACTIV, 2019, available at https://www.euractiv.com/section/agriculture-food/news/farmers-warn-of-far-reaching-covid-19-effects-on-eu-agriculture/
10. "Mental health and work: Impact, issues and good practices", World Health Organization (WHO), 2000, available at https://www.who.int/mental_health/media/en/712.pdf

Professionalization and Technology Intensification of Farming

Description

The profile of farmers is changing - from the older traditional farmer, to the younger highly trained and professionally qualified farmer, who manages and runs their farm as a business using the latest techniques and technology. This trend will continue to change the general profile of farmers and their education and continue to modernise farming across Europe. Modern high-tech and precision farming (both organic and conventional) uses more technology and automation, requires well trained, highly skilled, digitally aware, and ambitious farmers.

However small family farms dominate the structure of EU agriculture in terms of their numbers, their contribution to agricultural employment and, to a lesser degree, the area of land that they cultivate and the value of the output they generate. There were 10.5 million farms in the EU in 2016, with most of them (95.2 %) classified as family farms. Across all the farms in the EU-28, family farms used 81.4 % of the regular agricultural labor-force but farmed a little less than two thirds (62.3%) of the total area of agricultural land cultivated. Family farms reared 62.5 % of all livestock and produced 59.5 % of the agricultural output in 2016.

One of the crucial issues related to family farming is the ageing of farm managers. This phenomenon poses a serious risk to the sustainable development of family farming. In 2016, 3.3 million farm managers of family farms were aged 65 or over in the EU. This was more than one third of the total.

On farms with only family workers, the share of managers aged 65 or over (34.3 %) was much higher than in farms without any family labor (9.3 %). These figures suggest that farm managers working for corporations and cooperatives were much more likely to have stopped managing farms by the age of 65. However, the percentage of managers aged between 55 and 64 accounted for around one quarter of the total managers in all types of farm.

There were relatively few young farm managers in the EU in 2016. Managers younger than 40 years old accounted for about 10 % of all managers on farms with only family workers, although this share rose to 17 % in non-family farms. Young farm managers (aged under 40) of family farms were more common in Luxembourg (26.0 %); Austria (21.7 %) and Poland (20.0 %) than in most Member States. They were far scarcer in Cyprus (2.9 % of all family farm managers) and Portugal (3.3 %), where family farm managers aged 65 or over were relatively common (43.7 % and 50.1 % respectively).

Justification

Regional policies and foresight exercises will need to consider and help change the profile of farmers and farms across Europe.

High tech farming uses more technology and automation, with less employment and traditional skills. While this benefits economic outputs, it has a big impact on Europe's society. Most family farms are small and do not farm like this. Most are working off the farm out of financial necessity. They are not moving off the land, but they are commuting daily to work in other sectors. It means they are not hiring employees to work the farm. Traditionally, most of Europe's farming is a family enterprise. Even when the farmer's children leave, extended family and neighbours are called on.

References

1. "Agriculture statistics - family farming in the EU", Eurostat 2019 available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Agriculture_statistics_-_family_farming_in_the_EU
2. "Structural change in EU farming: how can the CAP support a 21st century European model of agriculture?", AGRI Committee , Agriculture and Rural Development, Directorate-General for Internal Policies Policy Department B: Structural and Cohesion Policies, European Parliament, 2016, available at https://www.europarl.europa.eu/RegData/etudes/STUD/2016/573428/IPOL_STU(2016)573428_EN.pdf
3. "EU Member States join forces on digitalization for European agriculture and rural areas", DigiBite, European Commission, Shaping Europe's digital future, 2019 available at https://ec.europa.eu/digital-single-market/en/news/eu-member-states-join-forces-digitalisation-european-agriculture-and-rural-areas
4. "Hi-tech farming touted as way to green Europe's food chain", Frédéric Simon, EURACTIV, 2016, available at https://www.euractiv.com/section/agriculture-food/news/hi-tech-farming-touted-as-way-to-green-europe-s-food-chain

Access to Knowledge, Education and Training

Description

People living in rural areas are generally more inclined to leave education or training early. A lack of educational skills and qualifications is likely to restrict access to a variety of jobs/careers. In 2015, the EU-28 early leavers' rate from education and training (defined for people aged 18 to 24 years) peaked at 12.2 % in rural areas, compared with 11.5 % in towns and suburbs, and 9.8 % in cities.

Just over one quarter (27.9%) of the EU's rural population (aged 30 to 34) had a tertiary level of educational attainment in 2015, this figure compared with a share of one third (33.4 %) for people living in towns and suburbs and almost a half (48.1 %) among city-dwellers. An analysis over time reveals that the rural areas consistently recorded the lowest level of tertiary educational attainment, while the gap between rural areas and cities grew. In 2004, just over one fifth (21.0 %) of the EU-28 rural population (aged 30 to 34 years) had a tertiary level of educational attainment, while the corresponding share for city-dwellers was just over one third (34.4 %), a difference of 13.4%; by 2014, this gap had widened to 20.5%, falling marginally the year after to 20.2% in 2015.

This situation of more highly educated people in cities may reflect several factors. For example, most universities and other tertiary educational establishments are based in cities, while cities tend to have more dynamic and specialised labour markets, which may be particularly attractive to graduates.

Employment opportunities tend to be largely concentrated in or near urban centres. Most people with a 3rd level qualification live in or near a town or city. Participation in higher education necessitates students distant from such facilities to relocate thus drawing young people out of rural areas. On graduation, these individuals find that their return to either their own community or some types of rural areas is limited due to the absence of employment opportunities.

The share of young people (aged 18 to24) living in rural areas of the EU who were Neither in Employment nor in further Education or Training (NEET) was 3.7% higher than in cities. In 2015, the share of young people (aged 18 to 24 years) in the EU-28 neither in employment nor in education or training stood at 15.8 %. An analysis by degree of urbanisation reveals that the NEETs rate for rural areas (17.9 %) was higher than that recorded for towns and suburbs (16.5 %) or for cities (14.2 %). An analysis over time (2004–2014) indicates that the EU-28 rate for rural areas was consistently higher than the rate for cities, with some of the widest gaps recorded during the latest three-year period for which data are available (2013–2015).

In keeping with the results for several other indicators, there was a marked geographical split when analysing information for education. Rural areas tended to record high NEETs rate in most of the eastern and southern EU Member States, where the difference between NEETs rates for rural areas and cities was usually quite wide. By contrast, NEETs rates were generally at a lower level in most of the western Member States, with a narrower range between the degrees of urbanisation and with rates in cities often higher than those for rural areas.

The EU-28 NEETs rate for young men was 15.4 % in 2015, compared with a rate of 16.3 % for young women. An analysis over time confirms the existence of a persistent gender gap, although this narrowed somewhat in recent years. The largest gender gap by degree of urbanisation was systematically recorded for rural areas. In 2015, the NEETs rate for young women living in rural areas (18.8 %) was 1.8% higher than the corresponding rate for young men (17.0 %).

Justification

Education and Knowledge is relevant for all rural regions as it enables its young people, females, and new entrants to be open to adopting innovative regional policies and supports that address issues such as:

- New skills and knowledge equally for all young people
- Reducing the Brain Drain of young people with high education from rural areas
- Growth in Individual expectations
- Growth in use of social media, platforms and connectivity
- Ability to adopt to the overall possibilities of digitalization

References

1. "Statistics on rural areas in the EU" Eurostat, 2017, available at https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_rural_areas_in_the_EU
2. "The Bologna Process: Trends 2010 – A decade of change in European Higher Education", Abby Chau, QS Worldwide, available at https://www.qs.com/the-bologna-process-trends-2010-a-decade-of-change-in-european-higher-education/
3. "Addressing brain drain: The local and regional dimension", Commission for Social Policy, Education, Employment, Research and Culture, European Committee of the Regions, 2018, available at https://cor.europa.eu/en/engage/studies/Documents/addressing-brain-drain/addressing-brain-drain.pdf
4. "Social Networks and Rural Development: LEADER in Romania", Doris Marquardt, Judith Möllers and Gertrud Buchenrieder, Journal of the European Society Rural Sociology, 2012 available at https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-9523.2012.00571.x
5. "Digital economy and society statistics households and individuals", Eurostat, 2019 available at https://ec.europa.eu/eurostat/statistics-explained/pdfscache/33472.pdf

Growth in Services and Tourism

Description

Rural communities, benefit from a relatively unspoilt environment containing spectacular landscapes and leisure activities. Growth in tourism services will have a major impact on Europe's rural communities and society. With an expected growth rate of around 6 per cent rural tourism is developing faster than the overall growth rate for international tourism arrivals. It will be important to retain the characteristics of the rural countryside while incorporating tourism and introducing factories, large businesses, or service-related activities. Most important to those wanting to live or visit rural areas is the beauty, cleanliness, and open spaces.

Rural areas with strong agri-food economies or other sectoral clusters, are transitioning from an agrarian based economy to increasing dependence on the services sector and new employment opportunities. These new entrants are having a major impact on rural communities and society across Europe.

The rural area now includes many visitors who spend some time in the area for its cultural, environmental, and other amenities. These people need services and infrastructure, that generate new employment opportunities for rural areas. Other new entrants are start-up companies, who are attracted by the beautiful environment, lower office and accommodation costs of villages and rural areas. This is giving rise to Rural CoWorking Spaces, Business Centres and Digital Hubs (often in renovated old buildings). However, these require excellent broadband infrastructure, which is still not available in many rural areas (such as those in Ireland). When these are relatively close to urban areas (such as in Belgium) they can result in people commuting from the city homes to rural offices.

There is a demographic mobility aspect to this also, in that many young people first want to work and live in urban, then they prefer to setup their companies and raise their families in lower-cost and more spacious rural environments, with family-friendly and female-friendly working arrangements. Then older people prefer to move back to the urban area to smaller accommodation that is nearer to services.

Rural tourism provides a complete tourism experience, offering both accommodation and attractions. Rural tourism creates place attachment, encouraging visitor loyalty and, therefore, repeat visits. Rural tourism has a good record in product development and innovation, and in drawing in new capital and entrepreneurs from cities, other regions, and countries, often driven by lifestyle choices. However, standards of service quality, marketing, product development and economic success vary considerably regionally and nationally.

Rural Tourism is widespread across Europe and is extensive in terms of turnover and employment. It is composed of a very large number of micro-businesses. However, it suffers from fragmentation, little cooperation or coordination and increasing competition internally and externally. It is important in terms of rural income and employment, typically providing between 10% and 20% of rural income and employment, twice tourism's income and employment levels averaged across Europe. Rural tourism is essentially a private sector activity,

driven by wealth and job creation, and often by farm diversification, which relies on landscape and related heritage conservation and infrastructure that is often paid for by the public sector.

Rural tourism is important in terms of culture and heritage conservation. It helps to retain aspects of heritage landscapes – either directly though the conservation and re-use of buildings and structures for tourism use, or indirectly through supporting the work of conservation agencies in monetary terms, by bringing in visitor income. It has societal job training and re-training impacts and has potential for expansion in this area. On a national scale it has great potential to become part of the new European growth in the creative industries, with their links to the arts, cultural activities and knowledge growth and attracting new entrants. As well as offering significant benefits to the local communities in which it operates.

Justification

As the growth in services and tourism will greatly affect rural societies, they must have a major impact on regional policies and be included in the context of any foresight exercises.

So for instance, some of the PoliRural pilots might explore policies and initiatives to support new forms of employment discussed above, tied into the stage of development of the region and its facilities.

Rural tourism has great potential to raise local and national prosperity, to help conserve Europe's rural heritage and to demonstrate how a pan European approach to solving problems and releasing potentials could be effective in creating world beating enterprises. Strengthening market knowledge, increasing skills, improving governance, partnerships, networking and new entrants, and creating innovative ways forward are all keys to success, as is the development of more sustainable tourism including moving towards low carbon approaches.

References

1. "Realising our Rural Potential - Action Plan for Rural Development", Irish Government, 2017, available at https://www.chg.gov.ie/app/uploads/2017/01/162404-rural-ireland-action-plan-web-2-1.pdf
2. "European rural heritage" Naturopa, No.95, 2001, Council of Europe, available at https://rm.coe.int/090000168093e8b0
3. "Projects & Practice List", Policy in Action, The European Network for Rural Development (ENRD), European Commission, 2020, available at https://enrd.ec.europa.eu/policy-in-action/projects-practice-list_en
4. "Industrial Heritage And Agri/Rural Tourism In Europe", European Parliament, Directorate-General For Internal Policies Policy Department B: Structural And Cohesion Policies, Transport And Tourism, 2013, Available at https://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/495840/IPOL-TRAN_ET(2013)495840_EN.pdf

Drive for Sustainability

Description

Based on population density, rural areas represent 93% of the territory in the EU. 20% of the population live in predominantly rural areas and 38% live in significantly rural areas. These areas are experiencing widespread changes in many parts of Europe. The reform of the Common Agricultural Policy (CAP) with its consequences for agriculture is an important factor. But it is only one. Changes in technology, lifestyles, consumer expectations and communications are also profoundly affecting rural areas.

Europe's rural areas are diverse and include many high-performing regions. However, some rural areas, and in particular those which are most remote, depopulated, or dependent on agriculture face particular challenges as regards growth, jobs and sustainability in the coming years. Rural areas are characterised by lower levels of income (in the EU the income per capita of predominantly urban areas is almost double that of predominantly rural areas), an unfavourable demographic situation, lower employment rates and higher unemployment rates, a slower development of the tertiary sector, weaknesses in skills and human capital, and a lack of opportunities for women and young people, compared to urban areas. Rural development policy seeks to establish a coherent and sustainable framework to assist the future development of these rural areas and has become a societal driver for rural communities.

The primary responsibility for assisting rural areas to cope with the challenges they face lies with EU Member States, and there is a long tradition of regional policies in Europe. However national rural development interventions increasingly take place within the framework of, and are moulded by, EU rural development legislation. National strategies also converge to a common model through the diffusion of best practice in successful case studies encouraged by the EU framework. In addition to the EU's Rural Development Regulation (RDR), and broader regional development strategies for rural areas, other instruments available to the EU and the Member States to address these problems include the Structural Funds, transport, communications, innovation, and employment policies.

The Commission's approach to EU rural development policy addresses three core areas of intervention – agricultural competitiveness, environmental protection, and the promotion of rural amenities, and strengthening and diversifying the economic base of rural communities – are at the heart of the EU's understanding of rural development. In practice, despite its centralised structure, there is considerable local autonomy. Although the European Community sets the menu – which now covers a rather diversified range of measures – it is the Member States (or their regions) which make the choices. Thus, we observe strong differences in the pattern of Regional Development expenditure across countries. Northern Member States put more emphasis on less favoured area and agri-environment measures, while southern and eastern Member States focus more on agricultural restructuring. Nonetheless, common financing of the policy through the EU budget does create an incentive for countries to structure their rural development policies not in line with local preferences but with a view to drawing down the maximum of EU funds.

Justification

The CAP and many other EU, National and Regional policies and initiatives are designed to address sustainable rural development policies and mainstream it into European Society and need to be considered in the context of foresight exercises addressing issues such as:

- Supporting, empowering, and building sustainable communities.
- Growing jobs and enterprise
- Civic engagement
- Increasing need to have land for food production

References

1. "Agriculture and rural development", European Commission Policies, 2020, available at https://ec.europa.eu/info/policies/agriculture-and-rural-development_en
2. "United Nations Sustainable Development Goals", available at https://sustainabledevelopment.un.org/?menu=1300
3. "Support for rural development by the European Agricultural Fund for Rural Development (EAFRD)", Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013, available at https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:347:0487:0548:en:PDF

POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People

SECTION T

Technological Drivers of Change

SECTION T: Technological Drivers of Change

We are living in a period where a number of technologies or technological systems are reaching a point of maturity and accessibility, for people living in Western Europe, that may very well transform important aspects of how we live and work in the coming decade. It is useful to stand back periodically to take stock of what is happening and ask what this means for regional policy decisions we have to take in the immediate or near future. Certainly, the list of technologies we have selected as conversation starters in the context of a regional Foresight initiative, will be different from those selected in the context of a national S+T or corporate Foresight.

In this section we therefore ignore very interesting and exciting developments in areas such as quantum computing, cryptography, no-code and low-code software development paradigms, social, collaborative and cognitive robotics, artificial creativity, 3D- and bio-printing technologies, artificial organs and organelles, new bio- and molecular-engineering paradigms, whole biome-sequencing, new and emerging technologies for bio-fabrication technologies. We have also ignored the science that is needed for the transition away from a fossil-fuel based economy towards a green economy. This is not just about replacing fossil fuels with more sustainable alternatives. It is also about replacing the industrial chemicals and derivatives whose production accompanies fossil fuel production. That means green chemistry, chemistry based on the use of organic inputs such a cellulose or other plant derived precursors and primary inputs, including organic waste materials.

We have also ignored more immediate issues related to voice commerce, Martech (marketing technology), and accelerated change in social media, as well as the many models of urban, in-shop, and in-house agricultural production paradigms. Although there is a lot of value to be had from exploring the evolution of technologies for sales, marketing, and distribution from web-sites to market-platforms to shop-as-a-service, Facebook-, Instagram- and Tik-Tok commerce, we cannot do so for want of time and space. If these are issues of relevance for your regional, the best is to try to involve in your regional Foresight initiative some of the more visionary local technology experts.

One issue that has existed for quite a while, whose time may have come, and whose adoption may have been accelerated by the pandemic is rural broad band. This is something that has been discussed for many years but whose adoption has been delayed or disappointing. The European Commission has been a champion of the adoption of rural broadband. It has financed many projects through its Framework programs to develop the technology and demonstrate its value. It has financed many projects for large-scale demonstration across the regions of Europe and it continues to monitor roll-out across the member states.

In April of this year, the EC published "The Rural Broadband Handbook: Facing the challenges of broadband deployment in rural and remote areas[8]." This and its associated webpage contains many resources which will be of interest to the PoliRural regional Foresight initiatives.

[8] https://ec.europa.eu/digital-single-market/en/news/broadband-handbook-facing-challenges-broadband-deployment-rural-and-remote-areas

Clearly the list of technology drivers that we have selected is far from complete, but we believe that it should provide a good set of conversation starters on issues of relevance for the development of your region and help orient local stakeholders towards important technology driven changes that may require an immediate policy response.

Rural Broadband

Description

Connectivity to fast internet in rural areas is still almost half of what it is on average in the EU (47% vs 80%). Despite some progress in rural areas the gap is not narrowing, as cities progress as quickly as rural areas in improving their connectivity. Things are moving in the right direction, but if the aim is to have 100% of Europeans, including in rural areas, connected to fast internet by 2020 the roll-out must accelerate.

Justification[2,3,4,5]

Small communities and surrounding rural areas with high quality broadband access reap both short- and long-term economic benefits. Short term benefits are characterized by modest increases in business and job growth. Business growth is realized through practical applications such as e-commerce and cost reductions. For this reason, many businesses have already reached out to rural areas thus giving rise to the recent trend called 'rural sourcing'. Some long-term benefits include growth in population, per capita income, and even GDP. However, broadband access does not just help businesses in these outlying areas. Rural communities and its citizens also benefit. Educational and government institutions can use high speed internet for scholastic and vocational training thus building a competent and competitive workforce. Medical providers require high-speed connections to supply telehealth which can immensely improve health care in rural areas. Also, research indicates that adequately connected citizens are often more involved in their communities. By prudently developing and creatively financing broadband, rural communities can keep pace with the global economy and prepare citizens for participation and competition in the modern world

Overall, rural mobile connectivity attracts new types of employment opportunities and enable economic growth, business advantages, educational and labor market, rural sourcing, telehealth, community. Local businesses can benefit from internet-based marketplace participation, to widen their distribution channels and optimize branding, procurement, packaging, precision agriculture. Based on the work carried out over the previous year, the main areas of digital benefit can be categorized as follows:

- smart agriculture
- e-commerce for local SMEs
- social services, such as health and elderly care
- community services, such as shared transport solutions
- e-government services, and
- access to communications, both private and business.

References

1. https://enrd.ec.europa.eu/action-plan-rural-broadband_en
2. https://ec.europa.eu/digital-single-market/en/news/connectivity-essential-precision-farming
3. http://espa2007-2013.stereaellada.gr/fileadmin/pages/5h_programmatikh/RIS3/RIS3_review_report_Sterea_Ellada__final_edited_2012_.pdf
4. http://www.cura.umn.edu/sites/cura.advantagelabs.com/files/publications/CAP-188.pdf
5. https://enrd.ec.europa.eu/action-plan-rural-broadband_en

Remote Working and Teleworking

Description

According to European Framework agreement (2002), telework is a 'form of organizing and/or performing work, using information technology, in the context of an employment contract/relationship, where work, which could also be performed at the employer's premises, is carried out away from those premises on a regular basis'[1]. Teleworkers can be described as those who use information and communications technologies (ICTs) thereby enabling them to carry out work from a distance from the place where the work results are needed or traditionally the physical location where the work would otherwise have been carried out[2]. This form f work-based activity can take many forms but typically the following five categories capture most types of telework[3]:

- Mobile telework. In this situation, the worker is not located at any one site but travels between, for example, customer or employer premises in order to maximize the delivery of services or capabilities.
- Home-based telework. Also commonly referred to as "telecommuting"[4]; here a worker carries out their work-based activities from their home instead of personally visiting an employer's office, customer site or other similar location.
- Telecentres. Typically, these describe local facilities where people seek to reduce the burden and cost of commuting to a central location.
- Functional relocation. In this situation, business functions (and processes) are concentrated and delivered from a distance such as sales activities conducted by telephone or computer network or customer service that can be conducted anywhere using remote access to systems.
- Tele cottages. Distinct from telecentres, these facilities are locally based and offer the teleworking community the opportunity for personal interaction, skills development and high-performance ICTs[5].

Justification

Technology is rather an enabler for telework rather than barrier as all agree that no expensive equipment or sophisticated knowledge is necessary for working remotely. Technological tools (Laptops, mobile phones), broadband connections and ICT services make easier than ever for employees and businesses to reap the benefits of remote working. While the advantages of remote working are clear to both businesses and employees (reduced office expenditure, reduced traffic, higher productivity, increased work satisfaction and flexible working hours, improve family planning). On the other hand, challenges in controlling and coordinating working activities outside the base office, reduction of social interaction and data protection issues could act as barriers for adopting this kind of work activities.

On the farm, technology is changing the way farmers manage their farmland and livestock – such as the use of satellite driven geo-positioning systems and sensors that detect nutrients and water in soil. Traditionally, farmers have gone to the fields to check the status of their crops and make decisions based on their accumulated experience. Nowadays, advanced technologies enable tractors, harvesters and planters to make decisions about what to plant, when to fertilize, and how much to irrigate. Numerous technologies including remote sensing, ICT

technologies, IoT and robotic systems, AI and PA systems have significant impact on automation of farm operations, providing practical, distance-based solutions for checking various farm activities remotely. As technology progresses, equipment will ultimately be able to tailor decisions improving the accuracy of operations, saving money, time, and work.

References

1. http://resourcecentre.etuc.org/linked_files/documents/Framework%20agreement%20on%20telework%20EN.pdf
2. Stanworth, C. (1997), "Telework and the information age", New Technology, Work and Employment, Vol. 13 No. 1, pp. 51-62.
3. E. R. Morgan, "Teleworking: An Assessment of the Benefits and Challenges", European Business Review, vol. 16, no. 4, pp. 344-357, 2004 [7] V. J. Morganson, D. A. Major, K. L. Oborn, J. M. Verive, M. P. Heelan, "Comparing telework locations and traditional work arrangements: Differences in work-life balance support, job satisfaction, and inclusion", Journal of Managerial Psychology, vol. 25, no. 6, pp. 578-595, 2010
4. There is a subtle distinction between the meaning of "telework" and "telecommuting", which is beyond the scope of this paper; see Gil Gordon's viewpoint on this difference in interpretation at www.gilgordon.com/telecommuting/ Generally, the former tends to be used more commonly within Europe while the latter is used synonymously in the USA
5. This classification is derived from European Telework Online (www.eto.org.uk).
6. https://dbei.gov.ie/en/Publications/Publication-files/Remote-Work-in-Ireland.pdf
7. https://books.google.gr/books?hl=el&lr=&id=uXwABAAAQBAJ&oi=fnd&pg=PP1&dq=benefits+from+working+remote&ots=g2DPlrLzvp&sig=DUQhotsQuuMOLX9nMPdqn0DyVgw&redir_esc=y#v=onepage&q=benefits%20from%20working%20remote&f=false
8. C. Cooper, "Telecommuting: The good, the bad, and the particulars.", Supervision, vol. 57, no. 2, pp. 10-19, February 1996. [2] C. D. Cooper, N. B. Kurland, "Telecommuting, professional isolation, and employee development in public and private organizations", Journal of Organizational Behavior, vol. 23, no. 4, pp. 511-532, June 2002, Page 7
9. P. Pyöriä, "Managing telework: risks, fears and rules", Management Research Review, vol. 34, no. 4, pp. 386-399, 2011 [9] K. Shafizadeh, D. Niemeier, P. Mokhtarian, I. Salomon, "The Costs and Benefits of Telecommuting: An Evaluation of Macro - scale Literature.", Institute of Transportation Studies, University of California, 1998 [10] P. R. Sparrow," New employee behaviors, work designs and forms of work organization", Journal of Managerial Psychology, vol. 15, no. 3, pp. 202-218, 2000
10. T. Maruyama, S. Tietze, "From anxiety to assurance: concerns and outcomes of telework", Personnel Review, vol. 41, no. 4, pp. 450-469, 2012
11. Applications of telework and their implications concerning gender, sector and seniority level – A qualitative approach. Available from:

https://www.researchgate.net/publication/282605120_Applications_of_telework_and_their_implications_concerning_gender_sector_and_seniority_level_-_A_qualitative_approach

12. https://buffer.com/state-of-remote-work-2019
13. https://community.plus.net/t5/Plusnet-Blogs/Remote-workers-index-the-best-countries-for-digital-nomads/ba-p/1635253#
14. https://www.eurofound.europa.eu/publications/article/2008/telework-in-greece
15. Saiz-Rubio, V.; Rovira-Más, F. From Smart Farming towards Agriculture 5.0: A Review on Crop Data Management. *Agronomy* **2020**, *10*, 207.
16. https://www.theguardian.com/sustainable-business/2016/feb/18/automated-farming-food-security-rural-jobs-unemployment-technology

Digital Transformation

Description

Digital transformation is the cultural, organizational and operational change of an organization, industry or ecosystem through a smart integration of digital technologies, processes and competencies across all levels and functions in a staged way. Digital transformation (also DX or DT) leverages technologies to create value for various stakeholders (customers in the broadest possible sense), innovate and acquire the capabilities to rapidly adapt to changing circumstances.

Rural areas represent over 80% of EU territory, and the EU's agricultural sector is one of the world's leading producers of food. European agriculture guarantees food security and quality, and provides millions of jobs for Europeans. At the same time, consumers' expectations of the farming sector are very high. They expect to be able to buy food that is high quality, safe, and affordable. Many also want to know how their food is produced and to be reassured that this happens with minimum environmental damage and usage of precious resources such as water and energy. The agricultural industry faces multiple challenges – and digital transformation can help it to meet them.

Digital technologies such as Cloud Computing, Linked Data, Semantic web, Artificial Intelligence, robotics, blockchain, High Performance Computing, Internet of Things (IoT), 5G and new sensor technologies have the potential to increase farm efficiency while improving rural communities' economic and environmental sustainability. Increased use of digital technologies will also have a positive impact on the quality of life in rural areas and attract a younger generation to farming and rural business start-ups. However, use of, and skills in, digital technologies in these sectors remains relatively low.

During the recent years cloud services has developed fast and has become crucial for the European data economy. With the Regulation on free flow of non-personal data, companies are now able to store and process their data in a cloud anywhere on the EU territory. Cloud computing also unlocks access to future and emerging technologies, such as artificial intelligence, high performance computing, the Internet of Things and blockchain. Link open data also exploit cloud resources or dealing with a huge amount of information. Linked Open Data is a powerful blend of Linked Data and Open Data: it is both linked and uses open sources. **Linked Data** is a method of publishing structured data so that it can be interlinked and become more useful through semantic queries. It builds upon standard Web technologies such as HTTP, RDF and URIs, but rather than using them to serve web pages for human readers, it extends them to share information in a way that can be read automatically by computers.

Digital technologies have the potential to revolutionise agriculture by helping farmers work more precisely, efficiently and sustainably. Data-driven insights can improve decision-making and practices and help increase environmental performance while making the job more attractive to younger generations. For instance, digitalisation can automate much of the paperwork required for farm administration under the CAP. **The CAP now allows a range of modern technologies including** data from the EU's Copernicus Sentinel satellites and

other Earth observation data to be used as evidence when checking farmers' fulfilment of requirements for area-based payments (either direct payments to farmers or rural development support payments), as well as cross-compliance requirements, such as stubble burning. Other new forms of evidence such as geo-tagged photos, information from drones and relevant supporting documentation from farmers, such as seed labels, are also acceptable, as part of a broader shift towards a so-called "monitoring approach" that will lead to a decrease in the number of on-farm checks. Visits to the field will only be necessary when the digital evidence is not enough to verify compliance.

Digital transformation also has the potential to offer consumers greater transparency as to how their food is produced. They offer opportunities to renew business models in value chains by connecting producers and consumers in innovative ways. Beyond farming, digital technologies are key to make rural communities more attractive, smart and sustainable, reducing problems related to remoteness and improving access to services. The EU is active with policies, such as CAP modernisation, and undertaking R&I activities laying the ground for digitalised and data-empowered European agriculture and rural areas.

Having access to real-time information is more and more vital for farmers, who can now connect their modern machinery to cloud computing. The European Commission's Digital Economy & Society Index shows that broadband is available to 71% of European homes — but to only 28% in rural areas; that mobile broadband, such as 4G, reaches 86% of European homes — but only 36% in rural areas. Ensuring adequate, reliable and affordable rural broadband connectivity infrastructure across the entire EU is essential in fostering a transformation to next-generation digital agriculture. Without adequate connectivity, it is difficult, sometimes even impossible for farmers to use their new applications to their full extent.

Justification

Research and innovation are vitally important to facilitate and accelerate digital transformation in agriculture and rural areas for the benefit of European citizens and businesses. In 2019 the European Commission and Member States signed a Declaration of Cooperation to drive policies and initiatives that accelerate and recognise the potential of digital technologies to help tackle important and urgent economic, social, climate and environmental challenges facing the EU's agri-food sector and rural areas, and establish a Europe-wide innovation infrastructure for a smart European agri-food sector and create a European dataspace for smart agri-food applications. Ensuring that the farming sector and rural areas are fully connected to the digital economy and our connected society is a major priority for the EU and Member State governments. Changes and opportunities in rural areas and farming related to the digital transformation are, and will be, enormous.

Regional policies and foresight exercises will need to consider strategic interventions that support the uptake of digital technologies, increased investments to develop new digital solutions, training/support and the crucial assessment of the socio–economic impacts of digitalisation. Public and private organizations increasingly release their data to gain benefits such as transparency and economic growth. The use of these open data can be supported and stimulated by providing considerable metadata (data about the data), including discovery, contextual and detailed metadata. In the rural area, it would allow to be able to exploit the information of the

processes (related to the cultivation and exploitation of the area, such as the benefits that local governments grant in favor of farmers), types of crops, agro-environmental data, geospatial data, etc. By collecting large amounts of data from crop yields, soil-mapping, weather data, machinery, fertiliser applications and animal health, digital farm management systems can help farmers better control and predict plant and animal development. Monitoring sensors can inform agricultural managers of the exact needs of any plant or animal, thus increasing the accuracy of intervention. Subsequently, farms can optimise their production costs by reducing water consumption and the use of fertilisers, by better preventing outbreaks of disease and ultimately by increasing their yields. They can furthermore ensure a greater abundance of high-quality, safe and healthy food — at a competitive price — to meet the needs of a growing population. The environmental footprint throughout the value chain will get smaller, and biodiversity on and around farms will increase. This will help with pollination and natural pest control, and with keeping the soil from washing away or from losing its natural nutrients.

References

1. https://www.i-scoop.eu/digital-transformation/
2. https://www.i-scoop.eu/internet-of-things/
3. https://www.govevents.com/blog/2018/02/01/defining-the-internet-of-government-things/
4. Digital transformation: Reinventing the wheel: digital transformations in the automotive industry, World Economic Forum, 2016.
5. "A smart and sustainable digital future for European agriculture and rural areas declaration", European Commission, Shaping Europe's Digital Future, 2019, at https://ec.europa.eu/digital-single-market/en/news/eu-member-states-join-forces-digitalisation-european-agriculture-and-rural-areas
6. "Digital Transformation in Agriculture and Rural Areas", European Commission, AGRI Research Factsheet, 2019, at https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-digital-transformation_en.pdf
7. "The future of farming: how digital can make a difference", Roberto Viola, Digital Single Market, European Commission, 2019, at https://ec.europa.eu/digital-single-market/en/blogposts/future-farming-how-digital-can-make-difference
8. "Smart farming: Bringing safe food, sustainable land management and jobs to rural areas", European Peoples Party, 2017, at https://www.epp.eu/papers/smart-farming-bringing-safe-food-sustainable-land-management-and-jobs-to-rural-areas
9. "Enabling Smart Rural: The Open Data Gap", European Data Portal published report, 2029, https://www.europeandataportal.eu/en/highlights/enabling-smart-rural-open-data-gap
10. "Linked Open Data", Eurostat, 2020, at https://ec.europa.eu/eurostat/web/nuts/linked-open-data
11. "The AGROVOC Linked Dataset", 2020, at http://aims.fao.org/vest-registry/vocabularies/agrovoc
12. "Dataset within Directorate-General for Agriculture and Rural Development", EUROPA, EU Open Data Portal, 2020, at https://data.europa.eu/euodp/en/data/publisher/agri
13. https://ec.europa.eu/digital-single-market/en/cloud

14. **https://ec.europa.eu/digital-single-market/en/blogposts/future-farming-how-digital-can-make-difference**
15. https://ec.europa.eu/eurostat/web/nuts/linked-open-data
16. The AGROVOC Linked Dataset (http://aims.fao.org/vest-registry/vocabularies/agrovoc)
17. The Potential of Metadata for Linked Open Data and its Value for Users and Publishers (https://jedem.org/index.php/jedem/article/view/138)
18. The aim of CROSS-NATURE proposal is the development of common Digital Service Infrastructure (DSI) services to provide free and open access to biodiversity data and oriented towards alien invasive species (AIS) control and biodiversity protection. (https://crossnature.eu/)
19. Cross-Forest aims to develop Digital Service Infrastructures - DSI - services oriented towards: (i) forest fires control through precise information on combustible materials, forestry maps and propagation models that need HPC resources to run properly and (ii) forestry evolution models on Country-Level. The foundations of those services will be forestry and GIS datasets that come from Portugal and Spain (https://crossforest.eu/)
20. https://www.europeandataportal.eu/en/highlights/enabling-smart-rural-open-data-gap
21. https://scihub.copernicus.eu/dhus/#/home
22. https://www.reeep.org/LOD-the-Essentials.pdf

The Internet of Things

Description

The Internet of Things (IoT) has been defined in a number of different ways[1]. Generally speaking, it refers to a global, distributed network (or networks) of physical objects that are capable of sensing or acting on their environment, and able to communicate with each other, other machines, or computers. Such 'smart' objects come in a wide range of sizes and capacities, including simple objects with embedded sensors, household appliances, industrial robots, cars, trains, and wearable objects such as watches, bracelets or shirts. Their value lies in the vast quantities of data they can capture and their capacity for communication, supporting real-time control or data analysis that reveals new insights and prompts new actions[2,3].

Justification

IoT is used to leverage the insights from data, automate, digitize, digitalize, optimize and in more mature stages transform processes, business models and even industries in a scope of digital transformation. The rapidly falling cost of sensor and Radio Frequency Identification (RFID) technology and the greater coverage and availability of wireless and mobile networks (including Wi-Fi and 2G/3G/4G mobile networks) have opened up new opportunities.

The IoT potentialities offer many possible applications in various domains including building management, security and surveillance, energy consumption, agricultural automation, telemedicine and healthcare, smart home and cities. Only some of them are currently completely deployed and in the future, there will be more intelligent applications for smarter enterprises, factories and cities(A smart city can be considered as the general application category in which other domains such a smart home, smart grid, smart automotive and traffic management are included). Smart city applications are developed not only to improve the management of urban flows but also to allow a real time response to challenges.

Especially in this century, many emerging technological, economical and environmental changes have generated interest in smart cities. These changes include climate change, economic restructuring, ageing populations, and pressures on public finances.

Furthermore, IoT is a powerful driver that will transform the entire farming and food domain into smart webs of connected objects that are context-sensitive and can be identified, sensed and controlled remotely. As such, IoT will be a real game changer in agriculture that drastically improves productivity and sustainability. It is estimated that, with new techniques, the IoT has the potential to increase agricultural productivity by 70% by 2050 which is positive, because according to Myklevy et al., the world needs to increase global food production by 60% by 2050 due to a population growth over nine thousand million.

In conclution, IoT is an important piece of technology that offers great advantages such as:

- Efficient resource utilization and low-cost hardware implementation for real-time data acquisition and processing

- Reduced human efforts due to the limited human intervention
- Low energy consumption
- Real-time marketing
- Decision analytics
- High-quality data

References

1. https://www.postscapes.com/iot/#definition
2. https://www.europarl.europa.eu/RegData/etudes/BRIE/2015/557012/EPRS_BRI(2015)557012_EN.pdf
3. https://www.parksassociates.com/blog/article/pr-09062017
4. https://www.i-scoop.eu/internet-of-things/
5. https://www.govevents.com/blog/2018/02/01/defining-the-internet-of-government-things/
6. https://www.i-scoop.eu/internet-of-things/
7. https://www.sciencedirect.com/science/article/pii/S1876610217302692
8. https://customerthink.com/the-internet-of-things-iot-solutions-and-its-benefits/
9. https://books.google.gr/books?id=5w2_DwAAQBAJ&pg=PA2&lpg=PA2&dq=IoT+advantages+low-cost+solution&source=bl&ots=3MtdVY4aJc&sig=ACfU3U0sNYjkBLVAUOPtf6pgaaWNueXQCw&hl=el&sa=X&ved=2ahUKEwjio_mPxPToAhUQwsQBHWW2DdkQ6AEwEnoECA0QRA#v=onepage&q=IoT%20advantages%20low-cost%20solution&f=false
10. https://ieeexplore.ieee.org/document/8355111
11. Saiz-Rubio, V.; Rovira-Más, F. From Smart Farming towards Agriculture 5.0: A Review on Crop Data Management. *Agronomy* **2020**, *10*, 207.
12. https://books.google.gr/books?id=iGpQDwAAQBAJ&pg=PA84&lpg=PA84&dq=IoT+advantages+low-cost+solution&source=bl&ots=blr9juMDx_&sig=ACfU3U3uX9za4jQip1vmuIpfm9JuBBHoaQ&hl=el&sa=X&ved=2ahUKEwjio_mPxPToAhUQwsQBHWW2DdkQ6AEwDnoECA0QNA#v=onepage&q=IoT%20advantages%20low-cost%20solution&f=false

Big Data, AI, Automation and Robotics

Description

Big Data refers to large amounts of data produced very quickly by a high number of diverse sources. Data can either be created by people or generated by machines, such as sensors gathering climate information, satellite imagery, digital pictures and videos, purchase transaction records, GPS signals, etc. It covers many sectors, from healthcare to transport and energy. Big data analysis solutions can be classified into two categories: "Data Discovery and Visualization" and "Advanced Analytics" (Frost & Sullivan 2018). Data Discovery and Visualization solutions integrate, transform, and big data sources using data mining algorithms to find insights into business use. Advanced Analytics solutions are focused on building use-case specific predictive or descriptive solutions using advanced modelling techniques, such as deep learning or advanced statistical methods.

Artificial intelligence (AI) can be defined as "a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation (Kaplan & Haenlein, 2019)". Machine learning has been used since the 1950's by researchers in order to analyze and extract information from data. AI refers to any machine or algorithm that is capable of observing its environment, learning, and based on the knowledge and experience gained, take intelligent actions or propose decisions. Autonomy of decision processes and interaction with other machines and humans are other dimensions that need to be considered. It has only been during the last decade with the rise of the generalized usage of the Graphics Processing Units (GPUs) that enabled the true development of neural networks and in particular what is nowadays referred to as Deep Learning (Arel, 2010). This newly found computational power gave rise to methods that are capable of solving complex, real-world problems.

Cobots is a short name for collaborative robots that are meant to operate in conjunction with, and in close proximity, to humans to perform their tasks. They are built to physically interact with humans in workplace that is shared between human worker and cobot. Cobots are the "hardware version of augmented intelligence" that we talk about in the software world. Instead of replacing humans with autonomous counterparts, cobots augment and enhance human capabilities with super strength, precision, and data capabilities so that they can do more and provide more value to the organization.

Justification

In an effort to make the process easier, the European Union implements, every year, a plethora of different programs focusing on the labor and industrial market, evolution, technology, and automation. And one thing that connects all of them is Industry 4.0. Worldwide, agriculture is a $5 trillion industry, and now the industry is turning to AI technologies to help yield healthier crops, control pests, monitor soil and growing conditions, organize data for farmers, help with workload, and improve a wide range of agriculture-related tasks in the entire food supply chain. Improved analytics and processing of data, especially big data, will make it possible to:

- transform Europe's service industries by generating a wide range of innovative information products and services

- increase the productivity of all sectors of the economy through improved business intelligence
- better address many of the challenges that face our societies
- improve research and speed up innovation
- achieve cost reductions through more personalized services
- increase efficiency in the public sector

Frost & Sullivan estimate big data revenue at 2017 of $8.54 billion. The revenue is expected to reach $40.65 billion in 2023. Automation and AI are accelerating the demand for technological skills over the next 10-15 years, while the need for basic cognitive skills, and physical and manual skills will decline. According to the Zion Market Research [Zion], global machine learning market was valued at around USD 1.58 billion in 2017 and is expected to reach approximately USD 20.83 billion in 2024, growing at a Compound Annual Growth Rate (CAGR) of 44.06% between 2017 and 2024. Replacing human labor with automation is a growing trend across multiple industries, and agriculture is no exception. Most aspects of farming are exceptionally labor-intensive, with much of that labor comprised of repetitive and standardized tasks, an ideal niche for robotics and automation.

We are already seeing agricultural robots or AgBots, beginning to appear on farms and performing tasks ranging from planting and watering, to harvesting and sorting. Eventually, this new wave of smart equipment will make it possible to produce more and higher quality food with less manpower

References

1. https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113826/ai-flagship-report-online.pdf
2. https://ec.europa.eu/digital-single-market/en/big-data
3. https://www.forbes.com/sites/cognitiveworld/2019/12/15/youve-heard-of-robots-what-are-cobots
4. https://patentimages.storage.googleapis.com/8f/92/55/78f01440703315/US5952796.pdf
5. https://ieeexplore.ieee.org/document/954751
6. https://www.i-scoop.eu/industry-4-0/cobot-collaborative-robot/
7. https://spectrum.ieee.org/automaton/robotics/industrial-robots/collaborative-robots-innovation-growth-driver
8. https://www.iiea.com/past-events/new-technologies-and-big-data-what-potential-for-the-agri-food-sector/
9. http://www.bdva.eu/sites/default/files/EuropeanBigDataValuePartnership_SRIA__v3.pdf
10. https://store.frost.com/global-big-data-analytics-market-forecast-to-2023.html
11. https://www.forbes.com/sites/cognitiveworld/2019/07/05/how-ai-is-transforming-agriculture
12. https://www.eu-robotics.net/sparc/10-success-stories/agri-food-robotics-briefing-document.html?changelang=2
13. https://ied.eu/project-updates/industry-automation-in-europe/
14. https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/new-technologies-automation-work-developments_en

15. Arel, I., Rose, D. C., & Karnowski, T. P. (2010). Deep machine learning-a new frontier in artificial intelligence research. IEEE computational intelligence magazine, 5(4), 13-18.

16. Kaplan, Andreas; Haenlein, Michael (2019). "Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence". Business Horizons. 62 (1): 15–25.

17. New York, NY, July 23, 2019 (GLOBE NEWSWIRE) -- Zion Market Research has published a new report titled "Machine Learning Market by Service (Professional Services, and Managed Services), for BFSI, Healthcare and Life Science, Retail, Telecommunication, Government and Defense, Manufacturing, Energy and Utilities, Others: Global Industry Perspective, Comprehensive Analysis, and Forecast, 2017-2024''.

Earth Observation and the Copernicus Programme

Description

Copernicus is the European Union's Earth Observation Programme, looking at our planet and its environment for the ultimate benefit of all European citizens. It offers information services based on satellite Earth Observation and in situ (non-space) data. The Programme is coordinated and managed by the European Commission. It is implemented in partnership with the Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium-Range Weather Forecasts (ECMWF), EU Agencies and Mercator Ocean.

Vast amounts of global data from satellites and from ground-based, airborne and seaborne measurement systems are being used to provide information to help service providers, public authorities and other international organizations improve the quality of life for the citizens of Europe. The information services provided are freely and openly accessible to its users. While earth observation products increasing information on farmers' activities, numerous initiatives research and testing of these products aim at reducing the costs of administering the CAP. Specifically, existing administration and control regimes entail high transaction costs for public administrators as well as private transaction costs and administrative burden for farmers. For example, according to DG-AGRI , the cost of controls to Member States in 2015 was EUR 1 125 million, which equates to 5.2% of total public CAP expenditure. Therefore, it is highly crucial to prepare and facilitate the transfer of developed EO products and services to the paying agencies including capacity building and demonstrating cloud computing capabilities. The new rules, which came into force on 22 May 2018, will allow data from the EU's Copernicus Sentinel satellites and other Earth observation data to be used as evidence when checking farmers' fulfilment of requirements under the CAP for area-based payments (either direct payments to farmers or rural development support payments), as well as cross-compliance requirements, such as stubble burning. Countries will be free to choose whether to apply the new monitoring approach. They will have flexibility over whether to apply it to specific aid schemes, such as the basic payment scheme of direct payments to farmers, or to rural development support measures, or to combinations of the two; they will also be able to gradually extend the area covered by monitoring within the first two years of its implementation. Additional benefits for national

administrations include a more integrated communication process with farmers, a reduced administrative burden as a result of fewer on-site checks and a flexible application process.

Justification

Helps policy decision-making regarding various societal issues, including humanitarian crises. Copernicus supports a variety of applications including Agriculture, Blue Economy, Climate Change and Environment, Development and Cooperation, Energy and Natural Resources, Forestry, Health, Insurance and Disaster Management, Security and Defense, Tourism, Transport, Urban Planning Regarding Copernicus, there is no denying the substantial impact this programme has had on the EO sector in Europe, with the investment of €4.3bn of EU funding in the period 2014-2020, the successful deployment of a constellation of operational Sentinel satellites, the free and open data policy, and the comprehensive programme of downstream services. These have really enabled the EO services sector to step up a gear to develop and deliver a range of new products and services to public and private sector customers both within Europe and outside of it. Advances in Information and Communications Technologies (ICT) have also had a huge impact. Whereas in the past it took days or weeks to access the latest Earth Observation data, today it is available in hours or minutes thanks to high bandwidth links and cloud computing, which also enable the data to be processed into information products and delivered to end-users and customers equally fast. Advances in artificial intelligence (AI) and machine learning are enabling our sector to derive ever-more sophisticated insights and analytics from EO data, and to combine it with novel data feeds from in-situ sensors and even unstructured data sources such as social media feeds, news channels, mobile devices and crowdsourcing. The range of applications and services that could be developed using this rich mix of information sources is very exciting indeed and we are watching this closely.

Furthermore, Copernicus is seen to take an increasing role for assisting paying agencies' inspections of farmers' compliance with their CAP obligations, making the **Integrated Administration and Control System** (IACS) more cost efficient. In this context, exploitation of Copernicus products and services will lead to:

- The development of improved e-public services that enable a better implementation of the CAP and simplify administrative procedures, integrating open and user-generated data.
- The development of personalized public services that support farmers to better comply with CAP requirements.
- Increase the transparency of compliance monitoring procedures related to the CAP.
- The reuse of data (open and user-generated) by agricultural consultants and developers for delivering their own added value services for farmers.
- To delivery of more effective and applied public administration.

References

1. https://www.copernicus.eu/en/about-copernicus
2. https://www.scitecheuropa.eu/remote-sensing/91612/
3. https://www.oecd-ilibrary.org/sites/a39dfa59-en/index.html?itemId=/content/component/a39dfa59-en#endnotea10z3
4. http://esa-sen4cap.org/content/project-background
5. https://ec.europa.eu/info/news/modernising-cap-satellite-data-authorised-replace-farm-checks-2018-may-25_en
6. https://op.europa.eu/webpub/eca/special-reports/new-tech-in-agri-monitoring-4-2020/en/
7. http://www.eo4agri.eu/content/eo4agri-mandate-payment-agencies
8. https://www.niva4cap.eu/project
9. The SENTINEL satellites go to https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Sentinel-2
10. For more on cross-compliance go to https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/income-support/cross-compliance_en

Precision Agriculture

Description

Precision agriculture (PA) or precision farming, is a modern farming management concept using digital techniques to monitor and optimize agricultural production processes. Rather than applying the same amount of fertilizers over an entire agricultural field or feeding a large animal population with equal amounts of feed, PA will measure variations in conditions within a field and adapt its fertilizing or harvesting strategy accordingly. Likewise, it will assess the needs and conditions of individual animals in larger herds and optimize feeding on a per-animal basis. PA methods promise to increase the quantity and quality of agricultural output while using less input (water, energy, fertilizers, pesticides, etc.). The aim is to save costs, reduce environmental impact and produce more and better food. The methods of PA rely mainly upon a combination of new sensor technologies, satellite navigation and positioning technology, and the Internet of Things. PA has been making its way into farms across Europe and is increasingly assisting farmers in their work**.**

Justification

Precision agriculture can actively contribute to

- **Food Security and Safety:** PA makes farming more transparent by improving tracking, tracing, and documenting. Crop and livestock monitoring will give better predictions on the quality of agricultural products. The food chain will be easier to monitor for producers, retailers, and customers. It will also play a significant role in terms of plant health. Current technologies allow to monitor to different levels of resolution in precision farming. Grid level ranges from field monitoring (ca. 30 x 30 m) to plant level monitoring (ca. 30 x 30 cm). Forthcoming technologies will make leaf level (ca. 3 x 3 cm) and spots on leaves (ca. 0.5 x 0.5 cm) accessible to optical automated diagnostics. Diseases undetectable by traditional means will be prevented by automated optical sensing and intelligent planning options.
- **Sustainable Farming:** PA already offers technologies for producing more agricultural output with less input. For instance, sensor-based monitoring systems provide farmers with better information and early warnings on the status of crops, and improved yield forecasts. PA also plays a major role in animal husbandry
- **Societal Change:** PA will reduce the gender gap by making farming operations easier for women, especially when it comes to using heavy equipment or performing difficult physical tasks. On the other hand, PA might have a negative impact on seasonal work. Seasonal workers are low paid and low skilled. They are usually employed to assist with harvesting tasks, such as fruit picking. Over 4 million seasonal workers are in temporary employment. Two thirds of them are migrant workers coming from central and eastern Europe to western Europe during the harvesting season, and they migrate within the European Union itself, following the cycles of fruit harvesting. Many of these migrants might be replaced by PA technologies and a new generation of robots.

- **Education:** PA technologies could really boost education levels in rural areas since they are all linked to the competencies identified by the EU for increasing competitiveness and growth.

References

1. https://www.europarl.europa.eu/RegData/etudes/STUD/2016/581892/EPRS_STU(2016)581892_EN.pdf
2. https://books.google.gr/books?id=c-lGDgAAQBAJ&pg=RA1-PA316&lpg=RA1-PA316&dq=precision+agriculture+greece+high+cost&source=bl&ots=_x7_n84c2I&sig=ACfU3U0CyWA_oEN9idH2VnMhUHOixVI-QA&hl=el&sa=X&ved=2ahUKEwiK4uqv_broAhW9aRUIHc-kASkQ6AEwDnoECAoQAQ#v=onepage&q=precision%20agriculture%20greece%20high%20cost&f=false

Electric and Autonomous Vehicles

Description

Autonomous vehicles are controlled by an automatic driving system that does not need a physical driver. Intelligent Transport Systems (ITS) is based on wireless technology that enables cars to communicate with one another via Vehicle to Vehicle (V2V) and with overhead traffic systems through Vehicle to Infrastructure (V2I). Driverless or autonomous vehicles (AVs) promise to bring substantial economic and societal benefits. It is widely assumed that driverless cars would have the potential, for example, to save human lives, minimize the financial cost of car accidents, improve urban mobility, decrease congestion and negative environmental impacts, provide more inclusive forms of mobility for the elderly and people with special needs, and increase productivity.3 According to World Economic Forum estimates there is substantial economic value at stake for the industry (US$ 0.67 trillion) and society (US$ 3.1 trillion) as a result of digital transformation in the automotive industry already in the period between 2016 to 2025.

Electric bicycles (e-bikes) also are gaining ground in the city. These bicycles have a battery and an engine to support the cyclist, resulting in longer trips being made. Typically, 7.5 kilometres is seen as the maximum range for cyclists. The e-bike doubles the range. This makes the e-bike not only relevant for inner city travel, but also for travel between cities. The main target groups for the e-bikes are commuters and the elderly. For commuters, the e-bike is often an alternative for the car. For the elderly it is a way to stay mobile. In general, the e-bike is more flexible and faster in cities than the car or public transport.

Justification

Autonomous cars drive with more foresight and care thanks to their extensive network connection, they know the most appropriate route in all contexts and offer their users the possibility of working on the way to the office, which could be a long journey, or to use time in another way. Not to mention the economic aspects that would entail the increased production of such automobiles. One of the great hopes coupled with autonomous driving is sustainability. Three of the key central points are:

- Zero emission traffic.
- Affordable transportation, always available or non-discriminatory.
- More humanized cities or saving resources.
- Furthermore, this technology offers the opportunity to create a perfectly adapted public transport network that is accessible at all times for all people.

The benefits offered by this technology in rural areas range from the increase in the performance of public transport, such as the contribution of renewable and non-polluting energies. Another benefit is the improvement of crop harvesting. As autonomous driving technologies advance, tractors also are expected to become some of the earliest machines to be converted. Autonomous tractors have been in development since the idea of precision agriculture came about in the 1980s. To try and save fuel and become more efficient, growers began using GPS technologies to guide their tractors across fields. As new technologies made wireless

communications easier and more reliable, these first steps toward self-driving tractors laid the groundwork for the autonomous vehicles that are now widely used in the large-scale farming industry. While completely autonomous tractors have not yet been approved for use in the field, that's not stopping manufacturers from developing them. According to CNH Industrial, a company that specializes in farm equipment and previewed a concept autonomous tractor in 2016, "In the future, these concept tractors will be able to use 'big data' such as real-time weather satellite information to automatically make the best use of ideal conditions, independent of human input, and regardless of the time of day. Modern tractors can offer a wealth of information. This is especially true of autonomous models that use GPS and automatic steering to control their course. Sensors can determine:

- The moisture level of the ground
- The progress of planting and harvesting operations
- Current yield
- Fertilizer and pesticide application rates
- The amount of fuel used on a given circuit or during a certain time period.

Some self-driving tractors can even provide guidance when applying fertilizer, making sure the tires stay between the rows and away from growing plants. Several important benefits that autonomous tractor systems may make possible are:

- Self-driving tractors' automatic planting systems have exceptional accuracy, resulting in seed conservation and a substantially improved return on investment (ROI) for growers.
- The tractors' sensors can also collect information on soil conditions, offering improved maintenance of already-planted crops and generating increased data both before and after harvest time.
- Self-driving tractors can reduce the workload and stress on employees, providing assistance for driving and managing a wide range of tasks on the farm.

References

1. https://www.europarl.europa.eu/RegData/etudes/STUD/2018/615635/EPRS_STU(2018)615635_EN.pdf
2. https://ec.europa.eu/transport/sites/transport/files/cycling-guidance/smart_choices_for_the_city_cycling_in_the_city_0.pdf
3. Managing Transition to Electrical and Autonomous Vehicles **https://reader.elsevier.com/reader/sd/pii/S187705091731596X?token=F2196FA32370FA362DAE0ADB0AB36F4ECBD322E87808D49D5B3254981D1617735B9831D6D7F554DF386E14F1E619D0A7**
4. Autonomous Robots for Agricultural Tasks and Farm Assignment and Future Trends in Agro Robots https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.418.3615&rep=rep1&type=pdf
5. Governing autonomous vehicles: emerging responses for safety, liability, privacy, cybersecurity, and industry risks, https://www.tandfonline.com/doi/full/10.1080/01441647.2018.1494640
6. https://www.industryweek.com/technology-and-iiot/article/21980253/autonomous-vehicles-enter-agriculture-market-with-debut-of-robot-tractor
7. http://www.bigag.com/topics/equipment/autonomous-tractors-future-farming/
8. https://www.researchgate.net/publication/228874732_Systems_requirements_for_a_small_autonomous_tractor
9. https://www.researchgate.net/publication/257157920_Development_of_a_deterministic_autonomous_tractor
10. https://pdfs.semanticscholar.org/e79f/fb78bdf206e30372613783967c6bb2ea832b.pdf

Renewable Rural Energy Systems

Description

A sustainable energy future for the European Union is important for all its citizens. Some areas within Europe are still deprived of access to a secure supply of clean and affordable energy. Gas and electricity networks are less well developed in rural areas and so the choice of fuels is more limited. Yet, there is a target to be reached - reducing greenhouse gas emissions in the EU by 40% by 2030 - and these rural areas have a significant role to play in reaching this.

However renewable energy sources such as wind, solar, biomass, bio-fuels, as well as new decentralised community-based generation, distribution and storage models are well suited to rural areas, and provide major employment, new farming energy crops, new businesses and revenue earning opportunities to sustain existing community activities, energy cooperatives, contribute to the circular economy, help to eliminate farm-waste and organic waste more generally and attract new entrants to rural areas.

At the same time, rural development is an important part of EU policies, since rural regions tend to be economically less advanced than urban regions. Energy can play a part here. Surprisingly, the role of sustainable energy for the development of rural areas in the EU has received little attention from policy makers to date.

There is a considerable scope for emissions reductions from energy consumption in the EU's rural regions and regions with limited economic activity. Targeted policies could help capitalise on this potential, through an increased use of renewable energy sources in these regions, a switch to low carbon fuels, and the improvement of a decentralised energy supply.

The power to switch from fossil fuels to renewable energy sources could rest in the hands of local communities. Decentralized rural community smart microgrid systems are capable of providing most, if not all, of the future energy needs of rural areas. Microgrids connect a rural community to a localized energy network that operates independently of the mains supply, to share local energy between households. The grid communities are decentralized and owned and run by each village or neighbourhood. The system combines several compatible technologies, including rooftop solar panels, electric vehicles, heat pumps and storage batteries, to intelligently harvest and distribute clean energy to the community.

Optimized properly, microgrids could play a vital part in supporting efforts to transition to renewable energy systems and meet climate targets. This could be achieved by Smart Integrated Decentralized Energy systems, that use an intelligent management system to integrate different components and balance local supply and demand, reducing costs. For example, solar panels collect energy when the sun shines and charge electric vehicles; any surplus power is either stored in a battery or sent by the system to power other houses in the community. For rural areas, such systems are less expensive in the long run than conventional grid-powered systems and don't require expensive infrastructure upgrades.

Justification

Decentralized rural community smart microgrid systems are capable of providing most, if not all, of the future energy needs of rural areas. So support of rural renewable energy supply will have a major impact on regional policies and be included in the context of any foresight exercises.

For instance, some of the PoliRural pilots might explore policies and initiatives to promote new and innovate approaches such as: Sustainable Energy Communities, Energy Co-operatives, Microgrids and Smart Villages. Smart Villages are communities in rural areas that use innovative solutions to improve their resilience, building on local strengths and opportunities. They rely on a participatory approach to develop and implement their strategy to improve their economic, social and/or environmental conditions, in particular by mobilising solutions offered by digital technologies. Smart Villages benefit from cooperation and alliances with other communities and actors in rural and urban areas. The initiation and the implementation of Smart Village strategies may build on existing initiatives and can be funded by a variety of public and private sources.

Smart Village strategies respond to the challenges and needs of their territory by building on their local strengths and assets. Strategies must determine short, medium and long-term goals. Progress must be measurable through performance indicators that will be set in a roadmap. These roadmaps should be reviewed at regular intervals to allow continuous improvement. Strategies may aim, for example: to improve access to services (in various fields such as health, training or transport), to enhance business opportunities and create jobs, to the development of short food supply chains and farming practices, to the development of renewable energies, to development of a circular economy, to a better exploitation of natural resources, to adapt to climate change, to preserve the environment and biodiversity, to a better valorisation of the cultural heritage for a greater tourist attractiveness etc.

References

1. "Energy Self-Supply in Rural Communities (ENSRC) project", Projects database, Intelligent Energy Europe, European Commission, 2020, available at https://ec.europa.eu/energy/intelligent/projects/en/projects/ensrc
2. "Renewable energy for sustainable rural development: significant potential synergies, but mostly unrealized", European Court of Auditors, Special Report No.5, 2018, available at https://www.eca.europa.eu/Lists/ECADocuments/SR18_05/SR_Renewable_Energy_EN.pdf
3. "These Dutch microgrid communities can supply 90% of their energy needs", Johnny Wood, World Economic Forum, 2018, available at https://www.weforum.org/agenda/2018/09/these-dutch-microgrid-communities-can-supply-90-of-their-energy-needs/
4. "Promotion of microgrids and renewable energy sources for electrification in developing countries", Intelligent Energy Europe, EIE/05/011/SI2.419343 Microgrids – Results Report, 2008, available at https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/microgrids_final_report.pdf

5. From Consumer to Prosumer", D4.3 Synthesis Report, ENABLE.EU (Enabling the Energy Union), 2016 , available at http://www.enable-eu.com/wp-content/uploads/2018/10/ENABLE.EU-D4.3.pdf
6. EU support for Smart Villages" European Commission, Strategy, Shaping Europe's digital future, April 2019, available at https://ec.europa.eu/digital-single-market/en/news/eu-support-smart-villages
7. "Smart Villages Portal", European Network for Rural Development (ENRD), 2020, at https://enrd.ec.europa.eu/smart-and-competitive-rural-areas/smart-villages/smart-villages-portal_en
8. "EU support for Smart Villages", European Commission, Shaping Europe's Digital Future, 2018, at https://ec.europa.eu/digital-single-market/en/news/eu-support-smart-villages
9. Smart Villages", European Commission, The European Network for Rural Development (ENRD), Smart and Competitive Rural Areas, 2020, available at https://enrd.ec.europa.eu/enrd-thematic-work/smart-and-competitive-rural-areas/smart-villages_en

Genetics and Molecular Biology

Description

Genetics is the science of heredity and variation in living organisms. Long before G. Mendel first wrote about the laws of inheritance in 1866, farmers used their understanding of inheritance of characteristics to improving crop plants and animals through selective breeding.

The development of genome and biome sequencing has enabled researchers to study and understand the world of microorganisms from broader and deeper perspectives. The contemporary advances in DNA sequencing technologies have not only enabled finer characterization of bacterial genomes but also provided deeper taxonomic identification of complex microbiomes which in its genomic essence is the combined genetic material of the microorganisms inhabiting an environment, whether the environment be a particular body econiche (e.g., human intestinal contents) or a food manufacturing facility econiche (e.g., floor drain). Powerful advances in genome sequencing technology, informatics, automation, and artificial intelligence have propelled humankind to the threshold of a new beginning in understanding, utilizing, and conserving biodiversity.

Justification

Genomics offers some real advantages and opportunities to improve livestock production in the developed world and advance the 'livestock revolution' in the developing world. In the developed world, the use of genomic tools will rapidly increase as the sequence information is translated into tools that can be easily used. Examination of genetic causes for differences related to behavior and stress might make it possible to breed healthier and more adaptable animals, which will lessen welfare concerns.

Genomics can also help address environmental issues on several levels. Increases in feed efficiency will lead to less waste output and lower production of methane. Already a transgenic phytase pig, which expresses phytase in its saliva and, hence, produces less phosphorus in the manure, has been developed in Canada

Also, these genomic approaches will look to measure more effectively genotype by environment interactions and to develop ways to select specific genotypes or 'designer genes' for specialized niche markets and products. As production systems are modified to be more capitalized, advanced genetic stock from developed countries will be used more frequently and increased production can be expected from the genomics-led improvements. Initial genomic discoveries in laboratories have quickly found their way to farms as commercial companies continue to employ these technological advances. It is envisioned that, in the future, instead of selection on Estimated breeding values (EBVs) for traditional traits, genomic selection based on thousands of genes markers is likely to be used for a wider range of traits of economic performance. Further discoveries and enhanced understanding of the complexity of livestock genomes will simply boost livestock's contribution in providing a sustainable source of protein worldwide, as well as playing a valuable role in biomedical research. Policy decisions that support smart and environmentally sound growth, access to technology by all levels of producers and continued governmental financial support for both short- and long-term genomics research will be required if the full impact of genomics on animal agriculture is to be realized

It is anticipated that advanced strategies and technologies of high-throughput DNA sequencing (HT-NGS), for clinical purposes in human medicine and implementation of genomic selection in farm animals breeding programs will probably be fully adopted in the next couple of decades.

References

1. https://www.pnas.org/content/115/17/4325
2. https://link.springer.com/article/10.1007/s13353-011-0057-x#Sec20
3. https://www.sciencedirect.com/science/article/pii/S0167779907002715?casa_token=CepkWkJMZTsAAAAA:xTarE2jXkaPBwNLqPJd4YiNj0JoovZ8tagpNoJ1ZiZEha4WZigZyS1_LWyQhlI3kaCqAmrEUmA

POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People

SECTION E

Economic Drivers of Change

SECTION E: Economic Drivers of Change

Many of the 12 regions undertaking Foresight initiatives in the context of the PoliRural project, have expressed an interest in exploring the diversification of the regional economy. Just how this might happen will vary from region to region based on a variety of factors such as the nature of envisaged growth, the raw materials it produces (food, fibre, wood etc.) its proximity to large population centers, its proximity to large logistic hubs, it's access to human capital and the quality of its communications infrastructure. Nevertheless, many have expressed an interest in the development of rural tourism and so this has been an initial focus on efforts withing the project to create System Dynamic Models, that will support the exploration of related policy scenarios. That was before the pandemic and the start of a learning process based on a series of lockdowns across Europe.

The impact of COVID has been especially severe because it is a disease we know little about, is easily transmitted, has a relatively high level of fatality and for many of those who survive it, apparently high levels of as yet poorly understood, long-term adverse health effects. It has resulted in

- Restrictions on international travel
- Cross border travel only for essential work and subject to long periods of quarantine
- Restrictions on local travel, restricted to immediate family or social bubbles
- The closing of hotels, bars, restaurants, cafés, and shops
- The closing of cinemas, theatres, museums, galleries, and concert venues
- The cancellation of sporting events including the 2020 Olympics
- The cancellation of festivals and summer or holiday celebrations and events

Governments have made considerable efforts to preserve employment and protect small businesses from bankruptcy. Nevertheless, the pandemic has been devasting for airlines, hotel chains, bar and restaurant franchises, event organizers and advertisers, not to mention taxi- and private bus-drivers, small mom-and-pop businesses in catering, accommodation, transportation and the organization of events and leisure experiences. Many will of these will go out of businesses and those who survive will have to change the way they do business. In this sense, COVID-19 has been a game-changer. Although things are slowly returning to normal, it is clear that the post-COVID "normal" will bear little resemblance to life before COVID.

Whatever the organizer of a tourism related Foresight might have done in early 2020, it will have to be a very different conversation now. The immediate impact on catering and accommodation includes

- Decrease in international tourism demand
- Increase in local tourism or demand for so-called staycations
- Decrease in business travel for conferences, fairs, and workshops
- Increase in home-working or remote team-working
- Disruption to business models due to different customers or clients with different needs
- Disruption to business models due to the need for social distancing of customers
- Disruption to business models due to high rents making businesses unprofitable

Perhaps local tourism related organisations have already stated to think about these things. If so, there may be an opportunity for the PoliRural foresight team to work with them on developing a vision for the new normal. There may be an opportunity to work with them on key questions that may include the following:

- Is this a one-off event that will not be repeated again or is COVID an example of a periodic disruption that we will have to learn to live with?
- Who are the new visitors that we will have to cater for?
- How will they get here (by car, public transport, bicycle, on-foot…)?
- What are their needs in terms of accommodation (overnight, weekends, long-stay…)?
- What are their needs in terms of catering, and entertainment?
- What activities will they want to take part in?
- Given the new costs of signage, sanitation and supervision, the need to protect workers, the need to implement social distancing, the reduce use of space, how will this affect the economics of all related businesses, and what is required to make them viable again?
- How can he public sector help in terms of training, local laws, regional marketing, support for innovation and entrepreneurship?

Employment Opportunities

Description

Employment opportunities are among the main factors that determine the attractiveness of the rural areas especially for the working-age population (Jentsch, 2017). Employment satisfies the monetary needs of the population and drives the aggregate spending which is crucial for the growth and development of the rural and overall economy. When talking about employment in rural areas usually the focus is on agriculture and industries in the agricultural value chain (Copus et al., 2006). It is essential to emphasize that the level of attractiveness of the rural areas is greater when it provides employment in other rural economics such as rural tourism, cultural tourism, alternative tourism (hiking, caving, mountaineering, etc.), spiritual tourism etc. The existence of employment opportunities in sectors other than agriculture attracts the interest of boarder population with wide verity of skills and professions. In order employment to be a driving factor it needs to satisfy certain attributes that are close or better than the employment attributes in the urban areas, such as: quality of employment, job flexibility, matched supply, and demand on the labour market.

The quality of employment covers human needs that may be satisfied through employment, such as income, working hours, safety, skills development and training (Expert Group on Measuring Quality of Employment, 2015). Besides the minimum required working conditions, job attractiveness is well connected with the existence of modern soft skills in human resource management especially for maintaining and attracting young population in rural areas.

Working time and locational flexibility involves redesign of occupations that can be carried out by telecommuting or working at home with no direct supervision, through the use of information and communications technologies (Eyck et al., 2003). Except from the positive effect of telecommuting on job satisfaction, it also has environmental benefits by reducing traffic and pollution. If we aim for reverse migration and keeping the current population in the rural areas, the rural employment opportunities need to be in line with the current modern technologies. The internet revolution has radically changed how and where working activities are performed. Working online and working from home are becoming a common trend worldwide and thus availability of the required infrastructure (e.g. 3G, 4G, 5G) is an essential enabling factor for attracting people to rural areas, especially when it comes to the younger population.

Rural economies should show consistency in labour market in a sense of capability to absorb newly qualified labour that is knowledgeable in using modern technologies, marketing, strategic thinking, operating in a globalized world etc. Very often economic activities in the rural areas are not consistent with the skills and capabilities of the available working force in the urban areas. The reason for this situation can be found both on the supply and the demand side of the labour market. Mainstream education has been influenced by modern Western trends creating qualifications way beyond the real needs of the rural economies. One approach to improve the match between the demand and supply sides of the labour market is through vocational education and training (VET) programmes and apprenticeships within firms (CEDEFOP - European Centre for the Development of Vocational Training, 2013). Poor Vocational Education and Training, especially in the Eastern Europe and Western Balkans, is an additional factor that contributes to mismatch between workers skills and jobs (Mojsoska-Blazevski, 2019; World Bank, 2017; Bartlett & Pagliarello, 2016; Swiss Agency for Development and Cooperation, 2009). In the context of mainstream rural economies - agriculture and gravitating industries - introduction of modern technologies such as precision agriculture, traceability, digital technologies for connecting to the market are crucial and agricultural VET curricula should definitely be modernized in line with these trends.

On the other side, the providers of rural employment have shown very slow adaptation to the modern ways of doing business and using the available supporting systems. Owners and managers of rural businesses are slow in accepting modern managerial approaches in all business processes (strategy, marketing, human resources, technology) as well as in using external supporting systems such as consultancy, training and similar services (Millns & Nations, 2006).

The intensive push migration which caused serious shortage of seasonal workers is an additional employment factor which affects wide range of rural activities. Because this is mainly a supply side problem, existence of flexible and stimulating policy for seasonal workers is essential for the support of the rural economy and thus for making rural areas more attractive (Hooper & Le Coz, 2020).

Justification

Employment opportunities undoubtedly determine the attractiveness of the rural areas especially for the young people. The existence of employment opportunities in sectors other than agriculture (e.g. rural tourism, cultural tourism, alternative tourism, spiritual tourism) attracts the interest of boarder population with wide verity of skills and professions. To make employment a driving factor it needs to satisfy certain attributes that are close or better than the employment attributes in the urban areas, such as: quality of employment, job flexibility, matched supply, and demand on the labour market. Another important aspect related to employment possibilities in rural areas is that they need to be in line with the current modern technologies.

References

1. Bartlett, W., & Pagliarello, M. C. (2016). Agenda-setting for VET policy in the Western Balkans: Employability versus social inclusion. European Journal of Education, 51(3), 309–315. Available at: http://eprints.lse.ac.uk/68873/1/Bartlett_Agenda-setting%20for%20VET_2017.pdf
2. CEDEFOP - European Centre for the Development of Vocational Training. (2013). Labour market outcomes of vocational education in Europe: Evidence from the European Union labour force survey. Luxembourg: Publications Office of the European Union, 2013. http://dx.publications.europa.eu/10.2801/44683. Available at: https://www.cedefop.europa.eu/files/5532_en.pdf
3. Copus, A., Hall, C., Barnes, A., Dalton, G., Cook, P., Weingarten, P., Baum, S., Stange, H., Lindner, C., Hill, A., Eiden, G., McQuaid, R., Grieg, M., & Johansson, M. (2006). Study on employment in rural areas. A Study Commissioned by the European Commission Directorate General for Agriculture, 264. Available at: https://www.researchgate.net/publication/228364830_Study_on_Employment_in_Rural_Areas_Final_Deliverable
4. Expert Group on Measuring Quality of Employment. (2015). Handbook on Measuring Quality of Employment: A Statistical Framework. United Nations, New York and Geneva. Available at: https://www.unece.org/fileadmin/DAM/stats/publications/2015/ECE_CES_40.pdf
5. Eyck, K. van. (2003). Flexibilizing employment: An overview. ILO. Available at: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_117689.pdf
6. Hooper, C., & Le Coz, C. (2020, February 18). Seasonal Worker Programs in Europe: Promising Practices and Ongoing Challenges. Migrationpolicy.Org. Available at: https://www.migrationpolicy.org/research/seasonal-worker-programs-europe
7. Jentsch, B. (2017). Young People in Rural Areas of Europe. Taylor & Francis. Available at: https://www.taylorfrancis.com/books/e/9781315233307
8. Millns, J., & Nations, F. and A. O. of the U. (2006). Promoting Farmer Entrepreneurship Through Producer Organizations in Central and Eastern Europe. Food & Agriculture Org. Available at: http://www.fao.org/tempref/docrep/fao/010/a0847e/a0847e00.pdf
9. Mojsoska-Blazevski, N. (2019). SKILLS MISMATCH MEASUREMENT IN NORTH MACEDONIA. European Training Foundation. Available at: https://www.etf.europa.eu/sites/default/files/2019-07/Skills%20mismatch%20measurement_North%20Macedonia.pdf
10. Swiss Agency for Development and Cooperation. (2009). Vocational education in the Western Balkans. Available at: https://www.fdfa.admin.ch/dam/deza/en/documents/themen/grund-und-berufsbildung/183696-berufsbildung-westbalkan-2009_EN.pdf
11. World Bank. (2017). Looking for Skills in the Former Yugoslav Republic Macedonia (Report Number: 112196-MK). World Bank. Available at: http://documents.worldbank.org/curated/en/914541498623380214/pdf/112196-WP-P133003-PUBLIC-27-6-2017-13-40-18-MKDReportLookingforSkillsFinal.pdf

Entrepreneurship and New Business Development

Description

According to Korsgarrds' research, two types of rural entrepreneurship are classified: first, "entrepreneurship in the rural" and second, "rural entrepreneurship". The former represents entrepreneurial activities that encompass a broad spectrum of business sectors and that are not particularly dependent on rural natural resources. The latter represents entrepreneurial activities that leverage local nature-based resources and are hence location dependent (Korsgaard 2015, Endeavor Insights 2015). The number of enterprises that are located in rural areas varies. In Finland it's more than 40%, in Great Britain 24% (Rural Development Programmes - RDPs factsheets 2019, Business in Rural areas in GB, 2019).

The important role of entrepreneurship as a driver of economic growth and diversification has long been recognized at European level (European Agricultural Fund for Rural Development, SME Initiative under the EAFRD). EU's strategy is to achieve smart, sustainable, and inclusive growth, where the creation of new "green" businesses is at the core to work towards the transition to a low carbon economy by 2050.

Making up over 44% of the territory of the EU, and home to more than 25% of the population, rural areas need to make a robust contribution if these strategic objectives are to be achieved (Eurostat, 2015, Rural areas statistics, 2018). Inspired by Klolfsen's (2019) article the contribution is needed on the following four topics:

- Individual support and capacity building on entrepreneurship
- Multi-actor community building and networking
- Support and resources on product-, service- and business development and modelling
- Mind-set, attitude, structures, and practices of entrepreneurship advisory and funding conducted by public institutions

Justification

The EU's objective is to advance diversification of the rural economy. Start-ups and SMEs form a backbone of the diversification elements. The forthcoming entrepreneurs' knowhow, support of communities, ambitious research, development and innovation actions and the amount and quality of the public service are in the focus of development. The multilevel support of rural entrepreneurship and entrepreneurship in rural areas is a key driver to enhance diversification on rural economy and rural viability to attract newcomers to work and live in rural areas.

References

1. Korsgaard S., Müller S., Wittorff Tanvig H., (2015),*"Rural entrepreneurship or entrepreneurship in the rural – between place and space"*, International Journal of Entrepreneurial Behavior & Research, Vol. 21 Issue 1 pp. 5 – 26, http://dx.doi.org/10.1108/IJEBR-11-2013-0205
2. Endeavor Insights, Entrepreneurship Ecosystem Insights, Entrepreneurship an Urban Phenomenon?, 2015, http://www.ecosysteminsights.org/is-entrepreneurship-an-urban-phenomenon/
3. European Agricultural Fund for Rural (EAFRD) Development, https://cohesiondata.ec.europa.eu/funds/eafrd#top, https://www.fi-compass.eu/esif/eafrd
4. SME Initiative under the EAFRD, https://www.fi-compass.eu/sites/default/files/publications/SME_Initiative_under_the_EAFRD.pdf
5. Rural Development Programmes (RDPs) factsheets (2019), https://enrd.ec.europa.eu/policy-in-action/rural-development-policy-figures/rdp-summaries_en
6. Business in Rural areas in GB, 2019, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828079/Businesses_-_August_2019__includes_SME_update_.pdf
7. Support and development of small and new firms in rural areas: a case study of three regional initiatives, Magnus Klofsten, Charlotte Norman, Eduardo Cadorin & Hans Löfsten, 19.12.2019, https://link.springer.com/article/10.1007/s42452-019-1908-z
8. Statistics on rural areas in the EU, 2017, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Statistics_on_rural_areas_in_the_EU
9. Rural areas statistics in EU, 2018, https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/eu-rural-areas-primary-sector_en.pdf

Diversification of Rural Economies

Description

Many EU rural areas suffer from structural problems such as lack of attractive employment opportunities, skill shortages, underinvestment in connectivity, infrastructure, and essential services, as well as youth drain (EC, 2018). The loss of small farms, rural employment, and regional processing facilities has sparked a broader rural decline (IPES-Food, 2019). Therefore, **creation of new rural value chains** (e.g., renewable energy, bioeconomy, circular economy, ecotourism, etc.) can offer good growth and job potential for rural areas (EC, 2018; IPES-Food, 2019). **Farm diversification** has been increasingly recognized as a rewarding farm strategy through which farmers produce on-farm **non-agricultural goods and services** with the aim to increase their income (Boncinelli et al., 2017; EC, 2018). Besides, farm diversification also benefits rural areas as a whole, as farmers provide a wider range of services to the local rural economy, which can create spill-over effects on employment in rural areas, and bring **added value to local economies** (EP, 2016; Boncinelli et al., 2018). On-farm diversification towards new activities is seen as central in the Common Agricultural Policy (CAP) reform, since it strengthens the territorial and social cohesion of rural areas (Bartolini et al., 2014).

Family farms, which account for 97% of Europe's farms, have been found to be less entrepreneurial than non-family farms and less likely to diversify into new enterprises. Promoting diversification in family farms is an important challenge for the EU's CAP, which aims to improve the viability of family farms in Europe (EP, 2016; EC, 2017; Yoshida et al., 2019). Moreover, many small and economically non-viable farms can only survive in farming by supplementing their farm incomes with income earned from outside the sector (Hennessy, 2014).

On EU level (EP, 2016) the **farm diversification**, which is entitled to support from the Common Agricultural Policy (CAP), must comply the definition of Eurostat (n/d). In EU Farm structure survey a farm diversification is the creation of any gainful activities on the farm, which are indicated as follows - all activities other than farm work having an economic impact on the holding; and refers to: 1) **other gainful activities directly related to the holding** where either the resources of the holding (area, buildings, machinery, etc.) or its products are used in the activity: (i) on the holding, such as tourism, handicraft, processing of farm products or forestry; (ii) out of the holding, such as agricultural and non-agricultural contractual work; 2) **other gainful activities not directly related to the holding**: (i) on the holding, such as non-farm work on the holding; (ii) out of the holding, such as working in a bank or teaching. **Other gainful activities** related to the agricultural holding includes follows: provision of health, social or educational services; tourism, accommodation and other leisure activities; handicraft; processing of farm products; production of renewable energy; wood processing (e.g. sawing); aquaculture; contractual work using production means of the holding (agricultural or non-agricultural work); and forestry (Eurostat, n/d).

Diversification has been increasingly recognized as a rewarding farm strategy through which farmers produce on-farm **non-agricultural goods and services**. The farmers employ farm inputs in products and services other than agricultural goods and increase their income (Boncinelli et al., 2018; Salvioni et al., 2020). Farm size, farm specialization, assets specificity, as well as farmer's age and education affects diversification decisions (Bartolini

et al., 2014; Meraner et al., 2015). Moreover, diversification offers a path towards farm viability, which can motivate of farmers to remain within the sector (Barnes et al., 2015).

Care farming or social farming has been formally defined as the use of commercial and non-commercial farms and agricultural landscapes as a base for promoting mental and physical health, through normal farming activity (Murray et al., 2019). SF includes activities using agricultural resources to **promote health and generate therapeutic services**, rehabilitation, inclusion, education and training, and employment (Tulla et al., 2017), as well integrating activities, such as social-health, educational, social and work integration and recreational ones towards disadvantaged people (Sruderi et al., 2014). People with disabilities, also intellectual ones, benefit from the practice of SF, becoming part of a social community, working in a farm and establishing relationships with farmers (Zasada, 2011; De Vivo et al., 2019). **Green care** is an inclusive and umbrella term that includes a broad variety of interventions such as **nature-based rehabilitation**, care farming, social farming, therapeutic horticulture, animal-assisted intervention, etc. (Garcia-Llorente et al., 2018).

Rural tourism is essential activity, driven by **wealth and job creation**, and often by farm diversification, which relies on landscape and related heritage conservation and infrastructure that is often paid by the public sector (Lane et al., 213); and represents a suitable and common opportunity to make use of synergy effects within **agri-environmental and landscape management** measures (Zasada, 2011). It can be presented by three categories as accommodation, recreation and education activities (Yoshida et al., 2019); and could be divided on **agri-tourism, ethnic tourism, ecotourism, creative tourism and culinary tourism**, which is part of cultural tourism (Sasu& Epuran, 2016). Besides, it is observed a new trend in rural tourism - concept of creativity and authenticity. The diversification into farm-tourism and other recreational activities represents a suitable and common opportunity to make use of synergy effects within agri-environmental and landscape management measures (Zasada, 2011).

The position of farmers in the **food chain** is an important factor and will also be addressed by the scheduled proposal to improve the EU food supply chain (EC, 2017). **Farmers' markets, community supported agriculture** (CSA) (Brunori et al., 2016), cooperative forms (i.e., food hubs, local food networks, farmers' markets, box schemes, buying clubs, value chains, etc.), along with a range of agriculture and food cooperatives owned by farmers, consumers (Committee of the Regions, 2011; Lutz et al., 2017); direct sales and online marketing of farm produce, informal networks of consumers, as in the case of solidarity purchasing groups - show that producers' and consumers' behavior co-evolve (Bele et al., 2018; Randelli & Rocchi, 2017). Adding-value activities include **direct marketing and processing** (Yoshida et al., 2019). Regionalizing supply chains should also become a primary objective for the food and agricultural components of the Circular Economy Package (IPES-Food, 2019). For consumers, it is a source of fresh, high-quality produce that is enriched by its history and the human relations involved and acts to stimulate interest and educate people about food and the value of products (EESC, 2018).

Local food systems (LFSs) and **short food chains** (SFCs) are based on multifunctionality concept (Zasada, 2011). LFSs and SFCs means the production of agricultural products and foodstuffs with the aim of selling them in an

area reasonably close to the farm of production (EC, 2013); and based on 're-localization' (Berti & Mulligan, 2016). The advantages of LFSs include: fairer prices for farmers, fresh, local and seasonal produce for consumers, a reduced environmental impact, greater traceability and benefits for the local economy and community; as well as encouraging tourism and bringing economic (Augere-Granier, 2016; Brunori et al., 2016).

Justification

In general, the on-farm diversification strategy represents a relevant option for increasing farms incomes or stabilizing income streams. The results of the empirical model confirm diversification as a strategy mainly adopted for reducing risk exposure. The evidence that vulnerable farms have a higher probability of enlarging their portfolio activities towards on-farm diversification demonstrates this.

Farms, which offer various farm diversification activities (i.e., rural tourism, care or social farming, local food systems, short food chains, landscapes and other ecosystem services), and provide goods and services, create jobs and spill-over effects on employment in rural areas, bring added value to local economies, create the networks and support community.

References

1. Augere-Granier, M.L. (2016). Short food supply chains and local food systems in the EU. Briefing, September 2016. European Parliamentary Research Service (EPRS). Available at: https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/short-food-supply-chains-and-local-food-systems-eu-state-play-their-socio-economic
2. Barnes, A.P., Hansson, H., Manevska-Tasevska, G. et al. (2015). The influence of diversification on long-term viability of the agricultural sector. Land Use Policy, 49, 404-412. http://openaccess.sruc.ac.uk/handle/11262/10845
3. Bartolini, F., Andreoli, M., & Brunori, G. (2014). Explaining determinants of the on-farm diversification: empirical evidence from Tuscany region. Bio-based and Applied Economics, 3(2), 137-157. Available at: https://www.researchgate.net/publication/264976375_Explaining_determinants_of_the_on-farm_diversification_Empirical_evidence_from_Tuscany_region
4. Bele, B., Norderhaug, A., Sickel, H. (2018). Localized Agri-Food Systems and Biodiversity. Agriculture, 8(2), 22. Available at: https://www.mdpi.com/2077-0472/8/2/22
5. Berti, G., Mulligan, C. (2016). Competitiveness of small farms and innovative food supply chains: The role of food hubs in creating sustainable regional and local food systems. Sustainability, 8(7), 616. Available at: https://www.mdpi.com/2071-1050/8/7/616
6. Boncinelli, F., Bartolini, F., & Casini, L. (2018). Structural factors of labor allocation for farm diversification activities. Land use policy, 71, 204-212. Available at: https://www.researchgate.net/publication/322010977_Structural_factors_of_labour_allocation_for_farm_diversification_activities

7. Boncinelli, F., Bartolini, F., Casini, L., & Brunori, G. (2017). On farm non-agricultural activities: geographical determinants of diversification and intensification strategy. Letters in Spatial and Resource Sciences, 10(1), 17-29. Available at: https://link.springer.com/article/10.1007/s12076-016-0168-4
8. Brunori, G., Galli, F., Barjolle, D., Van Broekhuizen, R., Colombo, L., Giampietro, M. et al. (2016). Are local food chains more sustainable than global food chains? Considerations for assessment. Sustainability, 8(5), 449. Available at: https://openaccess.city.ac.uk/id/eprint/14895/1/Brunori%20et%20al%20LocalGlobal%20Sustainability-08-00449%20May%2016.pdf
9. Committee of the Regions (2011). Opinion of the Committee of the Regions on 'Local food systems'. OJ, C 104, 2.4.2011, 1–6. Available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:104:0001:0006:EN:PDF
10. De Vivo, C., Ascani, M., & Gaito, M. (2019). Social Farming and inclusion in EU ESI Funds programming. Italian Review of Agricultural Economics, 74(2), 53-60. Available at: https://oajournals.fupress.net/index.php/rea/article/view/10853
11. European Commission (EC) (2013). Report from the Commission to the European Parliament and the Council on the case for a local farming and direct sales labelling scheme, COM/2013/0866 final. Available at: https://op.europa.eu/en/publication-detail/-/publication/be106719-60e5-11e3-ab0f-01aa75ed71a1
12. European Commission (EC) (2017). The Future of Food and Farming. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-713-F1-EN-MAIN-PART-1.PDF
13. European Commission (EC) (2018). Proposal for a Regulation of the European Parliament and of the Council establishing rules on support for strategic plans to be drawn up by Member States under the Common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EU) No 1305/2013 of the European Parliament and of the Council and Regulation (EU) No 1307/2013 of the European Parliament and of the Council. COM/2018/392 final - 2018/0216 (COD). Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52018PC0392
14. European Economic and Social Committee (EESC) (2019). Promoting short and alternative food supply chains in the EU: the role of agroecology. Official Journal of the European Union, C 353, 65-71. Available at: https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/promoting-short-and-alternative-food-supply-chains-eu-role-agroecology-own-initiative-opinion
15. European Parliament (EP) (2016). Farm diversification in the EU. Briefing April 2016, http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/581978/EPRS_BRI(2016)581978_EN.pdf
16. Eurostat (n/d). Glossary: Gainful activities of the farm. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gainful_activities_of_the_farm&oldid=195428

17. Garcia-Llorente, M., Rubio-Olivar, R., & Gutierrez-Briceno, I. (2018). Farming for life quality and sustainability: A literature review of green care research trends in Europe. International journal of environmental research and public health, 15(6), 1282. Available at: https://www.mdpi.com/1660-4601/15/6/1282

18. Hennessy, T. (2014). CAP 2014-2020 Tools to Enhance Family Farming: Opportunities and Limits: In-depth Analysis. EUR-OP. Available at: http://www.europarl.europa.eu/RegData/etudes/note/join/2014/529051/IPOL-AGRI_NT(2014)529051_EN.pdf

19. IPES-Food (2019). Towards a Common Food Policy for the European Union. The Policy Reform and Realignment That Is Required to Build Sustainable Food Systems in Europe. Available at: https://www.agroecology-europe.org/wp-content/uploads/2019/02/CFP_FullReport.pdf

20. Lane, B., Weston, R., Davies, N. J., Kastenholz, E., Lima, J., & Majewsjki, J. (2013). Industrial heritage and agri/rural tourism in Europe. A review of their development, socio–economic systems and future policy issues. Available at: http://clok.uclan.ac.uk/23241/

21. Lutz, J., Smetschka, B., Grima, N. (2017). Farmer Cooperation as a Means for Creating Local Food Systems—Potentials and Challenges. Sustainability, 9(6), 925. Available at: https://www.mdpi.com/2071-1050/9/6/925

22. Murray, J., Wickramasekera, N., Elings, M., Bragg, R., Brennan, C. et al. (2019). The impact of care farms on quality of life, depression and anxiety among different population groups: A systematic review. *Campbell Systematic Reviews,* 15(4), e1061. Available at: https://onlinelibrary.wiley.com/doi/full/10.1002/cl2.1061%4010.1002/%28ISSN%291891-1803.Social_Welfare_virtual_issue

23. Randelli, F.; Rocchi, B. (2017). Analyzing the role of consumers within technological innovation systems: The case of alternative food networks. Environmental Innovation and Societal Transitions, 25, 94–106. Available at: https://www.researchgate.net/publication/303873903_Analysing_the_role_of_consumers_within_Technological_Innovation_Systems_towards_sustainability_the_case_of_Alternative_Food_Networks

24. Salvioni, C., Henke, R., & Vanni, F. (2020). The Impact of Non-Agricultural Diversification on Financial Performance: Evidence from Family Farms in Italy. *Sustainability*, 12(2), 486. https://www.mdpi.com/2071-1050/12/2/486/htm

25. Sasu, K. A., & Epuran, G. (2016). An overview of the new trends in rural tourism. Bulletin of the Transilvania University of Brasov. *Economic Sciences. Series* V, 9(2), 119. Available at: https://pdfs.semanticscholar.org/07e4/4a82aba75051970f49cf5fc1629a6792c1be.pdf

26. Scuderi, A., Timpanaro, G., & Cacciola, S. (2014). Development policies for social farming in the EU-2020 strategy. Calitatea, 15(S1), 76-82. Available at: https://www.researchgate.net/publication/287709540_Development_policies_for_social_farming_in_the_EU-2020_strategy

27. Sidali, K.L., Kastenholz, E., Bianchi, R. (2013). Food tourism, niche markets and products in rural tourism: combining the intimacy model and the experience economy as a rural development strategy. *Journal of Sustainable Tourism*, 23(8-9), 1179-1197. Available at: https://www.tandfonline.com/doi/full/10.1080/09669582.2013.836210

28. Tulla, A. F., Vera, A., Valldeperas, N., & Guirado, C. (2017). New approaches to sustainable rural development: Social farming as an opportunity in Europe?. Human Geographies, 11(1). 25-40. Available at: https://www.researchgate.net/publication/317238765_New_approaches_to_sustainable_rural_development_Social_farming_as_an_opportunity_in_Europe

29. Yoshida, S., Yagi, H., & Garrod, G. (2019). Determinants of farm diversification: entrepreneurship, marketing capability and family management. *Journal of Small Business & Entrepreneurship*, 1-27. Available at: https://www.tandfonline.com/doi/abs/10.1080/08276331.2019.1607676

30. Zasada, I. (2011). Multifunctional peri-urban agriculture—A review of societal demands and the provision of goods and services by farming. *Land use policy*, 28(4), 639-648. Available at: https://www.researchgate.net/publication/229304913_Multifunctional_peri-urban_agriculture-A_review_of_societal_demands_and_the_provision_of_goods_and_services_by_farming

Sustainable Circular Economy and Bioeconomy

Description

Environmental, economic, and social challenges are creating pressures for transition from linear economy to circular economy. According to EU Circular Economy Action Plan (2020), global consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double in the next forty years, while annual waste generation is projected to increase by 70% by 2050. The circular economy and bio economy can significantly reduce the negative impacts of resource extraction and use on the environment and contribute to restoring biodiversity and natural capital in Europe. Transition to circular economy and bio economy can help to generate green growth and create new jobs especially to rural areas. (EU Circular Economy Action Plan 2020).

The Circular economy is an economic system that aims to create a close-loop system, minimising the use of resource inputs and the creation of waste, pollution, and carbon emissions (Ellen MacArthurs Foundation). Geissdoerfer et. al. (2017) defines Circular Economy as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.

According to the EU definition the bio economy comprises those parts of the economy that use renewable biological resources from land and sea – such as crops, forests, fish, animals, and micro-organisms – to produce food, materials, and energy. (EEA Report No 8/2018)

Transition to circular economy is one of the main goals of The European Green Deal (2019), Europe's new agenda for sustainable growth. As part of this agenda the European Commission will present in spring 2020 a Farm to Fork Strategy to make sure Europeans get affordable and sustainable food, to tackle climate change, to protect the environment, to preserve biodiversity and to increase organic farming.

Many predominantly rural regions in Europe see the shift to a circular bio economy as an opportunity to answer their multiple economic and social needs. The bio economy and circular economy can offer rural regions pathways for diversification and value addition, with possible social, economic and environmental benefits. (Jalasjoki 2019) Bio economy can generate new business opportunities to rural areas e.g. through cultivation and sourcing of biomass, cultivation of organic materials for production of chemicals, renewable energy production, pharmaceuticals, and many other sustainable and innovative products.

European Circular economy and bio economy policies have strong thematic links, both having, for example, food waste, biomass, and bio-based products as areas of intervention. The holistic approach to the circular economy and circular bio economy could prove particularly successful in rural areas because it provides a methodology that can help rural territories in designing sustainable and resilient development strategies. (Salvia et al. 2018)

Looking beyond the production and (re)use of biomass for materials, chemical and energy, the economic opportunities in bio economy also include the management and protection of natural habitats and landscapes

which generate rural tourism, help to manage water flows, protect and support societies and much more. These service-based bio economies already exist, and are part of rural society, supported through Rural Development Programmes. Yet they feature rarely in bio economy strategies. (EEA Report No 8/2018)

As stated by Manninen et al. (2018), transition to bio economy or circular economy does not happen by itself, but it requires a strong political will, ambitious targets, and action towards these targets. New technical, societal and business innovations are needed along the way, with science and technology as the key enablers. As a cross-cutting approach they effect on the whole of society, linking food security and people's well-being to the sustainable use of raw materials and natural resources.

Justification

Circular Economy and bioeconomy can be considered as great opportunities to rural areas in Europe and globally. It is essential to ensure that the benefits of the circular economy and bioeconomy can be understood in the frame of local specificities and people's concrete needs. Therefore, strategies and their expected results should be defined based on the specific territorial context.

In regional foresight exercise following topics can be used to launch a strategic conversation:

- Existence of national, regional, and local policies for circular economy and bioeconomy
- Education and training for sustainable agricultural practices, bioeconomy, and circular economy
- Existence of technical capacity for sustainability and circular economy
- Financial support for good agricultural practices and using biobased inputs and producing bio-based products
- Certification for organic production
- Campaigns for higher awareness among consumers for the importance of choosing sustainable products and services (food, cloths, energy etc.)
- Increasing awareness of the negative effect of illicit trade and black economy on citizens living standard and welfare programs

References

1. Ellen MacArthurs foundation: What is circular economy. [online] [cit. 12.4.2020]. https://www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy
2. Geissdoerfer, Martin, Paulo Savaget, Nancy M.P. Bocken, and Erik Jan Hultink. 2017. "The Circular Economy – A New Sustainability Paradigm?" Journal of Cleaner Production 143: 757–768. doi:10.1016/j.jclepro. 2016.12.048. [cit. 12.4.2020]. Available online: http://dro.dur.ac.uk/29108/1/29108.pdf
3. EU Circular Economy Action plan: https://ec.europa.eu/environment/circular-economy/index_en.htm
4. A New Circular Economy Action Plan - For a cleaner and more competitive Europe, 11.3.2020. [Online]. [cit. 12.4.2020] Available: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:98:FIN

5. European Green Deal. 2019. https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
6. Salvia R., Andreopoulou Z. S., Quaranta G. The circular economy: A broader perspective for rural areas. Article in Rivista di Studi sulla Sostenibilita. July 2018. DOI: 10.3280/RISS2018-001008. [cit. 14.4.2020] Available: https://www.researchgate.net/publication/326636588_The_circular_economy_A_broader_perspective_for_rural_areas
7. The circular economy and the bioeconomy - Partners in sustainability. EEA Report No 8/2018. [cit. 14.4.2020] Available: https://www.eea.europa.eu/publications/circular-economy-and-bioeconomy
8. Competitive advantage from clean food and responsible bioeconomy and circular economy Futures review of the Ministry of Agriculture and Forestry. 2018. http://urn.fi/URN:ISBN:978-952-287-675-2
9. Manninen, J., Nieminen-Sundell, R., & Belloni, K. (Eds.) (2014). People in the Bioeconomy 2044. VTT Technical Research Centre of Finland. VTT Visions, No. 4. Available: http://www.vtt.fi/inf/pdf/visions/2014/V4.pdf
10. Bioeconomy. European Commission, research and innovations. [Cit. 13.4.2020] Available https://ec.europa.eu/research/bioeconomy/index.cfm?pg=home
11. A sustainable bioeconomy for Europe: strengthening the connection between economy, society and the environment Updated Bioeconomy Strategy. 2018. [Cit. 14.4.2020] Available https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none
12. Bioeconomy and Climate Action in Rural Areas. ENRD Thematic group web page. [Cit. 14.4.2020] Available: https://enrd.ec.europa.eu/enrd-thematic-work/greening-rural-economy/bioeconomy_en
13. European rural bioeconomy: policy and tools Conclusions from the ENRD Thematic Group on 'Mainstreaming the bioeconomy'. 2019. [Cit. 14.4.2020] Available: https://enrd.ec.europa.eu/sites/enrd/files/enrd_publications/bioeconomy-briefing_1_policy-and-tools.pdf
14. Jalasjoki L. Bioeconomy is an opportunity for rural Europe. Article in SciTech Europa 25.4.2019. [cit. 14.4.2020] Available: https://www.scitecheuropa.eu/bioeconomy-rural-europe/96055/
15. Bioeconomy and Circular Economy. Ministry of Agriculture and Forestry of Finland. [cit. 15.4.2020] Available: https://mmm.fi/en/bioeconomy
16. Making of tomorrow. VTT portal for bioeconomy. http://makingoftomorrow.com/

Digital Agriculture

Description

The question of impacts of digital technologies on agriculture and rural development and future of "Digital Rural Regions" is not new and it was mainly studied in the "Internet Period".

There exists number of studies starting from early 2000. What is very important, many of them are still valid in present days. We need to analyse, why identified objectives were not yet realised? We need analyse social economic reason and also impacts of these objectives. What we can see, roll out of technologies is much faster then take up of solutions.

Second is to compare situation in different regions, we need to provide mapping exercise of European regions and compare the situation in these regions. What are the socio-economic differences? What are the geographic reasons? Which factors influence in different regions roll out and take up?

- **Cloud Hosting:** The Cloud Hosting concept is the basic enabler for providing scalable computation, software, data access and storage services.
- **Data/Context Management:** The Data and Context management implements facilities for transfer, conversion, storage, analysis and access of a huge amount of data through the cloud.
- **Internet of Things Services Enablement:** Instead of only connecting computers and servers, the Internet of Things (IoT) takes all physical objects into account and extends the capabilities of entities to process information autonomously, react proactively and context sensitive to their current environment.
- **The Applications/Services Ecosystem and Delivery Framework:** It will enable the creation, composition, delivery, monetization and use of applications and services on the Future Internet.
- **Interface to Networks and Devices:** A broad range of devices will be enabled to communicate in the Future Internet through any wireless or fixed physical network connection at any place.
- **Security:** Common to any application is the strong requirement of privacy, integrity, and security, providing the foundation to get acceptance and trust from all stakeholders.

All this challenges are also important for long time sustainability, and also for agri-food standardisation as whole.

In any areas there exist two types of standardisation efforts. Community or Industry driven effort. For such is necessary to have structure inside community, which will take leadership in this area.

Politically driven standardisation – in agri/food are it could include standards for animals' welfare, food security etc. To become this reality is necessary to support related policy. Also is good for policymakers to have partners on level of community

For any standard is important to transfer this standard to community, so there is necessary to support communication between researchers, politicians, industry, and also final users. It is necessary to transfer all knowledge to the users.

It is important, their requirements for standards are not pushed only by politicians or by large industry, but the standards have to cover needs of users like farmers, but also regional and local IST developers. It will not be succeeding without participation of this communities on all process

Mainly food market is international and for example information about food traceability has to be shared worldwide. So it is important also in this area to support standards Worldwide.

Justification

FAO is providing E-agriculture strategy guide developed together with International Telecommunication Union (ITU). This strategy guide assists countries in developing national strategies. FAO has developed Digital service portfolio to increase access to data, information, maps and statistics. On the side of EU, the agricultural European Innovation Partnership (EIP-AGRI) works to foster competitive and sustainable farming and forestry that 'achieves more and better from less'. It contributes to ensuring a steady supply of food, feed, and biomaterials, developing its work in harmony with the essential natural resources on which farming depends. he European Innovation Partnership for Agricultural productivity and Sustainability (EIP-AGRI) has been launched in 2012 to contribute to the European Union's strategy 'Europe 2020' for smart, sustainable, and inclusive growth.

References

1. Project Breakthrough. DISRUPTIVE TECHNOLOGIES - Digital Agriculture - Feeding the future. United Nations Global Compact, Volans. 24. May. 2017. Available at: http://breakthrough.unglobalcompact.org/site/assets/files/1332/hhw-16-0025-d_n_digital_agriculture.pdf
2. FAO. Digital service portfolio. Available at: http://www.fao.org/about/meetings/digital-agriculture-transformation/side-event/en/
3. Trendov, N. M., Varas, S. & Zeng, M. 2019. Digital technologies in agriculture and rural areas – Status report. Rome. ISBN 978-92-5-131546-0. Available at: http://www.fao.org/3/ca4985en/ca4985en.pdf
4. Séronie, J-M. 2020. The Digital Revolution, Precision Agriculture And Conservation Farming. Will Agri. 20. January 2020. Available at: https://www.willagri.com/2020/01/20/the-digital-revolution-precision-agriculture-and-conservation-farming/?lang=en
5. Weltzien, C. 2016. Digital agriculture – or why agriculture 4.0 still offers only modest returns. In LANDTECHNIK. 71(2), 2016, 66–68. DOI: 10.15150/lt.2015.3123. Available at: https://www.researchgate.net/profile/Cornelia_Weltzien/publication/304379608_Digital_agriculture_-_or_why_agriculture_40_still_offers_only_modest_returns/links/576d657b08ae0b3a3b755152/Digital-agriculture-or-why-agriculture-40-still-offers-only-modest-returns.pdf
6. ROTZ, Sarah, Emily DUNCAN, Matthew SMALL, Janos BOTSCHNER, Rozita DARA, Ian MOSBY, Mark REED and Evan D.G. FRASER. The Politics of Digital Agricultural Technologies: A Preliminary Review. Sociologia Ruralis. 2019, 59(2), 203-229. DOI: 10.1111/soru.12233. ISSN 0038-0199. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/soru.12233
7. EIP-AGRI Focus Group. 2020. Reducing food loss on the farm – Final Report. April 2020. Available at: https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/eip-agri_fg_reducing_food_loss_on_the_farm_final_report_2020_en.pdf

Accessibility and Mobility

Description

Rural territories are worse equipped than urban ones in terms of accessibility to services and opportunities (SMARTA, 2020). Loss of public transport contributed to increased social inequality and marginality and undermining the liveability of rural communities. Improving accessibility is an essential prerequisite for the sustainable development of rural areas. A lack of transport opportunities has been shown to be a barrier for accessibility and social inclusion in contemporary society. (Berg & Ihlström, 2019). The travel by private car plays a central role in realizing everyday activities for rural dwellers. Poor public transport services limit children's and adolescents' independent mobility in particular. For increasing the mobility and accessibility in rural areas it is necessary to reduce car dependency (Berg & Ihlström, 2019).

Measures aimed at improving mobility and accessibility among different groups must therefore consider the geographical and social context in which they live. Car-sharing very rarely occurs among participants, except within families for weekend activities such as shopping. Furthermore, relying on car-pooling is difficult when there are no other options for transport in the area (Berg & Ihlström, 2019). Rural areas and public transport hubs need to be linked with public transport, for example by coordinating school buses and conventional public transport. Coordination between public transport and other forms of services, such as delivery of post, groceries, and other goods, is important for everyday activities without a car. Good transport alternatives to rural areas are thus a prerequisite to attract labour and visitors for companies and organizations that are active in rural areas (Berg & Ihlström, 2019).

European Committee of the Regions (2014) considers: (i) that mobility is above all a right connected with the free movement of persons, and is a prerequisite for the quality of life to access essential public services (i.e., education, health and social services), commute to work or seek employment opportunities, pursue leisure activities, visit relatives, purchase goods and services; (ii) t remoteness and isolation increasing unemployment rates; (iii) necessity new approaches to funding transport, e.g., offering citizens personal transport budgets, such as 'mobility cheques'; (iv) need new tools - Intelligent transport systems (ITS) and improved ICT, and route-based public transport with on-demand transport such as 'on-call' buses, collective taxis, or car sharing.

The importance of car ownership for employment opportunities is high due to the lack of public transport (Soder & Peer, 2018). The measures and investments that foster sustainable mobility are as follows: enabling car-pooling; encouraging public transport usage (e.g., provision of subsidized public transport tickets); changes in the arrangement of work schedule and work location (e.g., teleworking); and investments in infrastructures and services (e.g., bike-sheds; prioritized parking for those who car-pool; provision of shuttle bus services). Forms of shared mobility become increasingly accessible in rural areas, mainly via digitization (e.g., mobility apps) and, in the longer run, automation (i.e., self-driving cars). There is potential to create and to shape new forms of (shared) mobility (Soder & Peer, 2018). Accessibility is a fundamental prerequisite for sustainable development, as an intrinsic right and condition of living (Vitale Brovarone & Cotella, 2020). As a consequence of the intense

processes of depopulation, ageing, and de-anthropization, as well as rural territories often suffer from scarce and inadequate access to basic services, amenities, and opportunities. Marginalization processes are the causes and consequences of scarce accessibility, which in rural territories is particularly challenging and undermines the liveability of rural communities (Vitale Brovarone & Cotella, 2020).

Moreover, rural territories are highly car-dependent and public transport services could be efficient, and particularly for those who have limited access to car use. Therefore, providing and supporting alternative forms of transport in rural areas is primarily aimed at counteracting transport exclusion (Vitale Brovarone & Cotella, 2020). This has influenced not only the elderly, but also to young people. Through the collaboration and coordination of local institutions (municipalities, schools, and health services), local transport companies and others, mobility could be improved. The digitalization & ICT of services (e.g., telemedicine, telecare, e-learning, and e-government) can potentially provide economic, environmental, and social benefits (Vitale Brovarone & Cotella, 2020).

Justification

Rural territories are worse equipped than urban ones in terms of accessibility to services and opportunities. A lack of transport opportunities has been shown to be a barrier for accessibility and social inclusion in contemporary society. In rural and sparsely populated areas, access to public transport is often poor compared to urban areas.

Good transport alternatives to rural areas are thus a prerequisite to attract labour and visitors for companies and organizations that are active in rural areas. Accessibility is a fundamental prerequisite for sustainable development, as an intrinsic right and condition of living

The dematerialization of services (e.g., telemedicine, telecare, e-learning, and e-government) can potentially provide several economic, environmental, and social benefits.

References

1. Berg, J., & Ihlström, J. (2019). The importance of public transport for mobility and everyday activities among rural residents. Social Sciences, 8(2), 58. https://www.mdpi.com/2076-0760/8/2/58/htm
2. European Committee of the Regions (2014). Opinion of the Committee of the Regions on 'Mobility in geographically and demographically challenged regions.' https://op.europa.eu/en/publication-detail/-/publication/01d07fe7-7085-11e4-b593-01aa75ed71a1/language-en/format-PDF
3. SMARTA (2020) The SMARTA project in a nutshell. https://ruralsharedmobility.eu/about/
4. Soder, M., & Peer, S. (2018). The potential role of employers in promoting sustainable mobility in rural areas: Evidence from Eastern Austria. International journal of sustainable transportation, 12(7), 541-551. https://www.tandfonline.com/doi/full/10.1080/15568318.2017.1402974
5. Vitale Brovarone, E., & Cotella, G. (2020). Improving Rural Accessibility: A Multilayer Approach. Sustainability, 12(7), 2876. https://www.mdpi.com/2071-1050/12/7/2876/pdf

Public Investment

Description

Public capital investments in rural areas include all investment that need to enable normal function of the rural life and rural economy. Most common example of public capital investments in the context of rural development are rural roads (road connecting rural places as well as roads connecting agricultural parcels), electricity, sewage, watery systems. Besides these type of projects, investments in **infrastructure for support of rural businesses** (e.g. irrigation infrastructure, water accumulations; channels for drainage; access to electricity on agricultural fields); **infrastructure for public services** (hospitals, schools, daily care for children and elderly people) and **other types of infrastructure** (facilities for social life and recreation), can also be considered as important groups of capital investments of public interest.

Investments in **roads** is crucial for easy access to rural area essential for maintaining rural population and attracting newcomers (Escobal and Ponce, 2002). Also, roads within rural areas with specific accent on the roads to agricultural lands is essential for the development of the agricultural, the gravitating industries thus the overall rural economy. Capital investments in **electricity, watery system and sewage** are additional essential investments for maintaining and attracting rural population (The Center for Development of the SE planning region, 2014). The intensive migration towards the urban areas have made significant impact on these types of investments in the rural areas especially in the Western Balkans and Eastern Europe countries. A significant factor influencing the political decisions for investing in this area is the political impact without paying attention on the public interest. Besides the importance of this investments in creating main conditions for living, this projects have multiplier effect on the local economy and the overall economy considering the fact that execution of these projects involve long list additional industries.

For maintaining rural population and attracting newcomers in the rural areas, investments in infrastructure for public services (e.g. hospitals, day care for children and elderly people) are of a great importance. This type of infrastructure has shown direct correlation with the number of young populations in the rural areas. One of the main reasons why youngsters are leaving rural areas is limited access to this type of services. Additionally, investments in other type of capital project that enhances the wellbeing in the rural areas are also projects such as recreational facilities, facilities enabling socialization both for youngsters and elderly people (Ministry of Agriculture, forest and water economy of the Republic of North Macedonia, 2014).

The agriculture as main economic activity and surrounding industries in rural areas need to be also supported with specific capital investments supporting the rural businesses (DG Agriculture and Rural Development, Unit Farm Economics, 2018). Type of project in this groups are irrigation infrastructure, water accumulations, channels for drainage, access to electricity on agricultural fields. Scarcity of water as a result of climate change increases the importance to invest in larger networks for irrigation supporting larger arable lands (UN Water, 2019). Additionally, the need of efficient irrigation requires reconstruction of already existing irrigation system that will ensure more economical usage of water with acceptable prices for the farming business. More often cases extreme weathers causing floods have serious impact on the agriculture. To avoid this type of problems

investments in new drainage systems and channels and reconstruction of the existing one is essential. The increased interest for operation in agricultural products with higher added value (e.g. green-house production) brought on the agenda the issue of stable electricity to the agricultural fields. Assuring stable access to electricity for agricultural purposes is additional type of investment in the group specific capital investments supporting rural businesses.

Justification

Public capital investments in rural areas encompass investments that are required for normal functioning of rural life and rural economy. Examples of public capital investments in the context of rural development are rural roads, investments in **infrastructure for support of rural businesses, infrastructure for public services** and **other types of infrastructure**. To make rural areas more attractive for rural population and potential newcomers it is crucial to support investments in infrastructure for public services (e.g. hospitals, day care for children and elderly people). The agriculture as main economic activity and surrounding industries in rural areas need to be also supported with specific capital investments.

References

1. DG Agriculture and Rural Development, Unit Farm Economics, 2018. Rural areas and the primary sector in the EU. Available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/eu-rural-areas-primary-sector_en.pdf
2. Escobal, J., Ponce, C., 2002. The Benefits of Rural Roads: Enhancing Income Opportunities for the Rural Poor. Lima GRADE 2002 – Work. Pap. 40-I, Working Paper 40 56. Available at: https://www.researchgate.net/publication/5078934_The_Benefits_of_Rural_Roads_Enhancing_income_opportunities_for_the_rural_poor
3. Ministry of Agriculture, forest and water economy of the Republic of North Macedonia, 2014. National strategy for agriculture and rural development 2014-2020. Available at: http://arhiva.mzsv.gov.mk/NSZRR%202014-2020.pdf
4. The Center for Development of the SE planning region, 2014. PROGRAMME FOR DEVELOPMENT OF THE SOUTHEAST PLANNING REGION. Available at: https://www.rdc.mk/southeastregion/images/JugoIstocenRegion_razvojnaPrograma%202015_2019-EN.pdf
5. UN Water, 2019. Climate Change and Water UN-Water Policy Brief. Available at: https://www.unwater.org/publications/un-water-policy-brief-on-climate-change-and-water/

Technical Support Services

Description

The agriculture sector is a unique sector due to its strategic importance for both European citizens (consumers) and the European economy (regional and global) which ideally should make the whole sector a network of interacting organizations. Rural areas are of particular importance with respect to the agri-food sector and should be specifically addressed within this scope. There is an increasing tension that has not been experienced in any other sector between the requirements to assure full food safety as well as sustainability while keeping costs under control. Also it is necessary to assure the long-term strategic interests of Europe and worldwide, also with regard to food security and global challenges. To solve the problems of future farming, we need to develop a new generation of knowledge management, which will help the agri-food sector to adopt in a changing world.

The objective of future knowledge management is to help the agri-food sector to be competitive in the market in the sense of required products, quality and amount, to be able to react on changes in the world market, changes in subsidies systems, requirements about environment protection, but also to be able to react for example on increasing costs of inputs or on climate changes. The future knowledge management systems have to support not only direct profitability of agri-food sector or environment protection, but also activities of individuals and groups, allowing effective collaboration among groups in agri-food industry and consumers and wider communities, especially in rural domain.

Having these considerations in mind, the proposed vision lays the foundation for meeting ambitious but achievable operational objectives that in the long run will definitively contribute to fulfil identified needs. The knowledge management represents the ongoing relationship between people, processes and technology systems involved in designing, capturing, and implementing the intellectual infrastructure of an organization. It encompasses the necessary changes in management attitudes, organizational behaviour, and policy. Knowledge management should create a value to the customer and increasing profitability of farms. It is clear from the definition that knowledge management goes one step further from the simple concept of information systems and data exchange and entails other two factors, people, and processes. This will require better exchange of information, but also adoption of new scientific and research results into agri-food sector.

Justification

The discussions on social networks demonstrate the growing importance of bottom up activities, collaboration, and social media. Open innovation and open data access are important for the future rural development. Such activities as Living Labs could help in future to rural regions. For urban population there exists growing activity called Smart Cities. It is important to support similar activities for rural regions - Smart Rural Regions.

References

1. Hasgall, A. and Shoham, S., 2008. Knowledge processes: from managing people to managing processes. Journal of Knowledge Management [Online], 12(1). Available from: http://www.emeraldinsight.com.ezp2.bath.ac.uk/Insight/viewPDF.jsp?contentType=Article&Filename=html/Output/Published/EmeraldFullTextArticle/Pdf/2300120104.pdf
2. Taminiau, Y., Smit, W. and Lange, A., 2009. Innovation in management consulting firms through informal knowledge sharing. Journal of Knowledge Management [Online], 13(1). Available from: http://www.emeraldinsight.com.ezp2.bath.ac.uk/Insight/viewPDF.jsp?contentType=Article&Filename=html/Output/Published/EmeraldFullTextArticle/Pdf/2300130104.pdf
3. Verdouw, C.N., Wolfert, J., Beulens, A.J.M., 2007. Information Integration in Multi-dimensional Agri-Food Supply Chain Networks: A Service-Oriented Approach. In: Cunningham, P., Cunningham, M. (Eds.), Expanding the Knowledge Economy: Issues, Applications, Case Studies 4. IOS Press, Amsterdam, pp. 1024-1031.
4. Wong, K.Y and Aspinwall, E., 2005. An empirical study of the important factors for knowledge management adoption in the SME sector. Journal of Knowledge Management [Online], 9(3). Available from: http://www.emeraldinsight.com.ezp2.bath.ac.uk/Insight/viewPDF.jsp?contentType=Article&Filename=html/Output/Published/EmeraldFullTextArticle/Pdf/2300090305.pdf
5. Gnip, P., Charvat, K., Krocan, M., 2008. Analysis of external drivers for agriculture. In World conference on agricultural information and IT, IAALD AFITA WCCA 2008, Tokyo University of Agriculture, Tokyo, Japan, 24 - 27 August 2008 pp.797-801 ref.2. ISBN 9784931250024. Available from: https://www.researchgate.net/profile/Karel_Charvat2/publication/234169091_Analysis_of_External_Drivers_for_Agriculture/links/02bfe50fcde7b0a274000000/Analysis-of-External-Drivers-for-Agriculture
6. DataBio H2020 project. 2019. DataBio Deliverable D4.4 – Service Documentation. Available at: https://sintef.brage.unit.no/sintef-xmlui/bitstream/handle/11250/2648027/DataBio_D4.4%2bService%2bDocumentation_v1.0_2019-12-30_EXUS.pdf?sequence=1&isAllowed=y
7. ŘEZNÍK, T., CHARVÁT, K., LUKAS, V., CHARVÁT, K., KEPKA, M., HORÁKOVÁ, Š., KŘIVÁNEK, Z., ŘEZNÍKOVÁ, H. Open Farm Management Information System Supporting Ecological and Economical Tasks. In Environmental Software Systems. Computer Science for Environmental Protection. Cham: Springer, 2017. pp. 221-233. ISBN: 978-3-319-89934-3, ISSN: 1868-4238. Available at: https://books.google.cz/books?hl=cs&lr=&id=18RXDwAAQBAJ&oi=fnd&pg=PA221&ots=6IHvjKzlyA&sig=TzFRAJqGnsql2638FcUUBXmZ_7g&redir_esc=y#v=onepage&q&f=false

Financial Support Services

Description

Financial schemes in the context of rural attractiveness present different form of financial programs for supporting rural economies and rural population. Financial schemes can be from different sources, but most common ones are governmental (both central and local) and non-governmental sources. Both foundations are focused on two main supporting streams: support for rural population income (e.g. subsidies for farmers) and support of capital investments in rural economies, rural infrastructure and rural social life (European Court of Auditors, 2016; Margaras, 2017; Volkov et al., 2019). Achieving higher attractiveness requires existence of certain preconditions and characteristics of the financial support such as: consistency with the real needs of the rural areas and rural population; technical support in application process; low level of bureaucracy, higher transparency and focus on specific groups of population such as youth and women (FAO, 1998; Finck et al., 2016; Gibon & Mihina, 2003).

Achieving high level of effectiveness of financial support for rural development and thus increasing the rural attractiveness is possible only if the needs of the rural population and rural environment are incorporated within these support programs (European Commission, 2014; 'The European Agricultural Fund for Rural Development', 2009). Absence of clear picture of the real situation of the rural life and the needs of the rural population is one of the most common bottlenecks that results in poorly allocated budgets. The example of the Western Balkan countries and their experience with execution of the EU pre-accession money for rural development is the most recent example of substantial gap between policy creation and the real needs of the rural socio-economic life (Volk et al., 2012). Historical marginalisation of the rural areas and economies combined with poor technical capacities of the institutions on a policy level are most common factors contributing to this situation. Like in the case of governmental financial schemes, the destiny of the non-governmental support programs is very similar. Developing countries in Eastern Europe and the Balkans have been beneficiaries for these programs for the last 30 years. Unfortunately, the effect of these programs were very marginal mainly as a result of low expertise, corruption and lack of management which are the main factors for poor understanding of the real needs of the rural population and rural economies (UNODC Statistics and Surveys Section (SASS), 2011). Establishing a process for development of programs for financial support on all policy levels with involvement of the final users is essential for achievement of positive results in rural development and increasing the rural attractiveness for the current population and the potential newcomers (European Commission, 2014).

Having strong technical support for beneficiaries, for usage of financial schemes in rural areas is another important attribute of this general economics factor. Applying for financial support is perceived as extensive administrative process that requires special skills and knowledge which very often is absent among rural population and rural businesses. Business planning, project writing, financial planning and similar skills are essential for enabling access to this financial program. Creating special schemes for developing and nurturing these skills among users and introduction of financial support for technical assistance are crucial for achieving

higher level of access to this financial scheme. Countries with strong policies in this direction have shown much better results in usage of available financial program for rural development.

Financial programs for support of rural development are usually aligned with high level of bureaucracy and low transparency in the application process as well as in the execution stage when finance is approved (Bosworth et al., 2020; Druel et al., 2015; Margaras, 2017). These factors are among the most crucial demotivating factors for the users and for the overall low level of usage of available opportunities for financial support. Complete elimination of bureaucracy is an almost impossible scenario mainly because of two reasons: beneficiaries have always tendency to capitalize on anomalies of non-defined policies whereas administration always tends to go with a safer approach including high criteria for applying, long list of documentation for proving eligibility, long duration of the approval process and extensive process of controlling the approved finance. Existence of clearly understandable policy that optimizes these administrational processes combined with strong technical support on the user side is a "win-win" approach that promises high effectiveness of the financial programs enabling higher attractiveness of the rural areas.

Aging of the rural population which has enormous impact on rural life and rural economic activities has put a highlight on the specific population categories such as youth and women (Athenosy & Revenco, 2014; Burholt & Dobbs, 2012). Push migration and modern technologies have contributed significantly to decrease of the number of young people in rural areas who are expected to take over the economies and other supporting activities in the rural areas. In this conditions women have also taken over the burden of scarce human resources and have created a demand for their more extensive involvement in the broader socio-economic life in the rural areas (Franic & Kovacicek, 2019). Developing and implementing policies for financial support that incorporates the special needs of these two categories of population presents a very important driver for rural development and can significantly contribute to attracting newcomers in these regions.

Justification

Financial programs for support of rural development are very important driver for rural attractiveness. Issues related to financial schemes which have to be addressed more carefully in order to effectively support rural economies and rural population are: consistency of the provided financial schemes with the real needs of the rural areas and rural population; focus on specific groups of population when designing the financial schemes; technical support in the application for financial schemes; low level of bureaucracy and higher transparency in the process of application.

References

1. Athenosy, L., & Revenco, V. (2014). Ageing Populations in Europe: Challenges and Opportunities for the CEB (p. 82). Council of Europe Development Bank. Available at: https://coebank.org/media/documents/Study_Ageing.pdf
2. Bosworth, G., Price, L., Hakulinen, V., & Marango, S. (2020). Rural Social Innovation and Neo-endogenous Rural Development. In E. Cejudo (Ed.), Neoendogenous Development in European Rural Areas: Results and Lessons. Springer Nature. Available at:
3. https://books.google.mk/books?id=tZPHDwAAQBAJ&pg=PA130&lpg=PA130&dq=.+(2020).+Rural+Social+Innovation+and+Neo-endogenous+Rural+Development.+In+E.+Cejudo+(Ed.),+Neoendogenous+Development+in+European+Rural+Areas:+Results+and+Lessons.&source=bl&ots=-UuAG65J0v&sig=ACfU3U2u1Gmg-uAeFtCCbdIRIIst9KvEoA&hl=en&sa=X&ved=2ahUKEwiG67qN9YrpAhUqQkEAHYkaAVgQ6AEwAXoECAoQAQ#v=onepage&q=.%20(2020).%20Rural%20Social%20Innovation%20and%20Neo-endogenous%20Rural%20Development.%20In%20E.%20Cejudo%20(Ed.)%2C%20Neoendogenous%20Development%20in%20European%20Rural%20Areas%3A%20Results%20and%20Lessons.&f=false
4. Burholt, V., & Dobbs, C. (2012). Research on rural ageing: Where have we got to and where are we going in Europe? Journal of Rural Studies, 28(4), 432–446. Available at: https://linkinghub.elsevier.com/retrieve/pii/S0743016712000101
5. Druel, E., Chrzanowski, P., Pollock, R., & Gray, J. (2015). WHERE DOES EUROPE'S MONEY GO? A GUIDE TO EU BUDGET DATA SOURCES. Open Knowledge. Available at: https://community.openspending.org/resources/eu/pdf/WhereDoesEuropesMoneyGo.pdf
6. European Commission. (2014). Empowering rural stakeholders in the Western Balkans. European Commission. Available at: http://www.forum-synergies.eu/docs/western-balkans-report-2014_en.pdf
7. European Court of Auditors. (2016). EU support for rural infrastructure: Potential to achieve significantly greater value for money : pursuant to Article 287(4), second subparagraph. Available at: https://www.eca.europa.eu/Lists/ECADocuments/SR15_25/SR_RURAL_EN.pdf
8. FAO, D. E. (1998). Rural Women and Food Security: Current Situation and Perspectives. Rome, Italy: FAO. Available at: http://www.fao.org/3/W8376E/W8376E00.htm
9. Finck, M., Ehrhart, K., & Núñez Ferrer, H. (2016). How the EU and Member States manage data transparency and accessibility on EU funds. Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2016/572692/IPOL_STU(2016)572692_EN.pdf
10. Franic, R., & Kovacicek, T. (2019). The professional status of rural women in the EU (p. 70). Policy Department for Citizens' Rights and Constitutional Affairs Directorate General for Internal Policies of the Union. Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608868/IPOL_STU(2019)608868_EN.pdf
11. Gibon, A., & Mihina, S. (2003). Livestock Farming Systems in Central and Eastern Europe. Wageningen Academic Publishers. Available at: https://books.google.mk/books?id=cBDTDwAAQBAJ

12. Margaras, V. (2017). Guide to EU Funding 2014-2020. Brussels © European Union. Available at: https://www.europarl.europa.eu/EPRS/Funding_Guide_EN.pdf

13. The European Agricultural Fund for Rural Development. (2009). EU Rural Review - The Magazine from the European Network for Rural Development. Available at: https://enrd.ec.europa.eu/sites/enrd/files/B99A191B-F5A8-43DF-59C2-452E3073B91D_0.pdf

14. UNODC Statistics and Surveys Section (SASS). (2011). Corruption in the western Balkans: BRIBERY AS EXPERIENCED BY THE POPULATION. UNITED NATIONS OFFICE ON DRUGS AND CRIME. Available at: https://www.unodc.org/documents/data-and-analysis/statistics/corruption/Western_balkans_corruption_report_2011_web.pdf

15. Volk, T., Rednak, M., & Erjavec, E. (2012). Western Balkans agriculture and European integration: Unused potential and policy failures? Post-Communist Economies, 24(1), 111–123. Available at: https://www.tandfonline.com/doi/abs/10.1080/14631377.2012.647631

16. Volkov, A., Balezentis, T., Morkunas, M., & Streimikiene, D. (2019). Who Benefits from CAP? The Way the Direct Payments System Impacts Socioeconomic Sustainability of Small Farms. Sustainability, 11(7), 2112. Available at: https://www.mdpi.com/2071-1050/11/7/2112

Education, Research, and Innovation

Description

Education, research and innovation (ERI) as drivers are in the group of economic factors primarily as a result of their importance to enhance and support the economic activities in the national economy and thus positively affect the rural economy (European Network for Rural Development, 2009). These drivers are essential for the national economic sectors to be in line with the demand at country level as well as with the global market and technological trends since we live in a tightly connected globalised world. The ERI support the rural economy through two main streams - providing skilful labour force and providing up-to-date knowledge (OECD, 2007).

Additionally, the importance of ERI in the context of rural economy is even greater considering the global challenges such as food security, climate change, digitalisation, scarcity of labour force and jeopardized natural environment and biodiversity (Détang-Dessendre et al., 2018; European Commission, 2019; European Network for Rural Development, 2009; FAO, 2016).

Considering the above there are several aspects that need to be considered when dealing with ERI, those are: the need of increased budgets for ERI for rural development; stronger links between ERI and the economies in the rural sector; Developed Vocational Education and Training (VET) in rural areas and for rural topics; Increasing the awareness for the importance of ERI among policy creators and rural population (Bajramović et al., 2016; (Cedefop - European Centre for the Development of Vocational Training, 2013).

It can be said that the size of the budget for ERI for rural development can be an indication of how countries perceive the topic of rural development and the degree of importance of this issue. In this context Western economies have shown much higher consciousness in this direction in comparison to the Eastern economies (Lampietti et al., 2009; Vosejpková, 2012). But if we compare the budget allocated to other spheres in the socio-economic life we can conclude that the budget for ERI for the topic of rural development is significantly lower than for other sectors. The situation becomes even more critical if we take in consideration the above mentioned anticipated global challenges. Therefore, it is crucial for the policy makers to start creating size of budgets that are in line with the needs of the ERI sector that should be derived from the needs of the national rural development and the need to adopt to the global rural challenges. Similar like in the case of the policies dealing with other economic factors a consistency of the budget for ERI and the needs of the rural economies is weak or absent. Especially this is the case of developing countries in Eastern Europe.

The developing capacity of the ERI sector is mainly determined by its capability to come up with new applicative knowledge (basic science) or the capability to adopt existing scientific knowledge to the local needs in the rural economy (Vidickiene et al., 2014). For less developed countries, with much scarce resources for ERI the second aspect is of greater importance. In order to enhance the capacity of the ERI to adopt existing scientific knowledge to the real conditions of the local rural economy it is important to establish a strong link between rural businesses and the academia (European Commission, 2018). Same as in the case of the budgets for ERI, Western countries are much stronger in this area. But even in the case of Western countries, ERI sector has significantly

failed to consider the needs of small-scale rural economies (e.g. individual family farms) in favour of the corporate rural economies. The situation is even more critical if we take in consideration that small-scale farming is a significant driver for rural employment, main creators of the supply for healthy and organic food and in general a significant contributor to the global agricultural GDP (Bajramović et al., 2016). We can conclude that stronger links with academia should be sturdily pursued and they should be conditionally connected with the budget for ERI (Heanue & O'Donoghue, 2014).

VET should be one of the main education links between the academia and the development process of the rural economy. Existence of well-developed VET is essential for creating skilful labour that can be absorbed by the rural economy as well as main source for knowledge to keep in line with the global technology challenges and early anticipation of potential market distortions. Again, Eastern Europe and especially the Balkan countries have shown much weaker approaches in this direction (Mojsoska-Blazevski, 2019; World Bank, 2017; Bartlett & Pagliarello, 2016; Swiss Agency for Development and Cooperation, 2009). Student enrolment in agricultural VET has been continuously decreasing in the last two decades and policy treatment of VET issue in agriculture and rural development has been very poor. Again, this situation hits the individual rural businesses the most because the budget capacities of corporate businesses allow high flexibility to adopt to the situation. Considering this, it is essential to develop a policy that emphasizes the needs of the VET which again needs to be in line with the real necessities of the final beneficiaries and those are rural population and rural businesses with special accent on individual private businesses.

Justification

Education, research, and innovation are among the core drivers when it comes to supporting the national economy which also has a positive impact on the rural economy. All of the above-mentioned aspects of the ERI as economic factor point at the absence of higher awareness of the importance of the ERI among policy creators and rural population as one of the main driver of rural development and consequently rural attractiveness. Among the most evident possibilities to support the ERI in the context of rural development is increasing the budgets for this sector and also positioning the development of Vocational Education and Training (VET) in rural areas and for rural topics as a top priority for policy makers.

References

1. Bajramović, S., Bogdanov, N., Butković, J., Dimitrievski, D., Erjavec, E., Gjeci, G., Gjokaj, E., Hoxha, B., Stomenkovska, I. J., Konjević, D., Kotevska, A., Martinović, A., Miftari, I., Nacka, M., Ognjenović, D., Rednak, M., Tuna, E., Volk, T., & Zhllima, E. (2016). Analysis of the agricultural and rural development policies of the Western Balkan countries. Publications Office. Available at: http://dx.publications.europa.eu/10.2791/744295
2. Bartlett, W., & Pagliarello, M. C. (2016). Agenda-setting for VET policy in the Western Balkans: Employability versus social inclusion. European Journal of Education, 51(3), 309–315. Available at: http://eprints.lse.ac.uk/68873/1/Bartlett_Agenda-setting%20for%20VET_2017.pdf
3. CEDEFOP - European Centre for the Development of Vocational Training. (2013). Labour market outcomes of vocational education in Europe: Evidence from the European Union labour force survey. Luxembourg:

Publications Office of the European Union, 2013. http://dx.publications.europa.eu/10.2801/44683. Available at: https://www.cedefop.europa.eu/files/5532_en.pdf

4. Détang-Dessendre, C., Geerling-Eiff, F., Guyomard, H., & Poppe, K. (2018). EU Agriculture and innovation: What role for the CAP? INRA and WUR. Available at: https://www.researchgate.net/publication/324603024_EU_AGRICULTURE_AND_INNOVATION_WHAT_ROLE_FOR_THE_CAP_EU_AGRICULTURE_AND_INNOVATION_WHAT_ROLE_FOR_THE_CAP
5. European Commission. (2018). Agricultural Knowledge and Innovation Systems: Stimulating creativity and learning. Available at: https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/eip-agri_brochure_knowledge_systems_2018_en_web.pdf
6. European Commission. (2019). AGRIRESEARCH FACTSHEET: DIGITAL TRANSFORMATION IN AGRICULTURE AND RURAL AREAS. European Commission. Available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-digital-transformation_en.pdf
7. European Network for Rural Development. (2009). EU Rural Review—Creativity and Innovation in EU Rural Development. European Network for Rural Development. Available at: https://enrd.ec.europa.eu/sites/enrd/files/B99849C0-00E8-A7DC-1D6A-775E2ED9F89A.pdf
8. FAO. (2016). Incorporating decent rural employment in the strategic planning for agricultural development. Food and Agriculture Organization of the United Nations. Available at: http://www.fao.org/3/a-i5471e.pdf
9. Heanue, D. K., & O'Donoghue, C. (2014). The Economic Returns to Formal Agricultural Education. Agriculture and Food Development Authority. Available at: https://www.teagasc.ie/media/website/publications/2014/Teagasc_Impact_of_Education_Report.pdf
10. Lampietti, J. A., Lugg, D. G., Van der Celen, P., & Branczik, A. (2009). The Changing Face of Rural Space: Agriculture and Rural Development in the Western Balkans. The World Bank. Available at: http://documents.worldbank.org/curated/en/431901468299121958/pdf/484610PUB0Rura101Official0Use0Only1.pdf
11. Mojsoska-Blazevski, N. (2019). SKILLS MISMATCH MEASUREMENT IN NORTH MACEDONIA. European Training Foundation. Available at: https://www.etf.europa.eu/sites/default/files/2019-07/Skills%20mismatch%20measurement_North%20Macedonia.pdf
12. OECD. (2007). Innovative Rural Regions: The role of human capital and technology. Available at: https://www.oecd.org/regional/regional-policy/Innovative-Rural-Regions.pdf
13. Swiss Agency for Development and Cooperation. (2009). Vocational education in the Western Balkans. Available at: https://www.fdfa.admin.ch/dam/deza/en/documents/themen/grund-und-berufsbildung/183696-berufsbildung-westbalkan-2009_EN.pdf
14. Vidickiene, D., Melnikiene, R., & Gedminaite-Raudone, Z. (2014). Development of Lithuanian rural regions towards knowledge society. In A. Wrzochalska (Ed.), Rural economies in Central Eastern European countries after EU enlargement. Inst. of Agricultural and Food Economics - National Research Inst. Available at: https://www.researchgate.net/profile/Teodora_Stoeva/publication/311793585_Development_and_management_of_rural_areas_in_Bulgaria_by_introducing_alternative_types_of_tourism/links/585ac38308ae8fce48f9105d/Development-and-management-of-rural-areas-in-Bulgaria-by-introducing-alternative-types-of-tourism.pdf
15. Vosejpková, M. (2012). Approaches to the rural development problems in the European Union and in some of the Central and Eastern European countries. Agricultural Economics (Zemědělská Ekonomika), 48(No. 4), 171–174. Available at: https://www.agriculturejournals.cz/publicFiles/59700.pdf
16. World Bank. (2017). Looking for Skills in the Former Yugoslav Republic Macedonia (Report Number: 112196-MK). World Bank. Available at: http://documents.worldbank.org/curated/en/914541498623380214/pdf/112196-WP-P133003-PUBLIC-27-6-2017-13-40-18-MKDReportLookingforSkillsFinal.pdf

Disaster Relief and Crisis Recovery Schemes

Description

Support schemes in extraordinary situations present specially designed programs developed to play the role of mitigation factors in the case of extraordinary situation such as pandemics, extreme weather conditions (floods, droughts) and similar (Delivorias & Scholz, 2020; Estrada et al., 2016). The appearance of the Covid-19 virus, frequent cases of extreme weather conditions in the last several years have substantial negative impact on the rural lives and have shown the need for structural changes that will enable introduction of proactive measures for successful mitigation (European Commission, 2020; FAO, 2020b). The institutional approach in this type of extreme situation must be in line with financial measures as well as the measures in technical areas (human expert capacity).

The **existent formal systems** for crises management in the countries have shown that there is need for structural reforms in the way that it will include the specific characteristics of the rural areas and needs of the rural population and economy. The latest cases of floods in North Macedonia (2016) and Serbia (2014) which had serious impact on the rural socio economic life, showed serious anomalies in the crisis's management and mitigation strategies (Milevski, 2017). Every crisis begins with initial essential measures mainly focused on saving human life, followed by financial support for the most impacted population. What the practice has shown is that the current support system does not have a proper approach in the later stages of the crisis where most of the challenges are in the area of **restoring** the economic and the social life. Usually this extraordinary situation has long term negative impact on the rural economy. The Covid-19 pandemic had impact on almost all agricultural subsectors especially to those sectors that are export oriented and sectors in which products have short shelf life (FAO, 2020a). Most vulnerable in these cases are the small economic entities (family farms, small business) with very limited capacities to adopt to the situation when there is a significant drop of their annual incomes. The situation is even worse if we consider that usually this type of businesses have limited capacities for loans considering the low value of the rural mortgages. The core for poor mitigation policies in this case is the absence of understanding the real situation in the rural areas and the way how rural population behaves in this case. From a social aspect, the pandemic created serious psychological impact also among rural population. Their everyday life is much more dependent on intensive social interaction than the urban population which must be considered in the measures for prevention and mitigation.

Justification

Based on the above, proactive policy schemes that involve cross institutional and multidisciplinary approaches in understanding the rural needs are essential in cases of appearance of extraordinary crises. This type of policies can guarantee covering all aspects of the rural socio-economics life in all stages of the crisis (initial stage, post crisis short-term stage and post-crises long term stage). These policies can reduce the migration that usually is intensified after this type of crises (e.g. floods). In some cases, crises can cause reversible processes in favor of the rural areas. These processes should be anticipated in the policies. The Covid-19 pandemics initiated a trend

among urban population to start thinking about the advantages to live in rural areas in times of social distancing and limited mobility of people. This can motivate people to start thinking to invest in rural areas and make decision to move from urban areas. But if essential preconditions are not available the process cannot achieve the potential dynamic which can result in significant impact on the already existent migration from rural area into the urban areas.

References

1. Delivorias, A., & Scholz, N. (2020). Economic impact of epidemics and pandemics. EPRS | European Parliamentary Research Service. Available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646195/EPRS_BRI(2020)646195_EN.pdf
2. Estrada, R., Griffith, A., Prim, C., & Sinn, J. (2016). Pandemics in a changing climate – Evolving risk and the global response. Available at: https://www.swissre.com/dam/jcr:552d59b2-76c6-4626-a91a-75b0ed58927e/Pandemics_in_a_changing_climate_Full_report_FINAL.pdf
3. European Commission. (2020). CORONAVIRUS: Emergency response to support the agriculture and food sectors. Available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-covid19-agriculture-food-sectors_en.pdf
4. FAO. (2020a). COVID-19 and the risk to food supply chains: How to respond? Available at: http://www.fao.org/3/ca8388en/CA8388EN.pdf
5. FAO. (2020b). Social Protection and COVID-19 response in rural areas. Available at: http://www.fao.org/3/ca8561en/CA8561EN.pdf
6. Milevski, I. (2017). Natural hazards in the Republic of Macedonia with special emphasis on flood and earthquake in Skopje in 2016. Available at: https://www.researchgate.net/publication/314154853_NATURAL_HAZARDS_IN_THE_REPUBLIC_OF_MACEDONIA_WITH_SPECIAL_EMPHASIS_ON_FLOOD_AND_EARTHQUAKE_IN_SKOPJE_IN_2016

Climate Change Risk Mitigation

Description

Climate action is also an important aspect of the EU rural development policy (EC, 2020). A number of steps have already been taken to integrate climate change concerns into successive reforms of Common Agricultural Policy (CAP).

Agroecological farming practices focusing on diversification of farming systems on landscape level, such as agroforestry, intercropping, mixed crop-livestock systems and crop rotation, can help farmers produce good yields while using natural resources more efficiently (Altieri et al., 2015; Nicholls et al., 2016). These practices can help improve soil health and carbon sequestration, water quality and nutrient flows, and control pests and diseases, and they can make farming systems more climate-resilient (EIP-AGRI, 2020). Compared to conventional monocultures, diversified agroecosystems supported greater biodiversity, better soil quality and water-holding capacity, and exhibited greater energy output/input ratios, and resilience to climate change. Diversified farming systems allow maintain soil fertility, crop production, also enhance the regulation of weeds, diseases, and insect pests while increasing pollination services (Altieri et al., 2015; Nicholls et al., 2016).

Both the Organic Farming Regulation and the CAP can be considered as tools with potential to foster ecological approaches in agriculture (EIP-AGRI, 2019). It is recommended to apply a diverse range of alternative agriculture or practices (biodynamic agriculture, organic farming, permaculture, natural farming, etc.), which are designed to reduce dependence on synthetic chemical pesticides, fertilizers, and antibiotics, and cut production costs, which in turn diminish adverse environmental consequences of modern agricultural production (Altieri et al., 2017; AEEU, 2020). Both organic and HNV farming, with its extensive, traditional agro-systems, produce a high environmental value and unique landscapes. Such practices, including low or minimal tillage, crop rotation and reduced fertilisation, present an important opportunity for climate adaptation (EEA, 2029). Technological development and digitization make possible big leaps in resource efficiency enhancing an environment and Climate Smart Agriculture (CSA), which reduces the environment-/climate impact of farming and decrease costs for farmers. CSA helps to mitigate and adapt to climate change, and its measures are diverse and include greenhouse gases emission reductions, sink enhancements, and fossil fuel offsets for mitigation (Scherer & Verburg, 2017), using modern technologies, such as the robots, satellites and drones (CEMA, 2017; EC, 2019).

Precision Agriculture (PA) or precision farming is also related to more recent approaches linked to climate change resilience, such as CSA (Zarco-Tejada, 2014). PA nowadays is seen as an "…environment friendly system solution that optimizes product quality and quantity while minimizing cost, human intervention and the variation caused by unpredictable nature" (Zarco-Tejada, 2014). PA comprises an improved management technologies such as soil sensing and mapping, yield monitoring and mapping, satellite-based positioning, remote sensing, field and crop scouting, geographical information systems (GIS), variable rate application, and automatic steering (Say et al., 2018). Guidance systems are the generic backbone technology for PA. They can be used by all kinds of equipment (e.g. tractors, combine-harvesters, sprayers, planters, etc.) and as part of a broad range of different

agricultural applications. Guidance systems focus on precise positioning and movement of the machine with the support of a Global Navigation Satellite System (GNSS) (CEMA, 2017).

It is argued that the lack of a clear definition of PA makes tracking adoption more difficult (Lowenberg-DeBoer & Erickson, 2019). One aspect of this is how to distinguish PA from other terms describing agricultural technology (e.g., site-specific farming, smart farming, and digital agriculture). From another perspective, there is no clear definition of what technologies are included in PA. The International Society for Precision Agriculture (ISPA) solicited input from their members on a definition "Precision agriculture is a management strategy that uses electronic information and other technologies to gather, process, and analyze spatial and temporal data for the purpose of guiding targeted actions that improve efficiency, productivity, and sustainability of agricultural operations."

It has been argued that young, well-capitalized farmers with large land areas and higher levels of education tend to be more willing to apply new technologies (Barnes et al., 2018; Say et al., 2018; Takacsne Gyorgy et al., 2018). PA technologies require significant investment of both capital and time but provide both productivity and profitability benefits. Conversely, among the main barriers are the high investment cost, cost of specific precision services, lack of IT knowledge, insufficient communication, and cooperation between actors and, very importantly (Takacsne Gyorgy et al., 2018). PA helps farmers to manage the spatial and temporal crop and soil variability within a field in order to increase profitability, optimize yield and quality, and reduce costs and environmental impact (Paustian & Theuvsen, 2017). PA deals with the management of the agricultural inputs including, seeds, fertilizers, water, pesticides, and energy to create savings on these inputs, increase yield, raise profitability and conserve the environment, including mitigation of climate change (Zarco-Tejada, 2014; Say et al., 2018).

Barriers to a greater application of knowledge, innovation and digitization include fragmentation, lack of capital and low training level in some parts of the farm sector, as well as incomplete broadband coverage and the time required to update CAP implementation systems in national and regional administrations (EC, 2019).

Justification

There are opportunities for implementing a wide variety of existing and proven measures at farm level that aim to improve the farm management, which can provide benefits for the mitigation of- and adaptation to climate change, the environment (i.e., soil, water and biodiversity), and the economy.

One type of measures are based on agroecological principles (i.e., biodynamic agriculture, organic farming, permaculture, agroforestry, intercropping, mixed crop-livestock systems, etc.). The second type measures are based on climate smart agriculture (CSA) technologies (robots, satellites and drones) and precision agriculture or precision farming, which is a management strategy that uses electronic information and other technologies, i.e., ICT & digital solutions, and Guidance systems (precise positioning).

References

1. Agroecology Europe (AEEU) (2020). Reforming the Common Agricultural Policy of the European Union in the Framework of the Green Deal. The Position of Agroecology Europe. Available at: https://www.agroecology-europe.org/wp-content/uploads/2020/04/AEEU-Position-paper-CAP-2020-FINAL.pdf
2. Altieri, M. A., Nicholls, C. I., & Montalba, R. (2017). Technological approaches to sustainable agriculture at a crossroads: an agroecological perspective. Sustainability, 9(3), 349. Available at: https://www.mdpi.com/2071-1050/9/3/349
3. Altieri, M. A., Nicholls, C. I., Henao, A., & Lana, M. A. (2015). Agroecology and the design of climate change-resilient farming systems. Agronomy for sustainable development, 35(3), 869-890. Available at: https://link.springer.com/article/10.1007/s13593-015-0285-2
4. Barnes, A. P., Soto, I., Eory, V., Beck, B., Balafoutis, A. et al. (2018). Exploring the adoption of precision agricultural technologies: A cross regional study of EU farmers. Land use policy, 80, 163-174. Available at: https://www.researchgate.net/publication/330049521_Exploring_the_adoption_of_precision_agricultural_technologies_A_cross_regional_study_of_EU_farmers
5. CEMA (2017) Smart Agriculture for All Farms. https://www.cema-agri.org/images/publications/position-papers/CEMA-smart-agriculture-for-all-farms_December-2017_.pdf
6. EC (2017). The Future of Food and Farming. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-713-F1-EN-MAIN-PART-1.PDF
7. EEA (2019). Climate change adaptation in the agriculture sector in Europe. Luxembourg: Publications Office of the European Union. Available at: https://www.eea.europa.eu/publications/cc-adaptation-agriculture
8. EIP-AGRI (2019). Ecological Approaches and Organic Farming. https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-research-ecological-approaches_en.pdf
9. EIP-AGRI (2020). Sustainable and resilient farming: Inspiration from agro-ecology. https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-brochure-sustainable-and-resilient
10. European Commission (EC) (2019). Evaluation study of the impact of the CAP on climate change and greenhouse gas emissions. Final report. https://op.europa.eu/lv/publication-detail/-/publication/0bc0e318-9ecf-11e9-9d01-01aa75ed71a1/language-en/format-PDF/source-114333306
11. European Commission (EC) (2020). Agricultural Policy. COP21: United For Climate. Available at: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/sustainability_and_natural_resources/documents/cop21-what-eu-agricultural-policy-does-for-climate_en.pdf

12. IPES-Food (2019). Towards a Common Food Policy for the European Union. The Policy Reform and Realignment That Is Required to Build Sustainable Food Systems in Europe. Available at: https://www.agroecology-europe.org/wp-content/uploads/2019/02/CFP_FullReport.pdf
13. Lowenberg-DeBoer, J., & Erickson, B. (2019). Setting the record straight on precision agriculture adoption. Agronomy Journal, 111(4), 1552-1569. https://doi.org/10.2134/agronj2018.12.0779
14. Nicholls, C. I., Altieri, M. A., & Vazquez, L. (2016). Agroecology: principles for the conversion and redesign of farming systems. Journal of Ecosystem and Ecography S, 5(1). Available at: https://www.researchgate.net/publication/303403356_Agroecology_Principles_for_the_Conversion_and_Redesign_of_Farming_Systems
15. Paustian, M., & Theuvsen, L. (2017). Adoption of precision agriculture technologies by German crop farmers. Precision agriculture, 18(5), 701-716. Available at: https://doi.org/10.1007/s11119-016-9482-5
16. Say, S. M., Keskin, M., Sehri, M., & Sekerli, Y. E. (2018). Adoption of precision agriculture technologies in developed and developing countries. Online Journal of Science and Technology, 8(1), 7-15. Available at: http://tojsat.net/journals/tojsat/articles/v08i01/v08i01-02.pdf
17. Scherer, L., & Verburg, P. H. (2017). Mapping and linking supply-and demand-side measures in climate-smart agriculture. A review. Agronomy for sustainable development, 37(6), 66. https://link.springer.com/article/10.1007/s13593-017-0475-1
18. Takacsne Gyorgy, K., Lamfalusi, I., Molnar, A., Sulyok, D., Gaal, M.et al. (2018). Precision agriculture in Hungary: assessment of perceptions and accounting records of FADN arable farms. Studies in Agricultural Economics, 120, 47-54. Available at: https://core.ac.uk/download/pdf/158570174.pdf
19. Zarco-Tejada, P. J., Hubbard, N., & Loudjani, P. (2014). Precision agriculture: an opportunity for EU farmers—Potential Support with the Cap 2014–2020. Joint Research Centre (JRC) of the European Commission. https://www.europarl.europa.eu/RegData/etudes/note/join/2014/529049/IPOL-AGRI_NT%282014%29529049_EN.pdf

POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People

SECTION E

Environmental Drivers of Change

SECTION E: Environmental Drivers of Change

A lot is written about the environment. Much of it by international organizations that aggregate data and carry out simulations on a planetary scale. For this reason, many people may accept the idea that the global climate is changing and that this has important consequences for life on earth yet fail to see exactly how this plays out where they live, the impact it is having on their quality of life or on the business they are in. Furthermore, they may fail to recognize that climate change is not something that will happen in 2050, but something that has already started, whose consequences are already quite significant, and for which action is required, not only to eliminate its primary causes, but to mitigate its effects.

The climate is not the only issue at stake here. We must also examine the impact of the way we live on out limited stocks of natural resources. These includes basic necessities such as potable water and good quality soil needed for the production of food. They also include living resources, such as stocks of birds and winged insects, natural habitats such as forests and coral reefs, as well as the mineral resources that are mined for nitrogen-based fertilizers, or the metallic compounds that are essential for much of the technologies that populate our lives such as mobile phones, wind turbines and long range electric vehicles.

The climate, the availability of mineral resources and the health of our natural eco-systems, are related in complex ways and are all essential for the continued existence of the peoples of this planet. Many of those stocks of 'natural capital' are concentrated in rural regions and must be managed by those living there for the overall benefit of society. These include the provision of drinking water, food, valuable natural landscapes which act as archives of historical monuments as well as places of leisure, rest, and relaxation. To assume such a role a region needs to inventory its stocks of natural capital, appreciate the private and public goods and services that it provides, and examine the opportunities and threats to which it is exposed.

A regional Foresight initiative is an opportunity to take stock of all of this. In particular it requires developing a detailed, locally grounded understanding of how phenomena such climate change is manifest locally, as well as how climate change and global consumption and production may impact life and work in the region.

We have tried to select a range of topics that will open up and support a strategic conversation on issues such as these for each PoliRural Foresight initiative. We are aware of the fact that this list if incomplete.

It could have included recent phenomena such as the vast locust swarms that started in Kenya and the Horn of Africa, spreading to east Africa, South West Asia, India and Pakistan, as well as across to West Africa and across the Atlantic to countries like Brazil. It is worth contemplating the scale of the devastation this is causing and examining how it will impact global food systems and immigration patterns to Europe. It could have included a note on the catastrophic flooding that is going on in China, Japan, and India. Flooding that is so great in the case of China, as to threaten the integrity of the Three Gorges Dam. Modern economies have become so interdependent that large-scale weather-related events such as these create unprecedented risks for economic activity even in Europe.

Countries such as China seem far away, but they are linked to the EU in many different ways. As co-producers of the green-house gases that are driving climate change, as consumers of things they produce and as collaborators in the supply chains of which we are all a part. So, it is useful to examine these links to understand them, the opportunities, and risks that they create and the actions we might take at regional level to optimize outcomes in the next ten years.

But there is another reason for looking at what is happening far away. We can learn from those things, about how complex earth-systems operate, how they evolve over time and what they can become.

One issue that we did not address and which perhaps we should have, is the issue of landslides. They have been disused recently in the Irish press, both this year in 2020[9] and in 2018[10]. In 2018, a local expert dismissed them as a rare phenomenon in Ireland, of no great significance because they only occur once every "3000 years." It is therefore strange that the landslides of 2018 were followed by landslides two years later. Perhaps this is a freak event, an outlier, and the experts are ultimately right with their thousand-year hypothesis. Perhaps this is a weak signal of a new phenomenon which may occur much more frequently than ever before. It is worth noting that there has been a sudden increase in the phenomenon of landslides in other parts of the world, in Japan for example.

In an article dated 26 June 2020, the Japan Times reported that the incidence of landslides has greatly increased in the last year[11]. Japan has experienced an average of 1,006 landslides a year every year in the period 2000 to 2009. This jumped to an average of 1,476 landslides a year in the period 2010 to 2019, with a maximum of 3,459 in 2018. The scientific consensus is that this increase is caused by climate change.

The ideal in Foresight is to pick-up on what may represent (in hindsight) weak signals of something new or emerging, that may one day assume much greater significance than what it is accorded today. It may be worth having a conversation in Ireland right now.

[9] https://www.farmersjournal.ie/landslide-washes-thousands-of-tonnes-of-peat-on-to-leitrim-farmland-555152
[10] https://www.farmersjournal.ie/listen-tyrone-landslides-were-a-one-in-3-000-year-event-349945
[11] "Landslides in Japan surged by half in decade due to climate change"
https://www.japantimes.co.jp/news/2020/06/26/national/landslides-surges/#.XzVglTVS-Uk

Climate Change

Description

Climate change is a global driver which is/will affect all areas and all economic sectors worldwide. Due to human activities (i.e. emission of greenhouse gasses) temperature has increased with 1°C compared to pre-industrial times globally. It is likely that temperature will further increase. This warming impacts the natural and human system, such as for example the delivery of certain ecosystem services. Therefore, there is a need of adaptation (i.e. adapting to life in a changing climate) and mitigation (i.e. reducing climate change by for example reducing the emission of greenhouse gasses). In Europe climate change resulted in changing rainfall patterns, rising temperatures, variability in seasonality, extreme weather events, such as heatwaves, droughts, storms, and floods. Agriculture is typically the most important sector in rural areas. On the one hand, agriculture is highly influenced by climate change as it depends on climatic conditions. On the other hand, agriculture contributes to climate change through the emission of greenhouse gasses (e.g. methane from livestock and nitrous oxide from chemical fertilizers). Also, other sectors in rural areas are/will be affected by climate change. For example, tourism might be affected as snowfall in winter might diminish affecting ski tourism.

Justification

Agriculture plays an important role in both mitigation and adaptation of climate change. The consequences of climate change will vary from region to region. Therefore, there is a need of policy response (i.e. adaptation and mitigation measures) at regional level.

Examples of adaptation strategies which can be taken in agriculture include:

- Change in planting date
- Adaptation in crop type
- Reduction of water loss
- Improvement in soil management

References

1. IPCC, Allen M, Babiker M, Chen Y, de Coninck H, Connors S, et al. Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report. In 2018 [cited 2020 Apr 8]. Available from: https://www.ipcc.ch/sr15/chapter/spm/
2. European Commission. Agriculture and climate change [Internet]. Agriculture and climate change - European Commission. 2020 [cited 2020 Apr 3]. Available from: https://ec.europa.eu/info/food-farming-fisheries/sustainability-and-natural-resources/agriculture-and-environment/agriculture-and-climate-change_en
3. EEA. Agriculture and climate change [Internet]. European Environment Agency. 2019 [cited 2020 Apr 3]. Available from: https://www.eea.europa.eu/signals/signals-2015/articles/agriculture-and-climate-change
4. European Commission, EEA. Agriculture — Climate-ADAPT [Internet]. 2020 [cited 2020 Apr 3]. Available from: https://climate-adapt.eea.europa.eu/eu-adaptation-policy/sector-policies/agriculture

Greenhouse Gas Emissions

Description

A greenhouse gas is a gas that traps heat which is radiated back to the earth. This phenomenon is known as the greenhouse gas effect. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Human activities since the beginning of the Industrial Revolution (around 1750) have produced a 45% increase in the atmospheric concentration of carbon dioxide, from 280 ppm in 1750 to 415 ppm in 2019. The vast majority of anthropogenic carbon dioxide emissions come from combustion of fossil fuels, principally coal, oil, and natural gas, with additional contributions coming from deforestation, changes in land use, soil erosion and agriculture (including livestock). This increase in emission of greenhouse gasses is linked to increasing temperatures (i.e. global warming).

In rural areas GHGs are produced by most if not all economic and social or consumer activities. For example, by transport and home heating as well as by industrial processes. They are also produced by agriculture produces greenhouse gasses.

The most important sources of greenhouse gasses in agriculture are:

- Methane produced by ruminant animals
- Nitrous oxide, nitrates and nitrogen gas from soil nitrification and denitrification
- Methane and nitrous oxide from manure decomposition.

In 2012, agriculture accounted for 10% of total emission of greenhouse gasses in Europe. The emission of greenhouse gasses by agriculture decreased by 23.8% from 1990 to 2012. This reduction in emissions of greenhouse gasses by agriculture is related to:

- Decreasing the livestock number
- Promoting more efficient farming practices
- Reducing the application of nitrogen-based fertilizers
- Improving manure management.

Several attempts have been made to integrate mitigation and adaptation objectives into agricultural policies. In Europe, the Commission has mainstreamed climate change objectives into its Common Agricultural Policy, including its Rural Development Programme (RDPs).

Land-use change, e.g. the clearing of forests for agricultural use, can also affect the concentration of greenhouse gases in the atmosphere by altering how much carbon flows out of the atmosphere into carbon sinks.

Climate change has become an increasing political priority over recent years. Today, its objectives are embedded in multiple policies. In Europe for example, the 2020 strategies consider climate change as one of its five targets. In this context, mitigation (actions to reduce greenhouse gas (GHG) emissions), and adaptation (actions that increase the capacity to adapt to changes in climate), are key objectives.

Justification

Further reduction of greenhouse gasses by the agricultural sector can be achieved by implementing farm management practices such as:

- Optimize fertilization rates
- Changing livestock diets
- Manure management
- Reducing carbon emissions from soil by maintaining permanent pasture
- Implementing conservation tillage
- Applying crop rotation and cover crops
- Capturing carbon by storing carbon in soil organic matter, trees and hedgerows

References

1. UNFCCC. UNFCCC Process | UNFCCC Kyoto protocol page [Internet]. 2020 [cited 2020 Apr 6]. Available from: https://unfccc.int/process-and-meetings#:2cf7f3b8-5c04-4d8a-95e2-f91ee4e4e85d
2. Eurostat. Greenhouse gas emission statistics - emission inventories [Internet]. Statistics Explained. 2019 [cited 2020 Apr 8]. Available from: https://ec.europa.eu/eurostat/statistics-explained/pdfscache/1180.pdf
3. Eurostat. Agriculture - greenhouse gas emission statistics [Internet]. 2018 [cited 2020 Apr 9]. Available from: https://ec.europa.eu/eurostat/statistics-explained/pdfscache/29569.pdf
4. European Commission. Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU (Text with EEA relevance) [Internet]. OJ L, 32018R0841 Jun 19, 2018. Available from: http://data.europa.eu/eli/reg/2018/841/oj/eng
5. European Commission. Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance) [Internet]. OJ L, 32018R0842 Jun 19, 2018. Available from: http://data.europa.eu/eli/reg/2018/842/oj/eng
6. European Commission. Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 [Internet]. OJ L, 32009D0406 Jun 5, 2009. Available from: http://data.europa.eu/eli/dec/2009/406/oj/eng

Tipping Points

Description

In the context of ecosystems, tipping points are thresholds which when exceeded can result in shifts in the state of the system. When the threshold is exceeded it possibly results in an irreversible regime shift. This change in the state of an ecosystem results in changes in the delivery of the ecosystem services of the ecosystem.
Examples of possible regime shifts include:

- Desertification of grassland
- Shrub expansion in the Arctic
- Eutrophication of lakes
- Ocean acidification and dead marine zones.

The change in the systems state is caused by one or more drivers which exceed a certain tipping point/threshold. Exceedance of the tipping point result in a major change in the structure, function or dynamic of the system, resulting in a new system state. For example, ecosystems such as lakes and coral reefs can undergo large, abrupt, persistent regime shifts. A regime shift is mostly driven by multiple slow processes such as for example (in the context of a regime shift in lakes or coral reefs) increased harvesting, global warming, and nutrient pollution. The collapse of the northern Atlantic cod fishery is an example of an environmental tipping point. An example of a possible tipping point is severe soil erosion risk in East Anglia due to the degradation and loss of peat soils. Other important drivers which can lead to regime shifts in ecosystems are large or incremental alterations in climate, land use, biodiversity (invasive species or the overexploitation of species), and biogeochemical cycles.

Regime shifts affect the agricultural sector in rural areas. Since, agriculture relies on a range of supporting systems: e.g. soil, water, climate, biodiversity (as biodiversity is linked with pollination and natural disease suppression). Therefore, sudden changes in ecosystem functioning associated with tipping points in climate, weather, soil health or biodiversity may have profound effects on agriculture.

Tipping points can also result in prompt food price spikes locally (or even globally) when they result in an agricultural supply shortfall; (for example a fisheries collapse).

Justification

In order to avoid major consequences of tipping points in rural areas, and more specific in the agriculture sector, it is important that tipping points are included in risk management policies and long-term planning.
Examples of possible relevant policy measures include:

- Build mechanisms to detect approaching tipping points
- Estimate cost and benefit of crossing a particular tipping point
- Promoting resilience

References

1. Benton T, Fairweather D, Graves A, Harris J, Jones A, Lenton T, et al. Environmental tipping points and food system dynamics: Main report. 2017 Jan [cited 2020 Apr 6]; Available from: https://dspace.stir.ac.uk/bitstream/1893/24796/1/GFS_Tipping%20Points_Main%20Report.pdf
2. Yletyinen J, Tylianakis J, Pech R. Planning for tipping points and enhancing resilience in production landscapes [Internet]. 2017 [cited 2020 Apr 8] p. 6. Available from: https://www.landcareresearch.co.nz/__data/assets/pdf_file/0019/142282/Policy-Brief-18-Tipping-Points.pdf
3. Lenton TM, Rockström J, Gaffney O, Rahmstorf S, Richardson K, Steffen W, et al. Climate tipping points — too risky to bet against. Nature [Internet]. 2019 Nov [cited 2020 Apr 6];575(7784):592–5. Available from: https://www.nature.com/articles/d41586-019-03595-0
4. Dakos V, Matthews B, Hendry AP, Levine J, Loeuille N, Norberg J, et al. Ecosystem tipping points in an evolving world. Nat Ecol Evol [Internet]. 2019 Mar [cited 2020 Apr 6];3(3):355–62. Available from: https://www.nature.com/articles/s41559-019-0797-2

Food Security

Description

According to the FAO, food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. Food security became a topic of attention in Europe when food prices increased in 2007 and 2008 and when the wheat prices increased in 2010. Food waste is linked to food security. According to the Food and Agriculture Organization (FAO), food waste is the "decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers". The estimations of FAO indicate that the world "wastes or loses around a third of the food it produces while more than 820 million people go hungry". Research and innovation is also linked to food security. By the implementation of genetic improvement and biotechnology food security can be improved. Research and innovation plays an important role in the adaptation to climate change, for example by improving the tolerances of crops and livestock to stresses, drought, and floods. This research and innovation also needs to be accessible to farmers. Trade is another factor which impacts food security. It is important that food security is taken into account in bilateral and international trade negotiations.

Justification

Examples of measures that can be taken to increase food availability (i.e. increase food security) are:

- Support the dominant small-scale mixed crop-livestock farming systems
- Ensure that innovations from demand-driven research are accessible to farmers
- Allow international trade from surplus to deficit areas
- Develop more regionally integrated agricultural policies

References

1. FAO. Chapter 2. Food security: concepts and measurement[21] [Internet]. 2003 [cited 2020 Apr 9]. Available from: http://www.fao.org/3/y4671e/y4671e06.htm
2. European Commission. Global food security [Internet]. EU Science Hub - European Commission. 2018 [cited 2020 Apr 9]. Available from: https://ec.europa.eu/jrc/en/research-topic/global-food-security
3. FAO. Food Loss and Food Waste | FAO | Food and Agriculture Organization of the United Nations [Internet]. 2019 [cited 2020 Apr 6]. Available from: http://www.fao.org/food-loss-and-food-waste/en/
4. FAO. 12.3.1 Global food losses | Sustainable Development Goals | Food and Agriculture Organization of the United Nations [Internet]. 2020 [cited 2020 Apr 6]. Available from: http://www.fao.org/sustainable-development-goals/indicators/12.3.1/en/
5. FAO. Food Loss and Waste Database [Internet]. Food and Agriculture Organization of the United Nations. 2020 [cited 2020 Apr 6]. Available from: http://www.fao.org/food-loss-and-food-waste/flw-data/en/
6. European Commission. Resources library on food waste [Internet]. Food Safety - European Commission. 2016 [cited 2020 Apr 6]. Available from: https://ec.europa.eu/food/safety/food_waste/library_en

Crop Loss due to Disease and Pests

Description

Plant protection in general and the protection of crops against plant diseases in particular, have an obvious role to play in meeting the growing demand for food quality and quantity. The losses from pathogens are direct, as well as indirect; they have a number of facets, some with short-, and others with long-term consequences. Most of the agricultural research conducted in the 20th century focused on increasing crop productivity. Plant pathology thus primarily focused on protecting crops from yield losses. The challenge posed today is greater, however, because the food security challenge is compounded by other essential issues, such as food safety and harvest quality, combined with increasing limits to manage diseases due to shrinking natural and human resources. Moreover, the risk of crop losses due to diseases are likely to increase as globalization of travel and trade as well as climate change influence crop pests. Climate change is likely to extend the seasonal activity of pests and diseases and the risks associated with these effects.

Crop losses caused by diseases, animal pests, and weeds, range between 20 to 40% of the yield that would be attained otherwise, depending on the production situations. This obviously represents a massive challenge to food security and food safety and cannot be ignored.

In 2019 the European Commission defined a list of 20 so called priority pests in Europe. On this list are pests that are important considering economic, environmental, and social problems these pests can cause. On this list are amongst others Xylella Fastidiosa (a bacteria affecting a wide variety of plants such as olive trees), the Japanese beetle (most problematic in fruit tree orchards), the Asian long-horned beetle (affecting forestry tree species), citrus greening and citrus black spot (affecting citrus plants). There is an urge to take measures against these priority pests as they cause can result in huge crop losses. Xylella Fastidiosa for example could cause annual production losses of up to €5.5B.

Justification

There is a need for measures to reduce effects of crop losses, in order to guarantee quality and quantity of food supply. An example of this is the implementation of integrated pest management. Integrated pest management is an integrated approach to prevent and/or suppress organisms that are harmful to plants through the use of all available information, tools, and methods.

Examples of methods for integrated pest management include:

- Crop rotation
- Appropriate plant protection methods
- Use of pest resistant cultivars
- Early detection of pests

References

1. Savary S, Ficke A, Aubertot J-N, Hollier C. Crop losses due to diseases and their implications for global food production losses and food security. Food Security [Internet]. 2012 Dec 1 [cited 2020 Apr 8]; 4. Available from: https://www.researchgate.net/publication/257788783_Crop_losses_due_to_diseases_and_their_implications_for_global_food_production_losses_and_food_security/link/54f726620cf2ccffe9daa7aa/download
2. Strange RN, Scott PR. Plant disease: a threat to global food security. Annu Rev Phytopathol [Internet]. 2005 [cited 2020 Apr 8];43:83–116. Available from: https://www.annualreviews.org/doi/pdf/10.1146/annurev.phyto.43.113004.133839
3. Jacobs C, Berglund M, Kurnik B, Dworak T, Marras S, Mereu V, et al. Climate change adaptation in the agriculture sector in Europe [Internet]. Luxembourg: European Environment Agency; 2019 [cited 2020 Apr 8]. 112 p. Available from: https://www.euroseeds.eu/app/uploads/2019/09/Climate-change-adaptation-in-the-agriculture-sector-in-Europe.pdf
4. Savary S, Teng PS, Willocquet L, Nutter FW. Quantification and Modeling of Crop Losses: A Review of Purposes. Annu Rev Phytopathol [Internet]. 2006 [cited 2020 Apr 6];44(1):89–112. Available from: https://doi.org/10.1146/annurev.phyto.44.070505.143342
5. European Commission. Commission Delegated Regulation (EU) 2019/1702 of 1 August 2019 supplementing Regulation (EU) 2016/2031 of the European Parliament and of the Council by establishing the list of priority pests [Internet]. OJ L, 32019R1702 Oct 11, 2019. Available from: http://data.europa.eu/eli/reg_del/2019/1702/oj/eng

Crop Loss due to Exceptional Weather Conditions

Description

The cost of crop losses caused by weather and climate-related extremes over the period 1980-2017 is approximately 453 billion euro in Europe. Crop production is particularly sensitive to prevailing weather conditions at key times of the year. For example, depending on a plant's stage of development, heavy spring frosts can damage the growth of cereals and destroy fruit blossoms. Especially in fruit orchards frost damage is becoming more and more a problem in Europe as fruit trees start to blossom earlier in the year due to climate change. Spring-to-summer droughts and heat waves can cause significant yield losses, while strong winds and heavy rainfall can make harvesting difficult and compromise quality. Drought is becoming a strong driver of crop losses in Europe. Since 1950, drought frequency has increased across southern Europe and most parts of central Europe, whereas it has decreased in many parts of northern Europe. The economic cost of drought/heat related agriculture loss of the 2003 drought and heat wave in Europe is estimated to be almost 15 billion euros. Meteorological and hydrological conditions therefore determine crop production, but they also have a knock-on effect on prices through the causal effect of supply and demand. This is true for the EU, as it is across the globe.

Justification

Farm-level adaptation can reduce losses caused by extreme events, but knowledge of all the impacts of climate change on agriculture is still limited, especially when impacts are multiplied or combined with other social-economic consequences of climate change. The European adaptation strategy is an important driver of adaptation strategies in Europe. One of the goals of this strategy is to align the different adaptation strategies in Europe.

Examples of adaptation strategies to mitigate negative effects of climate on crop production include:

- The use drought resistant cultivars
- Extreme Weather Early Warning Systems

References

1. EEA. Economic losses from climate-related extremes in Europe [Internet]. European Environment Agency. 2019 [cited 2020 Apr 6]. Available from: https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-2
2. Jacobs C, Berglund M, Kurnik B, Dworak T, Marras S, Mereu V, et al. Climate change adaptation in the agriculture sector in Europe [Internet]. Luxembourg: European Environment Agency; 2019 [cited 2020 Apr 8]. 112 p. Available from: https://www.euroseeds.eu/app/uploads/2019/09/Climate-change-adaptation-in-the-agriculture-sector-in-Europe.pdf
3. Eurostat. Agricultural production - crops [Internet]. Statistics Explained. 2020 [cited 2020 Apr 6]. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_production_-_crops
4. Powell JP, Reinhard S. Measuring the effects of extreme weather events on yields. Weather Clim Extrem [Internet]. 2016 Jun 1 [cited 2020 Apr 6];12:69–79. Available from: http://www.sciencedirect.com/science/article/pii/S2212094716300068
5. Schils R, Olesen JE, Kersebaum K-C, Rijk B, Oberforster M, Kalyada V, et al. Cereal yield gaps across Europe. Eur J Agron [Internet]. 2018 Nov 1 [cited 2020 Apr 6];101:109–20. Available from: http://www.sciencedirect.com/science/article/pii/S116103011830491X
6. D'agostino V. Drought in Europe Summer 2018: crisis management in an orderly chaos – Farm Europe [Internet]. Farm Europe. 2018 [cited 2020 Apr 6]. Available from: https://www.farm-europe.eu/blog-en/drought-in-europe-summer-2018-crisis-management-in-an-orderly-chaos/
7. European Commission. EU Adaptation Strategy [Internet]. Climate Action - European Commission. 2016 [cited 2020 Apr 6]. Available from: https://ec.europa.eu/clima/policies/adaptation/what_en

Property Damage due to Flooding

Description

Damage to property is the destruction of public or private property, caused either by a person who is not its owner or by natural phenomena. In rural areas the main concerns are related to damage in agricultural production, which is connected with risk management. Damage to property is usually associated with other factors of change in the countryside, mainly related to climate change, water shortages and violent atmospheric events. An example of climate related damage is flooding.

Floods refers to a body of water covering an area which is normally dry land. Floods may occur along the riverbanks, lakes and seacoast. However, river floods are most common.

River floods and lake floods occur because of too much water flowing into them, that overflows its banks, or sometimes even breaks the banks. The excess water is the result of excessive rains in the catchment area or/and sudden melting of snow and ice. Sea floods are caused by unusually strong sea waves hitting the coast. This may happen at the time of cyclonic storms or by tsunami waves. Sea floods caused by tsunami can be particularly sudden and violent.

Natural disasters commonly have deep, far-reaching consequences for the communities affected. In the European Region, floods are the most common disasters, causing extensive damage and disruption. The magnitude of the physical and human cost of such events can, however, be reduced if adequate emergency preparedness and planning are implemented, mitigation actions are undertaken, and timely and coordinated responses are launched throughout and after the event.

Between 1998 and 2009, Europe suffered over 213 major damaging floods, including the catastrophic floods along the Danube and Elbe rivers in summer 2002. Severe floods in 2005 further reinforced the need for concerted action. Between 1998 and 2009, floods in Europe have caused some 1126 deaths, the displacement of about half a million people and at least €52 billion in insured economic losses.

In addition to economic and social damage, floods can have severe environmental consequences, for example when installations holding large quantities of toxic chemicals are inundated. The coming decades are likely to see a higher flood risk in Europe and greater economic damage.

Agriculture and land-use management in Europe has changed immensely in recent decades. In an effort to become more self-sufficient in food production, modern agricultural practices have led to changes such as increased field size, the use of large farm equipment and elimination of buffer zones (areas of land, lying next to a waterway, kept in permanent vegetation) and hedgerows. These changes in farming methods have resulted in more deeply compacted soils, unchecked runoff, lines left from ploughing, and cracks in the soil. Factors such as compaction prevent the soil from being able to hold more water and lines and cracks in the soil concentrate the water flow —therefore speeding up the flow of water on the soil's surface. This in turn increases the volume and speed of water flowing into waterways and increases the risk of flooding.

Justification

The greater risk of floods means that flood risk management has become a major challenge, both in engineering and societal terms. Flood risk management schemes aim to decrease the probability and impact of floods - taking into account factors that include the avoidance of development in areas likely to flood, to ensure that local populations are informed and know what to do in the event of a flood.

Measures to reduce the risk of flooding include:

- Installation of floodways
- The installation of water buffering elements
- Reduction of soil-sealed areas to increase water infiltration

Flood risk management needs a holistic approach which takes into account the problems of rainfall, rivers, and flooding, in addition to the problems of societal planning and administration.

References

1. Mucke P, Kirch L, Walter J, Radtke K, Day J, Forster T, et al. World risk report 2019, focus: Water [Internet]. Bündnis Entwicklung Hilft and Ruhr University Bochum – Institute for International Law of Peace and Armed Conflict (IFHV); 2019 [cited 2020 Apr 8]. 77 p. Available from: https://reliefweb.int/sites/reliefweb.int/files/resources/WorldRiskReport-2019_Online_english.pdf
2. EEA. Disasters in Europe: more frequent and causing more damage [Internet]. European Environment Agency. 2019 [cited 2020 Apr 6]. Available from: https://www.eea.europa.eu/highlights/natural-hazards-and-technological-accidents
3. European Commission. Flood risk management - Water - Environment - European Commission [Internet]. European Commission - Environment. 2019 [cited 2020 Apr 6]. Available from: https://ec.europa.eu/environment/water/flood_risk/
4. European Commission, Directorate-General for the Environment. A compilation of reporting sheets adopted by water directors' common implementation strategy for the Water Framework Directive (2000/60/EC). [Internet]. 2013 [cited 2020 Apr 6]. Available from: http://bookshop.europa.eu/uri?target=EUB:NOTICE:KHAN13029:EN:HTML
5. European Commission. River basin management - Water - Environment - European Commission [Internet]. European Commission - Environment. 2019 [cited 2020 Apr 6]. Available from: https://ec.europa.eu/environment/water/water-framework/index_en.html
6. FAO. The impact of disasters and crises on agriculture and food security 2017 [Internet]. Rome: Food and Agriculture Organization of the United Nations; 2018 [cited 2020 Apr 8]. 143 p. Available from: http://www.fao.org/3/I8656EN/i8656en.pdf
7. European Commission. EU agricultural outlook for markets and income, 2019-2030 [Internet]. Brussels: European Commission, DG Agriculture and Rural Development; 2019 [cited 2020 Apr 8]. 96 p. Available from: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/agricultural-outlook-2019-report_en.pdf
8. EEA. Economic losses from climate-related extremes in Europe [Internet]. European Environment Agency. 2019 [cited 2020 Apr 6]. Available from: https://www.eea.europa.eu/data-and-maps/indicators/direct-losses-from-weather-disasters-3/assessment-2

Water Scarcity

Short description

Drought refers to a temporary decrease in water availability, for example, when it does not rain over a long period of time. Water scarcity, on the other hand, occurs when demand for water exceeds the available sustainable resources.

Water scarcity is becoming the most urgent challenge not only for agricultural production, but it is also becoming a source of conflicts in economic activity and social matters in rural areas. Problems with access to water affect many European regions. Especially in areas with intensive agriculture, high population densities and/or intensive industry. In 2007, at least 11% of the EU population and 17% of the EU territory experienced water scarcity. In 2019 Cyprus, Bulgaria, Belgium, Spain, Italy, and Malta used up 20% or more of their long-term supplies every year. Cyprus, which has been suffering severe drought, consumed much more than 40% of its renewable supplies in 2019. This has led to a growing concern throughout the EU regarding water scarcity problems and the significant impacts on water resources by agricultural activities. In Europe, agriculture has been estimated to account for around 24% of total water abstraction, although in parts of southern Europe, this figure can reach up to 80%. Irrigation of crops constitutes a considerable use of water, especially in southern Member States where irrigation accounts for almost all agricultural water use, and over-abstraction remains an issue. Agriculture has also been identified as the major sustainable water management issue in the implementation of the Water Framework Directive (WFD).

The most complete policy overview is provided in a document entitled the 'Blueprint to safeguard Europe's water resources' (European Commission, 2012) which aims at ensuring that good quality water, of sufficient quantity, is available for all legitimate uses. Some more recent insight is offered by the fifth implementation report (2019) (European Commission, 2019a) of the Water Framework Directive (2000), the central piece of environmental legislation concerning European waters.

Justification

Water is one of the most important natural resources, however, its availability may be periodically reduced due to droughts or periods where demand for water exceeds usable water resources (water scarcity). This requires combined action at EU level, all the more so as water scarcity is likely to continue due to climate change. Especially in rural areas where the agricultural sector consumes a lot of water (e.g. for irrigation) water policy is needed. In regions were agriculture is dependent on irrigation (i.e. non-rainfed agriculture) as in most parts of southern Europe the need of water policy and increasing irrigation efficiency is urgent.

References

1. Eurostat. Water statistics - Statistics Explained [Internet]. 2019 [cited 2020 Apr 3]. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Water_statistics&oldid=462735
2. European Commission. Report from the commission to the European parliament and the council on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Second River Basin Management Plans First Flood Risk Management Plans [Internet]. 2019 [cited 2020 Apr 8]. Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52019DC0095:EN:NOT
3. European Commission. Communication from the commission to the European parliament, the council, the European Economic and Social Committee and the Committee of the Regions. A Blueprint to Safeguard Europe's Water Resources [Internet]. 2012 [cited 2020 Apr 8]. Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012DC0673:EN:NOT
4. EEA. Water resources across Europe, confronting water scarcity and drought [Internet]. Copenhagen: EEA; 2009 [cited 2020 Apr 6]. 60 p. Available from: https://www.eea.europa.eu/publications/water-resources-across-europe
5. Mucke P, Kirch L, Walter J, Radtke K, Day J, Forster T, et al. World risk report 2019, focus: Water [Internet]. Bündnis Entwicklung Hilft and Ruhr University Bochum – Institute for International Law of Peace and Armed Conflict (IFHV); 2019 [cited 2020 Apr 8]. 77 p. Available from: https://reliefweb.int/sites/reliefweb.int/files/resources/WorldRiskReport-2019_Online_english.pdf
6. European Commission. Water scarcity and drought - Environment - European Commission [Internet]. 2019 [cited 2020 Apr 3]. Available from: https://ec.europa.eu/environment/water/quantity/scarcity_en.htm
7. European Commission. Water Scarcity and Drought in the European Union [Internet]. 2010 [cited 2020 Apr 3]. Available from: https://ec.europa.eu/environment/pubs/pdf/factsheets/water_scarcity.pdf

Heat Waves

Description

Human-induced global warming has already caused multiple observed changes in the climate system. These include an increase of temperatures, as well as longer, more frequent and intense heat waves in most regions.

A heat wave is characterized by the occurrence of abnormally hot weather. A heat wave has various and, in some cases, overlapping definitions, but is characterized by the World Meteorological Organization (WMO) as a period of time of at least six consecutive days when the maximum daily temperature is around 5°C higher than the average daily value in the reference period. It is a climatic phenomenon that can occur at any time of the year.

Climate data around the world suggest that heat waves have become more frequent over recent years, which is why they are considered relatively frequent globally. Heatwaves have already caused tens of thousands of premature deaths in Europe. The heatwave of 2003 for example caused around 70 000 premature deaths in Europe. Temperature records were broken in different parts in Europe in 2003, 2006, 2007, 2010, 2013, 2014 and 2015. Due to climate change, heat waves will become more frequent, more intense, and longer in the future. Recent studies, (IPCC reference), based on modelling data, conclude that about 14% of the world population will be exposed to “severe heatwaves” at least once every 5 years.

Changes in the frequency and intensity of extreme events, such as heat waves, have the potential to overwhelm the capacity for natural and human systems to recover from these disturbances, comprising their resilience. Heat waves cause various impacts on agricultural systems, leading to productivity losses, as well as increased irrigation needs due to the greater thermal and water stress. Heat waves also increase the meteorological risk of fire, and the occurrence of fires can cause serious damage to agricultural crops. Heat waves affect crops in different ways and can cause decreased photosynthesis, leaf senescence, decreased pollen production and pollen viability, seed abortion and, consequently, lower grain number and crop productivity. However, it should be noted that these effects can vary between crop types, cultivars and phenological development stages, resulting in different responses.

Justification

In order to avoid major consequences in rural areas, long-term adaptation measures should be adapted to decrease effects of heat waves in rural areas. Certainly in regions that are characterised by high temperatures and low rainfall the implementation of policy measures to prevent and mitigate major consequence of heat waves are crucial.

Examples of measures to reduce the risk of heat waves in rural areas include:

- Raising awareness of heat related illnesses
- Installation of green infrastructures to reduce temperature

References

1. European Commission. Agriculture and climate change [Internet]. Agriculture and climate change - European Commission. 2020 [cited 2020 Apr 3]. Available from: https://ec.europa.eu/info/food-farming-fisheries/sustainability-and-natural-resources/agriculture-and-environment/agriculture-and-climate-change_en

2. IPCC, Field CB, Barros V, Stocker TF, Qin D, Dokken DJ, et al. Glossary of terms. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Internet]. Cambridge University Press, Cambridge, UK, and New York, NY, USA; 2012 [cited 2020 Apr 8]. p. 555–64. (A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC).). Available from: https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf

3. WMO. Heat Waves animation - World Met Day 2018 [Internet]. 2018 [cited 2020 Apr 3]. Available from: https://public.wmo.int/en/files/heat-waves

4. Siebert S, Ewert F. Future crop production threatened by extreme heat. Environ Res Lett [Internet]. 2014 Apr [cited 2020 Apr 3];9(4):041001. Available from: https://doi.org/10.1088%2F1748-9326%2F9%2F4%2F041001

5. Thornton PK, Ericksen PJ, Herrero M, Challinor AJ. Climate variability and vulnerability to climate change: a review. Glob Change Biol [Internet]. 2014 [cited 2020 Apr 3];20(11):3313–28. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.12581

6. Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE. Cross-chapter case study. In: Climate Change 2007: Impacts, Adaptation and Vulnerability Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Internet]. Cambridge, UK: Cambridge University Press; 2007 [cited 2020 Apr 8]. p. 843–68. Available from: https://www.ipcc.ch/site/assets/uploads/2018/05/ar4-wg2-xccc.pdf

7. EEA. Extreme temperatures and health [Internet]. European Environment Agency. 2016 [cited 2020 Apr 8]. Available from: https://www.eea.europa.eu/data-and-maps/indicators/heat-and-health-2/assessment

8. Hoegh - Guldberg O, Jacob D, Taylor M, Bindi M, Brown S, Camilloni I, et al. Chapter 3: Impacts of 1.5°C global warming on natural and human systems. In: Global Warming of 15 °C, an IPCC special report on the impacts of global warming of 15 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change [Internet]. Intergovernmental Panel on Climate Change; 2018 [cited 2020 Apr 3]. Available from: http://pure.iiasa.ac.at/id/eprint/15518/

Wildfires

Description

In 2018, 178 000 hectares of forest and land was destroyed by wildfires in Europe. Although the area burnt each year by wildfires is decreasing in Europe, the number of countries affected by wildfires is increasing.

It is estimated that in 2009, 350 million hectares of land was burnt by wildfires. Resulting in damage to property, livelihoods, and deaths. 2009 was a year with severe wildfires in California and the Australian state of Victoria. This resulted in insurance costs of around $1.5B.

In 2009, 95% of the wildfires were caused by people, mostly due to negligence, economic interests, non-safe use of fire in agriculture and illegal land clearing.

Due to climate change the risk of wildfires has increased. Also increased population density increases the risk of wildfires, as it results in an increased demand for land an natural resources.

Justification

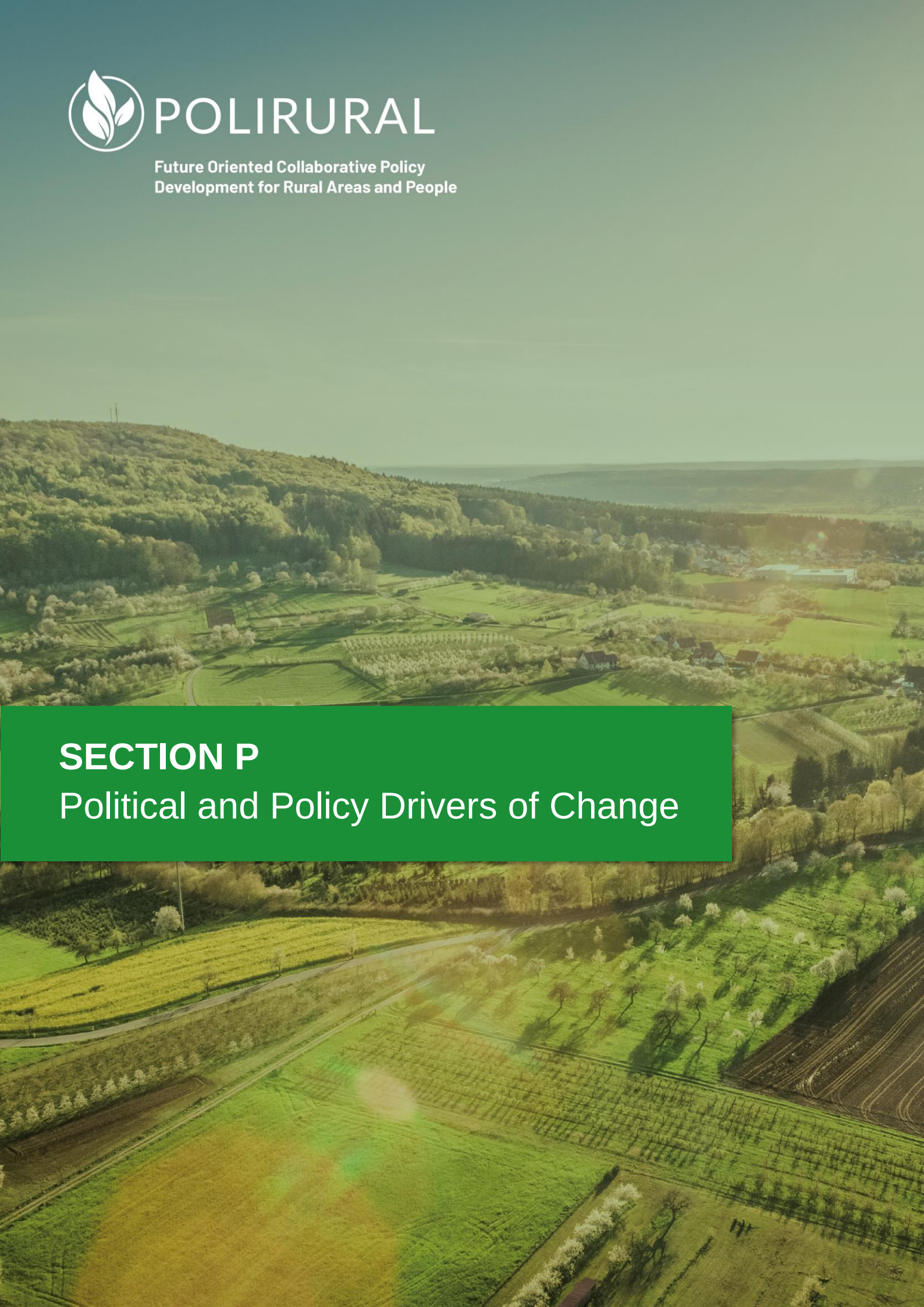
Integrated fire management is key to reduce wildfires. This includes fire prevention, early warning, monitoring and assessment, fire preparedness, fire suppression, but also restoration following fires. Wildfire monitoring and early warning can be done using satellite images.

References

1. FAO News Article: The wildland fire problem [Internet]. 2009 [cited 2020 Apr 9]. Available from: http://www.fao.org/news/story/en/item/29060/icode/
2. NASA Covers Wildfires from Many Sources [Internet]. NASA. 2015 [cited 2020 Apr 9]. Available from: http://www.nasa.gov/mission_pages/fires/main/missions/index.html
3. Heikkilä TV, Grönqvist R, Jurvélius M. Wildland Fire Management Handbook for Trainers. 2010 [cited 2020 Apr 9];250. Available from: http://www.fao.org/3/a-i1363e.pdf

POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People



SECTION P

Political and Policy Drivers of Change

SECTION P: Political and Policy Drivers of Change

Public policy is being transformed in at least three very different areas right now. All of which are of significance for the development of rural regions. These are

- The transition to a low-carbon economy
- The fifth major reform of the Common Agricultural Policy
- Adjusting to the new (post-COVID) normal

These are all somehow linked by a recognition that

- Democracy and capitalism no longer serves society as earlier generations may have hoped
- People need new and better jobs, and better working conditions
- Climate 'change' has become a climate 'crisis'
- Social inequalities need to be reduced

A Foresight initiative provides an opportunity for going back to basics, asking hard questions about how well the public is being saved by existing policy and making constructive proposals for how this might be improved. Politicians at EU and member state level have made change necessary (on CAP, climate, and pandemic response). The 'elites' are more open than before to new thinking and seem willing to accommodation for change. But they rely on inputs from the regions and the 'grass roots' of society as to what that change should look like.

New measures at EU and member state level under the headline banner of the 'green deal' will mobilize, not billions but trillions in finance and support mechanisms for the retrofitting of buildings, the development of carbon neutral energy sources, and the mitigation of green-house gasses on a massive scale. Much of this will be made available via banks and specialized funds for lending to the commercial, private, and public sector, including the regions and municipalities of Europe, for the implementation of hundreds of thousands of projects needed for the EU to realize it's green transition.

The new CAP requires member states to play a much greater role in the design and implementation of their own nationally or regionally adapted programs. Some will 'blend' money from the CAP budget with other moneys to improve farm-incomes and the resilience of local food systems. The work of 'payment agencies' will be transformed by new technologies including remote observation technologies based on the COPERNICUS. That will transform they work they do, and they will need to reinvent themselves for this new normal. It is likely that farming will have to account for its impact on the environment, making this a factor in the competitiveness of agricultural production systems but also enabling farmers to get paid fairly for the provision of public goods such as valuable landscapes or ecological goods and services. Some regions may integrate thinking about rural and urban models of production, their integration in modern systems of sales, marketing, and distribution, as well as with the circular bioeconomy.

Many of the jobs and livelihoods lost due to COVID will have to be replaced. Provision will have to be made for how to react should something similar happen again in the near future. Lessons need to be learned on how to preserve local food systems, essential workers will need to be protected and taught how to work in such stressful

conditions. These include people working in food processing, delivery, education, healthcare, and the care of the elderly. Disruption is an opportunity but only for those that have prepared themselves, for example via a well-run Foresight initiative.

Regional Policy

Description

Regional policy aims to improve economic conditions in regions of relative disadvantage. The regional policy of the European Union (EU), also referred as Cohesion Policy, is a policy with the stated aim of improving the economic well-being of regions in the EU and also to avoid regional disparities. More than one third of the EU's budget is devoted to this policy, which aims to remove economic, social, and territorial disparities across the EU, restructure declining industrial areas and diversify rural areas which have declining agriculture. In doing so, EU regional policy is geared towards making regions more competitive, fostering economic growth, and creating new jobs. The policy also has a role to play in wider challenges for the future, including climate change, energy supply and globalization. The EU's regional policy covers all European regions, although regions across the EU fall in different categories (so-called objectives), depending mostly on their economic situation. Cohesion policy is the European Union's strategy to promote and support the 'overall harmonious development' of its Member States and regions. Enshrined in the Treaty on the Functioning of the European Union (Art. 174), the EU's cohesion policy aims to strengthen economic and social cohesion by reducing disparities in the level of development between regions. The policy focuses on key areas which will help the EU face up to the challenges of the 21st century and remain globally competitive.

The cohesion policy is financed through three major funds: the European Cohesion Fund, the European Regional Development Fund (FESR) and the European Social Fund (FSE). These funds, combined with the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF), constitute the European Structural and Investment Funds (ESIF). European territorial cooperation aims to reduce the importance of borders within Europe – both between and within countries – by improving regional cooperation. It allows for three different types of cooperation: cross-border, transnational and interregional cooperation. The objective is currently by far the least important in purely financial terms, accounting for only 2.5% of the EU's regional policy budget. It is funded exclusively through the ERDF.

Regional policy is implemented in the framework of operational programmes. Operational programmes are detailed plans in which the Member States set out how money from the European Structural and Investment Funds (ESIF) will be spent during the programming period. They can be drawn up for a specific region or a country-wide thematic goal (e.g. Environment). For the European Territorial Cooperation goal, cross-border or interregional operational programmes are drawn up. Member States submit their operational programmes on the basis of their Partnership Agreements. Each operational programme specifies which of the 11 thematic objectives that guide cohesion policy in the 2014-20 programming period will be addressed through the funding available under the operational programmes.

Five main objectives will drive EU investments in 2021-2027. Regional development investments will strongly focus on objectives 1 and 2. Depending on Member States' relative wealth, 65% to 85% of ERDF and Cohesion Fund resources will be allocated to the following priorities:

- A **Smarter** Europe, through innovation, digitization, economic transformation, and support to small and medium-sized businesses a Greener, carbon free Europe, implementing the Paris Agreement and investing in energy transition, renewables, and the fight against climate change
- A more **Connected** Europe, with strategic transport and digital networks
- A more **Social** Europe, delivering on the European Pillar of Social Rights and supporting quality employment, education, skills, social inclusion, and equal access to healthcare
- A Europe **Closer to Citizens,** by supporting locally led development strategies and sustainable urban development across the EU.

Justification

Regional policy might impact the pilot regions either with investments in infrastructure (e.g. new transport networks, incubators, etc.) and/or with innovations in the agri food sector. The Smart Specialization Platform[1] for Agri-Food (S3P Agri-Food) established at EU level aims to accelerate the development of joint investment projects in the EU by encouraging and supporting interregional cooperation in thematic areas based on smart specialization priorities defined by regional and national government linked to agriculture and food. The investment opportunities generated by the S3P Agri-Food will contribute to a more competitive and sustainable EU food supply chain, more resilient food systems, and to a more effective targeting of the EU regional funds on growth and jobs, especially through the numerous SMEs and micro-companies that make up this chain. The Platform will also promote the complementarity of funding instruments in the support of an investment project pipeline.

References

1. European Commission, Glossary on Regional Policy. Available: https://ec.europa.eu/regional_policy/en/policy/what/glossary/c/cohesion-policy
2. European Commission, Regional Development and Cohesion Policy beyond 2020: The New Framework at a glance. Available: https://ec.europa.eu/regional_policy/en/2021_2027/
3. Ciampi Stancova, K., and A. Cavicchi. 2017. Dynamics of Smart Specialisation Agri- food Trans-regional Cooperation, JRC Technical Reports. Available: https://op.europa.eu/en/publication-detail/-/publication/9a34c1ba-7278-11e7-b2f2-01aa75ed71a1/language-en/format-PDF/source-121510758
4. Ciampi Stancova, K. 2019. Interregional Cooperation in agri-food smart specialisation. Regional Studies Association. Regions e-Zine, Issue 3. Available: https://www.researchgate.net/publication/331454080_Interregional_cooperation_in_agri-food_smart_specialisation_Objectives_of_the_Thematic_Smart_Specialisation_Platform_on_Agri-food

The Common Agricultural Policy

Description

Agricultural policy in the EU is formulated at EU-level, hence the term Common Agricultural Policy (CAP). Established with the Treaty of Rome in 1957, the CAP has until now had the following objectives:

- Support farmers and improve agricultural productivity, ensuring a stable supply of affordable food
- Safeguard European Union farmers to make a reasonable living
- Help tackle climate change and the sustainable management of natural resources
- Maintain rural areas and landscapes across the EU
- Keep the rural economy alive by promoting jobs in farming and agri-foods industries.

These objectives are achieved with three main types of policy instruments:

- **Income supports** in the form of direct payments to farmers ensure their income stability (linked to agricultural products), along with *payments to farmers for environmentally friendly farming* and delivering public goods (for which no market exists), such as taking care of the countryside (Regulation (EU) 1307/2013,
- **Market measures** to deal with difficult market situations such as a sudden drop in demand due to a health scare, or a fall in prices as a result of a temporary oversupply
- **Rural development measures** with national and regional programmes to address the specific needs and challenges facing rural areas (Regulation (EU) 1305/2013). Only with respect to rural development (including so-called structural policy), the member states are allowed to formulate additional 'own' policy. EU rural development measures are co-financed.

For the period 2021-2027 the EC has proposed a more flexible system, simplifying, and modernizing the way the CAP works, with a shift in emphasis from compliance and rules towards results and performance. The CAP will be transformed to cover nine objectives:

- Ensure a fair income to farmers
- Increase competitiveness
- Rebalance the power in the food chain
- Climate change action
- Environmental care
- Preserve landscapes and biodiversity
- Support generational renewal
- Vibrant rural areas
- Protect food and health quality

Through **strategic plans**, Member States will set out how they intend to meet the 9 EU-wide objectives using CAP instruments while responding to the specific needs of their farmers and rural communities. With a proposed budget of €365B, the CAP will account for almost one-third of the EU budget, divided between its two 'pillars': direct support for farmers/market measures (€286B and rural development measures (€79B). In order to allow

Member States to better adapt the policy to their farming sector's priorities, they will have the option to transfer up to 15% of their CAP allocations between direct payments and rural development. Member States will also have the flexibility to transfer an additional 15% from Pillar 1 to Pillar 2 for environmental and climate measures without co-financing. The future CAP will encourage increased investment in research and innovation and will require CAP strategic plans to include national agricultural knowledge and innovation systems (AKIS) strategies to boost initiation and development of innovation projects and to disseminate and use their results.

Justification

The impact of the transformed CAP will be seen in two major ways:

- More care for environmental, nature protection, biodiversity, and climate change
- More emphasis on innovation, diversification of agricultural and rural activities, as well as farm generational renewal CAP targeting young farmers.

An important renewal also is the introduction of CAP strategic plans and more subsidiarity. Each of these changes offer opportunities to reshape rural-regional strategies and actions.

References

1. Council of the EU. 2019. Post-2020 CAP reform package. Council Presidency Note, December 2019. Brussels available online: https://data.consilium.europa.eu/doc/document/ST-14934-2019-INIT/en/pdf
2. European Commission, The common agricultural policy at a glance, available online:https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance_en
3. European Commission. 2018. EU Budget: The CAP after 2020. August 2018, Brussels, available online: https://ec.europa.eu/commission/news/eu-budget-common-agricultural-policy-after-2020-2018-jun-01_en
4. European Commission. 2018a. Modernizing & Simplifying the CAP. Economic challenges facing EU agriculture. Brussels available online: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/eco_background_final_en.pdf
5. European Commission.2019. The future is rural: the social objectives of the next CAP. Available online: https://ec.europa.eu/info/news/future-rural-social-objectives-next-cap-2019-feb-15_en
6. Kuhmonen, T. 2018. Systems view of future of wicked problems to be addressed by the Common Agricultural Policy. *Land Policy* 77: 683-695 available online: https://www.deepdyve.com/lp/elsevier/systems-view-of-future-of-wicked-problems-to-be-addressed-by-the-1BPgRGyruQ
7. European Commission, DG Agriculture and Rural Development, Unit for Agricultural Policy Analysis and Perspectives: Agricultural Policy Perspectives Brief: Overview of CAP Reform 2014-2020, 2013, available online: https://www.gpp.pt/images/Programas_e_Apoios/PAC/DocumentacaoBase_Pacpos2013/05_en_overview_of_CAP_Reform_2014_2020.pdf

8. European Commission, DG AGRI: Strategic Plan 2016-2020, available online: https://ec.europa.eu/info/sites/info/files/agri_sp_2016_2020_en.pdf.
9. European Parliament: Albert MASSOT, Francois NEGRE Directorate-General for Internal: Towards the Common Agricultural Policy beyond 2020: comparing the reform package with the current regulations, September 2018, available online: https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/617494/IPOL_BRI(2018)617494_EN.pdf
10. Ľubica RUMANOVSKÁ, SUA , Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 16, Issue 1, 2016 Impact of EU Common Agricultural Policy 2014-2020 Implementation on Agriculture in Slovak Republic, available online: http://managementjournal.usamv.ro/pdf/vol.16_1/Art71.pdf
11. Friedrich Heinemann, ZEW - Centre for European Economic Research; Stefani Weiss, Bertelsmann Stiftung: The EU Budget and Common Agricultural Policy Beyond 2020: Seven More Years of Money for Nothing?, August 2018, available online: http://aei.pitt.edu/102513/1/3.pdf or https://www.bertelsmannstiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/EZ_Reflection_Paper_3.pdf
12. Michala INKÁBOVÁ Department of Finance, Faculty of Economics, Technical University of Košice, ACTA OECONOMICA UNIVERSITATIS SELYE International scientific journal, The Current and Future Shape of the European Union's Common Agricultural Policy, June 2019, available online: http://acta.ujs.sk/docs/acta%202019_1%20final.pdf#page=91
13. Bartosz Mickiewicz, Robert Jurczak,UNIWERSYTET SZCZECIŃSKI: Comparative Analysis of Means for Financial Support of the Common Agricultural Policy in 2007−2013 as in Relation to 2014−2020, Współczesne Problemy Ekonomiczne nr 12 (2016), available online: <https://wnus.edu.pl/wpe/file/article/view/1387.pdf
14. CEMA- European agricultural machinery industry, CAP 2021-2027 Study Cap Reform Highlights,availableonline: https://www.cema-agri.org/images/publications/brochures/CAP_2021-2027_Study_2019_12.pdf
15. Andreea Drăgoi, Cristina Bâlgăr, Institute for World Economy, Romanian Academy, The Future of Common Agricultural Policy and the Challenges of Europe 2020 Strategy, available online: https://core.ac.uk/download/pdf/25776687.pdf

Policies for the Environment and Biodiversity

Description

It is of great importance to examine human impacts on the environment and biodiversity, which are incorporated with basic economic, social, political, and ecological factors that determine the environmental concern within a region and a country. The impacts of environmental problems are largely related within the world-system together with socio-economic and political factors, such as public infrastructure, nutrition, poverty and dependencies, economic capacity and government and authorities concern. The power discrepancies between the centers of countries and peripheral regions provide a significant relation towards environmental concern. It have direct effect towards environmental concern in the rural regions and causes indirect effects (for instant on the agricultural sector). As a result, one of today's most pressing environmental issues is the conservation of biodiversity, which is especially important in peripheral regions. This is important in the context of the role of European region to develop paradigm viewed from the global perspective of common environmental limits, and its reflection in numerous societies on the periphery. Theoretical contributions elucidate the understanding and significance of sustainability from global and regional perspectives.

The challenge is for nations, government agencies, organizations, and individuals to protect and enhance biodiversity while continuing to meet people's needs for natural resources. If not met, future generations will live in a biologically impoverished world and perhaps one that is less capable of producing desired resources as well. Conserving biodiversity involves restoring, protecting, conserving, or enhancing the variety of life in an area so that the abundances and distributions of species and communities provide for continued existence and normal ecological functioning, including adaptation and extinction.

As in other rural regions, population size is relatively small. Planning policies in most countries for the past years rarely express a bottom-up approach, but rather a centralized approach to development, derived from national ideology. Peripheral regions are one of the most challenging areas in terms of socio-economic conditions, its multi-cultural population, as well as its geographically and ecologically diverse environments. There is a clear tendency of the official planning institutions as well as the out-sourced governmental initiatives to pursue increasingly a more sustainable approach that seeks to integrate environmental consideration within planning processes. These processes are still deficient in their lack of a coherent environmental strategy and implementation by the government and its agents in the rural regions, and in the lack of conceptual and material resources for an integrated treatment of the rural regions' social, economic, and environmental problems.

Environmental issues are among the policy domains where the expansion of the population is most notable, involving the transfer of substantial decision-making power from domestic bodies to the regional level. Presently, most environmental policies are formulated within EU bodies, rather than by national and sub-national governments, legislative venues, and regulatory agencies. European environment policy rests on the principles of precaution, prevention and rectifying pollution at source, and on the ‘polluter pays’ principle. Multiannual environmental action programmes set the framework for future action in all areas of environment

policy. The Directives are embedded in horizontal strategies and are taken into account in international environmental negotiations.

The EU environmental policymaking seeks to green the state and societies in the quest for more sustainable development. This effort, related to EU's visions of ecological modernization and weak conceptualizations of sustainability, encompasses efforts to establishing a green economy Achieving such goals requires fundamental changes to European and global production and consumption systems. EU initiatives to date relay largely on modest efforts to increase the use of more environmentally friendly technology and green capitalist markets without challenging the way these operate at more fundamental levels. EU leaders simultaneously seek to improve the international competitiveness of European firms and support technological development. Yet the creation of a more circular economy requires substantial lifestyle and livelihood changes and much further de-coupling of welfare improvements from ecological destruction and increasing natural resource use and material throughput. Peripheral regions have an important role in this processes and must take a lead in establish ideas of preserving the environment and biodiversity while upgrading the way innovation and precision agriculture are supporting the decrease in using chemical fertilizers, pesticides, and herbicides

References

1. Jordan AJ, Adelle C, eds. 2012. Environmental Policy in the EU: Actors, Institutions and Processes. London: Earthscan
2. https://www.europarl.europa.eu/factsheets/en/sheet/71/vides-politika-visparigi-principi-un-pamatsistema
3. European Environment Agency. 2014. Resource-Efficient Green Economy and EU Policies. Copenhagen: European Environment Agency

Energy and Carbon Policies

Description

The energy transition commonly refers to structural transformation of the global energy sector from fossil-based to zero-carbon by the second half of this century. The recent Clean energy for all Europeans package (CE4AE Package) introduced a comprehensive update to the energy policy of the European Union to facilitate this transition towards cleaner energy and to deliver on the EU's Paris Agreement commitments for reducing greenhouse gas emissions. This reorientation recognizes that technological solutions alone are likely to be insufficient to address the energy sector challenges but it is necessary to consider the complex interaction of a variety of economic sectors, policy fields, and socio-technical elements. The policy places renewable energy and energy efficiency into the center of a new internal energy market and set citizens at the core. It includes European-wide targets, inter alias, to increase the share of renewables in the EU energy mix to 32% by 2030. The necessity to further decarbonize the world's economies and the ambition to make Europe become the first climate-neutral continent is further endorsed by the new European Commission and "European Green Deal" – a set of new policy initiatives announced for the new legislation period 2019 to 2024 "to reduce emissions further and faster, and by at least 50% for 2030". The European Green Deal involves all sectors of the economy, notably transport, energy, agriculture, buildings, and many industrial sectors.

Justification

Energy transition and use of renewable energy have many potential benefits, including a reduction in greenhouse gas emissions, the diversification of energy supplies and a reduced dependency on fossil fuel markets. The growth of renewable energy sources may also stimulate employment in the EU, through the creation of jobs in new 'green' technologies. Energy transition can be seen as an opportunity for diversification of regional economies towards new sectors and it can offer significant, currently largely untapped synergies with regional development. Several EU and national funding programmes are available to incentivize the production and use of renewable energy, such as the European Agricultural Fund for Rural Development (EAFRD), the European Regional Development Fund (ERDF) and the Cohesion Fund (CF).

In the context of rural development, the OECD has identified the following key success factors for leveraging renewable energy:

- Embed energy strategies in the local economic development strategy so that they reflect local potential and needs,
- Integrate renewable energy within larger supply chains in rural economies, such as agriculture, forestry, traditional manufacturing, and green tourism,
- Limit subsidies in both scope and duration, and only use them to encourage renewable energy projects that are close to being viable on the market,
- Avoid imposing types of renewable energy on areas that are not suited to them,
- Focus on relatively mature technologies such as heat from biomass, small scale hydro, or wind energy,
- Create an integrated energy system based on small grids able to support manufacturing activities,

- Recognize that renewable energy competes with other sectors for inputs, particularly land,
- Assess potential projects using investment criteria, and not on the basis of short-term subsidy levels,
- Ensure local social acceptance by ensuring clear benefits to local communities and engaging them in the process.

References

1. European Commission (2019) Clean energy for all Europeans. Publications Office of the European Union, 2019. Available: https://op.europa.eu/en/publication-detail/-/publication/b4e46873-7528-11e9-9f05-01aa75ed71a
2. European Commission (2019) The European Green Deal. COM(2019) 640 final. Available: https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf
3. European Court of Auditors (2018) Renewable energy for sustainable rural development: significant potential synergies, but mostly unrealized. No. 05 pursuant to Article 287(4), second subparagraph, TFEU).
4. Available: https://www.eca.europa.eu/Lists/ECADocuments/SR18_05/SR_Renewable_Energy_EN.pdf
5. International Renewable Energy Agency (IRENA) (2020) Energy Transition. Online article. Available: https://www.irena.org/energytransition.
6. OECD (2012) Linking Renewable Energy to Rural Development, OECD Publishing, 2012, Available: http://dx.doi.org/10.1787/9789264180444-en.

The European Green Deal

Description

The rise of the temperatures, the pollution of oceans and the destruction of forests are only some of the consequences of climate change that our planet is currently facing. As a response to this global crisis, in December 2019, the European Commission presented its Green Deal Strategy, which consists in a set of policy initiatives aiming at putting Europe on track to reach net-zero global warming emissions by 2050. As the President of the European Commission said multiple times, citizens are at the core of this transition. The transition is going to improve people's well-being and make Europe more competitive. To achieve its ambition, the Green Deal needs to address all citizens, in a fair and just way. The institutions will support citizens and the regions that need to make bigger efforts in this transformation, ensuring that no one is left behind.

To deliver the Green Deal, actions will be taken in the following areas:

- Climate: Increasing the EU's climate ambitions for 2030 and 2050
- Energy: Supplying clean, affordable, and secure energy
- Industry: Mobilizing industry for a clean and circular economy
- Building: Building and renovating in an energy and resource efficient way
- Transport: Accelerating the shift to sustainable and smart mobility
- Agri-food: From "farm to fork" designing a fair, healthy, and environmental food system
- Ecosystems: Preserving and restoring ecosystems and biodiversity
- Environment: A zero pollution ambition for a toxic-free environment

The European Commission has also developed a roadmap which includes key actions that will be implemented in each area of the Green Deal.

To achieve the goals set by the European Green Deal, the European Commission presented the Sustainable Europe Investment Plan. This Plan will mobilize at least €1 trillion in sustainable investments over the next decade. As citizens are at the core of this transition, the plan includes also "the Just Transition Mechanism" which will be targeted to a fair and just green transition. It will mobilize at least €100 billion in investments over the period 2021-2027 to support workers and citizens of the regions most impacted by the transition to alleviate the socio-economic impact of the transition. The Mechanism will create the necessary investment to help workers and communities which rely on the fossil fuel value chain. It will come in addition to the substantial contribution of the EU's budget through all instruments directly relevant to the transition. The Just Transition Mechanism will protect People and citizens most vulnerable to the transition by: facilitating employment opportunities in new sectors and those in transition; offering re-skilling opportunities; improving energy-efficient housing; investing to fight energy poverty; facilitating access to clean, affordable and secure energy.

Justification

The Farm to Fork strategy sets out the regulatory and non-regulatory measures needed to create more efficient, climate-smart systems that provide healthy food, while securing a decent living for EU farmers and fishermen. It will have six principal objectives which feed into and are in turn influenced by other strategic objectives of the European Green Deal:

- To contribute to Europe's climate change agenda
- To protect the environment (linking to the Zero Pollution Strategy and the Circular Economy Strategy)
- To preserve biodiversity (contributing to the updated Biodiversity Strategy for 2030)
- To encourage sustainable food consumption
- To promote affordable and healthy food for all
- To improve farmers' position in the value chain.

References

1. European Commission (2019) The European Green Deal. COM(2019) 640 final. Available online https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf and https://ec.europa.eu/info/sites/info/files/european-green-deal-communication-annex-roadmap_en.pdf

2. European Commission (2019) Farm2Fork Strategy. Available online https://ec.europa.eu/food/farm2fork_en

Rural Tourism Policy

Description

The EU recognized "Tourism" as a vital essential economic activity for the peripheries, especially during economic downturns, as it generates jobs, impacts on growth rates as well as binding factor among cultures and heritages. Although there are many activities related to tourism implemented by EU, the Union has to form a common policy to regulate its tourism related activities for peripheral development. Diversity of interests, demographics, and economic factors make it difficult to expect a common tourism policy within the EU.

The EU report "International tourism trends in EU-28 member states - Current situation and forecast for 2020-2025-2030", shows that there is still a substantial potential for further expansion of the tourism business in the EU in coming decades. Both existing and new destinations can benefit from this opportunity, provided they do the necessary to ensure the right conditions with regard to the business environment, infrastructure, and travel facilitation.

In order to stay competitive and tap into the potential demand, it is essential to continue creating and raising awareness and to make tourism a mainstream topic on the political agenda, with an eye to develop the rural regions. Most of the EU destinations have a strong tradition in tourism and a great professionalism and can count on a highly developed tourism sector underpinned by some very strong assets.

Justification

EU policies also reinforce efforts to increase popularity of Europe as the most favorite chosen destination by setting regulations to preserve historical and cultural places. Job opportunity and economic growth are also the results to promote beneficial political objectives for policy makers in their public eye and gain trust in future tourism development. Relation between economic growth and tourism profoundly displays directly in providing more jobs, generating income resulting sustainable development. Cooperation among public and private sector also harmonized initiatives in a complex set of influences.

References

1. International tourism trends in EU-28 member states - Current situation and forecast for 2020-2025-2030, in <https://ec.europa.eu/growth/content/international-tourism-trends-eu-28-member-states-current-situation-and-forecast-2020-2025-0_en>
2. COM 665 in <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R0665>
3. "Tourism, Urbanization, and the Evolving Periphery of the European Union" <https://books.google.co.il/books?id=hjy5DwAAQBAJ&pg=PA32&lpg=PA32&dq=EU+policy+on+Peripheral+tourism&source=bl&ots=9DDV5UFT42&sig=ACfU3U2z7vbDkNUApV_ee3bin8X5QcuVFw&hl=en&sa=X&ved=2ahUKEwiJj7Cc9djoAhWMh1wKHQVHBPsQ6AEwBnoECAwQKA#v=onepage&q=EU%20policy%20on%20Peripheral%20tourism&f=false>

Industry and Enterprise Policy

Description

Development policies help foster new rural enterprises. There is a strong link between rural development policy and the growth of new activities in rural areas. Institutions and individuals promoting rural development now see entrepreneurship as a strategic development intervention that could accelerate the rural development process. The existence of an environment enabling entrepreneurship largely depends on policies promoting rural entrepreneurship. Policy initiatives aimed at encouraging the formation and growth of enterprises in rural areas need to take into account of the distinctive challenges facing these areas, which are associated with three main aspects: characteristics of the business environment; characteristics of rural populations and aspects of the existing economic structure. Rural entrepreneurs face certain challenges not encountered by urban entrepreneurs, related to low population density and greater distance to markets as well as to information, labor, and most other resources. EU-wide initiatives carried out under the auspices of the Leader local development approach help to promote economic diversification, in particular towards non-agricultural activities in rural areas. These European level initiatives are supported by national, regional, and local policies. Various initiatives within the framework of LEADER and LEADER+ are aiming to increase partnership building, co-operation and synergies amongst different actors through the establishment of Local Action Groups, as well as to further link different initiatives in diversifying the rural economies in the two districts with wider local economic development strategies that promote entrepreneurship as a motor for job creation and economic growth. A common feature of all these policies is a shared vision and a territorial, rather than sectoral, approach to rural development (going beyond agricultural or land-use policies). Creating the conditions in which innovative rural businesses can thrive require new ways of governing rural areas, as well as changes in consumer behavior. NGOs complement development policies by acting as innovators. Specific programmes on rural entrepreneurship are essential for the development of rural-based businesses. In this respect EU rural development policy is helping to facilitate the emergence and sustainability of new activities in rural areas.

Justification

Three factors have been identified as having particular influences on recent changes in rural policy: An increased focus on amenities, such as antiquities, historical sites and other recreational amenities; Pressures to reform agricultural policy, to reduce distortions to international trade, as well as for budgetary reasons; And decentralization trends in regional policy, with the aim of mobilizing local assets, involving a more „bottom-up" approach to policy and negotiated forms of governance.

The following policy recommendations can be put: Provide support for a programme of rural business incubators that emphasizes the process of business incubation and the active participation of key actors in rural localities as partners; and, Provide funds for universities to establish Innovation and Commercial Centers, focused on increasing their capacity to effectively support new and small rural businesses.

References

1. Apostolos G. Papadopoulos: Impact of the CAP on Agricultural Structures and Rural Areas, Agrarian South: Journal of Political Economy 4(1) 22–53, 2O15, available online: https://www.researchgate.net/profile/Apostolos_Papadopoulos3/publication/277953329_The_Impact_of_the_CAP_on_Agriculture_and_Rural_Areas_of_EU_Member_States/links/5d49e8c8299bf1995b6a94df/The-Impact-of-the-CAP-on-Agriculture-and-Rural-Areas-of-EU-Member-States.pdf

2. European Commission, DG AGRI: Strategic Plan 2016-2020, available online https://ec.europa.eu/info/sites/info/files/agri_sp_2016_2020_en.pdf.

3. European Network for Rural Development: EU Rural Review, European Union 2012, https://enrd.ec.europa.eu/sites/enrd/files/ED5808AC-994A-47AD-928F-0D3088716910.pdf

4. European Commission, Eurobarometer 2010, Europeans, Agriculture and the Common Agricultural available online: https://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_336_en.pdf

5. Michael Kenny, Department of Adult and Community Education, National University of Ireland, Maynooth, 2003, Social & Economic Aspects of Policy & Planning, available online: http://mural.maynoothuniversity.ie/1177/1/MKMod.pdf?origin=publication_detail

6. Organisation for Economic Co-operation and Development, The report: Strengthening entrepreneurship and economic development in East Germany - Lessons from local approaches, 2008, Key Policy Issues in Entrepreneurship and SME, available online: https://www.oecd.org/site/cfecpr/42203059.pdf

7. European Commission, Agriculture and rural development: INTERNAL EU AGRICULTURE AND RURAL DEVELOPMENT POLICY, Available online: https://www.un.org/esa/agenda21/natlinfo/countr/ec/agriculture.pdf

8. European Parliament: EU policy briefing, Agriculture: The common agricultural policy (CAP), 2019, available online: https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/635524/EPRS_BRI(2019)635524_EN.pdf

9. Európska komisia: DG AGRI, Dušan Chrenek, 2018, Spoločná poľnohospodárska politika po roku 2020, available online: http://www.arimex.sk/data/news/polnohospodarska_politika_po_roku_2020__d.chrenek.pdf

10. Ministerstvo pôdohospodárstva a rozvoja vidieka SR: os 4 LEADER, available online: https://www.mpsr.sk/index.php?navID=47&sID=43&navID2=286

11. SBA, Sprievodca iniciatívami na podporu MSP 2019, Bratislava, available online: http://www.sbagency.sk/sites/default/files/sprievodca_iniciativami_2019_final.docx.pdf

12. SBA: Porovnanie podmienok podnikania MSP v krajinách strednej Európy, 2018, available online: https://www.npc.sk/media/uploads/files/Porovnanie_podmienok_podnikania_MSP_v_krajinach_strednej_Europy_II3158H.pdf

13. Slow Food, Smerom k novej spoločnej poľnohospodárskej politike, available online: https://www.slowfood.com/sloweurope/wp-content/uploads/PAC_CORTO_SL.pdf

Trade Policy and the Rise of China

Description

The Belt and Road Initiative (BRI) (formerly known as One Belt One Road) is a Chinese programme, launched in 2013, that aims to connect Asia with Africa and Europe via land and maritime networks along six corridors to improve regional integration, increase trade and stimulate economic growth. It is seen as a revival of the Silk Road, an ancient network of trade routes that connected China to the Mediterranean via Eurasia for centuries.

The initiative includes a Silk Road Economic Belt – a trans-continental passage that links China with south east Asia, south Asia, Central Asia, Russia and Europe by land – and a Maritime Silk Road, a sea route connecting China's coastal regions with south east and south Asia, the South Pacific, the Middle East and Eastern Africa, all the way to Europe. Currently, it covers around 70 countries.

The initiative defines five major priorities (developed through Chinese investment):

- Policy coordination
- Infrastructure connectivity
- Trade
- Financial integration, and
- Connecting people.

Justification

According to the World Bank, around 45% of the world's population (2018) is rural; considering that the BRI includes, at the moment, around 70 countries rural populations will also be impacted by this programme. FAO has been collaborating to "maximize the poverty alleviation and rural development impact of Belt and Road Initiative. The Belt & Road Initiative involves huge investments in transportation and communications infrastructure. Matching these investments with much smaller investments supporting well designed complementary measures, the Belt and Road Initiative can make very substantial poverty alleviation achievements" (Vincent Martin from FAO, see below.)

These investments will have a direct and indirect impact in rural areas (and in neighbouring countries), for example, in the production and supply chain. The investments are an important part for the rural development but will have to be accompanied by public policies towards, for example, the decrease of bureaucracy, and a more sustainable and responsible production.

References

1. European Bank for Reconstruction and Development. Belt and Road Initiative. Available online: https://www.ebrd.com/what-we-do/belt-and-road/overview.html
2. Organisation for Economic Co-operation and Development (OECD). 2018. The Belt and Road Initiative in the Global Trade, Investment and Finance Landscape. OECD Publishing, Paris. 46 pp. Available online: https://www.oecd.org/finance/Chinas-Belt-and-Road-Initiative-in-the-global-trade-investment-and-finance-landscape.pdf
3. Chatzky, A. & McBride, J. 2020. China's Massive Belt and Road Initiative. Council on Foreign relations. Available online: https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative
4. United Nations in China. 2017. FAO China Calls for strengthening Agricultural Collaboration under the Belt and Road Initiative. Available online:<http://www.un.org.cn/info/6/562.html
5. FAO Regional Office for Asia and the Pacific. 2017. Focus on agriculture is key to ensures that Belt and Road initiative promotes sustainable development. Available online: http://www.fao.org/asiapacific/news/detail-events/en/c/885681/
6. The World Bank - Data. Rural population (% of total population). Available online: https://data.worldbank.org/indicator/sp.rur.totl.zs?name_desc=false

Pandemic Policies

Description

Pandemics are large-scale outbreaks of infectious disease that can greatly increase morbidity and mortality and that crosses international boundaries, usually affecting a large number of people. This last factor is crucial, as pandemics are identified by their geographic scale rather than the severity of illness.

The direct impacts of pandemics can be catastrophic. The health impacts of pandemics have been very intense over time (e.g. Black Death, AIDS, 1918 Influenza, COVID-19), but economic and social impacts have also been very significant. Evidence suggests that pandemics' frequency has increased over the last years because of the growth of global travel, urbanization, changes in land use and greater exploitation of the natural environment.

Rural areas have been very affected by pandemics, especially in territories that have resource-constrained settings, such as insufficient public health infrastructures, poor water and sanitation systems, which leads to reduced pandemic preparedness.

In order to reduce negative effects that derive from pandemics, pandemic policies and mitigation measures have to be applied in rural areas, focusing on maintenance of situational awareness, public health messaging, reduction of transmission and care and treatment of the illness.

Justification

During severe pandemics, rural areas experience significant impacts, with widespread increase in morbidity and mortality and several negative social and economic effects. The agricultural sector faces disruption, potentially, leading to shortages of goods, lack of workforce and economic damage. Therefore, overall decline in demand in agriculture industry is often very observed during events of pandemics.

The adoption of pandemic policies are crucial in rural areas, which can play a critical role in reducing infectiousness and susceptibility to pandemics, minimizing the negative pandemic effects.

The most cost-effective policies for increasing pandemic preparedness in rural areas consist of investment to strengthen core public health infrastructure, including water and sanitation systems.

In order to prevent and contain pandemic sparks in rural areas before they become a wider threat, it is very important to consider human health, animal health and environment to be interconnected. In rural areas, efforts must be made to control animal reservoirs, monitor high-risk populations such as people working at the animal interface (e.g. those involved in animal husbandry), and maintain robust health infrastructure. Biosecurity and veterinary public health must also be ensured.

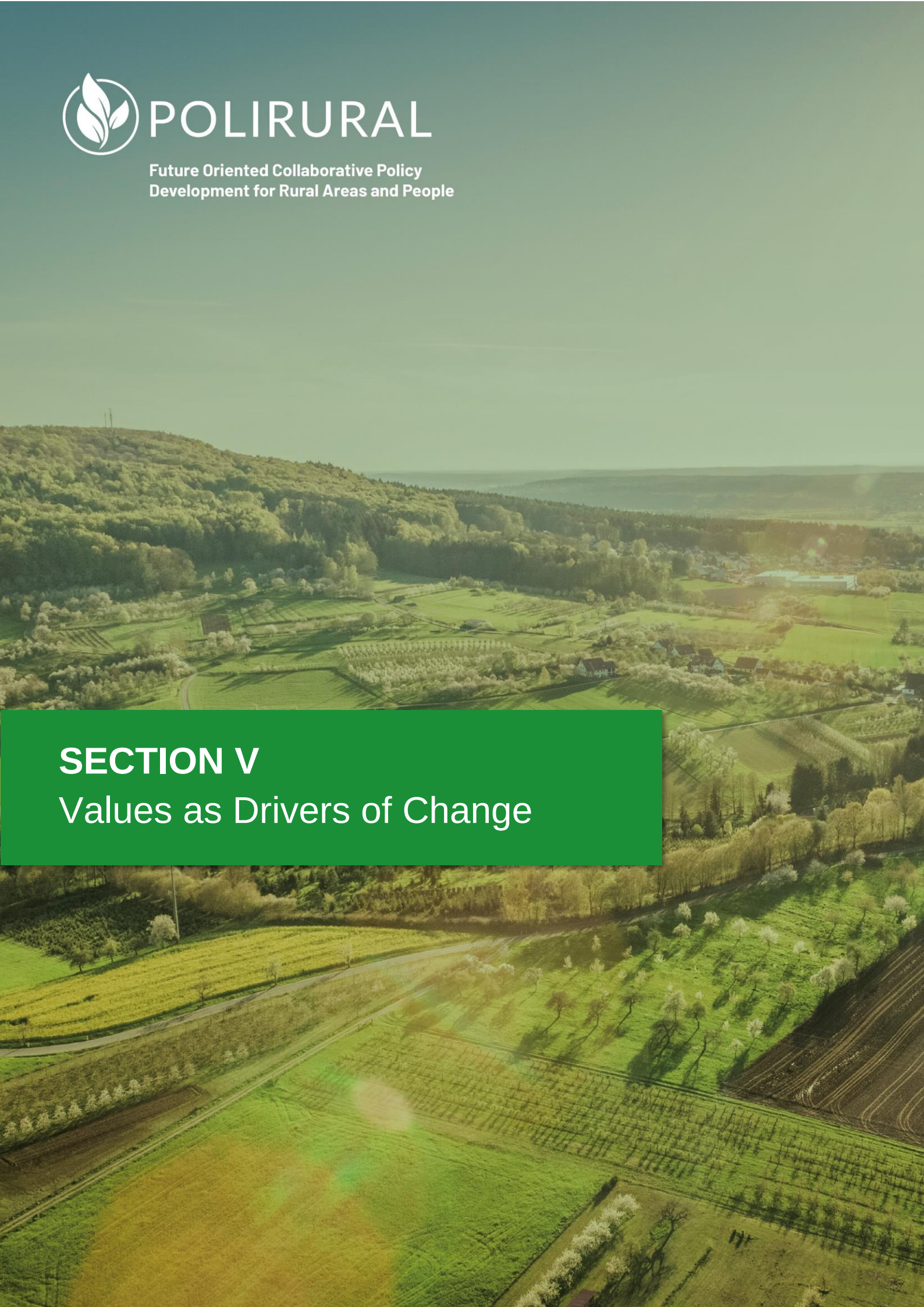
Building pandemic situational awareness is also crucial in rural areas, and it must be faced as an holistic policy, as it requires coordination across bureaucracies, public and private sector. This policy must include disease surveillance, crisis management and risk communication systems.

References

1. European Commission - Directorate-General for Economic and Financial Affairs. 2006. T*he macroeconomic effects of a pandemic in Europe - A model-based assessmen*t. ISSN 1725-3187. 21 pp. Available online: https://ec.europa.eu/economy_finance/publications/pages/publication708_en.pdf.
2. Madhav, N., Oppenheim, B., Gallivan, M., Mulembakani, P., Rubin, E. & Wolfe, N. 2017. *Pandemics: Risks, Impacts and Mitigation*. In: Disease Control Priorities: Improving Health and Reducing Poverty. Available online: https://www.ncbi.nlm.nih.gov/books/NBK525302/.
3. Thießen, M. 2016. P*andemics as a Problem of the Province: Urban and Rural Perceptions of the "Spanish Influenza" 1918-1919*. Epidemien und Pandemien in historischer Perspektive pp: 163-175. Available online: https://link.springer.com/chapter/10.1007%2F978-3-658-13875-2_12.
4. Roser, M., Ritchie, H., & Ortiz-Ospina, E. 2020. *Coronavirus Disease (COVID-19) - Statistics and Research*. Our World in Data. Available online: https://ourworldindata.org/coronavirus#citation.
5. Roser, M. 2020. The Spanish flu (1918-20): the global impact of the largest influenza pandemic in history. Our World in Data. Available online: https://ourworldindata.org/spanish-flu-largest-influenza-pandemic-in-history

POLIRURAL

Future Oriented Collaborative Policy Development for Rural Areas and People



SECTION V

Values as Drivers of Change

SECTION V: Values as Drivers of Change

It is rare that people have an opportunity to talk about their values or the principles by which they live. Nevertheless, people express their values through the decisions they make on a day to day basis. That includes their decisions about what to wear, what to eat, what to do in ones' spare time, the things people chat about and of course the way they vote in elections. These things are rife with contradiction and do not sum up to a coherent whole and people may say one this but do another. Such is the complexity of the so-called "rational man." Some values, or our expression of those values, are well thought-through and deliberate. Some are learned or assimilated. Some are adopted by simply 'going with the flow of what society or peer groups do. Different things seems important to the same people at different stages of their lives, priorities change across geographies and generations, and as the world and the experience of living changes over time.

Foresight is ultimately a change management tool. Its emphasis on engagement with stakeholders, groupwork and a structured process of collaborative learning, is intended to ensure opportunities for discovery and debate by those who take part, and to provide mechanisms by which diverse participants get to better understanding the needs of those with which they live and work, the constraints that the real world imposes on change and on those who try to orchestrate change, as well as mechanisms to achieve buy-in on the eventual conclusions and recommendations of the process. Ultimately that means shared agreement on the vision, action-plan and roadmap that constitute the formal deliverable of the Foresight exercise.

One of the challenges in developing a vision is to avoid triviality, or to end up with words that prove meaningless on further inspection. One-way for doing this is to test the vision against a list of values or principles that are fundamental to the way a community sees itself.

Ultimately our values underly what we may consider to be the good life, or the good society and that is why, in the context of a Foresight initiative, it is useful to try to understand what these are and how they might be changing.

A structured reflection on values could be part of a drivers' analysis activity or it could be left until later and handled as an integral of the vision building process. There are many ways of doing this. It is up to the animator or core team leading the Foresight initiative to decide how best to do this and how much time to give over to it, based on their own idea of how the process should proceed, as well as on the time and resources available for the implementation.

Concern for the Planet, the Climate and the Environment

Description

According to a new Eurobarometer survey, 94% of citizens in all EU Member States say that protecting the environment is important to them. In addition, 91% of citizens stated that climate change is a serious problem in the EU. European legislation is necessary to protect the environment, according to 83% of those surveyed.

Environmental value can be understood as a worth that a community or society places on environmental goods or services such as aesthetic and recreational facilities and resources.

The word 'value' is one of the most confusing and misused words in the English language. It means so many different things that people are often talking cross purposes when they talk about 'values' (and not just in an environmental context). What then do environmental values consist of? To environmentalists, they derive from the pleasure of using a clean environment (so-called use values) and from the pleasure of simply knowing that the environment is clean, now and in the future (so-called non-use values). To those not directly concerned with these things, the environment may have a value if it contributes to social and economic well-being, and it does this by providing inputs into production (soils, forests etc.) and as a sink for waste. All these are very real values, and there is little disagreement on that. Where disagreement comes about is when we try and convert these values into money terms. This is more acceptable to those dealing with the social and economic benefits of the environment than to those interested in the use and non-use values. Valuation in money terms can be accepted more widely if we can agree that such values are seen as a tool for deciding what we are willing to sacrifice from our scarce resources to protect the environment. No one argues that we should devote all our resources for this purpose, and therefore by implication there must be some trade-off between environmental protection and economic use of the environment. The next step is to agree on how to measure what we are willing to sacrifice. Here we make the case for money because it is a convenient unit of account. It allows us to compare values across very different things. Of course any other unit of account would be valid, as long as it was well understood by everybody.

General associations with the environment are Pollution in towns and cities, Climate change, Green and pleasant landscapes, Protecting nature, The state of the environment our children will inherit, Man-made disasters such as oil spills, industrial accidents, The quality of life where you live, Earthquakes, floods and other natural disasters, Using up natural resources.

Justification

Non-market valuation of the environment is a growing field and for good reason. It can, and has contributed to better decision-making in the public sector, both in terms of rules for investment as well as regulations on activities that harm the environment.

What Do Environmental Values Consist of? How Do We Value Environmental Goods and Services and What Are the Problems with Such Values?

References

1. Anil Markandya. Why We Should Value the Environment? And When?. /cit. 04-04-2020/. Available online: https://www.czp.cuni.cz/Vzdel/letni_skola/program/Markandya_Why%20we%20should%20value%20the%20environment%20and%20when.pdf
2. Dr Ken Henry AC. The value of the environment. 04 March 2010. /cit. 04-04-2020/. Available online: https://treasury.gov.au/speech/the-value-of-the-environment
3. Special Eurobarometer. Attitudes of European citizens towards the environment. 2008. /cit.04-04-2020/. Available online: https://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_295_en.pdf

Interest in Personal Health, Self-Care and Wellness

Description

Self-Care is an approach or philosophy, that drives an individual for healthy choices. From diet and exercise to health literacy, and also compliance to medical treatment – all are part of the same effort. Self-Care of citizens supports public organizations to cope with growing public health care costs.

Wellness and healthy living are megatrends that used to be comprised of more discrete, siloed markets (i.e., the fitness or spa industries,) but now everything is converging in, and around, wellness, and the concept is remaking whole industries and categories of living—whether fashion, real estate or tourism. The global wellness economy continues to outpace the world's GDP growth. Nature, healthy food, detox, alternative treatments and wellness retreats in rural areas or countryside are important concepts in wellness business.

Well-being and health are a megatrend, and potential alternative therapies are on the rise. The business also attached retail and hotel chains to the wellness entrepreneurs, creating a new type of tourism, but the wellness and alternative therapies business lacks control. In addition, there is no consumer protection for various types of treatments and wellness services, claiming to improve your health and wellbeing.

Justification

Citizens' self-care supports public health organizations keeping costs under control. Consumer rights need to be clarified in relation to various types of treatments and wellness providers available. Citizens health, wellbeing and self-detemination will be imroved by self-care practise. For rural areas new types of tourisim concepts can be developed driving from wellness and self-care trends.

References in English

1. EU Health Policy Platform[online], 2020. https://webgate.ec.europa.eu/hpf/
2. Global Wellness Summit. The Future of Wellness. Global Wellness Report, 2020. https://www.globalwellnesssummit.com/2020-global-wellness-trends/global-wellness-trends/
3. Directoral General for Interal Policies. Complementary and alternative therapies for patients, 2017. Available online: https://www.europarl.europa.eu/cmsdata/135562/ENVI%202017-10%20WS%20CAM%20%20PE%20614.180%20(Publication).pdf

References in Finnish

1. http://www.unelmaelama.fi/retriitit-ja-kurssit.html
2. https://yle.fi/uutiset/3-10035701

Food Movements for Vegetarians, Vegans, Flexitarians and Climatarians

Description

Ever growing number of Europeans are refraining from eating meat by adopting a vegetarian or strictly vegan diet. The values behind this trend are related to ethics according to which animals are free to exist in their own right. These values are supported and made well-known by climate-conscious campaigning organisation organizations such as Greenpeace. It is not only about diet, vegans promote a lifestyle that excludes, as far as possible and practical, all forms of exploitation of and cruelty to animals for the purposes of food, clothing or anything else. Vegans do not eat animal products at all, including milk and dairy products. Vegetarianism means the practice of not eating meat or fish, especially for moral, religious, or health reasons. Vegetarians don't eat animals, but may eat products that come from them (such as dairy and eggs). People typically choose these diets because of health concerns, ethical or religious restrictions or moral concerns about harming animals or because of wanting decrease their carbon footprint. In addition to these food movements, there is also organic food movement, which means that farm products and ingredients are grown without the use of pesticides, synthetic fertilizers, sewage sludge, genetically modified organisms, or ionizing radiation. According to organic movement, animals that produce meat, poultry, eggs, and dairy products should not be fed by antibiotics or growth hormones. Moreover, there is a food trend called climatarianism. Climatarians are persons who choose to eat according to what is least harmful to the environment. Climatarians typically cut out meat and other foods with a high carbon footprint. In addition, the projected trend in decreasing meat consumption in Europe is also down to those who reduce their meat consumption, known as 'flexitarians', who are keen to make more health and environmentally conscious food choices but without dramatically changing their diet and still continuing consuming animal products in some extent.

Justification

These trends are significantly related to consumption of the main agricultural products in EU and globally and to agricultural jobs across EU in the end. There are different impacts for the production of a wide range of agri-food products, including meat, arable crops, milk and dairy products, and fruit and vegetables. Moreover, there are significant environment related impacts of this trend. For example if EU citizens were to eat 50% less meat, dairy products and eggs, this would reduce agriculture greenhouse gas emissions by 25 to 40%.

The above described consumer trends and food movements have impacts on what agricultural products should be produced and how. The consumer demand for production of milk and dairy products will decrease. Consumer demand of meats, excluding poultry products will decrease. Consumer demand of meat substitute and oat products is increasing. Also consumer demand of organic vegetables, grains and vegetable oils is likely to increase. All agriculture production needs to consider how to make production environmentally friendlier and cruelty-free, reducing greenhouse gas emissions and other negative climate impacts. Also the production needs to be kept as pure as possible from the usage of synthetic fertilizers and antibiotics.

References

1. EU agricultural outlook 2018-2030: Changing consumer choices shaping agricultural markets. 2018. Available online: < https://ec.europa.eu/info/news/eu-agricultural-outlook-2018-2030-changing-consumer-choices-shaping-agricultural-markets-2018-dec-06_en>
2. OECD-FAO AGRICULTURAL OUTLOOK 2018-2027. Available online: <http://www.fao.org/3/i9166e/i9166e_Chapter6_Meat.pdf>
3. Meat Substitutes Market Size, Share & Trends Analysis Report By Product, By Raw Material, By Region And Segment Forecasts, 2012 - 2022. (2018) Available online: <https://www.reportbuyer.com/product/5491674/meat-substitutes-market-size-share-and-trends-analysis-report-by-product-by-raw-material-by-region-and-segment-forecasts-2012-2022.html>
4. Greenpeace. Feeding the problem, 2019. Available online: <https://storage.googleapis.com/planet4-eu-unit-stateless/2019/02/83254ee1-190212-feeding-the-problem-dangerous-intensification-of-animal-farming-in-europe.pdf>

Concern for Natural Resource Scarcity

Description

Oil and natural gas, farm land, water, food, and minerals are critical to ensuring our wellbeing and prosperity. Due to expanding economic activities, growing population, and climate change these resources have become increasingly sensitive to higher prices, supply shortages, and export restrictions. The mismatch between future demand and supply is crystallizing into one of the most complex and urgent issues policymakers will face in the 21st Century. Unless the challenges arising from these scarcities are confronted in a comprehensive and proactive manner, our economies will stagnate and political power will diminish in the international system. To that end, this report examines the implications of these resource scarcities for EU Member States and offers seven recommendations for addressing them.

Resource scarcity is defined as a situation where demand for a natural resource is exceeding the supply – leading to a decline in available resources. When we talk about scarce resources, we usually imply that current use is unsustainable in the long-term. Scarcity can involve non-renewable resources, such as oil, precious metals and helium. It can also involve potentially renewable resources, which are being consumed faster than their ability to replenish (e.g. over-fishing, excess use of freshwater.)

A rise in demand can cause a resource to become scarce. For example, when a civilisation has a small population, freshwater is abundant with hardly any opportunity cost. However, with a rising population, a well or reservoir may fail to keep up with the increase in demand. For example global demand for materials has increased ten-fold during the 20th century and is set to double again by 2030, compared to 2010. Demand for water, food, energy, land and minerals will continue to rise substantially, given the increasing purchasing power of a growing population. Bottlenecks in supply could be further aggravated by climate change, making natural resources increasingly scarce and more expensive to source.

Agriculture is the dominant land use in Europe; almost 50% of the land surface is given over to agricultural production of some form. A significant part of Europe's natural heritage (including its biodiversity) is therefore to be found within rural landscapes. The agricultural sector is one of the major natural resource-based industries that can provide biodiversity benefits through the application of sustainable management systems and the adoption of alternative and innovative technologies and practices.

It is hoped that when a good becomes scarce the market mechanism will provide an incentive to develop alternatives. For example, with oil becoming more scarce, there is an incentive to develop electric cars which run on solar power or wind power. However, if technological substitutions are not available then scarcity is a more serious problem, for example, there is often an alternative to oil, but if water becomes scarce – there is no meaningful alternative.

Justification

How well do the markets function with resource scarcity – limited resources? Competition is not the same as conflict. If the free market functions properly, it's mechanism set a price that creates equilibrium of supply and demand, thus resolving competition and rivalry. Under a proper legal framework the price mechanism represents a fundamentally peaceful way of assigning scare resources to different purposes (allocation). In the longer term, capacity adjust: as demand increases the price rises and more capital is invested to expand production. Especially in the commodity markets, this mechanism, however, often fails to function adequately. As the markets for energy and metals demonstrate, the poor quality of available data often leads to a luck of transparency concerning price formation, payment and incomes. Strongly fluctuating price create planning insecurity and discourage necessary investment to expand capacity. With many resources there is also strong concentration on the supply side (geographical and/or commercial ownership). Barriers to investment and market entry, oligopolistic structures and uncertainty about future demand hamper investment, as do high capital cost, long investment periods (with returns only after several years) and investment risk.

As the threat of absolute resource scarcity looms closer, poor people are the most vulnerable and least equipped to cope. Inclusive and sustainable resource management is thus a developmental and environmental necessity – and a moral imperative, too.

Understanding interactions between biodiversity and agricultural production and translating this knowledge into management practices is essential to ensure the delivery of safe and sufficient food, fibre and fuel, as well as public environmental services that all Europeans and the world benefit from. The notion that agriculture has to become more sustainable is incorporated in local, regional, national, European and global policies and instruments. Knowledge is being increasingly accumulated on how biodiversity can be mobilized to make agriculture sustainable.

References

1. European Union, 2010 Reproduction is authorised provided the source is acknowledged. Water Scarcity and Drought in the European Union [online], August 2010 [cit. 2020-04-02]. Available online: https://ec.europa.eu/environment/pubs/pdf/factsheets/water_scarcity.pdf
2. Resource Scarcity in the 21st Century: Conflict or Cooperation? The Hague CENTRe foR STRATEGIc STUDIES (HCSS) and TNO PAPER No 2010•03 ISBN/EAN: 978-94-91040-11-5 Author: Dr. Islam Qasem [online], [cit. 2020-04-02]. Available online: https://hcss.nl/sites/default/files/files/reports/Strategy_Change_PAPER_03_web.pdf
3. Report of a Science|Business symposium RESOURCE INNOVATION NEW IDEAS FOR MANAGING SCARCE RESOURCES AND ENERGY, © Science Business Publishing Ltd 201, [online] ,[cit. 2020-04-02]. Available online: http://sciencebusiness.net/sites/default/files/archive/Assets/4ad7883d-c49c-4fd0-bb88-d862978f6595.pdf

4. NATURAL RESOURCES AND CONFLICT: A NEW SECURITY CHALLENGE FOR THE EUROPEAN UNION nicholas garrett and anna piccinni, SIPRI Policy Brief [online] June 2012, [cit. 2020-04-02]. Available online: https://www.sipri.org/sites/default/files/files/misc/SIPRIPB1206.pdf
5. RESCOOP 20-20-20, Report on financial barriers and existing solutions, [cit. 2020-04-02]. Available online: https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/rescoop_20-20-20_financial_barriers_and_existing_solutions_en.pdf
6. THE LIMITS TO Growth, Donella H. Meadows Dennis L. Meadows J•rgen Randers William W. Behrens Ill, A Report for THE CLUB OF ROME'S Project on the Predicament of Mankind, Library of Congress Catalog Card Number: 73-187907 ISBN 0-87663-165-0 [online] Design by Hubert Leckie Printed in the United States of America Published in the United States of America in 1972 by Universe Books, 381 Park Avenue South, New York, New York 10016 © 1972 by Dennis L. Meadows [cit. 2020-04-02]. Available online: http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf
7. The 2011/2012 European Report on Development, Confronting Scarcity: Managing Water, Energy and Land for Inclusive and Sustainable Growth, Overseas Development Institute (ODI), European Centre for Development Policy Management (ECDPM), German Development Institute/Deutsches Institut für Entwicklungspolitik (GDI/DIE) [online]. © European Union, 2012 Reproduction is authorised provided the source is acknowledged. Printed in Belgium. [cit. 2020-04-02]. Available online:
8. Agriculture Sector and Biodiversity Conservation Best Practice Benchmarking, DG ENV.B.2/SER/2009/0018 , [cit. 2020-04-09]. Available online: https://ec.europa.eu/environment/archives/business/assets/pdf/sectors/FINAL_Agriculture.pdf

Attitudes Toxwards Car Ownership, Personal Mobility and Convenience

Description

Even the end of car ownership has been discussed for a while, in Europe car ownership rates haven‘t yet dropped dramatically. In Europe there are about one private passenger car per two persons. The highest number of passenger cars cars per inhabitant in the EU, was in 2017, in Luxembourg, with 670 cars per 1000 inhabitants. In the EU Member States for which information is available, a petrol engine powered the majority of passenger cars in 2017.

In fact, the car ownership comes with a considerable cost to the public in terms of emissions, congestion and parking space. Across Europe, congestion costs us more than €100 billion annually — that’s 1 percent of EU GDP. Private cars are one of the most expensive assets that people own and yet they sit unused for 96 percent of the time. The perception among some cohorts is that cars take up a lot of space and are polluting. The challenge we face today is to make better use of our cars to reduce their impact on the environment and use these assets more economically to benefit more people. On one hand, the consumers stay convenience driven - and choose private cars over public transportation as they perceive it making living more easy and comfortable. In addition, private car is still valued as a status symbol and as a symbol of freedom and independence for some consumer segments. On the other hand, private cars are also perceived as expensive and inconvenient due to the fact that wages have stagnated and new apartments don‘t come with garages. There is increased cost and inconvnience finding a place to park. Especially in cities, people are time poor and crave convenience, which is seen in the adoption of delivery of meals and groceries and the consumption of meal kits, where these services are available. Cities are making efforts to get cars off the roads to reduce congestion and improve public health. They do this by impoving public transport and encouraging biking and walking and by offering shared citybikes etc.

Sharing economy trend is related to new services in cities such as Uber. However, these services are available mostly in bigger cities and they can’t yet provide with public transport an alternative to car ownership in rural areas. It has been suggested, that more flexible public transportation system with on-demand service will replace traditional bus line with fixed routes and timetables and provide alternative for owning a car. In the future new options are becoming available; on-demand type of services also for public transportation and eventually autonomous driving. Autonomous vechiles may come for logistics first and then for personal transport.

Justification

The different trends related to car ownership will impact also rural areas. Rural areas may also consider new ways of mobility and providing same time more affordable and low emission options to get visitors to rural areas (i.e. for tourism and shopping of agricultural products) New solutions may need to be invented, how people will get there and get around in countryside without using private cars. New options should be considered how to make better use of cars also in rural areas instead of just sitting in garage unused most of the time

References

1. European environment agency. Transportation statistics, 2012. Available online: <https://www.eea.europa.eu/data-and-maps/data/external/passenger-cars-by-motor-energy>
2. Statista research and development, 2020. Available online: <https://www.statista.com/statistics/607540/car-per-capita-eu/>
3. European environment agency. Car ownership rates projections, 2012. Available online: <https://www.eea.europa.eu/data-and-maps/figures/car-ownership-rates-projections>
4. European environment agency. Assessment of global megatrends, 2015. Available online: <https://www.eea.europa.eu/soer/europe-and-the-world/megatrends>
5. Does sharing cars really reduce car use? Barbora Bondorová & Greg Archer Transport & Environment, 2017. Available online: <https://www.transportenvironment.org/sites/te/files/publications/Does-sharing-cars-really-reduce-car-use-June%202017.pdf>
6. Shared mobility solutions improve access to jobs, health services and education. International Transport Forum, 2016. Available online: <https://www.itf-oecd.org/sites/default/files/docs/shared-mobility-solutions-improve-access-media-release.pdf>
7. Can public transport compete with the private car? IATSS Research, 2003. Available online: <https://www.sciencedirect.com/science/article/pii/S0386111214601412

Political Apathy and Loss of Trust

Description

Trust is universally required in all aspects of life and in all sectors and in both, urban and rural areas. Good example is pandemic in 2020, where trust to EU, decisions of national and local governments were crucial to ensure people acting based on suggestions not driven by fees and punishments for breaking rules. Trust in the European Union has strengthened in last years (44% in 2019, +2 percentage points since 2018), reaching its highest level since 2009. Trust in the national political institutions is lower and has even decreased during last years (34% in 2019).

Nowadays media (incl. social media) plays important role on people's trust and may influence important decisions like Brexit is a clear prove of that power and need to identify the situation and act. The last decades have witnessed a growth in the share of young European Union (EU) citizens who express alienation, and distrust toward social and political institutions at the national as well as the European level. Whilst young people may very active in sharing their opinions on different processes and their views of places and stating their groups of interests by applying to different news of discussions groups online, political activism is much lower not only in voting rates, but also in expressing any interest in politics or existing policies. But with all the online possibilities, we still live in the same systems - political participation and civic engagement is crucial aspect in our day European democracies. The attitude of young people towards politics is not purely due to apathy or disengagement but a result of the wrong education they receive through the curriculum, as well as of a disillusionment with mainstream party politics.

Some of the main reasons for people not to involved is

- Belief that their vote doesn't count, having an opinion that one person cannot make a difference
- Dislike of political environment and/or politicians, having negative opinion based on scandals at all levels of government
- Opinion that elected politicians don't represent peoples' interests and do not represent rural areas
- Lack of trust in government, believing that needed changes for rural areas will be made, but instead thinking that beneficiaries from laws and programs will be corporations and the wealthy citizens or politicians themselves
- Negative information in media and lack of information in rural areas on how to get involved, about the decisions made and influence of taken decisions on everyone's' daily life.

Justification

Loss of trust is influenced by access to valid and trustable information and ability to analyse it (critical thinking), therefore identification of trustable media (newspapers, websites etc.) in the rural region, people habits and usage of those and other media, learning of critical thinking can support in stating the situation.

Talking about the situation in rural areas it's important to identify practical actions of people, such as civic engagement (measured by people involved in NGOs, people participating in community activities etc.), voting

activity (measured by people participating in elections, people having voting rights) and even the readiness to act - political activism (measured y people involvement in parties, people interested about politics).

Rural attractiveness is closely connected also to young people being ready to get involvement in creation of rural future, so young people apathy is a possible thread, which can be changed and is influenced by youth policies, civic education in schools, active work/existence of youth centres in rural areas, youth workers, school parliaments etc.

Loss of trust is not only a characteristic of individuals, but it applies to organizations and their external interlocutors. Defining trust, therefore, becomes important for entrepreneurs and / or organizations because it allows you to direct choices in the right direction. Confidence is measured through the use of some indicators. These indicators allow you to identify the trust based on the expense that individuals and families in relation to investments, expenses, savings and the trust of companies with respect to the country's economic performance, in addition to the organizational one. The results of these indicators are usually aggregated by means of the arithmetic mean; through this medium an index is drawn up which represents people's trust.

Total climate breakdowns are also proposed, which are indicated in the index and seasonally adjusted with the direct method, namely:

- Economic climate, simple weighted average arithmetic balances relating to judgments and expectations on Italy economic situation, expectations on unemployment (this last with an inverted sign);
- Personal climate, simple arithmetic mean of the weighted balances of the remaining six questions make up the climate of trust (judgments and expectations on the economic situation of the family; current opportunity and future possibility of saving; opportunity to buy durable goods; family financial balance);
- Current climate, average of the questions relating to the sentences (economic situation of Italy and the family; current savings and purchase of durable goods; family financial balance);
- Future climate: average of expectations. The balances relating to the variables of the consumer survey consist of the difference between the percentage frequencies of the favorable and unfavorable methods and provide summary indications on the phenomena observed.

The questions of the questionnaires used to measure trust (mainly of the closed ordinal qualitative type), provide a predetermined and comprehensive range of answer possibilities (from three to five, with the addition of the Do not know / do not answer mode) of the type: " Very high"; "Tall"; "Freeze", "Low", "Very low".

To assess the confidence of companies, an index is elaborated through a simple arithmetic average of seasonally adjusted sales of the questions deemed most suitable for assessing the optimism / pessimism of companies. Manufacturing confidence includes order-level judgments, inventory-level judgments (with inverted sign) and production-level expectations. Questions that contribute to building firm confidence include order and / or construction plan judgments and employment expectations. For market service companies, the calculation of confidence includes questions related to judgments and expectations on orders and judgments on business progress. Finally, for retail businesses, the climate includes questions related to sales valuations, sales expectations and inventory valuations (with the sign inverted). Sales to business survey variables are the

differences between favorable and unfavorable methods. For each question, the results are expressed in terms of percentage frequencies relating to the individual response methods (generally three, for example: "High", "Normal", "Low").

Indexes can be used:

- The Organizational Trust Inventory (OTI)
- The Consumer Confidence Index
- The Business Confidence Index

References

1. Bromiley P. (1996) *The Organizational Trust Inventory (OTI): Development and Validation.* Available online: https://www.researchgate.net/publication/232553329_The_Organizational_Trust_Inventory_OTI_Development_and_Validation
2. Council of Europe (2020). *Citizenship and participation.* Available online: https://www.coe.int/en/web/compass/citizenship-and-participation
3. Instituto Nazionale di Satistica (2020). Available online: https://www.istat.it/it/archivio/fiducia+consumatori+e+imprese
4. Jan W. van Deth, Martin Elff (2020). P*olitical Involvement and Apathy in Europe.* Available online https://www.researchgate.net/figure/Political-Involvement-and-Political-Apathy-in-European-Countries-corrected-percentages_fig3_5015608
5. Simon Oxenham (2017). *The rise of political apathy in two charts.* Available online: https://www.nature.com/news/the-rise-of-political-apathy-in-two-charts-1.22106
6. Viktor Dahl, Erik Amnå et.al. (2018) *Apathy or alienation? Political passivity among youths across eight European Union countries*. Available online: http://eprints.lse.ac.uk/88033/1/Banaji_Apathy%20or%20Alienation_Accepted.pdf

Activitism by Young People, Employees, Shareholders and Voters

Description

Activism is understood as the use of direct and noticeable action to achieve a result, usually a political or social one. It is active participation of people in some, especially public events. It is activity, action, working zeal, ability to respond to stimuli from the environment. It is people making their concerns heard and asking for action on those issues by those who are in power. Activism that happens online is often referred to as “clicktivism.”

Youth activism is a form of civic engagement by people of school-age, who are interested in public affairs. They organize through social networks or blogs, expressing disapproval through various electronic petitions. They are often more focused on material than spiritual values. They are familiar with using social media such as Facebook, Instagram and TikTok. The phenomenon of today's youth is also virtual life. Young people often acts as an autonomous unit where they create their own world with their own values, and their own behavior, often without their family knowing it. Many fear that they might engage in dangerous environments. Nevertheless, a positive example good example of a high-profile youth activist is Greta Thunberg a Swedish environmental activist who has gained international recognition for promoting the view that humanity is facing an existential crisis arising from climate change. Thunberg's activism started after convincing her parents to adopt several lifestyle choices to reduce their own carbon footprint.

Employee Activism corresponds to actions taken by workers to speak out for or against their employers on controversial issues that impact society. Employee activists focus on campaigning to change their company's policies, with a focus on social activism, actions performed intentionally to generate social change. Employee activism may be stimulated directly by the employer, but it is more frequently generated organically by the employee through self-motivation and determination. Common actions for employee activists to take include speaking out on social media, leaking internal company emails, whistleblowing, or, in extreme circumstances, staging walkouts and protests. The majority of employees of big corporation like Amazon and Google, particularly Millennials, believe that they are right to speak up for or against their employers when it comes to hot-button issues.

Good examples of Political activism are:

- The **Occupy movement,** an international progressive socio-political movement that expressed opposition to social and economic inequality and to the lack of "real democracy" around the world. It aimed primarily to advance social and economic justice and new forms of democracy. The movement had many different scopes, since local groups often had different focuses, but its prime concern was how large corporations (and the global financial system) control the world in a way that disproportionately benefited a minority, undermined democracy and caused instability.
- The Y**ellow Vest movement,** a populist, grassroots protest movement for economic justice that began in France in October 2018. The movement was initially motivated by rising fuel prices and a high cost of living.

- **Extinction Rebellion** is a global environmental movement with the stated aim of using nonviolent civil disobedience to compel government action to avoid tipping points in the climate system, biodiversity loss, and the risk of social and ecological collapse.

There are lots of other kinds of activism. Share-holder activism for example is where shareholders d write letters to the chairperson of a big corporation to complain about some issue. This can escalate into open letters written to the press, the disruption of shareholder meetings in which they hold shares, voting against measures or organizing boycotts.

Activist shareholders, through their equity rights, can influence the behaviour of a company (with different tactics) and therefore cause changes within it to the detriment of other shareholders. Based on what has been said, these indicators have been chosen because they allow identifying the power of the shareholders in the assemblies based on the number of investments held and its impacts.

Justification

The values are being changed during the lifetime, they do not arise by themselves, but reflect different life situations experienced by a person.

Especially Young people are happy and willing to discuss different topics, they seek the meaning of life, they feel the need to self-realization. Developing knowledge, skills, competences, attitudes in areas of social engagement - it is very important to focus on improving their current position and engaging them into social life.

How are the different forms of activism influencing rural areas now and in the future?

References (in English)

1. United Youth Against Hate and Violent Extremism in Europe /cit. 04-04-2020/. Available online:http://www.unitedagainstracism.org/projects/united-youth-against-hate-and-violent-extremism-in-europe/
2. Intervention of Marcelino Marcos Líndez, President of the General Assembly of the Principality of Asturias /cit.04-04-2020/ https://erp2019.eu/news/young-people-need-to-be-protagonists-in-rural-development-processes/
3. ERYP Survey 2019. Available online: https://europeanruralparliament.com/index.php/youth
4. ERYP puts an end to it by giving rise to “Europe’s real rural agenda” 2019. Available online: https://erp2019.eu/news/eryp-ends-with-europes-real-rural-agenda/
5. Jason Wingard, Employee Activism Is The New Normal. So Why Is Amazon Leadership Freaking Out?, 2020, /cit.04-04-2020/. Available online:
6. https://www.forbes.com/sites/jasonwingard/2020/01/10/employee-activism-is-the-new-normal-so-why-is-amazon-leadership-freaking-out/#526e1a6927f1
7. Margaret Rouse, WhatIs.com, Employee activism /cit. 04-04-2020/, Available online: https://searchhrsoftware.techtarget.com/definition/employee-activism
8. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.553.8454&rep=rep1&type=pdf

9. https://archivioceradi.luiss.it/files/2011/10/FTSE-MIB-2013-Evoluzione-degli-assetti-proprietari-ed-attivismo-delle-minoranze.pdf

References (in Slovak)

1. Jakub Dvorský, Občianske združenie Vidiecky parlament mladých na Slovesnku. 2019. Available online: https://www.vipa.sk/web_files/2020/3/2007.pdf
2. Prieskum Rady mládeže Slovenska. 2019. Available online:
3. https://mladez.sk/2019/12/03/prieskum-rady-mladeze-slovenska-kazdy-piaty-mlady-by-volil-lsns-nejde-uz-o-protestny-hlas/
4. Mirko Kašubjak. HODNOTOVÉ PREFERENCIE MLÁDEŽE – Prieskum hodnôt súčasnej mládeže. 2017. Available online: https://blog.hlavnespravy.sk/1161/hodnotove-preferencie-mladeze-prieskum-hodnot-sucasnej-mladeze/
5. Vyhlásenie Európskej vidieckej mládeže Candas 2019. Available online: https://www.vipa.sk/web_files/2019/12/1942.pdf

Solidarity and Sense of Community

Description

Solidarity is the binding of individuals into a cohesive collectivity, it is an emergent attribute of groups that facilitates collective action and social order. As an agreement between and support for the members of a group solidarity is closely related to the sense of community where community is the people with common interests living in a particular area. Sense of community becomes stronger when community is facing some difficulties and need to join the efforts to reach common goals. This is the case, for example, now when people are dealing with major health crises (Covid 19 outbreak). Communities uses available natural, financial and human resources to meet the community needs – looking for compromises and taking into account all the members of community, creating a feeling of a safe place to be and shaping a fertile place for community led and individual initiatives - this brings us to the social cohesion as an important aspect of united community. Social cohesion is described as a wilingness of members of a society to cooperate with each other in order to survive and prosper. The concept of social cohesion has returned to the fore in the political and public debate following the spread of research on social capital, a theme closely related to it. The author to deal with the concept of social cohesion in a more organic way is Robert Putnam (1993) in his essay on the levels of social capital in the Italian regions - a topic subsequently studied under the empirical profile by Roberto Cartocci (Cartocci, 2007; Cartocci and Vanelli, 2015). The contribution of Regina Berger Schmitt (2000) also shows how the two concepts of social capital and social cohesion are closely linked, so much so that the author identifies social capital as one of the key elements of social cohesion (Berger-Schmitt, 2000). It is based on two central elements, namely "the reduction of disparities, inequalities and social exclusion" and "the strengthening of social relations, interactions and bonds" (Berger-Schmitt, 2000).

Justification

Social cohesion, solidarity and sense of community are concepts that have regained interest in scientific and politic field. From the documents produced by the Council of Europe in recent years, it can be seen how the institutions at European level have also emphasized the issue of social cohesion, considering it fundamental for the formulation of recommendations on social policy through - for example - creation of a European platform on social cohesion (Council of Europe - European Social Cohesion Platform).

Mutual caring and support helps to generate a more vibrant and **resilient society** and **social stability** can be an effect of social cohesion, even if it is not its only manifestation. Sense of community as sensation of being a part of a group impacts people's involvement in societal processes – **active citizenship**, solidarity, exchange of know-how and knowledge etc.

Curently we see the importance of community action and solidarity in order to restrain the pandemic of Covid-19 - we are being asked right now to limit contact, to work remotely, and to do this mostly to shield those who are most vulnerable.

Social and Solidarity Economy is also a field growing in importance in the agenda of discussions and practices in a governmental context of public policies in their several entities, multilateral organizations, as well as among researchers of the area all around the world. The emergence of territorial policies of Social and Solidarity Economy represent an interesting case in the construction of a "new" area of local public action.

References

1. BACIC Miguel Juan, PEREIRA MORAIS Leandro, Social and Solidarity Economy as a tool for territorial development and socio-occupational inclusion, CIRIEC N° 2017/06. Available online: http://www.ciriec.uliege.be/wp-content/uploads/2018/03/WP2017-06.pdf
2. LEAP Braden, THOMPSON Diego, 2018, Social Solidarity, Collective Identity, Resilient Communities: Two Case Studies from the Rural U.S. and Uruguay Social Sciences, MDPI, Open Access Journal, vol. 7(12), pages 1-19, November. Available online: https://www.mdpi.com/2076-0760/7/12/250/pdf
3. HECHTER M., "Sociology of Solidarity", Editor(s): Neil J. Smelser, Paul B. Baltes, International Encyclopedia of the Social & Behavioral Sciences, Pergamon, 2001. Available online: https://doi.org/10.1016/B0-08-043076-7/01969-0

Social Entrepreneurship

Description

In recent decades, various entrepreneurial and organizational forms (foundations, NGOs, associations, social cooperatives, etc) have established themselves to pursue social objectives and, at the same time, their importance has grown a lot. For this reason, the two indicators identified will help in identifying how many and which social realities are present, who undertakes this type of activity and where, as well as the impact that they have. The need to dwell on the issue of the social impact generated by social enterprises arises from the transition phase that the Italian third sector is going through and which is inevitably linked to the transition from a welfare state model to a welfare society (or "civil") model. , two welfare systems that are based on as many principles. On the one hand, that of redistribution, in which the state withdraws resources from citizens through taxation and redistributes them through the welfare system; on the other, the circular subsidiarity principle in which citizens are involved in the process of planning and production of services (co-production), which overcomes the public-private dichotomy (or State-market) by adding a third dimension, that of civil. Even the Third sector - as a fundamental part of the renewed welfare model - undergoes a metamorphosis, passing from being redistributive to productive. In the first model, the resources were mostly public in nature and therefore the state remained the owner of the design of social services. In the last twenty years, however, a change has begun in this sense that affects both the sources of resources for the Third sector (increasingly market-oriented and with growing relationships with credit institutions), and the consequent need to implement methodologies and tools for assessing the social impact of their work on the reference communities, overcoming the typical difficulties of these subjects in identifying human and economic resources to be dedicated for this purpose (OECD, 2015).

As Perrini and Vurro argue (Perrini, Vurro, 2013), in fact, "the progressive contraction of public and private resources available to projects with a social value has been accompanied by the need to optimize the processes of allocating resources towards entrepreneurs, initiatives and organizations that were able to demonstrate with transparency and objectivity the effectiveness of their intervention models in support of complex social problems in the various areas typically ascribed to the Third sector ".

"Evaluating" means "giving value" and not merely measuring and judging. If in the previous logic it was sufficient to check transparency and report through appropriate documents, today it is the Third sector itself that must identify a sufficiently precise and wise metric such as to guarantee respect for the identity of the social enterprise. A metric that goes beyond the measurement logics strictly related to the capitalist world, which leaves out defining and fundamental aspects of the Third sector (such as, for example, the degree of internal democracy), and which is able to enhance the elements and paths of social innovation of which social enterprises are the bearers of the means and ends of their actions. Furthermore, the issue of social impact assessment is also linked to the need to find an Italian response to the orientation dictated at European level (CESE, 2013), which provides that the objective of measuring social impact is " measure the social effects and impact on society determined by specific activities of a social enterprise "and that" any measurement method must be developed

starting from the main results obtained by the social enterprise, must favor its activities, be proportionate and must not hinder social innovation. The method should aim to find a balance between qualitative and quantitative data, in the awareness that "narration" is central to measuring success ".

References

1. https://www.cecar.edu.co/documentos/centro_de_emprendimiento/Emprendimiento-Social-Reporte-Especial.pdf
2. http://www.rivistaimpresasociale.it/rivista/item/141-misurazione-impatto-sociale/141-misurazione-impatto-sociale.html?limitstart=0

Civic Engagement

Description

In theory, a one way to more abstractly define civic engagement is to perceive it as – relatively speaking – action of an individual performed for the purpose of changing a condition of the environment falling under authority of a polity.[1, 3] To this day, there already are some indicators developed for the purposes of measurement of civic engagement. Among these are worthy of note, mainly: non-political volunteering, participation in fund-raising activity, activity focused on promotion of nation-state politician (especially for the purposes of their election into certain political office) or of certain political or economic agenda,[4] but these manifest not only in – let it be said – an active form of personal approach, but can also assume a passive one.[2] What can be considered to enable (or block) the activity measured by a certain indicator are specific personal interests, economic setup, social bonds and political rights, which exist in the polity observed. Extent and intension of performance of these activities can be determined by quantitative and qualitative values of these objective dispositions.

Those, who are performers of the afore-mentioned action (or actions), can either be individuals or groups of them. Motives for their action can, in regards of what was stated in the introduction, here, be relatively indefinite. For instance: In respect of the current situation in the whole of Europe or its nation states, people can be interested in changing of the conditions of a governed environment in the contexts of what is or can be called a “climate change situation” (e.g.: transnational and transnationally-instilled national political protests), “economic prosperity, administrative performance and political compliance” (i.e.: transformation of national economy, techniques of bureaucratic communication and control and means of enforcement of political interest), “social integration and security” (e.g.: recent monothematic and organized mass migration cases) or “gender-oriented social rights” (e.g.: deinstitutionalization of established and institutionalization of new modes of sexual relations or orientations). Besides that, new media for communication have become available during last decades, which to a great extent affect processes of articulation of demands and mobilization of “activists” for the purposes of the engagement.

Justification

It is, at least in the current democratic political systems, where citizen participation is fundamental for the functioning of the government – believed that civic engagement is demanded by the societal system in order to sustain itself.[4] Those people, who are concerned about the condition of their community, perform different kinds of activities to directly or indirectly manage their society. In the case of this research-project, rural areas have their specific societal environment which civic engagement reflects in both its aims and forms of practice. Moreover, through the optic of civic engagement a sense of community of an individual or group in the particular rural area can also be observed/derived from it, based on the elements of engagement the individual or group work with.

Civic engagement is a mean of expression of interest people have in their community and in their action of a capacity they have to affect it. These are all relevant factors for consideration for policymaking processes, especially if those who govern intend to maintain a stable society or wish to adjust it to the demands of its ever-

changing internal or external environment. Thus, by knowing a position of civic engagement in a certain rural polity, it is possible for (– be it high or low level –) decision-makers to evaluate the role and potential of members of a given polity, on the one hand, and assess the value of that polity for both individual and the larger society, on the other.

References

1. BANYAN, E. Margaret. 2007. Civic Engagement. 2020 [online]. Chicago, IL : Encyclopædia Britannica, Inc. [cit. 2020-03-23]. Available online: https://www.britannica.com/topic/civic-engagement
2. BÚTOROVÁ, Zora – GYÁRFÁŠOVÁ, Oľga. 2010. Občianska participácia: trendy, problémy, súvislosti. In : Sociológia [online]. 1969 – 2020, vol. 42, 2010, no. 5 [cit. 2020-03-27]. Available online: https://www.sav.sk/journals/uploads/05130915Butorova%20Gyarfasova2%20OK%20AF.pdf
3. CARPINI, D. Michael. 2020. Civic Engagement. 2020 [online]. Washington, DC : American Psychological Association [cit. 2020-03-23]. Available online: https://www.apa.org/education/undergrad/civic-engagement
4. KEETER, Scott et al. 2002. The Civic and Political Health of the Nation: A Generational Portrait. 2020 [online]. Medford, MA : Tufts University : Center for Information & Research on Civic Learning and Engagement [cit. 2020-03-24]. Available online: http://circle.tufts.edu/sites/default/files/2020-02/civic_political_health_nation_2002.pdf

NIMBYISM

Description

Not in My Backyard Phenomenon or NIMBYISM signifies one's opposition to the locating of something considered undesirable in one's neighborhood. Initially the phrase have appeared in the context of the effort by electric utilities to construct nuclear-powered generating stations and also have been used a lot in the context of installation of wind generators.

NIMBYISM has two distinct usages and categories of users. In some circumstances, it connotes the unwillingness of individuals to accept the construction of large-scale projects by corporations or governmental entities nearby, which might affect their quality of life and the value of their property. The phrase is also used by social service and environmental justice advocates to imply an absence of social conscience expressed by a class-, race-, or disability-based opposition to the location of social-service facilities in neighborhoods.

NIMBYISM often is used with a negative connotation describing the duplicity of human nature- an attitude of people, acknowledging the overall necessity of treating environmental and social issues, but not willing to be hosts of concrete solutions and facilities. This attitude is claimed to be egoistic and irrational. This attitude highlights a major contradiction between what people are saying and what they are allowing to do - one of the most visible conflicts nowadays are about alternative energy issues - people are keen to say that alternative energies are important, but when it comes to build wind turbines there is a systematic opposition. The same happens with refugees camps and other "uncomfortable" issues.

Justification

NIMBYSME is not a phenomene to be left appart in rural development, because of its dual nature. From one side it can be an obstacle to implementation of solutions facing environmental and social issues - as activities enhancing social inclusion and development of alternative energy infrastructures. From the other side NIMBYISM could also be a factor of local activisme that benefits to community building and strengthening which is an important aspect in territorial development. NIMBY movements also can have a positive and proactive role in generating innovative solutions to local as well as transnational environmental issues.

References

1. KINDER, Peter D., 2019, Not in My Backyard Phenomenon, Encyclopædia Britannica, Inc. [cit. 2020-04-02]. Available online: <https://www.britannica.com/topic/Not-in-My-Backyard-Phenomenon>
2. HADDAD M.Alice, HAGER Carol, 2015, Nimby Is Beautiful: Cases of Local Activism and Environmental Innovation around the World, 236 p., Berghahn Books. Available online: <https://books.google.lv/books?id=esydBAAAQBAJ&lpg=PA5&ots=5WFjL84_jo&dq=Nimbyism%20treats&hl=lv&pg=PA5#v=onepage&q=Nimbyism%20treats&f=false>
3. Hermansson, Hélène. (2007). The ethics of NIMBY conflicts. Ethical Theory and Moral Practice. 10. 23-34. 10.1007/s10677-006-9038-2., Available online: <https://www.researchgate.net/publication/225835419_The_ethics_of_NIMBY_conflicts>

The Impact of Covid-19 on Society and its Values

Description

According to definition given in Encyclopedia Britannica crises occur when a community of people—an organization, a town, or a nation—perceives an urgent threat to core values or life-sustaining functions that must be urgently dealt with under conditions of deep uncertainty. Pandemics can be one of the initiators of crises.

Pandemics are for the most part disease outbreaks that become widespread as a result of the spread of human-to-human infection. There have been many significant disease outbreaks and pandemics recorded in history, including Spanish Flu, Hong Kong Flu, SARS, H7N9, Ebola, Zika. The pandemic related crises have been associated with enormous negative impacts on health, economy, society and security of national and global communities. As well, they have caused significant political and social disruption.

Covid-19 is a worldwide pandemic emerged in 2020 affecting territories on multiple scale, coming from China, the Corona virus causing Covid-19 illness, expands quickly all around the Europe and other parts of the World. Most of the EU countries have declared the state of emergency in order to restrain and slow down the propagation of the virus and to limit the loss of life. State of emergency includes timely school closure, cancellation of public gatherings, mobility restrictions, market and sporting restrictions. Important related issues are also disruption of food and other supply chains, loss of jobs (that can hardly or never been recovered) and closure of businesses which leads to loss of properties (farms, homes…).

State of emergency causes societal difficulties, as people capacity to deal with physical distancing, fears, unusual rhythm of life, find new ways of socialization, and economical difficulties as the economy have been slowed down and a lot of industries sees their turnover falling. Policies sustaining economies are adapted to maintain employments and reduce effect of preparing financial crises, but uncertainty of how long the pandemic crisis will last delays long term decisions. Furthermore, prevention policies may be seen as restrictive and may raise questions about individual liberties that may cause loss of confidence in government.

Justification

Crisis have multiple effects on territories : the impact of economic loss can result in instability of the economy through direct costs, long term burden, and indirect costs. The social impacts of pandemics are severe, for example, school closure raises a range of ethical and social issues, particularly since families from underprivileged backgrounds are likely to be disproportionately affected by the intervention. In remote rural areas, with already existing economic difficulties, public health issues are even more relevant, as the medical assistance is not ready to deal with a big number of patients in the same time. And digitalisation is still a problem in some areas – people are missing access to digital public services, as well as digital skills, which is also adding treats of social distancing.

Pandemics are no longer simply the domain of public health and clinical medicine, but also a social issue, an economical development issue, and a global security issue as re-emerging infectious disease outbreaks may raise bio-terrorism concerns.

An effective and efficient emergency response can reduce avoidable mortality and morbidity and reduce the types of economic and social impacts. How to have an effective and efficient emergency management will be a critical task of governments to deal effectively with disease outbreak and a pandemic now and future.

Pandemics are tackling society values in several ways - restrictive policies tackles individual liberties; health is no more an individual issue, but becomes more than before a societal value (healthy society); common fight with the virus enhances the sense of community; facing global economic, social and health crisis questions such values as solidarity and empathy.

References

1. ARJEN Boin. 2017. Crisis managment. 2020 [online].: Encyclopædia Britannica, Inc. [cit. 2020-04-01]. Available online: https://www.britannica.com/topic/crisis-management-government
2. Qiu, W. & Rutherford, Shannon & Mao, A. & Chu, Cordia. (2017). The Pandemic and its Impacts. Health, Culture and Society. 9. 1-11. 10.5195/HCS.2017.221. Available online: https://www.researchgate.net/publication/321689453_The_Pandemic_and_its_Impacts
3. WHO. (2011b). Comparative Analysis of National Pandemic Influenza Preparedness Plans.pdf. Aivailable online: https://www.who.int/influenza/resources/documents/comparative_analysis_php_2011_en/en/
4. METTA Matteo, 2020.The impact of COVID-19 on the Current CAP Consultations. 2020.03.11.[online]: Arc 2020. [cit.2020-03-23]. Available online: https://www.arc2020.eu/impact-covid-19-current-cap-consultations/
5. MacKellar, L. (2007). Pandemic influenza: a review. Population and Development Review, 33(3), 429-451. Available online: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1728-4457.2007.00179.x

Glocalization

Description

Glocalization is intended to facilitate changes of understanding, experience and attitudes through the social process of exploring the world and ourselves as part of the world and participants in the world. It may happen that the food we eat for our lunch has travelled longer miles and had been in much more countries than we ourselves. Even if we are fine with that, the necessity to be able to trace the food throughout all its' stages, providing us knowledge of what we eat is important reason for making decisions towards sustainable food consumption. It is just one of the themes that can and should be worked within the theme of ties between local and global. Glocalization is a process that includes globalization and localization, the merging of global and local interests, where the ability to simultaneously think globally and act locally is used to make decisions related to everyday life.

Globalization states that local experience and values can exist and develop when merging with the global situation. This means that glocalization can make us both similar and different. Rural communities all around the Europe has a strong traditions and culture heritage, same time – it is a unique place for new tendencies to be developed in a context of global world, like new mobility solutions to service provide, market for local products all around the world using digital market places etc.

Globalization and localization exist simultaneously and that the borders between globalization and localization have merged, exist in mutual interaction, thus are mutually enriching. This means that global processes are not destructive to the local characteristics, that the local community can gain from the influence of globalization, and that there is a foundation to perceive the global context as a source of opportunity.

An opinion exists that the separation of local from global is inappropriate for understanding the world that we currently live in. To understand various space scales, we can use methods that provide spatial information - cartography, travelling, moving - both physically and virtually.

Characteristics of the glocalization process change according to the context of the space in which it is viewed. We can talk about the globalization of rural Europe; if the reference point is a global context, we can talk about the glocalization of country and the glocalization of our own local community. Accordance to both global standards and local needs - these are basic requirements that determine the development of a local community in a globalised world. We can understand the interaction of these contexts if we imagine two different scales of space where our comprehension exists simultaneously, but we change the focus range of perception when switching from one to another.

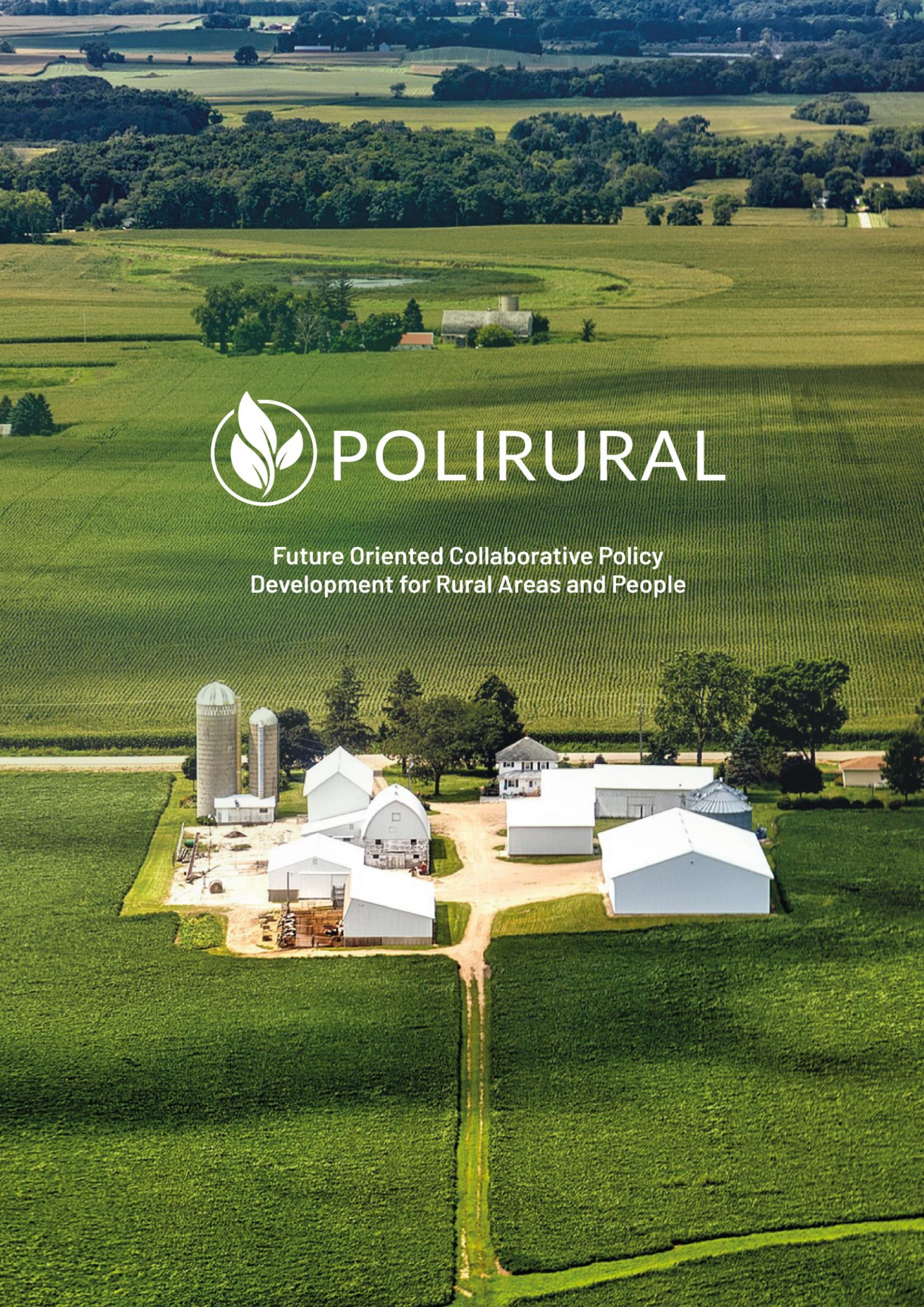
Justification

Glocalisation is a social process through which the global issues are linked to the everyday lives in the local community and the everyday activities of the local community – to global issues and global development. Examples of Glocalization for civil society can be responsible tourism, eco-villages, civil society forums, collecting and recycling of expired medicines, batteries and waste paper, charity, Big Cleanup, Reduce, Reuse, Recycle

activities, sustainable fashion, direct purchase, etc. It may be also recognized by practiced traditions in community (incl. culture NGOs, cultural events, cultural, history and natural heritage), access to internet in villages (broadband coverage density, broadband coverage quality, internet access points), as well as direct connection by identifying multinational cooperation projects in villages, especially between new-old EU countries. EU and outside EU cooperation and ties with developing countries, seasonal workers from abroad, municipality and NGO international cooperation activities. On practical everyday level it is also about hte understanding of presence of global businesses in rural areas and the value of local products, likelocal markets, local producers, short supply chains, green public procurement, people having their own garden/products.

References

1. Belousa Inga, Pastore Ausma, Glocalization methodology for enrichment of the understanding of the glocalization and improvement of the glocal experience., LAPAS, 2015. Available online: <https://lapas.lv/wp-content/uploads/2015/05/Gloka_06052015_EN.pdf >
2. Editor Magda Szczudło, Glocalization in adult education. Recommendation for adult education programs and projects. 2018, Erasmus+ project result., Available online: <https://issuu.com/kolping8/docs/glocalization_in_adult_education._r>
3. Pascual Jordi, PERAIRE Mariona, VALENT Joana, Globalisation/Localisation - Glocalisation, Agenda 21 for culture, UCLG Culture Committee, 2014. Available nline: <.http://www.agenda21culture.net/sites/default/files/files/documents/en/glocalizacin-eng.pdf>



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