# A VISION FOR RURAL AREAS

**MAP Discussion Paper**

# LONG-TERM VISION FOR RURAL AREAS: CONTRIBUTION FROM 20 SCIENCE-SOCIETY-POLICY PLATFORMS

## MAP DISCUSSION PAPER

### AKIS MAP, HUNGARY
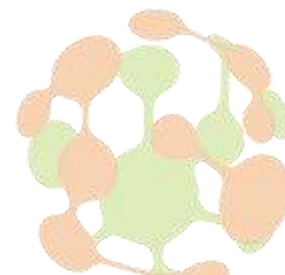
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# 1. Introduction

The main challenge rural population in Hungary is facing today is achieving stable and **sufficient income and adequate services**. The main opportunity is the **new generations** with new way of life and thinking. The presence of young people constitutes a valuable human capital. The biggest challenge is how to help them become successful, particularly in the field of cooperation. Rural communities should become more autonomous in the long run characterized by families who are dedicated to live in rural areas.

The **Hungarian AKIS MAP** covers geographically the whole country. On the one hand, due to its size Hungary is considered one region in several policy aspects and on the other hand, the topic itself – Agricultural Knowledge and Innovation System - is a horizontal issue. The MAP is expected to have the greatest impact if the territory is not further subdivided. The relevance of the topic is justified also by the fact that it is embedded into the CAP strategic planning, thus it requires the cooperation of policy makers, researchers, and farmers or in broader context the society. The MAP's core group is the AKIS sub-working group established by the Ministry of Agriculture to facilitate the CAP strategic planning process. The sub-working groups activities supplement, however, the activities of an AKIS group established originally by the Hungarian Chamber of Agriculture and re-established by the Chamber and the Ministry of Agriculture last year with a broad and more general focus. The activities are designed so that to achieve the following specific objectives: participation in the situation analysis, SWOT analysis, needs assessment i.e. strategic planning of AKIS in the context of knowledge-transfer; digitalization; research and innovation. Through these objectives, the MAP aims to achieve the development of tailor-made policy toolkit in the context of the abovementioned topics.

***Keywords***: Digitalization, Rural areas, Agricultural Knowledge and Innovation System (AKIS), Digitalization

# 2. Results from desk research

## 2.1.    Review of key trends

Certain demographic factors, such as aging, the growing welfare and income gap as well as socio-economic tensions greatly influence the environment which increasingly **requires innovative solutions** at all levels (Ministry of Innovation and Technology, 2020).

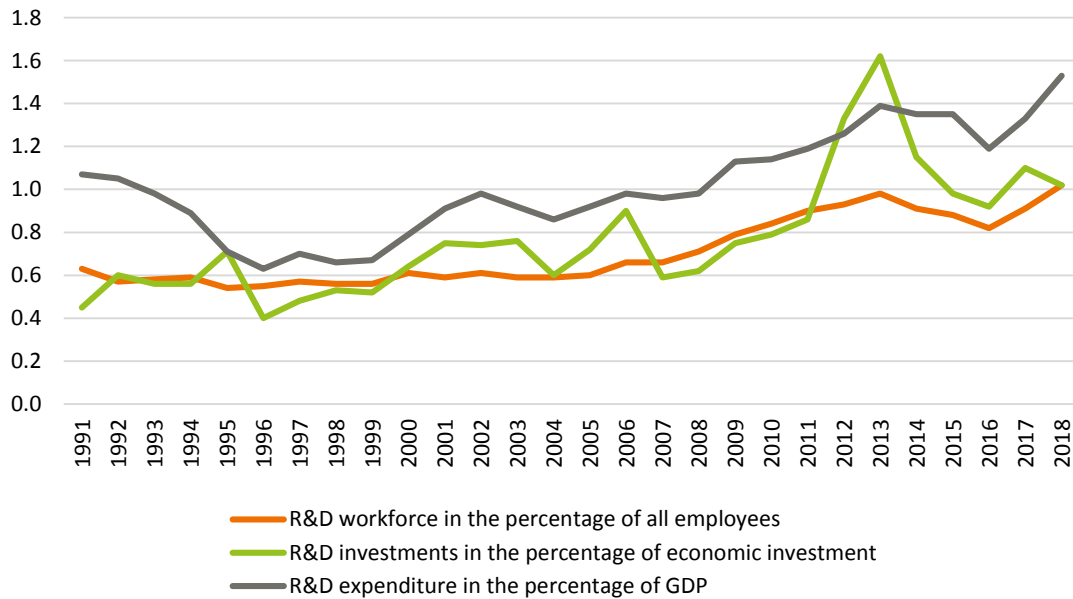**Figure 1 Changes of the ageing index of Hungary and its regions**
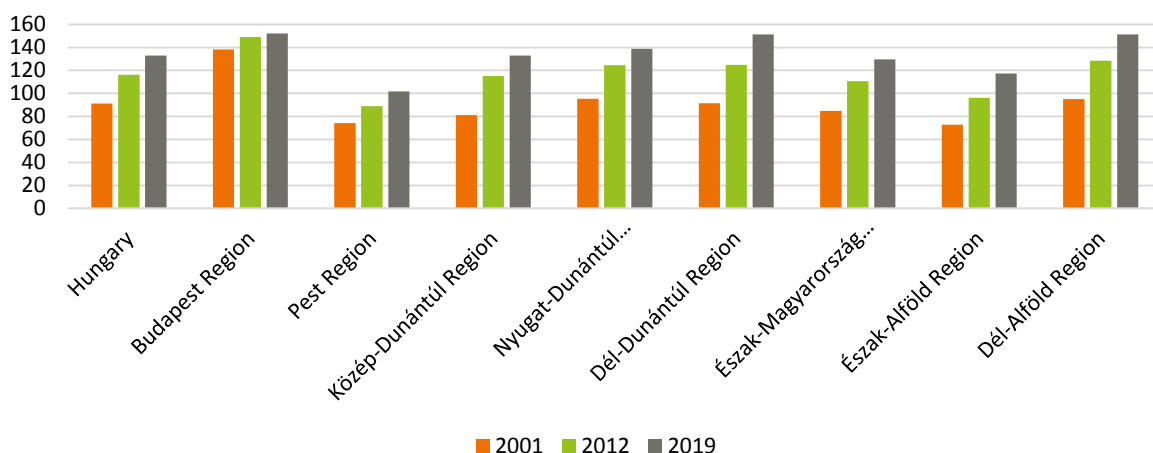


Source: Hungarian Statistical Office, 2020

In Hungary global trends related to technological development, innovation, digitalisation, and the on-going overall industrial revolution have just **started to reach the countryside** and are still at the beginning of their transformative journey. They are considered by many as unstoppable, irrevocable outside forces, pushing the rural areas towards a new future.

Continuous innovation is a key to competitive business in the XXI. century. One of its foundations are the **R&D activities** which show an increasing trend over time in Hungary (Figure 1).

**Figure 2 Main trends of R&D in Hungary, 2000-2018**



R&D workforce in the percentage of all employees
R&D investments in the percentage of economic investment
R&D expenditure in the percentage of GDP

Source: National Statistical Office, 2019

In the **global realm** new technologies are becoming widespread, **5G, IoT and Big data** transforms whole sectors fundamentally, including agriculture. Automatization and the improvement of technologies and management based on data collection is a key to increasing productivity and effectiveness. With the possibility of cost reduction, companies can **trade off human workforce**.

**In Hungary digital economy** accounts for 20 percent of the gross value added of the national economy and provides employment opportunities for 15 percentage of the employees (Digital Start-up Strategy of Hungary, 2016). However, economic benefits from the digital development of **agriculture are still unutilized** (Digital Welfare Program 2.0, 2017).

Hungary performs well regarding **high-speed broadband accessibility** but insufficient **digital skills** from the side of the population (Figure 3), sporadic use of ICT by enterprises and poor performance in digital public services lower its score in the DESI index. Although Hungary scores among the last regarding digital public services, a significant progress can be observed from 2017 onwards (Ministry of Innovation and Technology, 2019).

Majority of the agricultural producers are **unable to adapt** to the changing climate conditions due to technology gaps and lack of knowledge. Furthermore, available databases are fragmented and difficult to access. The most vulnerable groups are the elderly and people with **low qualifications**. Especially the latter group is at risk of lagging behind which can intensify social inequalities (Digital Start-up Strategy of Hungary, 2016).

**Figure 3 Share of individuals with low level of digital skills in Hungary**
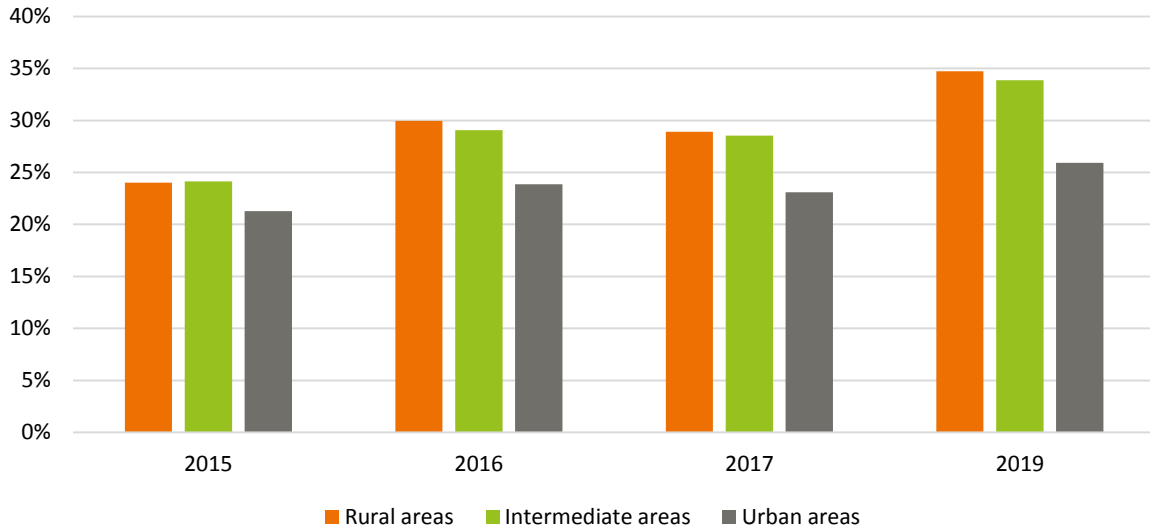


Source: European Commission, Digital Scoreboard

The exponentially increasing amount of the available data and information expands the size of the **knowledge base** extremely and makes the provision of 'access for all' necessary. In the agri-food sector this will contribute to the economic, ecologic, and social sustainability of production.

**Figure 3 The evolution of digital agriculture**



Source: www.accenture.com

The new information technologies radically change **consumer behaviour** as well. Healthy food such as quality white meat, fruits and vegetables or products without additives are on an increasing demand, environmental and animal welfare aspects as well as traceability issues are emerging (Ministry of Agriculture, 2017).

## 2.2.    Review of main challenges and opportunities

The period of the CAP 2021-2027 will play a major role in the infrastructural and organizational coordination of certain elements of the **Hungarian AKIS**. It is considered a big challenge that the structure and the coherence of the different components has not been fully developed yet. In several cases there is a problem also with the quality of the components. The level of professional, management, digital and language skills of farmers is low. The agricultural education is outdated and/or its infrastructure is of low quality. Furthermore, the sector is characterized by the lack of complex knowledge.

While focusing on **digitalization** in general it is to underline that Hungary is facing a number of challenges, such as the shortage digital and management skill and the companies' weak knowledge about the initiatives available and how they can best capitalise on them. These issues are also reflected in the Digital Transformation Enablers' Index and the Digital Technology Integration Index which ranks Hungary as a country lagging behind. In case of agriculture it is to emphasize that the mobile network and internet coverage is not adequate on agricultural lands and forest areas. The legal background promoting the exploitation of opportunities created by digitalization (e.g. drones, data management) is not in place.

There is a lack of agricultural consultants with proper **knowledge** of agricultural informatics and innovation. The information on implemented innovative procedures is unsatisfactory. Certain technologies cannot be adopted to small farms or only to a limited extent and the return on innovative investment is also uncertain. Further challenges that are brewing for the future are as follows: still missing or outdated environmental and economic **data required** by efficient production needs to be made available; data right related questions need to be clarified and equal access to digitalization and information should be provided to all farmers to avoid the exclusion of some groups.

Besides CAP a number of strategic and other **initiatives** are in place to help advance knowledge transfer, digitalization and innovation in the shorter and longer term: EIP - Agri platform, BIOEAST initiative, E-Knowledge, Vocational training 4.0 strategy, Agricultural vocational training in the 21st century or Medium Term Strategy. Digital transformation is of course such a comprehensive change that is to be experienced at different levels of the economy. In Hungary the measures are coordinated by the Digital Wellbeing Programme under the umbrella of which several agriculture related strategies have been developed: Super Fast Internet Program, Digital Export Development Strategy, Digital Education Strategy, Digital Agricultural Strategy, Digital Food Strategy, DigKomp, Artificial Intelligence Strategy, 5G Digital Strategy, etc.

**Digital solutions** might contribute to more efficient use of resources, risk mitigation in production, reduction of losses, productivity growth, better traceability and quality assurance. In certain cases, they can be solutions for labour shortage. The increase in productivity has favourable impact on both environment and climate. As regards the introduction of digital applications several challenges seem to appear such as lack of information on new technologies, lack of digital skills and limited access to reliable cost-benefit analyses of the use of technology (EC, 2019a). As to the increase in profitability it is important to develop digital technologies based on farmers' needs and solving real problems. The National Digital Agriculture Strategy is aimed at developing the digital agricultural innovation environment and start-up ecosystem.

Digitalization has, however, negative impacts as well. Its costs might cause problems first of all to **smaller enterprises**. Greater administrative burden might be an additional burden and without adequate use of available data sustainability cannot be improved. Digital technologies might have an impact both on vertical and horizontal integration of the food chain. The latter of which favours large food suppliers. (Pesce et al., 2019)

## 2.3.    Summary of existing foresight(s)

In the following decades, a continuous revolution of new technologies will take place. The widespread dissemination of information technology, the digitalisation and automatization of industrial processes will open new dimensions in the agri-food sector. The competitiveness of the Hungarian agri-food economy will

be highly influenced by how successfully it can **adapt these technologies**. That is, it needs to direct its investments, change of technologies and research & development activities into this direction. Precise understanding of the production process and its environment, collecting data, building databases, development and integration of automatic intervention and decision support tools, in one word: **digitalisation**, is one of the determining directions of the future. For a future-oriented, efficient Hungarian agriculture it is essential to develop **necessary competencies** and to create **adequate conditions** for education and the dissemination of the required knowledge (Ministry of Agriculture, 2017).

The prerequisite for strengthening **family farms, small and medium farms** is to strengthen their market-orientation. They need to be able to supply to local, regional markets, provide services and especially create and operate producer cooperation for these purposes. Productivity and effectiveness of these smaller enterprises can be increased by disseminating good practices, providing training and advisory services for them. (With diversification of their activities they will be less exposed to outside economic and environmental impacts). More and more, farm managers should be young, trained professionals devoted to agriculture, have up-to-date knowledge on management and information technology, open to modernisation and innovative solutions, as well as to cooperation for development. In the **food processing** sector knowledge- and innovation-based products and technological developments with high value added should be in the centre (Ministry of Agriculture, 2017).

Technological development, an increase in automatization and the spreading of robotic technologies will support enterprises **in handling labour shortage**. Due to the technological development and innovation physical work is expected to become easier and thus improve the **judgement (or image) of jobs** in the agri-food sector among young people (Ministry of Agriculture, 2017).

Based on the vision of Hungary, its companies will become able to **benefit from the challenges** caused by digitalisation, most of them by quitting their business model based on cheap labour. An energetic, dynamic, ambitious group of enterprises will emerge with products ready to prevail in the international or the domestic markets. SMEs work in a constant search for new opportunities and with the utilisation of modern management methods and technologies (Ministry of Innovation and Technology, 2019).

The operation of enterprises is successfully supported by the money and capital markets as well as by innovation facilitator support organisations and services. **Entrepreneurship is appealing** and honourable, entrepreneurs have a strong community organising role, their social perception is very positive. A predictable, **stable business environment** with low bureaucratic costs is established (Ministry of Innovation and Technology, 2019).

**Digital transition** for the Hungarian economy can be the new engine for growth in the coming years. Until 2025 it can generate an additional EUR 9 billion in the GDP (Ministry of Innovation and Technology, 2019).

# 3. Results from interviews with MAP members

This section covers the interviews of Delphi Method and providing a summary of the key ideas expressed during the interviews. 6 interviews were made by AKIS MAP members and summarizing focus group meeting was held.

## 3.1.    Challenges and opportunities in the next 20 years

There were two main current themes highlighted during the interviews how to **keep young people** in the rural areas, the other one is finding **digital/ smart solutions** to help rural living, especially adapting climate change and extreme weather conditions. These problems have been important issues for a long time, but ultimate solutions still have not been found.

These themes can be considered as challenges in the next 20 years, as well. Among the challenges, an urgent need to **increase digital knowledge, skills**, and competencies both among young and older people were also mentioned. When the initial phase of development of digital databases, which is under way now, will be finished, awareness raising and teaching people how to access and use the databases will be the next important step. If we take COVID-19 also into consideration, the current theme is to find new solutions to earn a living (e.g. new forms of enterprises, new services).

A competitive agriculture moving towards high-tech based on innovation and modernization is bothe an opportunity and challenge and requires very highly **skilled workforce**. External **technological dependence** is growing, the technology service sector encompassing agriculture has no rural, domestic development base. On the other hand, the software side in universities and agricultural research is strong in Hungary.

In the vision **rational land use,** strengthened provision of environmental public goods and nature protection is **well balanced** with **industrialized agriculture** aimed at ever increasing competitiveness and efficiency. It requires an **adequate mix of policy tools** (e.g. subsidies and regulations) and **professional knowledge transfer** provided by consultants/ advisory groups. Digitalization e.g. in the form of precision farming is also aimed at keeping environmental aspects in the focus to avoid an ecological catastrophe in the near future.

The **widespread use of innovative technologies** and digital tools as well as precision techniques (to have higher yield, income or even substituting human labour and reducing costs) are envisioned. A significant challenge is, however, the **proper application and use** of technical improvements. More private/public investments in RDI are needed to change the situation for the better. Another challenge is to **educate and train** farmers and consumers to use digital technologies in a proper way.

The Digital Agricultural Strategy (DAS), which the Hungarian government accepted on 1 August 2019, pays special attention to the development of the digital competences and skills of farmers in the forthcoming years.

The AKIS digitization and innovation system has a serious responsibility and potential for optimizing input use in terms of the **sustainability of agricultural production**. The environmental and protection aspects of natural resources, as well as the adaptation of existing knowledge and good practices and subsidies to local conditions, and **a new economic and social balance**, are needed.

The reinterpretation of the green dimension, the validation of the social dimension and the landscape maintenance function contribute to the sustainability of agriculture and the countryside. The utilization of biomass and the expansion of the **circular economy** require the strengthening of knowledge transfer, supplemented by cooperation, mentoring and counselling. Shift profiles towards green technologies, which will help **create jobs for the highly skilled**. The labour demand of digitalisation can be expanded with education and training. There is a danger that the number of secondary and tertiary students in agricultural education will decline and that robotisation will also reduce the direct job creation potential of rural areas.

Concentrated development subsidies with agricultural focus do not really fit in developments with a social dimension. The strengthening of the **demand for local products and short supply chains** can help in the fight against depopulation. The polarization of rural areas reinforces the need for support for the social dimension in smaller, backward areas. With digitalisation, the **retention and expansion of the intellectual layer,** and the **social community development**s can strengthen the service and productive function of the rural area.

## 3.2.     Desirable future for 2040

A forecast for rural areas for 2050 was made using the method developed by the Department of Future Studies at Corvinus University. The low probability of occurrence of high-significance events is based on a set of 130 factors and the driving forces built by Scenarios Szabó (2015). The vision is not the desired vision,

pessimistic or worst-case scenario. Emergency scenarios help with adaptation and planning. It serves as the focus of support policy, giving critical mass.

The shock would be the **cessation of the CAP**, which is particularly risky. The CAP can help the transition to sustainability, in addition to the economy, increase environmental efficiency by protecting natural resources. In greener countryside, the population will also find **service jobs**. There will be a very dual space, which will not be separated, but there will be **winning and losing rural areas** everywhere, where economic life and production will develop, or will not develop if equal opportunities are not achieved.

By 2040 rural areas will be technologically, digitally much more advanced, farmers will "drive" their **driverless agricultural machines**/equipment from home by using digital technologies which will be widespread in the rural areas as well. Probably this is a factor that can **motivate/convince young people** to be farmers and remain in the rural areas. The popularity of healthy (chemical-free) food production and lifestyle is increasing, **special consumer demands** for lactose-free gluten-free, fructose-free products are emerging. These will get more importance in the future.

Both the CAP and regional policy need to be fundamentally overhauled, with the issue of rural development hovering between the two policies. **Green policy is at the heart of new strategies**, and its central role in shaping sustainability is indisputable. The role of a skilled individuals with digital knowledge is appreciated in rural areas. It will be necessary to create conditions for medium-sized estates equipped with technology and for electronic education and knowledge transfer in the countryside. The development of an **innovative space close to nature** that utilizes its environmental endowments adds value.

## 3.3.      Challenges in reaching the vision

To reach the vision, **new type of teaching methods and tools** are needed (short, easy-to-process, visual contents). Among challenges the following factors can be mentioned: unfavourable demographic processes (aging society, slow generational change, people leaving the countryside, rural polarization); lack of clarity on data use and data rights issues; inequalities in access to digital assets and information and their consequences such as further lagging behind

Among opportunities better coordination of existing institutions and platforms, digitization, robotization, genetic engineering (drought-tolerant plants), new rural life forms (home office), and consequently the development of rural services can be named.

Quality instead of mass production and increase in food processing rather than in raw material production. To meet these goals **consumer attitude** needs to be changed and **food waste** must be reduced. Health-conscious, local patriotic consumer audience is expected to be formed through campaigns, marketing actions and subsidies. Primary producers get the necessary support to find their markets via education, community campaigns and by changing regulatory environment.

**Potential added value** of AKIS and the digitization:

- complex agricultural education, agricultural entrepreneurship training,

- knowledge and management (e.g. dissemination of knowledge and development of a knowledge base for education, reduction of administrative costs),

- technology (e.g. use of digital technologies on the Internet and networks, online shopping, processed food for the health industry),

- integrated research network, practice-oriented research and application, agro-informatics developments,

- innovative projects, businesses, R&D and grants for the further development of digital infrastructure, and

- cooperation, mentoring, counselling.

The proliferation of technologies that promote smart production and the enforcement of absolute or strict environmental sustainability are necessary to achieve the vision. The CAP is not conducive to such progress. This requires raising the awareness of society and the population. Without the development of **human capital**, production will continue to be based on the exploitation of resources. Maintaining human capital in lagging regions seems to be a hopeless task. By developing digital skills, a skilled workforce can become region independent. An example is the home office option urged by COVID19.

# 4. Conclusion and next steps

Implementing the **new green CAP** is a major challenge for agriculture in Central and Eastern European countries. The development of **human capital** is a basic condition for changing the green approach. Immediate changes are needed to achieve the desired future. Without them, the future vision will be hardly realized. AKIS will play a major role in transforming input use while considering natural and environmental perspectives.

Under the green CAP system, there is an economic and social **redistribution of aid**. This is necessary to create a circular economy. Profile change contributes to job creation for the highly skilled. The labour demand of digitalisation can be expanded with education and training. Depopulation reinforces the need for support for the social dimension. With digitalisation, a layer of intellectuals can be brought to the countryside and the social, service, and productive functions of the regions can be strengthened.

Sharing focused, **effective strategic approaches** and good practices at international and regional levels is important. Vision creation is needed at every level. At the same time, the visions in Brussels are too far removed from rural actors, and the national levels are bound to prevent the spread of Covid19. There is currently no scope for developing large-scale rural strategies.

A topical issue in rural areas is **Covid-19 resilience** and adaptation to the post-viral situation. As an economic opportunity, food production and rural tourism may develop in a new structure in the direction of domestic demand. Those living in rural areas are at risk of further digital divide, but the lack of infrastructure seems to be particularly beneficial for the climate and the environment.

# Annex 1. References

5G Strategy /5G Stratégia/

Accenturedigital (2017): Digital agriculture: improving profitability www.accenture.com/_acnmedia/accenture/conversion-assets/dotcom/documents/global/pdf/digital_3/accenture-digital-agriculture-point-of-view.pdf

Analytical factsheet for Hungary: Nine objectives for a future Common Agricultural Policyhttps://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_hu.pdf

Artificial Intelligence Strategy /Mesterséges Intelligencia Stratégia/

BioEast Initiative /Bioeast kezdeményezés/ - https://bioeast.eu/

Declaration - A smart and sustainable digital future for European agriculture and rural areas (2019) https://ec.europa.eu/digital-single-market/en/news/eu-member-states-join-forces-digitalisation-european-agriculture-and-rural-areas

Digital Economy and Society Index (DESI) 2019 Country Report, Hungary - https://ec.europa.eu/digital-single-market/en/scoreboard/hungary

Digital Education Strategy - https://digitalisjoletprogram.hu/files/0a/6b/0a6bfcd72ccbf12c909b329149ae2537.pdf

Digital Export Development Strategy of Hungary - https://digitalisjoletprogram.hu/files/a5/23/a523883ca591ddd299de3fafe5bdfbec.pdf

Digital Start-up Strategy of Hungary - (2016) https://digitalisjoletprogram.hu/files/89/ea/89eac5ce5f74178f3f527945f7edd08f.pdf

Digital Welfare Program 2.0 (2017) https://www.kormany.hu/download/6/6d/21000/DJP20%20Strat%C3%A9giai%20Tanulm%C3%A1ny.pdf

EC (2019a): A smart and sustainable digital future for European agriculture and rural areas. Declaration. https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=58563

Hamza E., Rácz K., Szabó D., Vásáry V. (2019): Contribution of agricultural vocational training to the labour supply 2018 /Az agrárszakképzés szerepe a munkaerő-utánpótlásban 2018/. NARIC Research Institute of Agricultural Economics /NAIK Agrárgazdasági Kutatóintézet/ http://repo.aki.gov.hu/3471/

Juhász, A (2019): National Digital Agriculture Strategy (NDAS) - https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Telecom19/3-Juhasz%20Aniko_AGMF.pdf

Ministry of Agriculture (2017): The Concept of Food Economy of Hungary 2017-2050. Quality food for Hungary and for the world.

Ministry of Innovation and Technology (2019): Strategy of Strengthening of the Hungarian SMEs 2019-2030 https://www.kormany.hu/download/5/f7/b1000/KKV_Strategia.pdf#!DocumentBrowse

Ministry of Innovation and Technology (2020): Research, Development and Innovation Strategy of Hungary 2021-2030. Draft version

National Digital Agriculture Strategy -/Digitális Agrár Stratégia/ - https://ivsz.hu/wp-content/uploads/2016/06/ivsz-digitalis-agrar-strategia-2016.pdf /

National Info-communication Strategy /Nemzeti Infokommunikációs Stratégia/ - https://www.kormany.hu/download/a/f7/30000/NIS_végleges.pdf

Pesce M., Kirova M., Soma K., Bogaardt M-J., Poppe K., Thurston C., Monfort Belles C, Wolfert S., Beers G., Urdu D. (2019): Research for AGRI Committee – Impacts of the digital economy on the food-chain and the

CAP, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels. https://www.europarl.europa.eu/RegData/etudes/STUD/2019/629192/IPOL_STU(2019)629192_EN.pdf

Szabó, M. (2015): Országos vidékfejlesztés tervezés megalapozása forgatókönyvének a ELTE társadalomtudományi Kar Szociológia Doktori Iskola interdiszciplináris társadalomkutatási Doktori Program, doktori dolgozat.

Vocational training 4.0 Strategy /Szakképzés 4.0 stratégia/ - https://www.nive.hu/index.php?option=com_content&view=article&id=1024:szakkepzes-40-strategia&catid=10:hirek&Itemid=166

# Annex 2. Survey Questionnaire

Long-term vision for rural areas from the aspects of AKIS

Q1 –Are you aware of any studies, documentation, foresights, initiatives regarding the future of the AKIS (national, regional, local levels)

Q2 – According to you, what are the main current theme(s) for rural areas in the MAP region (i.e in Hungary)? "How is it to live in rural areas at the moment". Regarding the impacts of the COVID-19 how do you see the resilience of the country (resilience to acute shocks as the one of the pandemic)

Q3 – Opportunities and challenges in the next 20 years: What do you see as the main opportunities and challenges coming up until 2040?

Q4 – What is your vision for your rural territory by 2040?

Q5 – What are the challenges in reaching the vision?

Closing: How could the MAP contribute to the debate on the long-term vision for rural areas at local, national or EU level?