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Andrej LISEC
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E N G L I S H
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Invited lecture

RESPONDING TO THE IMPACT OF THE COVID-19 ON FOOD VALUE CHAINS – CASE OF INDUSTRY PRACTICE

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Abstract Supply chain operations in food value chains includes all logistics activities that enable the flow of agriculture inputs, outputs, and agriculture-related services, such as transportation, warehousing, procurement, packaging and inventory management. The efficacy of logistics is critical for the agri-food sector, in particular in times of crisis. Disruptions can cause adverse impacts on the quality of food, freshness, its safety, and can impede access to markets and affordability. The COVID-19 pandemic caused that the governments around the world implemented different measures, including a reduction in the transportation of goods (ground, ocean freight and air freight), as well as migration of labour domestically and internationally. In order to stop the transmission of the disease workers are less available in transportation systems because restrictions across borders. These issues induce disruptions in the logistics of the food supply chains. The contemporary business environment in COVID-19 pandemic environment imposes an increased need for the development of decision-support tools. The Shadow IT solution will be described on the example of the inventory control model for frozen fruit wholesale, implemented as a spreadsheet application.

Keywords:
COVID-19,
agriculture 4.0,
agricultural
supply
chain
(ASC),
shadow
IT,
model

1 Introduction

The period from 2019 to the present days is characterized by the COVID-19 pandemic, caused by the virus SARS-CoV-2, which affected almost all activities around the globe. COVID-19 or coronavirus disease caused global tragedy with high death rate. In order to prevent and retard the virus spreading in the population, governments of many countries have closed borders and have imposed quarantine and strict lockdowns. The world economy has been jeopardized through disruption of manufacturing operations, logistics and supply chain, and many other sectors (Singh et al., 2021; Hobbs, 2020; Remko, 2020). According to (Chamola et al., 2020) the pandemic strongly affected healthcare, food, tourism, automotive and aviation, oil and construction industries, and consequently majority of industrial and business sectors. The measures implemented against COVID-19 spreading have imposed reductions in the transportation of goods, services that rely on transport, as well as migration of labour domestically and internationally (FAO, 2020). Disturbances of transportation systems and movement restrictions (within and across borders) significantly influenced workers availability. All of these constraints have upset the balance of already fragile global food supply chain. Food supply chain (FSC) is based on a quite delicate balance between consumption, production and inventory (Song et al., 2021). As it is stated in (Sterman 2000), even a minor disruption of this chain can cause its instability due to the delays between decisions and the results, which in turn may introduce oscillation and amplification. Sustainability of FSC, already endangered by climate change, poverty and hunger (Workie et al.m 2020), has been additionally faced with logistics problems related to the shipment of food and agricultural inputs, which directly threated food security and nutrition. Realization of daily life and business activities have been difficult due to inability of planning based on historical data, but even more, uncertainty of workforce caused by employees' inability to work because of illness.

Food and agriculture are being affected in all countries as a result of measures against to COVID-19. The impacts of COVID-19 differ across farming systems and make some countries more exposed than others. Most agricultural activities are season-specific and weather-dependent; they follow a fine-tuned pattern of timing, pacing and sequencing of activities. A delay in one activity can have impacts throughout the production process, affecting yields and output. Capital-intensive farming could be most affected, particularly where production relies on a great variety and large

amounts of intermediate inputs, such as seeds, feeds, fertilizers, pesticides, lubes and diesel. But also, subsistence farmers can be affected. While they rely more on their own farm-based inputs, many have to purchase their inputs on local or regional markets, including their seeds, feeds or diesel. Their input supply chains are typically more fragile and more susceptible to disruptions. Importantly, they use more manual labour and, where the disease takes a direct toll on their health or their movement, this can impede not only their ability to produce for others, but also undermines their own food security. Weaknesses of the current global supply chain have been exposed resulted in revenue loss, demand, and supply unfulfillment in COVID-19.

Lockdown cannot be considered as a permanent solution for a long-run from an economic and social perspective. A lack or a delay of supply of these products affects people in the informal sector of urban areas who rely on produce from rural areas for their livelihood. The closure of restaurants, cafes, and street-food vendors, for instance, can also lead to significant reductions in otherwise reliable market outlets for many farmers, whose incomes will decline when products cannot be brought to markets. The International Labour Organization (ILO) reported an initial estimation that almost 25 million jobs could be lost worldwide due to COVID-19, and it may stretch to 40 million (ILO, 2020).

The contemporary business environment in COVID-19 pandemic environment imposes an increased need for the development of decision-support tools. Many of them are developed by people who are not professional programmers, but domain experts who need support in performing specific tasks and activities. These people are so-called end-user programmers. Shadow IT coexists with mandated information systems. Developed and applied by non-IT domain experts, it is as a rule, but not exclusively, used for resolving nonroutine issues, for which mandated IS does not have appropriate functions. Shadow IT solutions are not supported or controlled by IT departments (Rakovic et al., 2020). The Shadow IT solution will be described on the example of the inventory control model for frozen fruit wholesale, implemented as a spreadsheet application.

The company for which the spreadsheet application was developed operates within the food industry, in the sector of deep-frozen fruit and vegetables. The company cooperates with industrial and retail clients. The process of deep-frozen fruit wholesale on the German market will be described in this paper. The clients of the

company are the biggest retailers on the German market. They are ordering the goods every week in smaller quantities and from many different locations. To keep the status of a reliable supplier, the company has to deliver each order in the requested quantity and within the requested time. Considering the mentioned requests and dynamics of sales, an external warehouse and developed distribution network on the German market are necessary to deliver each order under requested conditions. The company has engaged a 3PL (third-party logistics) partner for this purpose (Jeremic et al., 2020).

2 Strategic measures, solutions, and opportunities for a more resilient post - COVID-19 in agricultural supply chain (ASC)

Agricultural supply chain (ASC) is essential for the economy and the society. This supply chain represents complex system, containing numerous participants, mutual dependencies and feedback (Ivanov, 2020a). Consequently COVID-19 pandemic affected ASC participants in multiple ways, directly and indirectly. Many papers tackled different topics in order to propose solutions to the crises caused by the coronavirus disease. COVID-19 supply chain risks and selected approaches to improving resilience could be described in Figure 1.

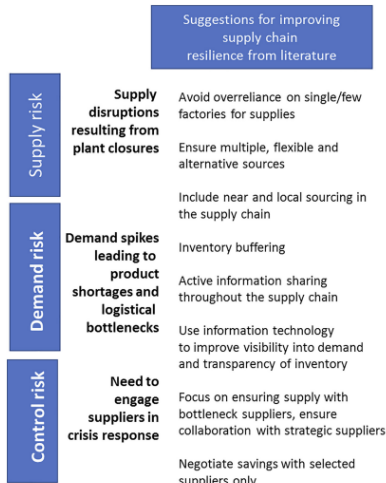


Figure 1: COVID-19 supply chain risks and selected approaches to improving resilience on COVID-19.

(Source: Remko, 2020)

2.1 Agriculture 4.0, Artificial intelligence and machine learning as a response to the COVID-19 impacts

Nayal et al. (2021) considers challenges of implementing artificial intelligence and machine learning (AI-ML) for moderating the impacts of COVID-19 on the ASC. Even before COVID-19 crises, ASC digitalization have been addressed in the context of risk and uncertainties mitigation and improvement of the supply chain resilience, agility and robustness (Antić, 2018; Ciruela-Lorenzo et al., 2020; Sharma et al. 2021). Digitalization includes various technologies such as AI (artificial intelligence), blockchain (BC), big data (BD), cloud computing (CC), Internet of things (IoT) and machine learning (ML) (Ciruela-Lorenzo et al., 2020; Wamba et al., 2018; Antić, 2018). According to (Nayal et al., 2021) AI represents technological driver for digitalization, while ML can be considered as application of AI. Digitalization of the ASC, defined by applying of AI-ML, aims to manage and optimize numerous challenges that the ASC faces during the COVID-19 period and beyond. AI-ML should contribute to the ASC risks reduction through more accurate forecasting, real-time information usage, transparency increment, traceability and predictability improvement (Nayal et al., 2021). Nevertheless, the application of AI-ML in the ASC is in its developmental stage and requires more focus from researchers and practitioners (Dhamija and Bag, 2020). Furthermore, many participants of ASC are far away from using any IT support for their activities, so AI-ML concept does not sound like a solution that can be applied in the near future.

Agriculture 4.0 is the 4th agriculture revolution that involves digitalizing the entire agricultural production process (through smart / precision farming) and its supply chain. Digital agriculture involves remotely gathering and saving, reviewing, and exchanging data for optimum activities across the entire food supply chain using software and resources in order to reduce the impact of the COVID-19 on food value chains. In agriculture 4.0, decisions are made at three distinct stages (pre-farming, on-farm, and supply value chain – after-farming) based on available data to improve food production, processing, storage, distribution, and consumption. The application of agriculture 4.0 to modern agriculture is summarized in Figure 2.

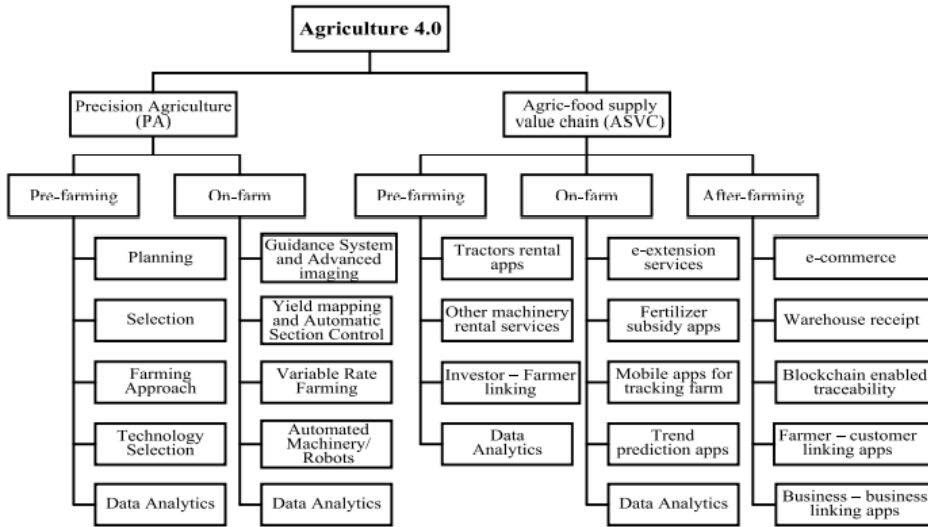


Figure 2: Structure of Agriculture 4.0

(Source: Oruma et al., 2021)

Farmers should realize that agriculture 4.0 is the future of farming. A good understanding of digital farming technology is necessary to ensure a profitable business model especially in pandemic COVID-19. They should invest in modern smart machinery and avoid the importation of obsolete machinery and influence of disturbance in agricultural supply chain (ASC) caused by pandemic COVID-19. In the Agricultural supply chain (ASC), the emphasis is on decision support systems (DSS) through mobile phones, software, and apps, including activities, technologies, and processes that add value or optimize any or all the blocks in the agri-food supply chain. The ASC covers operations before the actual farming like services or mobile apps that link farmers with tractors, other machinery (drones), investors, and aggrotech that handles data analytics. During the main farming operation, stakeholders can also provide value addition through e-extension service apps, fertilizer subsidy apps, mobile apps for farm tracking/monitoring, trends prediction apps, and aggrotech service providers for various aspects of data analytics (Lezoche et al., 2020).

Precision agriculture (PA) is using digital technology to manage and control all aspects of food production, processing, and storage to improve production sustainability (Shafi et al., 2019). As it shown at Figure 3., PA uses digital technologies of IoT, GPS guidance, GPS-based soil sampling, control systems, drones, robotics, autonomous vehicles, variable rate technology, automated hardware, telematics, and software.

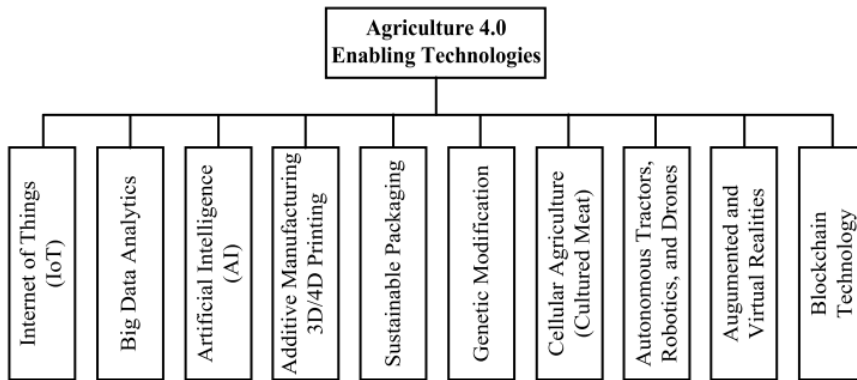


Figure 3: Technologies for Agriculture 4.0

(Source: Oruma et al., 2021)

Farmers can apply PA before and during farming through a decision support system. The pre-farming stage helps farmers to plan, select seedlings or agricultural inputs, choose a farming approach, and apply the appropriate technology based on the available data. During farming, PA enables farmers to use the proper amount of farm inputs, fertilizer, and other resources to improve farming output sustainability by adopting appropriate digital technologies. Farmers can do farming in a whole new way with PA through approaches like desert farming using drip irrigation, hydroponics, urban farming, etc., which are now possible. PA assumes that growth, stability, and performance are affected by a farm’s topology, environmental factors, and morphology (Shafi et al., 2019). Farm monitoring/forecasting platforms are integrated with the most precision farming and smart mechanization services to manage and optimize the food production process. Farm monitoring is achieved through the data obtained from IoT, drone technology, satellite aerial imaging, etc., and customized to meet specific farm requirements. Farmers can use the results from farming monitoring for a variable-rate farming application of inputs to

different farm sectors. Forecasting/prediction of farm yield is possible with additional data from weather/metrological centers. Yield prediction and what-if analysis are also performed from these data to improve output at minimum inputs in a sustainable farming approach. Farm monitoring platforms also provide early warning systems to farmers to mitigate the risk of low yields due to unfavorable environmental conditions like bad weather, pest, and disease invasion (Abayomi-Alli et al., 2021).

Big data is a computer science field concerned with the analytics of big (large and complex) data to draw useful information. On their own, the individual data may not make much sense, but when analyzed on a large scale using artificial intelligence, helpful information, trends, and patterns can be drawn from big data analytics. Big data uses statistical analysis, optimization, inductive statistics, and principles from nonlinear statistics to derive laws (regression, nonlinear interactions, and causal effects) from large data sets with low information density to discover relationships and dependencies or perform forecast outcomes behaviors (Corallo et al., 2020). Five Vs characterize big data; volume, velocity, variety, veracity, and value (Ishwarappa et al., 2015). Big data requires high computation, storage, and processing resources, which the IoT network cannot handle in isolation.

Blockchain technology enables recording information digitally that is very difficult to change, hack, or alter. It consists of an increasing list of records (blocks), with each block containing a cryptographic hash of the previous record. It is a digitally distributed ledger system with seven distinct properties: programmable, secure, immutable, unanimous, distributed, anonymous, and time stamped. Blockchain technology is secured because all its records are individually encrypted; it is immutable because any validated record in Blockchain cannot be reversed or changed. The approach is unanimous because all participants must agree to the validity of each entry. All network participant has a copy of the transaction records for transparency. It is anonymous because the identity of all participants is either anonymous or pseudonymous. Finally, all its records are time-stamped blocks. Blockchain technology enables traceability, information security, and efficient use of resources within the agriculture 4.0 context. Some benefits of blockchain technology adoption in agriculture 4.0 include reduction in food wastage by detecting bottlenecks in the agri-food supply chain; combating food fraud such as fraudulent labeling of food, thereby increasing food safety (De Clerq et al., 2018).

Artificial intelligence involves the intelligence demonstrated by machines or computers. It is the study of intelligent agents. AI describes machines that mimic human cognitive functions like learning and problem-solving. AI makes machines more capable of understanding human speech, competing with professionals at the highest levels of strategic games, autonomously operating vehicles, intelligent routing and content delivery networks, and military simulations. Modern AI approaches include deep neural networks (computational intelligence), statistical methods, and traditional symbolic AI. The tools commonly used for AI applications include search and mathematical optimization, neural networks, and strategies based on probability and economics. AI applications include machine learning, natural language processing, expert systems, computer vision, robotics, etc. (Brzeski et al., 2019).

Robots are used in agriculture to automate simple, dirty, dehumanizing, repetitive, or dangerous tasks (like weed control, planting, harvesting, sorting, packing, or pest control), thereby enabling farmers to focus on more critical tasks. Smart machinery and drone technology are other enabling technology for Agriculture 4.0. Smart mechanization involves using autonomous tractors/drones for planning, automation, monitoring, optimization, and management of farm operations in providing more food sustainably from our limited land resources and changing climatic conditions for our teeming population. Smart mechanization uses IoT sensors, software, autonomous solutions, and artificial intelligence for soil preparation, planting, crop treatment, farm monitoring, harvesting, and processing using data from the farm. Autonomous tractors can eliminate operator fatigue by ensuring more daily working hours (Erfani et al., 2019).

Additive manufacture (3D and 4D printing) is computer controlled three-dimensional manufacturing by depositing materials in layers. It uses binder jetting, directed energy deposition, powder bed fusion, sheet lamination, vat polymerization, and material extrusion in creating new three-dimensional objects. Three additive manufacturing technologies are sintering (melting materials without liquefaction to create complex, high-resolution products), melting (electron beam), and stereolithography (photopolymerization whereby an ultraviolet laser is fired into a vat of photopolymer resin to create torque-resistant ceramics parts able to endure extreme temperature (Javaid et al., 2019).

Augmented reality (AR) uses digital technology to superimpose generated text, graphics, images, etc., on the real physical view of objects, thereby providing an enhanced user experience. AR user interface includes a screen, monitor, helmets, facemask, glasses, goggles, head-mounted display, window, windshield, etc. This technology blurs the boundary between the physical and digital worlds. For an AR user, the real and virtual worlds coexist. The user can obtain helpful information about an object or location while interacting with virtual content in the real world (Jung et al., 2018).

Other disruptive technologies include bioplastics for sustainable packaging (e.g., starch-based bioplastics) that will result in entirely biodegradable waste on its stated lifespan. This is intended to solve the plastics problem that takes several years to decompose and constitutes a severe threat to aquatic life (Gadhawe et al., 2018).

Genetic modification (genomics) enables new breeds with improved yields and resistance to harsh environmental conditions. It can also develop crops with particular vitamins and minerals for healthy living (Raman, 2017).

Cellular agriculture produces food (agricultural produce) from cell cultures using different applicable technologies such as biotechnology, molecular biology, synthetic biology, and tissue engineering. Culturing food is another technology that can produce meat and grow plants in the lab (of commercial quantity) to ensure food security in the future. Cellular agriculture has a lot of potential and positive environmental effects for the future of farming. It will enable space astronauts to culture meats on spaceships in the future while eliminating animal cruelty in slaughterhouses. Cellular agriculture has applications in meat, dairy, eggs, gelatin, coffee, horseshoe crab blood, fish, fragrances, and silk (Stephens et al., 2000).

2.2 Urban agriculture perspectives

Urban agriculture in developed countries should be fostered with emerging growing practices and edible green infrastructures, such as vertical farming, hydroponics, aeroponic, aquaponic, and rooftop greenhouses. Notwithstanding the limitations of traditional urban farming activities, innovative and disruptive solutions and short food supply chains of fresh agricultural products might play a positive role in lessening uncertainties from global systemic risks. of urban production. Findings

from field-scale studies and reviews suggest that various forms of smart and innovative urban agriculture, such as vertical indoor farming, greenhouses, aquaponics, soil-less hydroponics, and aeroponics, result in high yields of horticultural products up to 140 kg/m² /year (Armanda et al., 2019).

Innovative urban farms with climate control systems encompass high levels of technology, such as precision automation for nutrient dosing, light-emitting diode (LED) technology, artificial intelligence and blockchain, to optimize the growing process minimizing maintenance and costs (O'Sullivan et al., 2019). In addition to production capacities, advanced indoor urban farms are less subject to natural disasters and weather-related problems, and may revitalize abandoned buildings, brownfield sites, and vacant spaces (O'Sullivan et al., 2020).

Pulighe and Lupia (2020) presents the idea of urban agriculture based on eatable green infrastructures, such as vertical farming, hydroponics, aeroponic, aquaponic, and rooftop greenhouses. This idea is response of the authors, Pulighe and Lupia (2020), to the fragility of large cities to unexpected multifaceted global risks introduced by COVID-19. Urban agriculture involves the cultivation, processing, and distribution of food in or around heavily populated towns, cities, or metropolitans on a commercial scale. It includes animal husbandry, aquaculture, apiculture (beekeeping), horticulture, etc. Due to the high land cost in urban areas, it is usually practiced at the perimeters of cities. Urban farming includes creating fresher foods, using unutilized spaces, increasing food security, and reducing food waste due to proximity to food load centers. Urban farming can be in the form of vertical farming, hydroponics, aeroponics, aquaponics, microgreens farms, shipping container farms, and rooftops farming, mushrooms farming, etc. In our proposed framework for adopting agriculture 4.0, we shall focus on peri-urban farm locations for an efficient realization of commercial-scale urban farms (Shamshiri et al., 2018).

Vertical farms are indoor farms that use soilless technologies such as hydroponics or aeroponics to grow crops. Vertical farming technologies ensure the optimal use of land by stacking the level of yields on each other. It uses artificial lighting in a highly controlled crop growing condition to ensure all year-round growing and harvesting irrespective of the farm location's environmental conditions. The crops cultivated in a vertical farm are characterized by high edible mass percentage, low plant height, fast-growing plant species, and short shelf life. The idea of vertical

farming is to reclaim land from agriculture to forestry, save clean freshwater, reduce CO₂ emissions resulting from long transportation of food, increased variety (biodiversity) of food, and freshness of food. Despommier (2010) first used the term vertical farm.

Hydroponics technology is the soilless cultivation of plants, in which nutrients are supplied to the crops through the water. The nutrients can be from organic sources or inorganic/artificial sources. The nutrient solution can be static or continuous flow in design. The nutrient solution will cause eventual loss of its nutrient after prolonged usage, and the answer is usually drained out and replaced with a new solution. The drained solution can mix with ocean water leading to water pollution. One major limitation of hydroponics is the limited air holding capacity of water, as one kilogram of water can only hold 8 milligrams of air, even if aerators are used. This means that inadequate aeration may result; hence, the continuous water flow is crucial for successful operation (Jones, 2016).

Aeroponics is the cultivation of crops with no substrate. It involves growing crops in an environment that is saturated with nutrient-rich water droplets. This farming approach provides excellent aeration and water saving. Aeroponics requires 65 % less water than hydroponics and one-quarter of nutrients under the same farming conditions. Mist is generally easier to handle than water in a zero-gravity environment; hence, aeroponics is of particular interest to NASA's space research. Aquaponics combines aquaculture (usually fish farming) and hydroponics. The aquatic effluents resulting from fish waste and uneaten feeds accumulate in the water and increase its toxicity. This nutrient-rich water is filtered and pumped to the hydroponics section for crop cultivation. Aquaponics has five basic units: rearing tank, settling basin, biofilter, hydroponics subsystem, and sump. It has the water-saving capacity of hydroponics coupled with an added advantage of eliminating environmental pollution from wastewater (Diver et al., 2000).

Aquaculture is the farming of aquatic plants and animals such as fish, algae, crustaceans, aquatic plants, etc. It involves both the cultivation of fresh water and saltwater plants and animals under controlled conditions. Marine culture is the cultivation of aquatic organisms for food in a marine environment. The four commonly used mariculture structures are: floating cage, net enclosures, earth ponds, and a constant water circulation system (Gentry et al., 2017).

2.3 Fragility of the regional food supply chains RFSC at the COVID-19 crisis

The COVID-19 pandemic has illuminated the fragility of the prevailing food supply system. Prior to the pandemic, the amount of food consumed at home and away from home in the U.S. was roughly equal (USDA, 2020). At the height of the COVID-19 emergency, however, wholesale markets rapidly diminished when restaurants, hotels, and schools closed (Yaffe-Bellany, 2020). Consequently, grocery retail demand increased significantly, with consumer panic-buying and more meals prepared at home (Hall et al., 2020; Morgan, 2020; Venuto, 2020). Conventional food supply chains, with package sizes and infrastructure intended for wholesale buyers, struggled to adapt for retail sales, and large concentrated meat and dairy processors and longhaul transportation networks were disrupted by labor shortages as workers became ill (Hobbs, 2020). As a result, many consumers experienced increased food prices and shortages at the grocery store.

The long-term sustainability, viability, and resilience of RFSCs can be significantly improved by selectively employing some transportation, warehousing, and inventory management best practices that make conventional food supply chains efficient and effective (Rogoff, 2014). Faced with the COVID-19 crisis, the regional food producers and distributors need to adopt logistics best practices. These best practices are extracted from the comprehensive literature review on logistics for regional food systems conducted by Mittal et al. (2018) and Marusak et al. (2020):

- Determining the optimum number and facility locations of warehouses is critical for logistics efficiency, with implications for labor, transportation, inventory, and indirect costs; proximity to suppliers and/or customers is another important consideration. Urban distribution centers for agriculture farmers – direct relation with urban cities customers. Identify collection centers closer to producers, for example develop storage facilities like warehouse receipt system platforms where farmers can deliver their produce without the need to go to markets. Take an inventory of public and private storage facilities, including available cooling infrastructure, and map out and assess cold chains that can be used for emergency storage. Ensure that the stockpiles of food meet the nutritional needs of the population when combined into food baskets for distribution. Provide sufficient

physical spaces to farmers' organizations that allow workers to maintain physical distancing rules and to manage the home delivery logistics, for example spaces for product aggregation and preparation of boxes.

- Implementing warehouse inventory management systems, using inventory tracking systems, and matching supply with demand through demand forecasting can reduce logistics costs and improve service levels.
- Increase the power of public procurement on essential agricultural supplies and ensure that market channels and logistics are still available for farmers. Make rapid reforms to procurement procedures and rules, including rapid payment and cash-on-delivery, for small farmers and processors, while maintaining high food quality and safety standards. Transform restaurants, cafes, and street-food vendors into local food suppliers using their urban facility location for online delivery services. Strengthen home delivery or “near” to home delivery to ensure consumers access to fresh and local products. Retain agri-dealers and livestock supplies shops as essential services with call and collect or delivery services only. Procurement of supplies to the urban cities should be organized directly from agriculture farmers
- Improved supplier reliability and reducing supply uncertainty can help organizations to match supply and demand, thereby increasing inventory availability and supply chain responsiveness.
- Increasing vehicle utilization load rates via optimized routing and scheduling and consolidating delivery routes can help organization to increase its logistics efficiency and reduce transportation costs. Vehicle selection presents selecting appropriate vehicle types and sizes to meet supply chain objectives is critical for transportation efficiency; large and refrigerated vehicles can improve product freshness and facilitate longer delivery routes, but they also tend to have low fuel efficiency. Adopt measures like “green channels/green lanes/green corridors” for critical agricultural products and production materials such as fruits and vegetables to minimize hurdles in transport.
- Use innovative logistics and transport methods for direct deliveries to semi-urban populations, including delivery trucks, pick-ups or bicycles. Ensure on-time and frequent deliveries. Buyers with busy schedules tend to highly value on-time deliveries; they also typically prefer more frequent deliveries,

which reduce the amount of inventory that they must carry while increasing product availability and freshness.

- Hiring outsourced transportation services of third-party logistics providers can reduce overall transportation costs and for making home deliveries through e-commerce. The railways play a major role in making both the supply and demand end meet. However, it is necessary for the railways to utilize this opportunity to make its freight operations more efficient so as to increase the volume of freight transportation.
- Organizations in different supply chains can work at horizontal collaboration together to cluster their logistics activities and assets (e.g., through shared transportation and processing facilities) for greater efficiency and reduced logistics costs.
- Understand the demand and make plans with forecasting and simulations, how demand may evolve and how production, processing and distribution can be adapted.
- Technologies such as RFID and blockchain can accelerate information sharing and improve visibility into inventory positions and logistics flows.
- Allow movement of seasonal workers and transport operators (e.g. truck drivers) across domestic and international borders. Adequate health screening, testing, and safety protection measures should be taken. Special flights/trains/coaches can be organized to help seasonal workers to get to their workplace.
- Train local labor force in agricultural activities. Many agricultural activities, such as planting, harvesting and storage are tightly integrated into seasonal timetables. When and where seasonal workers are not available, options to mobilize unemployed or underemployed workers or reallocate workers from other areas with temporary labor surpluses (restaurants) should be considered. This would afford unemployed individuals with additional income, and open options to retrain the workforce, in addition to contributing to keep the food value chain alive. It could also be a new variation of the public work programs.
- Inform and promote the use of existing apps that have been developed to reduce food waste in urban areas.
- The government authorities collaboration with the ground level authorities is essential to maintain law and order and communication. Involve

government and local authorities in order to ensure fast deliveries. It is observed that trucks are stranded for several hours at the national highways. This can be solved by utilizing FAST tags for identification of vehicles. The process can be augmented through online based permissions from a government portal checked through bar code or similar.

3 Shadow IT – Reasons for Occurrence

Shadow IT coexists with mandated information systems. Developed and applied by non-IT domain experts, it is as a rule, but not exclusively, used for resolving nonroutine issues, for which mandated IS does not have appropriate functions. Shadow IT solutions are not supported or controlled by IT departments. The reasons for the emergence of shadow IT are numerous, but there is always a need for end users to complete their job. Despite an ERP (Enterprise Resource Planning) system implemented to increase standardization and control, end users create workarounds in the form of shadow IT due to Unreliability, Inflexibility, Not Easy to Use, and Lack of coordination (Alojai, 2017). Dissatisfaction of employees with the existing ERP system (Tajul et al., 2016) or dissatisfaction during its implementation, according to Kerr, Houghton and Burgess (2007), provides a fertile ground for the development of shadow (feral) IT.

Authors generally agree that Shadow IT, Feral Systems, IT workarounds are opposite of IT systems, but their definitions are in some respects different.

Shadow IT describes the supplement of “official” IT by several, autonomous developed IT systems, processes and organizational units, which are located in the business departments. These systems are generally not known, supported and accepted by the official IT department (Rentrop et al., 2019). Shadow system is defined by usage as individual user’s voluntary deployment of one or more systems besides or instead of the mandatory system to perform a task (Haag et al., 2015). Shadow Information Technology (IT) occurs when users develop systems outside of the central information technology department (Chua et al., 2014). Feral systems are argued to be those mechanisms which circumvent regular systemic procedures to the extent that they create alternative means of accessing data (Kerr et al., 2007). Feral Information Systems (FIS) is any technological artefact (e.g. spreadsheets) that end users employ instead of the mandated Enterprise System (ES) (Spierings et al.,

2014). Feral systems have largely been regarded as the users’ response to discrepancies between official IT software systems and actual business processes (Tambo et al., 2016). A workaround is a strategy of using a computer system in a manner that it was not designed to be used for or using alternative methods to accomplish a work task (Alojairi, 2017). Computer workarounds are a form of anomalous system use which refers to a variety of sociometrical actions around IT artefacts. These actions may not be consistent with the designed uses and official rules but nevertheless constitute a form of IT enactment in practice (Azad et al., 2012). Where a mismatch occurs between the expectations of technology and actual working practice, employees may implement a ‘workaround’ by deviating from set procedures (Ferneley et al., 2006).

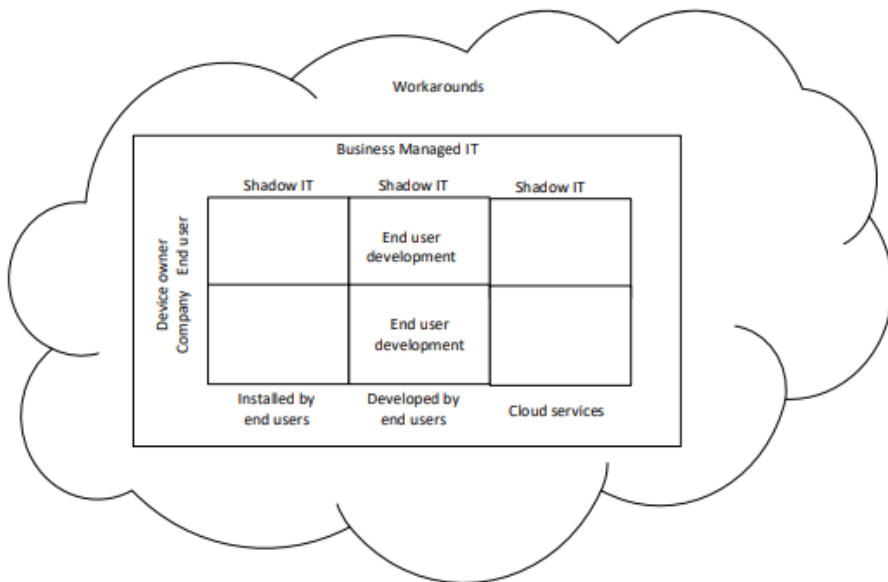


Figure 4: Shadow IT, End user development and Workaround

(Source: Rakovic et al., 2020)

The reasons for the emergence of shadow IT are numerous, but there is always a need for end users to complete their job. Despite an ERP (Enterprise Resource Planning) system implemented to increase standardization and control, end users create workarounds in the form of shadow IT due to Unreliability, Inflexibility, Not Easy to Use, and Lack of coordination (Alojairi, 2017). Dissatisfaction of employees

with the existing ERP system (Tajul et al., 2016) or dissatisfaction during its implementation according to Kerr, Houghton and Burgess (2007) provides a fertile ground for the development of shadow (feral) IT. Although companies consume huge resources for the ERP system implementation that does not guarantee accurate data in the centralized database. As shadow IT often complements or replaces certain ERP system functions, “real data” can be different from the data found in the ERP system (Kerr et al., 2010). The very systems that should reduce and remove shadow IT become their spawning ground (King et al., 2014). It is useful to know that even distrust in the ERP system can be the reason for end users to start developing shadow IT (Kerr et al., 2007). As the reasons for shadow IT, users often mention a long response time (fulfilment of user requests) by IT department (Györy et al., 2012), and low initial (perceived) costs of shadow IT (Zimmermann et al., 2014). The growing number of mergers and acquisitions of organizations indicates that the “problem” of shadow IT will continue to occur in the future (Kerr et al., 2007). However, shadow IT should not only be observed from a negative point of view, and it is also necessary to consider the adaptability and innovative potential of shadow IT (Zimmermann et al., 2014).

Managing shadow IT is necessary because many shadow ITs support key business processes. Although these systems are mostly developed without the knowledge and support of IT departments, and bring many risks, Haag et al. (2015) emphasize that organizations should be careful with sanctioning the shadow IT system development as these systems can be very useful both for the organization and for the performance of individuals in doing their job. Behrens (2009) provides advice for a successful organizational use on the basis of a case study conducted: recognize shadow IT, learn from shadow IT, eliminate bias towards shadow IT, do not try to control shadow IT, and encourage good shadow systems. In the same manner, Haag et al. (2015) state that it is necessary to recognize and support the development of shadow IT. Managing shadow IT should start with researching the motivation of shadow IT occurrence (Tambo et al., 2016), then analyzing users’ abilities to develop shadow IT (Spierings et al., 2014) and once each individual shadow IT instance is identified in individual business processes, it is necessary to evaluate each shadow IT instance and control the shadow IT instances (Zimmermann et al., 2014).

4 Spreadsheet application for inventory control of frozen fruit

According to Jeremic, Djordjevic and Antic (2020), in order to improve material flow management, decision-makers should have the appropriate form of support in the process of decision-making. For these purposes, decision-making models are widely used. These models should include all relevant information from the environment and represent significant support to the decision-maker in choosing the available alternatives. Nowadays there are a lot of BI (business intelligence) tools and software solutions that provide necessary support in the process of decision-making. However, spreadsheets are still one of the most used tools for decision-support because of their functionalities, ease of use, and flexibility.

Since the company supplies one main distribution centre, for the 3PL partner is required to have a developed logistics network and to be able to deliver each order to the customer on time. Therefore, it is necessary to apply the logistic concept of cross-docking delivery. Cross-docking implies the existence of one large, main distribution centre from which smaller distribution centres are supplied (Vogt, 2010). Smaller distribution centres' locations provide the ability to cover all regions and delivery locations in Germany. The essence of this concept is that full truck (Full Truck Load - FTL) departs from the main distribution centre loaded with the goods that have to be delivered to the multiple unloading points. The trucks arrive to smaller distribution centres and each of them serves several unloading points. Depending on which unloading point the goods have to be delivered, transshipment is performed in a smaller distribution centre. Then, the goods are loaded into smaller vehicles which transport them to the final place of delivery. This concept of delivery proves to be efficient when it is necessary to deliver smaller quantities of 33-euro pallets, as is the standard for FTL, to more locations. The described concept enables savings in terms of time and costs.

The process of delivery is initiated with a sales order. Upon receiving the sales order logistics planner records it in the existing spreadsheet tool and checks the inventory level of ordered SKUs (Stock Keeping Unit). If there are enough inventories on stock, a planner proceeds to creation of sales order in ERP (Enterprise Resource Planning) system and creates a delivery note which is referred to the previously created sales order. If there are not enough inventories on stock, the replenishment order has to be created. The replenishment order should be created as soon as the

stock level reaches a defined safety stock level. Safety stocks are often called reserve stocks. They should satisfy the demand, during unforeseen, sudden events, which were not foreseen in previous periods (machine failure in the production line, unrealized deliveries, etc.) (Antic, 2014). For the inventory control problem, considered in this paper, the safety stock was defined as an average daily sale for the current month multiplied by Lead Time. Lead Time is defined as the time between placing the replenishment order and delivering the goods to the customer. However, given the lack of an adequate procurement plan and the lack of tools to support the decision-maker in defining inventory replenishment points, this process represents a significant challenge for the planner controlling the process. The planner takes control actions based on his experience and his predictions of customer demand.

After order processing, a transport order with instructions for deliveries is created and forwarded to the logistics provider in Germany. The logistics provider should confirm deliveries within the required deadlines. According to the distance of the retail distribution centre, one or two days before the required delivery date, the goods are collected and sorted, depending on the place of unloading, and transported to the appropriate distribution centre. On the delivery day, the goods are delivered to the final place of unloading, and after the completion of deliveries in the current day, the logistics provider sends information about the status of all deliveries. After confirmation of deliveries, invoices are sent to the customer thus completing the order delivery process.

The success of this process is depended upon successfulness of the inventory control process. The inventory control process is a key factor in the success of the delivery and ultimately customer satisfaction. To improve the process of inventory control, it is necessary to identify material flows and their subjects in the process of wholesale delivery. When material flows are defined, accumulation places of the flow's subject should be identified and implemented in the decision-support tool. In this way, a decision-maker has available information about the state of the flow's subject all the time. Based on this information, the planner takes control actions that will affect the state of the flows' subjects, and thus the entire delivery process. Appropriate decision-support tool, for the logistics planner, should enable insight into data relevant for the process (inventory levels, forecasted demand, history sales data, etc.) and generate suggestions of control actions for the decision-making.

4.1 Specification and design of outputs

This stage is oriented toward end-user of the solution being developed i.e. model interpreter. The end-user in this case is the person who uses the output of the model/application for a specific purpose i.e. decision-making. The methodology based on the structured design requires the outputs to be presented on separate worksheets. Since the solutions' main goal is the improvement of the material flows control, users require three types of reports: active sales orders report, replenishment realization report and delivery realization report.

Active sales orders report enables insight into all orders that will be delivered in the upcoming period or that are already in the process of delivery. This report has multiple benefits to the user of the application because it enables insight into deliveries of ordered SKUs in the current and upcoming period, and decision-making upon these deliveries (creating delivery routes, negotiating additional quantities, etc.). The replenishment realization report provides an overview of planned and realized inventory replenishments. The user has available different statuses, which he can use for replenishment orders filtering (by processing, in preparation, transit, realized and unrealized orders) and upon which he can perform various analyses. Delivery realization report provides an insight into realization of deliveries in the previous period. Based on these data the user performs analyses such as: dynamics of deliveries by SKUs, delivery locations, time period of the year, service level, etc.

4.2 Conceptual design of the workings section

Conceptual design of the workings section shows the hierarchical relationship of the model elements and their interconnections. It is created according to the importance of functions and elements in the process itself. The first step is defining of root elements, i.e. elements/functions of the highest level which do not have dependents. On the top of the hierarchy are located the elements of the highest importance, which represent the purpose of the process and below them are added the elements that are their direct predecessors. The main goal of this stage is to visualize instances of multiple dependants of a particular element of the model.

The purpose of developed spreadsheet application is an overview of all data relevant to the specific SKU, which are necessary for decision-making and control of SKUs material flow. Considering that, it is necessary to have available data regarding planned inputs, state of inventory levels and planned outputs for each SKU. Figure 5. shows conceptual design of the workings section.

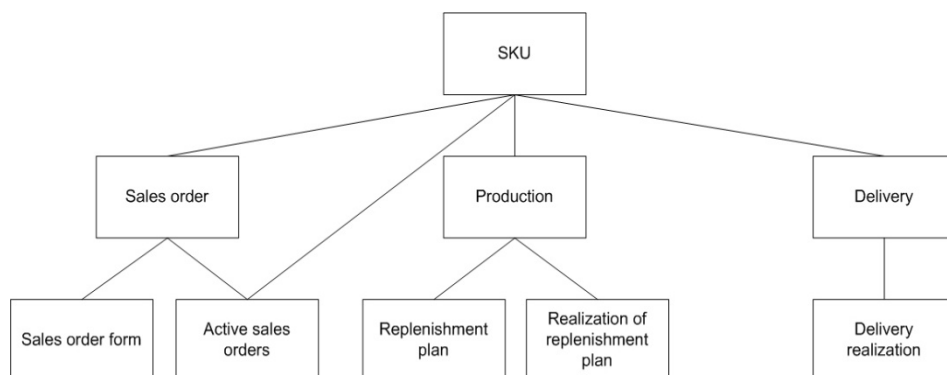


Figure 5: Conceptual design of workings section

(Source: Jeremic et al., 2020)

4.3 Logical design of the workings section

In this stage it is necessary to describe the structure defined in the previous stage in more detail. Given that for complex spreadsheet models, a complex form of a graph can occur when defining a conceptual design, in this step, it is necessary to transform it into a tree form. Thereby, the two rules can be applied (Rajalingham et al., 2008). The first rule introduces duplicating of the elements with more than one dependant, whereby predecessors of these elements are not shown in the model at this stage. The second rule implies that predecessors of duplicated elements should be presented as a separate module in the tree form. Logical design of workings sections of developed spreadsheet application, in accordance with previously described, is shown in Figure 6. In this case, database of active sales orders represents predecessor of two elements – sales order and SKU. Since this element does not have predecessors, there was no need for presenting additional module.

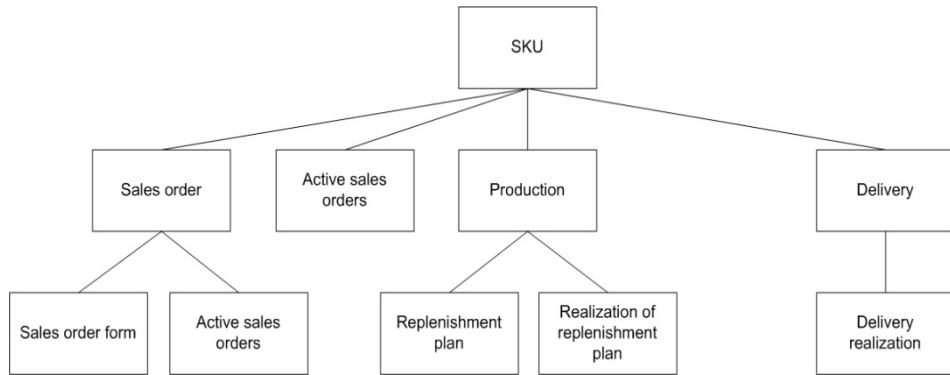


Figure 6: Logical design of workings section

(Source: Jeremic et al., 2020)

4.4 Construction of the workings section structure

Construction of the workings section structure defines how the previously described structure and logic of the model are implemented in the spreadsheet. This stage is based on the indentation principle which is applied to the row labels and its corresponding values. Each value is indented by the assignment of a virtual spreadsheet column for each indentation level. The elements of the same hierarchical level are represented in the same column, whereby each row contains only one function. Since the developed spreadsheet application doesn't have functions that interconnect its elements, Figure 7. represents a modified workings section structure according to the applied structured methodology (Rajalingham et. al., 2008). Since one of the main deficiencies of the existing spreadsheet tool was data overprocessing and the need for a lot of manual work, the new spreadsheet application is implemented with a significant level of work automation through the procedures developed in Visual Basic for Applications.

SKU	Procedure		
Sales order		Procedure	
Sales order form			Procedure
Active sales orders			Procedure
Production		Procedure	
Replenishment plan			Procedure
Realization of replenishment plan			Procedure
Delivery		Procedure	
Delivery realization			Procedure
Active sales orders		Procedure	

Figure 7: Construction of the workings section structure

(Source: Jeremic et al., 2020)

Workings section is accessed through the main menu of the application or through the navigation menu which is implemented for each worksheet. By filling the sales order form users activate macro which transfers the data to the workings section. The sales order element considers sales order management. If there are enough inventories of ordered SKU, the user proceeds to the sales order processing. There are three different sales order statuses: pending, ordered, and delivered. Pending status means that the order is recorded but not processed. Ordered status considers that the sales order is processed and that the delivery order is forwarded to the logistics provider. Delivered status is active when the goods are delivered, and its sales order can be archived in the database of realized deliveries. The user manages the sales order status depending on its realization, which is coordinated with the logistics provider.

If there is not enough of ordered goods on stock or its inventory level is below defined safety stock, the user has to place the replenishment order. The replenishment order form is the output of the inventory control model, which is implemented through the spreadsheet application, and it is a part of the production element. Each generated replenishment order has its status: ordered, in preparation, transit, delivered, unrealized. Ordered status means that the replenishment order is recorded, and it is pending for approval from the production department. In preparation status defines that the order is confirmed, and it is in the process of production. Transit status identifies that the order is on its way to the main distribution centre. Unrealized status considers that the order is either rejected from the production unit or it is decided to cancel its realization. All replenishment orders

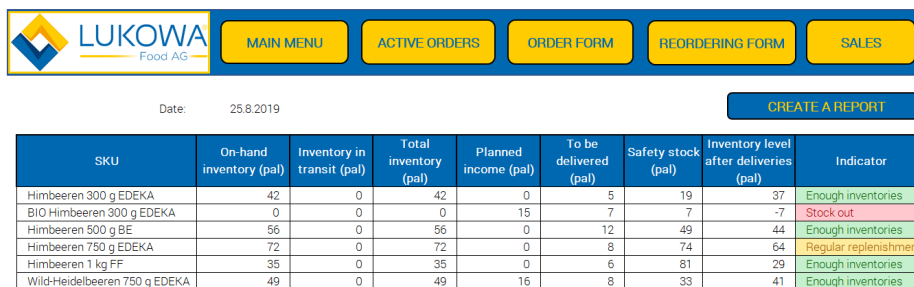
are presented in two reports, active and archived orders. Active orders report consists of orders which have status pending, in preparation or transit. In the report of archived orders there are the orders with status delivered or unrealized. Depending on the realization of these orders, the user manages their statuses. When the status changes the user has to update the reports, which is done by activating the macro which transfers the data to the appropriate report.

In case when there are enough inventories on stock, the user processes the order through the ERP system, sends delivery order to 3PL partner and changes its status to ordered. After delivery realization, order status should be changed to delivered. By activating the macro from active orders report all delivered orders are archived to delivery realization report.

4.5 Construction of the input section

During this stage, it is important to separate the cells intended for the input of the data, for two reasons. The first one refers to the importance of obtaining accurate input data. The second reason is that data entry cells are often referenced in more than one formula. In this manner possibility of formulae overwriting is reduced, as well as accidental interference of users to the application functioning.

The input section of the developed application consists of two input forms: sales order form and replenishment order form. The sales order form implies following input data: sales order number, requested delivery date, delivery destination, ordered SKUs, the quantity of ordered SKUs. This order form is created considering the clarity and ease of use, but the data arrangement is different than for the working and output section. Therefore, a transition table is implemented in order to prepare the data in the form and formats of destination database. The replenishment order form is the output of the inventory control model that is implemented through this spreadsheet application. This form consists of the following data: ordered SKUs, the quantity of ordered SKUs and the requested loading date.



SKU	On-hand inventory (pal)	Inventory in transit (pal)	Total inventory (pal)	Planned income (pal)	To be delivered (pal)	Safety stock (pal)	Inventory level after deliveries (pal)	Indicator
Himbeeren 300 g EDEKA	42	0	42	0	5	19	37	Enough inventories
BIO Himbeeren 300 g EDEKA	0	0	0	15	7	7	-7	Stock out
Himbeeren 500 g BE	56	0	56	0	12	49	44	Enough inventories
Himbeeren 750 g EDEKA	72	0	72	0	8	74	64	Regular replenishment
Himbeeren 1 kg FF	35	0	35	0	6	81	29	Enough inventories
Wild-Heidelbeeren 750 g EDEKA	49	0	49	16	8	33	41	Enough inventories

Figure 8: Input interface developed in Visual Basic for Application

(Source: Jeremic et al., 2020)

4.6 Implementation of functions and relationships

This step represents interdependences of model/application elements implemented through calculations and formulas. In this step formulas and calculations needed for the workings section are created. In contrast to the structure of conceptual and logical design of the workings section, in which the top-down approach is applied, this step is based on the bottom-up approach. The bottom-up approach implies moving from the lowest hierarchical levels to the highest during formula creation.

The spreadsheet application, described in this paper, except for the control model, does not have implemented calculations in the form of functions/formulas that interconnect the elements of the application. Simple calculations are used at the level of the working section, while interconnection of application elements is achieved by the implementation of procedures developed in Visual Basic for Application. The procedures fill the workings section and provide the appropriate output based on the given inputs.

SKU	SKUOverview ()		
Sales order		OrdersUpdate ()	
Sales order form			OrderEvidence ()
Active sales orders			OrdersReport ()
Production		RealizedReplenishmentsUpdate ()	
Replenishment plan			ReplenishmentEvidence ()
Realization of replenishment plan			ActiveReplenishmentsUpdate ()
Delivery		DeliveriesUpdate ()	
Realization of delivery			DeliveryEvidence ()
Active sales orders		OrdersReport ()	

Figure 9: Implementation of functions and relationships

(Source: Jeremic et al., 2020)

4.7 Completion of the output section

Completion of the output section is the final stage of the application development and implies definition of the output, based on the previously shown input values and calculations. The output section of the described spreadsheet application consists of several reports which represent records of certain material flows. These reports are related to the elements of the structure diagram: sales order, production and delivery.

The sales order element contains active orders report which gives insight to all active sales orders in one place. This overview can be really useful in determination of trend dynamics according to different criteria. The element production generates two reports related to the realization of the replenishment orders, active orders and archived orders. The active orders represent evidence of the orders that are pending, or they are in the process of realization. This report is divided into three parts related to ordered, in preparation and orders in transit. The archived orders are orders realized or rejected due to various circumstances. The delivery element results in a report of realized deliveries. Based on the data from the report the user can perform a various set of analysis, which can give him valuable information for the process of decision-making.

The newly developed application represents improvement of the existing spreadsheet solution by increased automation, upgraded structure and various reports upon which the user can perform different analyses. One of the greatest benefits is shifting users' focus from manual work to managing the process of frozen fruit delivery, and allowing him to think about the further improvement of both, process and application itself.

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STUDY OF THE LOGISTICS SERVICE PROVIDERS PERFORMANCE IN MOROCCAN AGRICULTURAL SECTOR

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Abstract The main objective of this paper is to study the situation of LSP operating in the agricultural sector which is a key sector for the Moroccan economy. This study will help contractors to make a correct decision concerning the choice of a performing LSP in the agricultural sector, while providing a multi-criteria decision method (MCDM): fuzzy AHP. Nowadays the expansion in terms of service has become crucial for any implementation of a successful outsourcing strategy and to attract and convince contractors through well adapted services, furthermore, the diversity in terms of the offer made by the LSP and the competitiveness between them made the task of the contractors complicated. This paper intended to provide an exploratory study grouping, on the one hand, the various Moroccan LSP and the level of their service offered in logistics services in the agriculture field, and on the other hand, the different criteria that influence the choice of those LSP. As a result, a proposal of an MCDM is established. The objective is to provide the contractors with a decision-making tool for selecting suitable LSP to collaborate with and evaluating the outsourcing performance.

Keywords:

LSP,
agricultural
sector,
contractors,
MCDM,
Fuzzy
AHP,
outsourcing
strategy,
logistics
service
offer

1 Introduction

Any company seeking to be competitive must necessarily and primarily outsource some of its activities, particularly those of a logistical nature, it would thus be focused on its core business (Hdidou et al., 2018). In fact, by entrusting its logistics to a specialist will enable it to reduce the risks and the cost of these ancillary activities (Alami et al., 2016). As such, it is obvious that a company must focus on its development and its marketing strategy. But often, logistical problems take over and leave less time to develop the core business. Besides «the national Moroccan strategy for the development of logistics competitiveness», has as its main objective the improvement of the performance of the logistics sector as a whole, which is currently at a stage requiring additional support and effort on the one hand¹, and on the other hand, the state had adopted a proactive strategy for the development of the agricultural sector embodied by the Green Morocco Plan (GMP). The GMP aims to promote the agricultural sector suffering from several obstacles and which is a real driver of growth and socioeconomic development of the country.

Through this paper, we first propose to carry out a study on LSP operating in the agricultural sector in Morocco to assist decision-makers in their choices while implementing one of the most commonly used multi-criteria methods in the agriculture, and subsequently encourage them by the outsourcing strategy.

This study will be reviewed from multiple points: first of all, we present the state of the logistics outsourcing in the agriculture sector in Morocco, through secondary data collected on the Logistics Service Providers (LSP) operating in the Moroccan territory in this field. Quantitatively, the study concerns a set of 57 LSP the most present LSP in Morocco and which offer services in their field.

It is necessary to note that this manuscript is based on the results obtained from the study published in a conference proceeding (Azzouz et al., 2020), these results clearly show that in spite of the importance of the agriculture sector in economic, social and environmental terms on our country, it's still remains, strongly handicapped by a poorly performing logistics. This sector relies only on traditional services such as transport, and it remains resistant to high value-added services. This can be

¹ Ministère de l'équipement et des transports, Stratégie nationale de développement de la compétitivité logistique, Synthèse de la stratégie et du Contrat-Programme 2010 – 2015, 2011

explained by the nature and characteristics of their supply chains, which involve several stakeholders throughout the production chain, for example at the traditional distribution level, the immature stakeholders don't attach importance to the good logistic practices and don't have the logistic organizations (Mir et al., 2018).

This study will allow us to highlight the most performing LSP in terms of the criteria determined by the contractor contributing to the resolution of the decision problem with LSP in agriculture field, which are dealing with a variety of offer, so the decision-making tool for selecting suitable LSP to collaborate with contractor, in the agricultural sector is the study's purpose.

2 The multiple criteria decision making for the choice of a logistics service provider: agricultutre sector case

2.1 State of the art on the agricultural sector in Morocco

Morocco has adopted several strategies for the profound transformation of its economy which is aimed to upgrade and improve the competitiveness of strategic sectors for the national economy ². Through sectoral strategies aimed at modernizing its productive system and strengthening its performance and its resistance for the Moroccan economy to be registered on a path of strong and sustained growth².

The Government has also initiated strategic policies that contribute to the awakening of key sectors, among this plans which are implemented through sectoral program contracts, we find Agriculture Green Morocco

Since its independence, Morocco has placed the agricultural sector at the core of its development choices because of the important issues, raised by this sector on economic, social and territorial plan (Nejar et al., 2018).

² Rapport de la CFCIM, (2018). Le Maroc en bref . 13 Juillet

According to the Green Morocco Plan (GMP), Moroccan agricultural sector has doubled its turnover in 10 years. Local authorities have boosted the sector and increased its productivity by pursuing a policy of crop diversification and mechanizing plots. GMP, has given new impetus to the agricultural sector through a high mobilization of investment, both public and private.

So the modernization of the agriculture sector has become a necessity, by the establishment of a of regulatory and structural measures to generate an environment favourable to the professionalization and competitiveness of Moroccan products. This modernization aims to improve the agricultural techniques, better management of resources and intensification of production(Harbouze et al., 2019).

Given a study achieved on the LSP's offer suitability with contractor's demand in Morocco in terms of logistics services [4], according to the three sectors which constituting the Moroccan economic community, it seemed essential to take special care to a sector which is the core of the Moroccan economy and which suffers from weaknesses in both at the infrastructure and regulation level.

In order to deal with these constraints, the State has promoted this sector, while implementing in 2008 a plan named: Green Morocco Plan (GMP) which aims to make the agricultural sector a real driver of growth and socioeconomic development of the country (Harbouze et al., 2019).

Among the main objectives of this plan are:

- Modernization of the sector and integration into the global market while creating wealth across the entire value chain.
- Better promotion and sustainable management of natural resources.

In order to achieve these objectives, the state has established a logistics platform for distribution for the agricultural sector, while taking into consideration the proximity of economic operators and also consumers for a good convergence and concentration of the flows required for the development of a competitive offer of logistics services. (Azzouz et al., 2020)

These platforms will provide infrastructure (storage, large cold storage warehouses capacities, etc.) and many services (handling, quality control and traceability of products, administrative, banking, etc.) and will contribute to the discount and homogenization of marketing costs, the continuity of the cold chain, traceability, and better compliance with hygiene conditions³.

The considerable range of needs, sometimes highly specialized, emerges needs mainly in terms of storage space, cold chain infrastructure and adequate transport (especially during peak periods: marketing of agri-food products, fruit, vegetables and cereals and agro-industry outsourcing)³.

To go with the agricultural export's growth, the action plan predicts the following actions³:

- Improving logistics related to the exports of agricultural products and to the GMP initiatives through:
 - The development of an offer of logistics services within or near the agropoles envisaged in the GMP.
 - The development of logistics related to the cold chain at level of the entire chain between the production, warehousing until delivery by using road and sea transport and port transit.
 - Support for assembling exports around freight forwarders and transport organizers.
- Encourage investment in cold chain infrastructure and equipment (cold storage warehouses, refrigerated transport, maintenance and monitoring of cooling systems, etc.)
- Encourage the outsourcing of logistics associated with the export of agricultural products.

To sum up, the state's efforts in this sector are significant, however, they remain unfulfilled without the promotion of the logistics service sector. Indeed, the level of

³ Synthèse de la stratégie et du Contrat-Programme 2010-2015. Stratégie Nationale de Développement de la compétitivité Logistique, Ministère de l'Équipement et des Transports.

outsourcing of the logistics of the Moroccan companies is very low today, only 10 % proceed by outsourcing compared with 75 % for some countries such as Japan [9]. Moreover, the demand for logistics services is increasing, particularly in the distribution and export sectors. This request has a key role in the upgrading of the offer (Bennouri et al.,2020).

Due to their requirements and professionalism, many key structured stakeholders have made the evolution of the offer possible. The recourse to the aggregation of actors, for a better organization of incoming and outgoing flows by adopting the outsourcing strategy based on the shared management of logistics of the entire value chain from the procurement to the distribution of finished products is proven by the emergence of the LSP which offers value- added and targeted services³.

Therefore, these incentives have engendered a multitude of specialized LSP for specific sectors, it evokes a decision problem that the contractor must take into consideration because he is confronted by a diversified offer from the LSP, especially with the state direction towards the implementation of a rating and labelling system as a tool to enable the access to bank financing, and to the public markets through calls for tenders associated with multi-flow logistics zones and also the classification and qualification of integrated logistics actors (labelling system)⁴, this in order to attract investors in the logistics sector and to promote the emergence of integrated national and international operators, and to motivate economic operators to resort to the organized service providers for their logistic needs and outsource their logistics activities and to unite private sector for membership in the various labeling systems of the sector launched by the government³.

2.2 Choice of method

In the literature, many authors have trailed the issues of selection and evaluation of LSP, they focused on the evaluation criteria of LSP as well as on the multidimensional aspect of the problem (Hasannia et al.,2017).

⁴ AMDL, Système de labélisation. Logistics Performance Label.
<https://www.amdl.gov.ma/amdl/excellence-logistique/>

Therefore, the contractor must select a certain number of service providers presumed to be suitable partners. This choice can be achieved in different aspects, whether it's strategic, technical or geographical (Kierzkowski et al., 2005). This service provider selection problem is classified as a decision problem (Patila et al., 2020). Indeed, the choice of provider is a most critical step, since the effectiveness and efficiency of the outsourcing and even its sustainability will depend heavily on the suitability and performance of the provider (Arif , 2016). Especially with the encouragement of the state and the implementation of strategies that favors the occurrence of specialized actors in the logistics professions.

The multi-criteria analysis methods or, more exactly, the multi-criteria decision-making methods are fairly recent techniques and in full development (Ben Mena, 2000), by their attitudes of integrating any type of criteria (Amini et al., 2017), these procedures seem better to make it possible to converge towards an appropriate compromise rather than an often unsuitable optimum.

Ultimately, to solve this complicated issue, many techniques are suggested in the literature (Wetzstein et al., 2016).

Typically, when we pose a multi-criteria problem, it is a question of finding the “most appropriate solution” in light of a number of criteria (Ben Mena, 2000).

Aguezoul (2014) ranked the main models for selectin LSP according to five categories:

- Multi-Criteria decision support tools: (or MCDM: multi-criteria decision-making).
- Statistical models.
- Artificial intelligence.
- Mathematical programming.
- Hybrid models.

The choice of one or the other model depends on the character of the criteria (qualitative, quantitative), the outsourced activity and the set of LSP put in competition.

In our study, we will focus on multi-criteria decision-making tools (or MCDM, there are several methods that are part of this category, we cite for example AHP, ANP ... (Sohrabia et al., 2016).

The choice of the AHP method is justified by its practical and systematic nature for this type of problem, whereas the fuzzy logic is justified by its ability to represent uncertain information (Zouggari, 2011).

Regarding supplier selection, the AHP method is in particular used to treat the multi-criteria decision issue for supplier classification (Zouggari, 2011).

Accordingly, opting for this method is proved by a literature study on fuzzy AHP carried out using SCOPUS which gives 8,284 published papers (all fields).

According to a study conducted (Kahraman et al., 2015), we have extracted a comparison between the 4 most commonly used methods in agriculture:

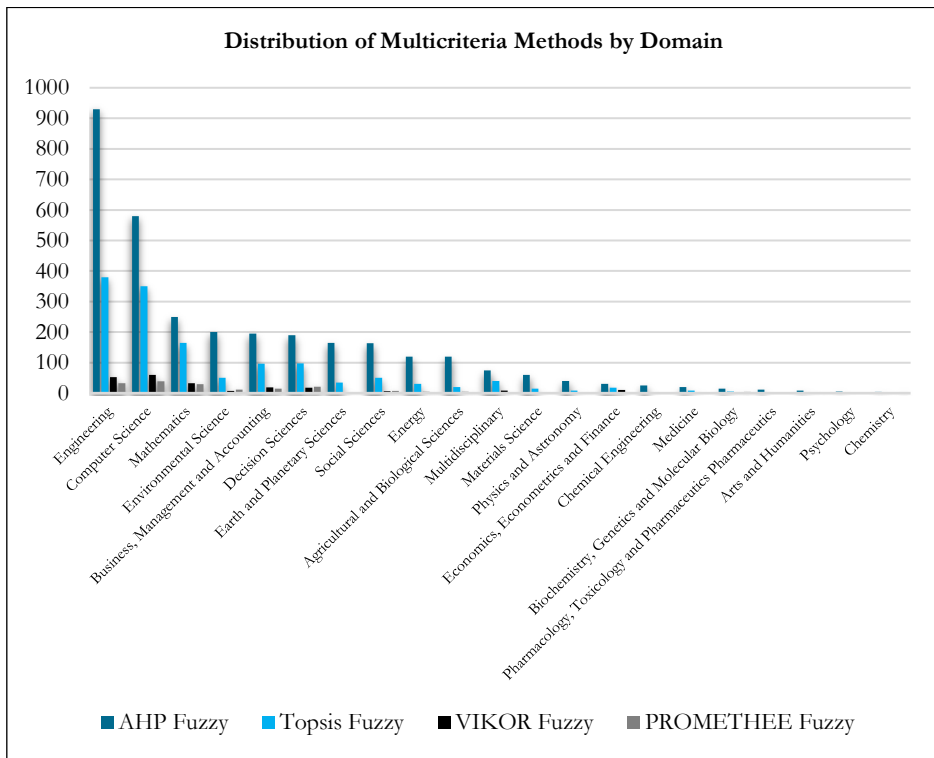


Figure 1: Distribution of multicriteria methods by domain

(Source: own.)

The review literature for the fuzzy VIKOR method using SCOPUS for extracting 964 papers published in various fields. For TOPSIS fuzzy, the review literature enables to extract 4010 papers published in several fields, However the fuzzy AHP method was the method that refers to the most published papers among these 4 methods by employing SCOPUS with 8284 papers in all fields (Kahraman et al., 2015).

If we specify the most explored areas, we find that the fuzzy AHP method greatly exceeded the other methods in terms of published paper in the field of agriculture with almost 100 articles against almost 10 papers for the other methods.

And according to (Kahraman et al., 2015), at the agricultural level, fuzzy AHP almost remains the only method used.

This finding, the choice was made to adopt the fuzzy AHP as a multi-criteria decision method to remedy the issue of the choice of LSP as part of a strategy of outsourcing among a panoply of offers available in the Moroccan market.

2.2.1 The AHP method

After choosing the fuzzy AHP method for the resolution of the LSP selection problem in the agriculture field, this choice based on the literature review referred to above, we will present a general overview of the chosen method.

The Analytical Hierarchy Process (AHP) is a structured approach used for decision-making in complex problems, proposed by Saaty (1980).

The AHP method provides a hierarchical organisation of decision-making criteria and a quantification of relative priorities for a given set of alternatives taking in consideration the pairwise judgements of decision-makers, Thus, it possible to treat problems with quantitative and qualitative criteria (Feki, 2013), using the following three principles: decomposition, comparative judgements and the synthesis of priorities (Saaty, 1983).

The AHP consists in breaking down a complex, multi-criteria problem into a hierarchy where each level is formed by a few manageable elements that are then broken down into another set of elements (Wind, 1980). The second step concern the use of measurement methodology to prioritize among the elements at each level of the hierarchy. The third step is to synthesize the priorities of the elements to establish the global priorities for the different alternative factors.

3 Case study: Selecting LSP in the Agricultural Sector

We have proposed a multi-criteria decision-making method for the selection of LSP operating in the agricultural sector, as part of an outsourcing strategy. The multi-criteria or multidimensional nature of the LSP selection issue makes the problem more complex.

This present research examines a multidimensional classification of LSP that provides a service which fit into the agricultural filed. Our approach will be focused on the evaluation of LSP based on a multi-criteria classification approach using an example of the prioritization of 57 LSP taking into consideration evaluation criteria.

A multitude works relating to the issue of LSP selection have suggested a certain number of criteria, and various approaches have been used to assess these criteria (Chai et al., 2013; Hasannia et al., 2017; Ho et al., 2010).

For that purpose, we will conduct an exploratory study of a representative sample of LSP operating in Morocco and services included in the agricultural sector. These LSP can be made up of foreign LSP with subsidiaries in Morocco or National LSP.

This exploratory, quantitative and qualitative study, was achieved on 57 LSP. This sample is statistically representative of LSP considered TOP LSP, whether in terms of technological innovation, the range of services offered, the level of traceability used, or their involvement in the agricultural sector. These characteristics will lead us to the identification of the criteria represent sources of customer added value (Mevel et al., 2010). Thus, the contractor can differentiate each LSP from its competitors regarding their expertise (Aguetzoul, 2019).

This study will be based on the following elements:

- Secondary data of LSP operating in Morocco, collected from their website portal, or on the websites of professional corporations.
- Summary table synthesizing all collected data.

Based on this information, a classification of LSP considered to be recognized as the best LSP will be established using the fuzzy AHP method, while adopting statistical tools linking all the LSP and the selection criteria set by contractors as examples:

- Tables
- Graphics and Scoreboard

The results of the exploratory study will highlight the most performant PSL in the agricultural sector giving the best choices among all the alternatives available by the inclusion of the various criteria.

3.1 Decision making: modeling and tools

Our research problem concerns the LSP selection using several criteria that we have previously set at 4 criteria but can be specified by the contractor as well.

In this section, we present the methodology adopted as well as the set of Moroccan LSP chosen as a sample in the outsourcing of logistics activities process. The objective is to determine the LSP which best meet the requirements of contractor in the agricultural sector, among a wide range of existing LSP in the market.

The problem of selecting LSP is one of the strategic decisions that have a considerable impact on the company's performance. For the decision-maker, the issue of LSP selection involves determining the number and the portfolio of LSP to be retained (Zouggar, 2011).

Therefore, the first step is to collect the necessary data based on the sample of 57 Moroccan LSP. Secondly, summary table synthesizing all collected data will be established.

The statistical study presented in table 3 allows us to get a clearest vision on the physiognomy of the Moroccan market in terms of the services offered by the LSP in the agricultural sector and then detect the most efficient LSP while taking into account the criteria that will be determined by the decision-makers.

In order to quantify and evaluate the data collected, we have used a rating associated with each criterion in regard to its level.

Table 1: Table of verbal judgment and the scores associated with each judgment

Criteria notes	Traceability	Specialization of the sector	Technology	Services offered	Transport
1	Website+contact	Does not work in this field	Website	Transport	Basic: road, railway
2	Tracking(icon)	A simple national actor	SI/EDI	Warehousing, storage, handling	Maritime
3	Tracking (customer space, blog,)	National and international actors	TMS, WMS,	Cold warehousing, Controlled temperature Storage	Airline
4	Advanced tracking	Specialization with specific fleets	Computer software, platform,	Transit	Messaging, Express, urgent transportation
5	RFID/GPS....	Restricted only to this field	IA, RFID,	Contract logistics, advanced, SCM	Cold transport, Temperature controlled

The transition from one level to another is cumulative, the maximum score that can be reached is 5 if all the underlying levels of a criterion are fulfilled.

For the types of variables, we notice that they are not of a numerical type, then in order to make them manipulable we need to convert the so-called linguistic variables to numeric variables by assigning quantifications to each linguistic variable according to a scale.

This brings us to introduce the fuzzy concept and linguistic variables to cope with the limitations of the methods and their uncertainties. In fact, the fuzzy sets introduced by (Zadeh, 1965), provides us with a new mathematical tool to deal with the uncertainty of the information. Due to the real decision-making situations and the vagueness of human mind, it is impossible to exactly express preferences and personal judgments confidently.

These judgments are often resulting from insufficient information and/or difficult to quantify, the fuzzy set theory can be used successfully (Zadeh, 1965).

Therefore, a fuzzy approximate value can be used to generate a more accurate modelisation of human judgment. We take as an example the evaluation of a LSP, terms like bad, medium, good and excellent can be the alternatives of ordinary numerical values (Igoulalene, 2014).

Among the different forms of fuzzy number, the triangular fuzzy number is the most popular.

The working principle of fuzzy AHP consists of a cross-over of the alternatives that are the subject of the study via a square matrix which contains the alternatives in row and in column.

Indeed, in his article, (Chang, 1996) proposed for the first time a method of calculating priorities for triangular fuzzy comparison matrices by introducing triangular fuzzy numbers for binary comparison between criteria.

So, we will have for each criterion 3 matrices: the first one represents the matrix M, it corresponds to the middle values of triplet which is composed of (L, M, U) elements, the other matrices are L and U which correspond to the other elements of the triangular fuzzy number.

We use a saaty scale for fuzzy AHP appropriate for our situation

Actually, the differences between two scores related to two alternatives vary between 0 and 4 respectively, the score 0 if it is the crossing of the same alternative or two alternatives have the same score, and the score 4 in the case where one of the alternatives had a maximum score and the other a minimum.

In this case we applied a mathematical formula revealed after observing the behavior of the scores associated with the saaty scale.

Table 2 represents a suitable saaty scale.

Table 2: Table of Saaty scale

(Bellaaj, 2011)

The difference between score	The assigned score	Judgment verbal numerical evaluation		
1	3	Extremely most important	8	9
2	5	Very strongly most important 7	6	7
3	7	strongly most important 5	4	5
4	8	Moderately most important 3	2	3
5	9	Equal importance 1	1	1

3.1.1 Treatment and result

After applying the fuzzy AHP method, we reached the following results:

We have end up with a dashboard linking all the spreadsheets for the fuzzy AHP method on the one hand, and on the other hand the selected sector that we have fixed for agriculture. Graphical tools and tables judging the performance of the method will also be used relating to the evaluation of the separability and homogeneity of the obtained ranking.

The choice of this sector is bound to its vitality as well as to its specialization, whether in terms of services or transport modalities, while bearing in mind the indisputable role of technology and traceability in ensuring the performance in this sector.

Later, decision-makers will be able to adapt these criteria, to their needs by giving a score between 1 and 5 to each of them. Any changes to this dashboard will involve changes in the other spreadsheets.

The table 3 represents the scores that constitute weights for the agricultural sector, recommended by a decision-maker or a group of decision-makers seeking a compromise between them. This to evaluate the weight of each criterion while taking into consideration the nature of the professional activities and services to be outsourced.

Table 3: Score of criteria

Criteria	Agriculture
Specialisation	5
Traceability	4
Technology	3
Services	2
Transport	4

Table 4: Extract from dashboard for the fuzzy AHP method

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The table 4 concerns the classification of the LSP achieved by the fuzzy AHP method. In addition, we have specified the occurrences of each ranking, for example in our case, the first ranking is devoted to a single LSP which is «Bolloré logistics», for the second ranking there was a single LSP which is "XPO logistics", and "Logicold" for the third ranking. From the 4th classification, we notice that the fuzzy AHP behaves differently, where it ranked 4 LSP for the 4th position.

The table 4 also corresponds respectively to the LSP data, we can make variations to find out the rating of each LSP by bringing in on ly the name of LSP concerned, and it displays the sector and the rating of the different criteria.

3.1.2 Synthesis

The fuzzy AHP method allowed us to achieve a classification of the LSP operating in the field of agriculture in order to help the decision-maker to make a good decision and then make an efficient choice of LSP adequate according to their priority in terms of selection criteria.

As a perspective, on the one hand, we envisage putting in place some indicators for the evaluation of the quality of classification obtained for the different alternatives, on the other hand, we are planning to insert witness LSP to ensure the compliance of the results obtained previously and also we will study the homogeneity of our method.

4 Conclusion

The study carried out on one of the key sectors forming the fabric of the Moroccan economy revealed several aspects that allowed us to become aware of a certain failure concerning the insufficiency and the poorly performing logistics, which is explained by the nature and characteristics of their supply chains. Indeed, for Morocco the development of this performing logistics is major challenges of economic growth and competitiveness both on the national and international market.

Thus, the reforms implemented in the context of the national strategy for the development of logistics and also in the other national plans through sector-program contracts for the development of various sectors in Morocco for example the agriculture sector, has favored the creation of a dynamic around LSP with the installation of many foreign LSP and the diversification of the offer of Moroccan LSP. This offer ranging from the simple service of transport to the total assumption of the logistics function and the supply chain of the customer while evolving similar to LSP abroad.

The study achieved has focused on the study of the state of the LSP operating in Morocco in the field of agriculture while taking into account some criteria.

This study was based on one of the decision-making methods, but this decision-making, for several structures is a complex and inevitable task in improving their processes. This decision affects various sectors and multi-criteria decision support tools have been the subject of diverse applications in several areas.

Through this paper, it appeared that the problem of the choice of LSP in the field of agriculture is one of the strategic decisions which has a considerable impact on the performance of the contractor. This choice was based on the priority of well-defined criteria by decision-makers which vary according to the priority expressed by the contractor.

The study made it possible to highlight and implement one of the existing MCDM methods for decision-making and to apply it to a sample of LSP operating in Morocco, which is the fuzzy AHP method.

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DIGITALIZATION OF AGRI-FOOD SUPPLY CHAINS: FACTS AND PROMISES OF BLOCKCHAIN TECHNOLOGY

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Abstract With the globalization agri-food supply chains become longer and more complex, what makes it difficult to manage. parallel with this there is increasing customer demand for knowing the origin, ingredients and delivery chain of agricultural products. the need for more efficient, traceable and visible supply chain for agri-food products appears from supply side. The digital methods of industry 4.0 are able to provide solutions for these demands particularly those which are able to trace product reliable way from its origin to consumption. blockchain is a disruptive technology by which every important product information can be collected, stored and shared with the actors involved in the product process chain from the first phase to the final customer. The paper provides an overview about blockchain technology and its operation in agri-food supply chains environment, then presents some examples from the practice of different countries where blockchain was applied in the agricultural sector in order to introduce experiences as facts, and further possibilities as promises by blockchain.

Keywords:
digitalization,
agrifood,
supply
chain,
blockchain,
technology

1 Introduction

In 2030, the world's human population is predicted to touch 8.6 billion (Farmingfirst & CGIAR). One of the impacts of this phenomenon is that natural resources are decreasing and their availability must be safeguarded and workers working in the agricultural value chain are at stake as well. The challenge is to make our food systems more sustainable which is depend on innovative tools and approaches being developed and deployed around the world. Sustainable food systems are interconnected and represent the full agri-value chain, from pre-production and production to supply chains and consumption. In addition, the amount of data in our world is increasing rapidly (Zyskind et al., 2015). Across the industries, leading companies are trying to implement their own proprietary authentication software where they function as a centralized trusted authority.

Supply chain (SC) refers to the design, engineering, production and distribution processes of goods and services from suppliers to customers (Muckstadt et al., 2001). The agriculture supply chain (ASC) is like any consumer product supply chain that includes the suppliers, leading firms, customers, and distribution partners. The primary difference is that either animals or humans consume the final products, and the raw material is grown in farms using agricultural practices (Miranda-Ackerman & Azzaro-Pantel, 2017).

Nowadays, agriculture supply chain is very complicated by fragmented inbound and outbound networks (Denis et al., 2020). The complexity can come from across industries, with multiple functions interacting with different, potentially conflicting objectives and numerous dependencies between material and information flows. In recent years both consumers and the participants of agricultural and alimentary sectors presented more and more interest regarding product information in order to maintain customer's trust and supply chain reliability. The increasing trend of origin oriented consumption in the developed countries is further stimulating the need for a solution is able to support of information availability during the life of product in supply chain. Customers are interested in what happens during the steps of supply chain process. The deficiencies of traceability, lack of information for the consumer about the origin, process and shipment of products, needs for transparency and visibility, problems of data management i.e. collection and sharing of product

information, problems of centralized supply chain management are also such reasons drive to find a supply chain wide method (Azzi et al., 2019).

The main challenge of the supply chain remains in the traceability and data management system (Azzi et al., 2019). In addition, a centralized management system could represent a threat to data integrity, availability, and resiliency, leaving the system subject to corruption fraud and tampering (Abeyratne & Monfared, 2016). Advances in digital and analytics technologies offer a way to optimize the agriculture supply chain. The agriculture industry is capturing more data than ever, on everything from agronomy to the weather to logistics to market price volatility. Data storage capacity has increased, storage cost has plummeted, and computational power has grown (Denis et al., 2020). Agriculture digitalization can be a solution for these problems. Implementation blockchain technology as agriculture digitalization is one of the disruptive technologies of industry 4.0.

A blockchain is essentially a distributed database of records, or public ledger of all transactions or digital events that have been executed and shared among participating parties. Each transaction in the public ledger is verified by consensus of a majority of the participants in the system (Rosby et al., 2016). Blockchain can work in a decentralized environment, which is enabled by integrating several core technologies such as cryptographic hash, digital signature (based on asymmetric cryptography) and distributed consensus mechanism The blockchain technology has the key characteristics, such as decentralization, persistency, anonymity and auditability (Zheng et al.2018). Fraud and malfunctions can thus be detected quickly. Moreover, problems can be reported in real-time by incorporating smart contracts (Haveson et al., 2017; Sylvester, 2019). Smart contracts are basically computer programs that can automatically execute the terms of a contract (Rosby et al., 2016). Considering the above arguments, the main objective of this paper is to observe facts, problems and promises of blockchain technology in agri-food sector. Regarding above arguments, this paper presents an overview and collects the benefits of blockchain in agri-food supply chain, then shares practical experiences from different countries tried blockchain in various branches of agricultural sector. The paper is organized as follows: section 1 contains introduction; section 2 provides an overview of blockchain; section 3 describes the research method; section 4 presents experiences concerning blockchain application and section 5 concludes the achievable benefits of blockchain.

2 Overview of blockchain

The blockchain technology is based on the distributed ledger. A distributed ledger is a database that is updated independently by each participant (or node) on a large network (Presthus & Omalley, 2017). Blockchain is a distributed ledger that is shared and agreed upon a peer-to-peer network (Crosby et al., 2016) (Sternberg & Baruffaldi, 2018). A blockchain contains a single record of the data which is stored in blocks on every participant's node (Yli-Huumo et al., 2016). Each block corresponds to a timestamped record that is verified through a defined consensus protocol of the blockchain network and secured via public-key cryptography ('hashing') (Seebacher & Schuritz, 2017).

There are two main characteristics of blockchain technology that are important for its implementation and meaningful use in logistics and supply chains/supply networks (Kawa & Maryniak, 2019):

- Secure, verified, trustable exchange of information through blockchain in real time that makes them accessible to all members of supply network or to anyone else (depending on the type of blockchain),
- Possibility of automatic verification and execution of agreed transactions when certain requirements are met through smart-contracts-applications that are living on blockchain (Christidis & Devetsikiotis, 2016).

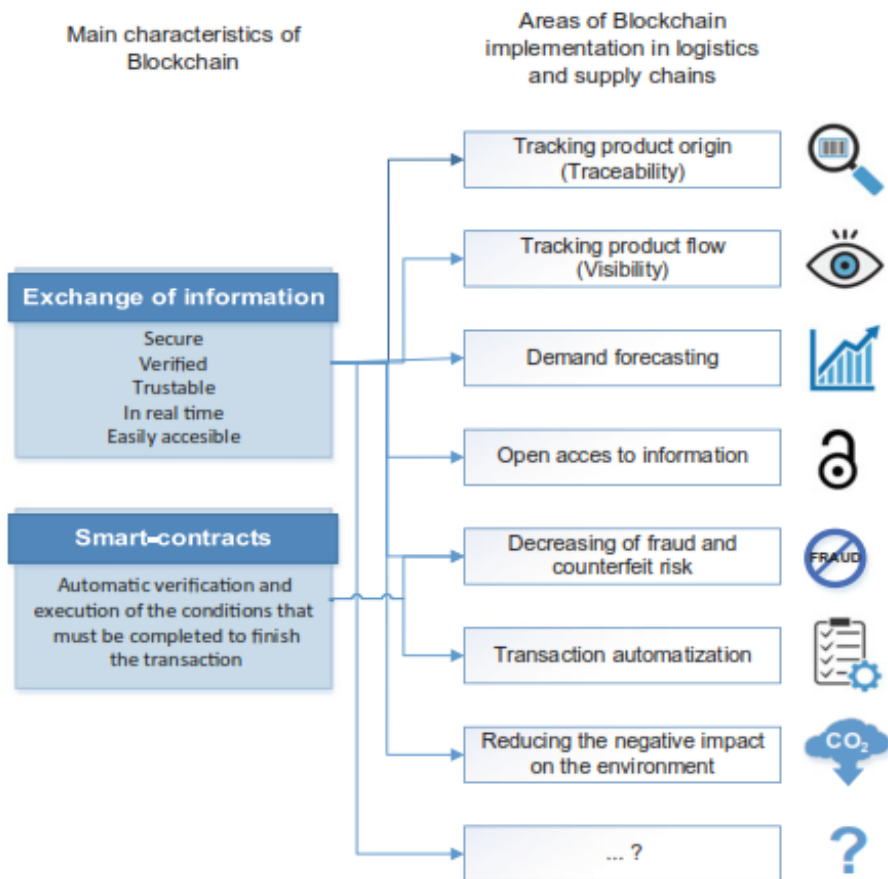


Figure 1: Characteristics and implementation areas of blockchain in logistics and supply chain.

(Source: Kawa & Maryniak,2019)

Based on these main features of blockchain, implementation areas for its use in logistics and supply chain are being developing in various directions. Some of the most important current implementation areas of blockchain in logistics and supply chain are tracking product origin as well as tracking product flow through supply network, demand forecasting, decreasing of counterfeit and fraud risk, open access to information in supply chain, reducing the negative impact on the environment and transaction automatization through smart contracts. In many cases, implementation areas of blockchain are combined in supply chain management, and

blockchain is simultaneously used for example for tracking product origin and flow, but also for decreasing fraud risk and more accurate demand forecasting.

2.1 Agricultural Supply Chain

Agricultural supply chain is a complex system which responsible for the circulation of agricultural products in the market. As the carrier of the circulation of agricultural products, agricultural commercial resources are important guarantee to meet the demand of agricultural products and to maintain their quality and safety (Leng et al., 2018). It is critical to ensure these value chains running smoothly and successfully by applying advanced internet technologies. Supply chain management deals with production, refining, delivery, selling consumption, and disposal (Kamble et al., 2020). The process of the supply chain is summarized in Figure 2. In developing countries, the food supply chain faces several challenges, such as the need for confidence among stakeholders which often correlated with their credibility and traceability required by the end-users, and the difficulty of managing risks, delays, or disruptions is often occurred due to insufficient or lacking information (Kittipanya-Ngam & Tan, 2020). Blockchain technology is one of the best ways to meet these challenges (Niu & Li, 2020)

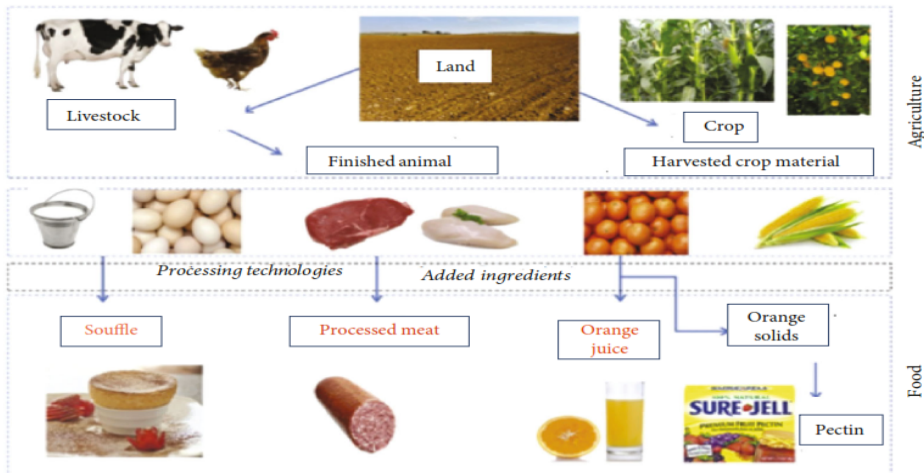


Figure 2: Agricultural food supply chain process.
(Source: Sabir et al., 2021)

3 Research Method

Providing an overview regarding the nature, operation and application of blockchain in the supply chains a secondary research was conducted. In order to know and apply the past experiences of different pilot projects in some countries some examples were collected from various sectors and supply chains also from food supply networks. By the pilots the quantifiable positive impacts can be gathered as well as the conditions needed for the application, furthermore difficulties could be appeared during the implementation and application process. By several examples general impacts can be classified related to sectors or supply chains and best practices can be identified for particular fields. This paper provides information in agri-food supply chains' perspective from various scientific and practical sources such as comparative analyzes, literature reviews, research findings, use cases, case studies or white papers (citations).

4 Experiences of blockchain application

Feng Tian (2016) proposed a new decentralized traceability system based on RFID and blockchain in China. The current centralized logistic system creates the agri-food loss ratio is between 25 % and 30 % in China annually. New, decentralized traceability system could increase the transparency of the supply chain, strengthen the information credibility, realize the real-time tracking of agri-food, and consequently, enhance the safety assurance of the agri-food supply chain.

Stranieri et al. (2021) researched the impact of implementation blockchain technology which are transparency and traceability the information flow of poultry, lemon, and oranges supply chain in a large European retailer and found that blockchain has a positive effect on the profit or return on investment of the agri-food supply chain. It improves the quality of products by improving consumer satisfaction by giving an access to information and the possibility of feedback, as well as by creating transparency and sharing information between stakeholders. Table 1 showed the measurement of impacts received by interviewing between Stranieri et al. and retailers.

Themes/Measures	Poultry supply chain		Lemons supply chain		Oranges supply chain	
	Producer	Retailer	Producer	Retailer	Producer	Retailer
Themes/Measures from the conceptual framework						
<i>Efficiency</i>						
Production/Distribution costs	0	0	0	0	0	0
Profit	+	+	+	+	+	+
ROI (Return on investment)			+	+		
<i>Flexibility</i>						
Customer satisfaction	0	+	+	+	0	+
Volume	0	0	0	0	0	0
Delivery	0	0		0	0	+
Number of lost sales					0	
<i>Responsiveness</i>						
Fill rate	0		0			
Lead time	0	0		0		0
Product lateness		0		0	0	0
Customer complaints			+			
Shipping errors					0	
<i>Food quality</i>						
Intrinsic quality attributes/product characteristics	0	++	0	++	+	++
Intrinsic quality attributes/process characteristics			0			
Extrinsic quality attributes/labelling	++	+++	+	+++	+	+++
<i>Transparency</i>						
Accuracy	+					
Accessibility and availability	+	+++	+	+++	+	+++
Information sharing	+	+	+	+	+	+
Quantity of traced information					+	
New themes/measures						
<i>Supply chain governance</i>						
Vertical coordination	+	+		+		+
Behavioural uncertainty	-	-	-	-	-	-
Technological uncertainty	+	+	+	+	+	+
Physical asset specificity	++	+	+++	+	+++	+
Human asset specificity			+		+	
<i>Resources and capabilities</i>						
New knowledge creation	+	+		+	+	+
Capabilities improvement	+	++	++	+		+

Note: 0: no impact; +: increased and code retrieved at least once from the interview; ++: increased and code retrieved at least twice from the interview; +++ increased and code retrieved at least three times from the interview; blank space: not mentioned by interviewee.

Figure 3: The impact of blockchain on the performance of firms

(Source: own.)

Caro et al. (2018) tried to implement blockchain in agri-food supply chain called AgriBlockIoT using Ethereum or the Hyperledger Sawtooth. These decentralized traceability systems guarantee transparent and auditable asset traceability by integrating various IoT sensor devices during agri-food supply chain. Caro et al. proposed a solution based on blockchain technology for agri-food supply chain management, which increases control and trust by achieving transparency, auditability and immutability of the stored records in a trustless environment gathered based on blockchain in the supply chain.

Azzi's group (2019) explained how blockchain improves the supply chain management two Swiss Startups Ambrosus and Modum, by enhancing the transparency and the traceability in the manufacturing supply chain. It is achieved by a policy that focuses on the transparency of the chain, where accurate data collection and secure data storage are required. A good traceability system aims to minimize the production and distribution of unsafe or bad quality products by

improving the labeling and racking systems. The track and trace systems have evolved from paperwork to Internet of things (IoT) hardware and sensors.

5 Conclusion

In this paper authors dealt with a disruptive technology of industry 4.0 in a particular sector where the nature of products makes especially valuable the product information. Blockchain is capable to ensure a basis for an innovative, reliable and efficient data management with a shared digital ledger. Blockchain also provides information related to products where come from, products specification, type of product used, harvesting time, and others. With the application of blockchain food supply chains can be shortened in time with waiting time reduction, operation can be traceable, product information can be monitored and shared, food safety and quality can be ensured. By the reviewed blockchain experiences authors could identify benefits which are proved by data and more promises of blockchain can come true by further application.

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SLOVENIA ON THE WAY TO DRONE DELIVERY - WHAT MORE NEEDS TO BE DONE

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Abstract Nowadays, it is impossible to bypass the fact that digitization, robotics and automation of work are becoming an increasingly important part of our living and business. It becomes crucial, especially in urban areas, to identify new operational models that could be applied for last mile deliveries, where increasing of city logistics sustainability is being the main goal. Drones have been widely acknowledged as a promising technology in many fields and industries, especially for the delivery of medical and aid packages in humanitarian and healthcare logistics. In this study, we present the project of Post of Slovenia, which aimed to implement first delivery drone to the fleet to access hard-to-access locations. Slovenian Post aims to create innovative, cost-efficient and market-led business environment for the development and take-up of new drone services and technologies within the Slovenian's internal market. As the national legislation in this area is still relatively unregulated, Post of Slovenia has actively contacted with the national authorities, which are the drafters of the relevant legislation, in order to accelerate the introduction of delivery drones into Slovenian airspace.

Keywords:

drone
delivery,
U-space,
sustainability,
delivery
solutions,
logistics

1 Introduction

Over the last few years, drones have become less of a fantasy and more of a reality. They already contribute positively to wildlife conservation, emergency rescue and military operation efforts. Drones are prime candidate for solving a complex and expensive last-mile delivery. They are able to deliver where no person can. The UPS is using drones for delivery routes around water, hilly terrain and unpaved streets. La Poste has been using them to make deliveries to remote Alpine villages. The Swiss Post is testing drones for delivery since 2015. They have transported mail, parcels, emergency relief supplies and high priority lab samples.

When talking about the delivery of medical items, time and efficiency are of highest priority. Delivering of urgently needed medications to remote areas by Traditional Last-Mile Delivery Modes (TLMDMs), like delivery vans and trucks, represents quite a large challenge for delivery companies. Is not only the problem of hard access of some locations. There are also issues as traffic congestion, traffic accidents, road closures, poor transportation infrastructure etc. All these impose a huge time pressure on the delivery system. Unmanned Aerial Vehicles (UAVs), also known as drones, offer a sensible solution to overcome the challenges associated with last-mile delivery by TLMDMs. Interest in the use of drones for the delivery of small parcels, not only for medications, has arisen dramatically during the last few years. Their competitive advantage is multifaceted. They are not restricted to established road networks; they do not need a delegated driver (pilot); they do not require launching infrastructures. The coronavirus pandemic also proved that UAVs are able to reduce the physical interactions between senders, delivery service and recipients. Drones can save time and cost but what is more important, they can also save people's lives. All of the above have induced many companies to begin drone delivery of medical items to hard-to-access locations. Several studies (Haidari, 2016) revealed that employing drones, compared to TLMDMs, in vaccine delivery can reduce annual logistics costs by \$0.08 per dose and improve vaccine availability by 2 %. They concluded that the cost savings of the drone vaccine delivery, compared to the delivery by TLMDMs, outweigh the capital cost of installment and maintenance of the drone system. Despite the fact that employing delivery drones can improve healthcare logistics, the challenges associated with delivery of times-sensitive medical items to hard-to-access locations require efficient logistics planning solutions.

UAVs are expected to become a crucial part of everyday operations in many industries. Several applications are already in place, such as in agricultural field analysis, crop spraying and monitoring, recreational video-taking, property and infrastructure inspections, and warehouse inventory checking (Anderson, 2017). Such applications are expected to play an important role in delivery services for e-commerce companies. The Federal Aviation Administration (FAA) is developing rules and regulations for drones to fly over populated areas, which should pave the way for drone-based commercial delivery services (Pasztor, 2019). UPS received the first authorization from the FAA to operate drones in populated area, which represents a huge step towards commercial usage of drone deliveries (Black T, 2019). Amazon has been investing significantly in its Prime Air program with drone deliveries within a 30-minute time window to customers within 15-mile radius from prospective areas where drones operations are possible (Palmer, 2020). Google has been investing in a drone-delivery program named Project Wing (Kanellos, 2014), e-commerce businesses Alibaba and DJ.com in China have been utilizing drones to fulfill demand in certain areas since 2016 (Harashima, 2017). SF Express, the largest Chinese logistics firm, has received the first official permit to legally offer drone-based delivery services nationwide in China in March 2018 (Huang, 2018). DHL invested in its Parcelcopter program (Bryan, 2014).

Specific details on drone-based delivery operations are mostly dependent on future government regulations. Delivery trucks usually transport on longer distances with a larger quantity of items while drones for e-commerce deliveries may deliver small number of items per trip in a short distance, given payload weight limitations and battery capacity requirements. Drones can also travel at a constant high speed while trucks depend to road traffic conditions. Furthermore, drones can provide more customized delivery options, where orders can potentially be delivered to wherever the customer is located at a given time, e.g., at home, work, or on a boat. Given these facts, it is clear that there is a need for new operational approaches for the management of drone-based delivery systems (Chen, Improved delivery policies for future drone-based delivery systems, 2021).

Our objective is to contribute to this emerging area by exploring research problems, relevant for delivery sector in Slovenia. Besides accessing remote places safely, using drones also brings other benefits. One of them is fast delivery. Drones can deliver far more per day at a far faster rate. They don't have to circumvent traffic

congestions or accidents since they have pre-programmed and perfectly optimized routes. German company called Wingcopter created a special drone that can combine multiple trips, what is making deliveries much more efficient. Depending on the size of drones and the weight of packages they carry, drones can be a much more sustainable form of delivery. Generally, drones consume far less energy per kilometer than the average delivery van. They are powered by electricity, meaning drones have little to no CO2 emissions. Plus, drones have the potential to perform other activities for the greater good while they are delivering mail parcels, like collecting air quality data, keeping tabs on illegal loggers, or checking in on alternative power plants. Another great benefit, as a byproduct of using drones for delivery, is also data gathering. For example, current drone flight plans can assist regulatory agencies in planning and monitoring drone flight patterns and routes to avoid costly crashes into other drones or even buildings and power lines. USPS also plans to utilize unmanned aircraft systems (UAS) to gather sensor and geospatial data for autonomous vehicles. Other companies are exploring drones as methods of distributing groceries, prescriptions, hot meals, and other lightweight goods. (Escher Group, 2021)

The remainder of the paper is structured as follows: Section 2 discusses history of drones and some pilot implementations of delivery drones and related research. Section 3 introduces first steps towards unmanned aircraft package delivery at Post of Slovenia. Section 4 describes how we see the future of drone delivery. Finally, Section 5 summarizes the observations and outcomes of this study and outlines some avenues for future research.

2 Related literature

2.1 A brief look at the history of drones

Drones have been in use for more than two decades, but their roots go back to World War I, when both the US and France worked on the development of unmanned automatic aircraft. As is often the case with modern technologies, regulation usually follows technological development itself, which often dictates the pace. While drones and related technologies are evolving to unimaginable heights, the regulation of the area is following at a slower pace, which is becoming faster. Due to the deserved opportunities for development, the regulation also began to

slowly direct development and set certain frameworks for it. These are needed because unmanned aerial vehicles were considered toys until a few years ago, but today they are capable of many activities, from inspecting infrastructure, searching for casualties, filming, to delivering medical and postal items to the front door. They are capable of automatic take-off, flight and landing - this is also an important difference between drones and aircraft models - aircraft models and modelers belong to a special category of drones. Aircraft models require in-depth flight knowledge, which has contributed to good practices to date.

Unmanned aerial vehicles have evolved into real tools (sometimes even weapons), without which many industries can no longer imagine everyday life. They offer fast, safe and greener solutions to problems that were considered complex, financially demanding, environmentally unfriendly and dangerous for workers yesterday. The production, sales and use of drones are growing exponentially. They are already used today in various fields, from postal services (delivery of items), energy (infrastructure inspection), agriculture (crop control, livestock, use of sprays), media space (photography and aerial photography) to security (police and army and borders control).

In the initial stages of development and use, however, drones also caused some complications. Innovation and development need a certain amount of time for people and the environment to get used to them and to some extent to adapt to them. All innovations inevitably bring with them regulation. It is necessary to establish clear rules of the game for (safe) use and to anticipate the consequences in the event of unforeseen events (eg traffic accidents and insurance). In the field of drones, one of the first visible incidents was certainly the crash of a recording drone behind the famous skier Marcel Hirscher in 2015. At the same time, various questions arose about situations such as e.g. unmanned aerial vehicle and manned aircraft accident. It has happened several times that civilian airports in Europe have had to close due to the presence of drones in their airspace. The first such incident occurred on December 19, 2018, when two drones were spotted at Gatwick Airport in the morning. For security reasons, the airport was closed, which remained closed for 33 hours, resulting in more than a thousand flights being canceled and more than 140,000 passengers affected. The airport suffered damage of € 1.7 million and airlines that had to cancel flights suffered damage of € 64.5 million. In response to such events, countries have begun to enforce their own rules in the field of drones.

2.2 Regulatory framework

In Slovenia, the first regulation in the field of unmanned aerial vehicles was obtained on 29 June 2016 and was in force until 31 December 2020¹ or is still valid in the transitional period until 31 December 2021, when the legislation delegated by EASAE² comes into force. The latter represents the legal framework for the establishment of U-space. U-space is a set of new services based on a high level of digitization and automation of functions and special procedures that support safe, efficient and secure access to airspace for a large number of drones.

In April 2021 (with a transitional period until January 2023), the EU Commission adopted the U-space package (three regulations), which together establish the basis and create conditions for safe, secure and green operation of drones and for safe joint operation of drones and manned aircraft in a section of our airspace known as U-space. These three regulations are: (1) Commission implementing regulation (EU) on a regulatory framework for the U-space, (2) Commission implementing regulation (EU) amending Commission Implementing Regulation (EU) 2017/373 as regards requirements for providers of air traffic management/air navigation services and other air traffic management network functions in the U-space airspace designated in controlled airspace and (3) Commission implementing regulation (EU) amending Regulation (EU) No 923/2012 as regards requirements for manned aviation operating in U-space airspace.

Today, the EU aviation regulatory framework already provides for and allows all types of operations with drones, but these operations are subject to strict and time-consuming approval procedures, which usually come with added operational restrictions. Within the U-space, the aim is to improve the general state of awareness about the operation of drones and to streamline and automate authorization procedures - we are dealing with a high level of digitization and automation. The aim is to remove as many restrictions as possible and to support the development of a competitive market for drone services in the EU. Due to the demand for the services of drones in urban and suburban environments and around logistics hubs and airports, the already mentioned U-space will initially develop right there.

¹ Uredba o sistemih brezpilotnih zrakoplovov, Uradni list RS, št. 52/16, 81/16 – popr. in 195/20.

² European Union Aviation Safety Agency or the European Union Aviation Safety Agency, which takes care of the safety and environmental protection of aviation in Europe.

As the complexity of traffic patterns is high and the demand for drone services is increasing, this needs to be addressed through special traffic management provided by U-space. It will come into force in January 2023, so before that date, EU Member States can start innovative U-space designs themselves, which they are not obliged to install in their space by that date. Before implementing the U-space, Member States will also need to prepare for the implementation of a number of requirements, e.g. requirements for the certification of U-space service providers and the provider of a common information service (i.e. CIS - common information service) carried out under the U-space Implementing Regulation (Brezovar, 2021 (accepted for publication)).

U-space is also included in the "Strategy for sustainable and smart mobility - guiding European transport on the right path for the future"³, which was presented in December 2020. The strategy lays the foundations for a green and digital transformation of the EU transport system. The strategy mentions drones in several places, indicating the important place that drones will occupy in the future of European transport. The strategy explains that proactively shaping our future mobility through the development and validation of new technologies and services is key to maintaining the benefits. The EU will therefore provide favorable conditions for the development of new technologies and services and all the necessary legislative tools to validate them. In the near future, we can expect a higher incidence and wider use of drones (unmanned aerial vehicles) for commercial uses, autonomous vehicles, hyperloop technology, hydrogen aircraft, electric passenger aircraft, electric water transport and clean urban logistics. A stimulating environment is crucial for such groundbreaking mobility technologies so that the EU can become a major destination for the deployment of such technologies for innovators. Start-ups and technology developers need a flexible regulatory environment to test and deploy their products. The Commission will work to facilitate testing and testing and to ensure that the regulatory environment is suitable for innovation in order to support the introduction of market solutions. The Commission fully supports the deployment of drones and will continue to develop appropriate rules; inter alia for the U-space system, to make it appropriate to enhance safe and sustainable mobility.

³ Available at <https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:52020DC0789&from=FR>.

2.3 Global success story of UAVs

Drones are able to perform deliveries that are very difficult to be performed by manned aircrafts. They are air vehicles and associated equipment that fly autonomously or remotely controlled. Drones bring significant economic savings and environmental benefits. At the same time, they also reduce risks to human life. Drones are increasingly used in commercial as well as in civilian applications. Evolution on the technology, regulations and society acceptance is in favor of an accelerated deployment of drones for professional applications.

The UAV market already has a great variety of hardware, software, and operational products to offer. The key element for global UAV success story largely depends on local regulation. The international regulatory bodies work together in the context of JARUS (Joint Authorities for Rulemaking on Unmanned Systems) initiative. In addition to national authorities, Europe participates in this work through EASA (European Aviation Safety Agency) (Hussein, 2021).

There have been a recent promising developments in Europe with the publication of: procedures for the operation of unmanned aircrafts (EU C. I., 2020), regulation on unmanned aircraft systems and on third-country operators of unmanned aircraft systems (EU, 2020), and Vertical Take-off and Landing (VTOL) certification (EASA, 2020).

Amazon CEO, Jeff Bezos, first introduced drone delivery. With the advancement of online business and B2C delivery, Bezos had thought of an approach to decrease the delivery time in a developing market. Amazon was developing a substitute method for delivering their products by drones. During the episode, Bezos introduced the world to Amazon's new Octocopter, which will be the essential delivery device behind this new service. Bezos guaranteed that Amazon would have the capacity to deliver their products in less than 30 min from its warehouses to the customer's home (Bamburry, 2015). Amazon's reputation to ensure satisfaction has given Amazon a major advantage in the retail industry.

Last-mile delivery is considered to be a choke point for the delivery of packages to consumers, especially for e-commerce companies. This final segment of the supply-chain accumulates the largest costs, stemming primarily from transport and labour costs (Joerss, 2016). This corroborates the reason why Amazon and UPS are investigating drone deliveries in urban areas as a viable solution. However when this materialises, the Very Low Level (VLL) urban airspace (i.e. , the portion of the airspace assigned for drones by regulatory bodies) will experience high densities of drone traffic flying in close proximity to natural and man-made obstacles. To explore these commercial demands, Unmanned Traffic Management (UTM) programs such as U-Space in Europe, are developing critical services such as deconfliction management and dynamic capacity management (SASAR-JU, 2019).

Drone delivery services have gained buzz in the media because internet businesses have been developing quickly during last few years. The utilization of business drones may turn into a key advantage and a key difference that assists internet business organizations to achieve almost instantaneous deliveries, which will create enormous advantages for web-based business retailers over the globe that can help separate them from each other as the opposition warms up for consumer satisfaction and retention (Chen G. Y., 2016). Realizing a future that makes drones a regular part of our daily lives will require answers to the following potential issues and obstacles. Like other delivery services, it is essential for drone operators to understand their duty towards their customers (Nok, 2015).

US regional airline Mesa Air Group started to conduct commercial drone deliveries in the last-mile food and beverage market in the USA. In that way, Mesa is becoming the first scheduled airline to lunch drone delivery in the USA. They ordered four delivery drones Flirtey Eagle to aerospace technology developer Flirtey. An electric-powered, advanced drone conducts deliveries to homes and businesses. Flirtey's autonomous software platform conducts autonomous flight operations. Should the initial trials prove successful, the parties plan to expand their business across the USA and to New Zealand (Symonds, 2021).

The SESAR U-Space outlook study postulates delivery drone services to be viable by 2035 (SESAR, 2016). In order to be synchronized with the SESAR U-Space program, a forecast to estimate the number of drone-eligible parcel deliveries for the five European countries until 2050 has been performed. To be conservative with the

drone-based parcel delivery demand forecast, the average economic growth rate is used, which stands at 1.8 percent for Europe as of 2019 (CBS, 2019).

Drone-based delivery of small consumer packages and fast-food meals has the potential to make a large contribution to transportation in urban areas. Drones represent an agile and sustainable transport mode for e-commerce companies and quick-service restaurants, especially when high-volumes of high-speed deliveries are required. Drone-based delivery may contribute to ease traffic congestion in our already congested urban cities.

3 First steps towards unmanned aircraft package delivery at Post of Slovenia

Drones have been on Posts' radar for a while now because they are able to deliver where no person can. The USPS is using drones for delivery routes around water, hilly terrain, or unpaved streets. La Poste has been using drones to make deliveries to remote Alpine villages. Not only are these towns tough to get to, they are also especially treacherous in the winter. Driving on icy, snowy roads puts postal workers in danger, and makes it less likely deliveries will make it to their destination on time. (Escher Group, 2021)

Slovenian Post carried out its first trial flight with an unmanned aircraft, i.e. a drone, which delivered a package to the Poštarski dom mountain hut on Vršič in the final phase of its flight. The company is undertaking this innovation project to look for new business opportunities and take an active approach to forming regulations that govern flying and operating unmanned aircraft in Slovenia. Many companies around the globe already use this method to successfully deliver packages, whereas the current European legislation does not yet permit flying outside one's field of vision. Post of Slovenia used a specific VTOL drone for their delivery trail, which is able to fly longer distances as it takes off and lands vertically and flies horizontally.



Figure 1: First trial flight with an unmanned aircraft for Post of Slovenia which delivered a package to the Poštarski dom mountain hut on Vršič

(Source: Archive of Post of Slovenia)

Post of Slovenia is initiating its first trial flights with unmanned aircraft as a preparation for the time when the company will be able to deliver essential packages to places that cannot be reached as quickly or efficiently by conventional vehicles. In view of the current delivery trends, the company is no longer far from the moment when, instead of mere trial flights, will be able to carry out actual drone deliveries. Post of Slovenia wants to be actively involved in the process of creating regulations that govern flying and operating unmanned aircraft in Slovenia, with the clear aim of looking for new business opportunities. Although technology has enabled this for quite some time now, regulations that govern airspace are proving to be an obstacle. At the moment, Europe does not have much maneuvering space to accommodate mass deliveries of this type. There is great potential for using drones in deliveries for a variety of purposes. These include delivery of laboratory samples from remote areas, delivery of goods from ships to land, and even delivering online purchases to end customers. Post of Slovenia sees great potential in drone delivery, also for the segment of online shopping delivery, as a service with the highest added value.

The main advantages of using this type of vehicle include reduced pollution, optimization of logistics channels, quick deliverability of essential goods and materials to remote and difficult-to-access areas, etc. In addition, great potential can be found in supplying and delivering postal items to mountain posts and cabins, while collecting and removing waste on the way back to the valley. The same goes for emergency delivery of medicines and medical devices, which would fulfil the aim of remaining a relevant and comprehensive link between the Slovenian economy and the population.



Figure 2: Delivery of blood samples from a remote health center by drone (multicopter).

(Source: Archive of Post of Slovenia)

The area of deliveries by means of unmanned aircraft is dominated by technologically more advanced countries, such as the United States, China, New Zealand, Australia, Germany and Switzerland, along with companies such as Alibaba, Amazon and Google. China is predicted to begin providing drone deliveries of one-ton cargoes across distances of up to 1,500 km as early as 2025. The EU has ambitious plans as well, as the European Commission sees the future of unmanned aircraft in agriculture, the energy sector, supervision of law and order, online stores and mobility in general.

Further steps of Post of Slovenia in this area involve participation in RDI (research, development and innovation) projects and demo projects to set up environments in which autonomous deliveries are possible, and the establishment of/joining a consortium of major Slovenian companies that see the opportunity to create business models of the future in the area of commercial use of autonomous aircraft and other autonomous vehicles. Additionally, these companies are ready to influence the creation of the currently applicable legislation with their experience to date.

Post of Slovenia carried out the first trial flight with an unmanned aircraft in collaboration with a Slovenian company OneDrone, the first Slovenian operator of unmanned aircrafts of the highest category, which enables aircraft operations in the most challenging conditions, and with start-up company ElevonX, which produces unmanned aerial vehicles (UAV) and even entire systems. The start-up developed the SkyEye modular unmanned aerial vehicle (UAV) system and brought it into a serial production.

4 How do we see the future

The market size for drone services is expected to grow from €3.8 billion in 2018 to €55 billion by 2025, and Insider Intelligence forecasts that the number of consumer shipments using drones alone will reach 29 million by 2021 (Insider Intelligence, 2021). This is (tentatively) supported by some other estimates e.g. Statista Research Department predicted in August 2021 that the global commercial drone market would reach a size of around 58.4 billion USD (i.e. 50.4 billion EUR) in 2026. The market is projected to grow at a compound annual growth rate of more than 16 % between 2021 and 2026 (Statista Reserch Department, 2021).

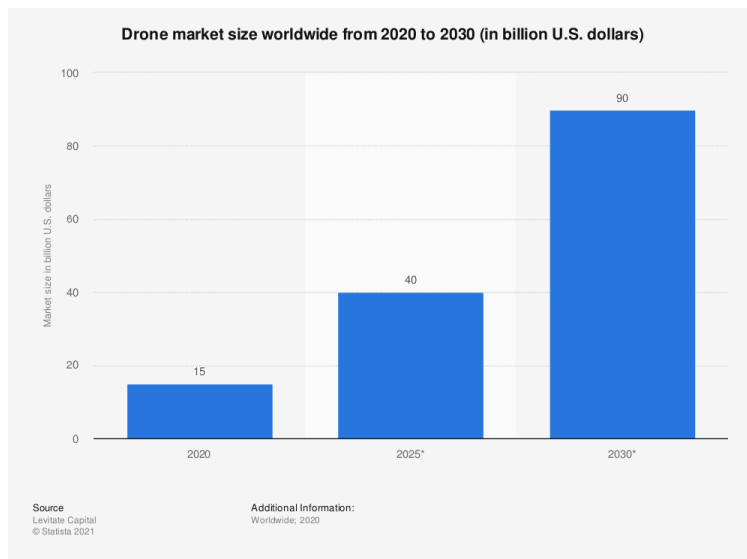


Figure 3: Drone market size worldwide from 2020 to 2030

(Source: Levitate Capital, Statista 2021;

<https://www.statista.com/statistics/878018/global-commercial-drone-market-size/>)

Given the many estimates of the size of the global “drone” market (Grand View Research, 2021) and huge venture capital investments in the “drone” industry, we can conclude that drone delivery is no longer just some science fiction thing but more a fact that will happen in the future.

Regarding the new EU regulations Commission Implementing Regulation (EU) 2021/664 of 22 April 2021 on the regulatory framework for U-space, we are convinced that now is the right time to start research and development work in this field in companies such as Post of Slovenia.

Next step is creation of a U-space system that will control and manage all autonomous craft in the 0-120m altitude range and will allow communication between all craft in the range (drones, helicopters, emergency helicopters, paragliders and anything else that comes within the flight range). The U-space system will allow controlled, reliable and, above all, safe flight for all stakeholders.

4.1 Drone capabilities for U-space

The capabilities expected for enabling U-space services are divided into three groups to support different types of service: foundation, initial, and advanced services (SESAR-JU, 2018) as shown at Figure 4.

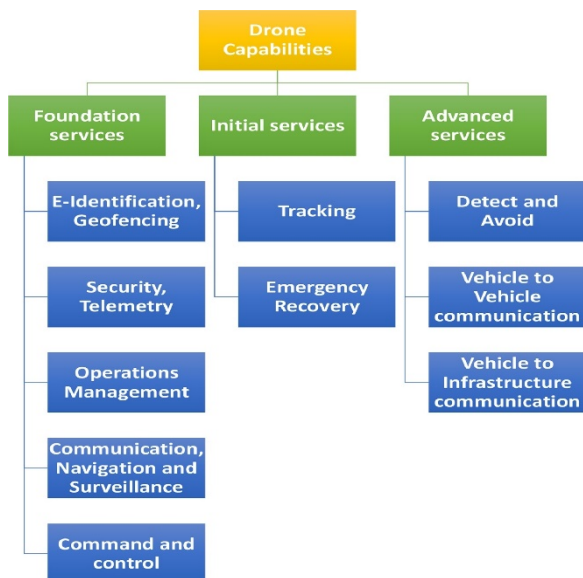


Figure 4: Drone capabilities for U-space
(Source: Hussein, 2021)

Capabilities for the foundation services include geofencing, security, telemetry, operation management, e-identification, communication, command and control, surveillance, and navigation. E-identification is the ability for identifying the drone and its operator in the U-space. Geofencing is the drone ability to be compliant with time, geographical, and altitude restrictions defined by the geo-fencing service. Security is making the drone able to protect itself and its data (i.e. interaction with infrastructure and other vehicles) from attacks. Telemetry is the ability for transmitting measurement data from a drone to another drone or to a service provider for meeting the demands of relevant services. Communication, navigation, and surveillance that makes the drone able to meet performance requirements of the communication, navigation and surveillance in the specific environment in which it will operate. This capability consists of on-board sensors and equipment (e.g. voice

radio relay, data link, etc.) as means to achieve the required performance. Command and control is the drone's ability to communicate with a ground control station for conducting the flight (normally through a specific data link). Operations management is the ability for planning and managing the drone missions. This involves accessing and using of all relevant information for planning, notifying, and operating a mission.

The initial services capabilities include tracking of the drone by providing flight parameters that include at least its position and altitude, and emergency recovery, which is the ability of drones to take into account failure modes such as link failure, command and control (C2) failure. It also takes measures for ensuring the safety of the vehicle itself, other vehicles, and property and people on ground.

The advanced services of the U-space are vehicle to infrastructure communication (V2I) which is the drones' ability for sharing information with infrastructure components and vehicle to vehicle communication (V2V) that is making drones able to communicate information to each other. The nature of the exchanged information and its performance depend on the application. Another advanced service is detect and avoid which is ability of drones to detect hazards, or cooperative and non-cooperative conflicting traffic, and to take the appropriate actions to comply with the applicable rules of flight.

4.2 Mobile telecommunication infrastructure

Mobile telecommunication networks could be the best solution to provide scalable connectivity solutions for U-space services and BVLOS operations in the future. Mobile telecommunication infrastructures/solutions for the U-space services should enable increased flexibility in the design and implementation of new types of services making reference to the U-space services requirements. The mobile telecommunication infrastructure should be capable of meeting appropriate U-space services performance requirements for coverage, quality of service, safety, security and reliability (resilience, failure modes, redundancy), while minimizing environmental impacts and respecting the privacy and safety of citizens.

Current mobile telecommunication networks can already provide sufficient connectivity and enable U-space services in some environments and use cases. In the future, developed mobile telecommunication solutions for U-space services could enable scalable, flexible and adaptable services, also for demanding environments and use cases.

However, there are some challenges to meet to enable cooperation in the telecoms and aviation sectors. The telecoms industry providing the mobile telecommunication services is market driven. In addition, current commercial mobile networks are typically built and optimized for users on the ground. Large numbers of users in the air will cause interference to the mobile networks and users on the ground, if not implemented in a controlled manner. Coverage and service requirements are also not currently optimized for users in the air. Close cooperation between the two sectors is needed, firstly to understand the performance requirements that U-space services put on the mobile telecommunication services, and secondly to develop a compromise on how the requirements can be met by the mobile telecommunication networks and services. The technical requirements of U-space services should be realistic and possible to meet in practice. This will also require developing new common business models for the cooperation between U-space and mobile telecommunication service providers (Brezovar, 2021 (accepted for publication)).

U-space must be able to adapt to new communication technologies and automation, both ground-based and airborne, and increasingly allow for more advanced forms of interaction with the overall U-space ecosystem, predominantly through interoperable communication systems capable of digital information and data exchange such as the 5G mobile telecommunication infrastructure. Ultimately, the next generation of mobile telecommunication infrastructure must be persuaded to encompass the range of UAS/UAM demand, business models, applications and technologies, and to support safe and efficient U-space operations that also include manned aviation and existing ATM systems to ensure a fair and equitable access to the airspace.

Although mobile telecommunication networks can provide connectivity for many challenging environments and operations in the future, there will always be environments where mobile networks are not the optimal connectivity solution, such as high altitudes or remote locations.

5 Conclusion

Urban parcel transport faces a lot of difficulties for a reason of the high population, lack of infrastructure, traffic congestion and pollution problems. Globalization and technological blooming caused a strong increase in demand of products and services. Consequently, several cities have tried to implement sustainable city logistics, which would allay cities' problems related to distribution of goods. Motivated by the challenges associated with the logistics of delivering items to remote areas we have introduced a drone delivery system aimed at covering the population living in hard-to-access locations. In the proposed system, we assume there is a set of locations with a certain demand for daily items.

Drone delivery has been talked about for almost a decade, and very intensely since 2013, when Amazon unveiled its plans in the field with the Prime Air project. Other technology giants soon jumped on the train, including Google with its Wing project. The media coverage of these initiatives has created the illusion that drone delivery is already quite commonplace in the world, but in reality we are still a long way from it. Most of these projects are still deep in the development phase and far from commercialization and everyday use. According to our assessment, delivery by drones will first be established in the supply of more remote locations in less populated areas (eg. delivery of consignments to remote mountain farms or perhaps the supply of mountain lodges). In the delivery of special cargo (medicines, biological samples, etc.) the time to serious commercial supply in this area will be measured in years rather than months.

The main advantages are certainly the speed of delivery and the reduction of the burden on human resources. Neither can be neglected the ecological component (electronically powered drones operate without emissions; the noise burden on the environment is also reduced).

The key challenge, at the moment, is legislative constraints (which only laid the foundations for flights outside the pilot's field of vision with the new EU legislation) and the lack of adequate infrastructure for the integration of unmanned aircraft into the airspace.

Automatic flight of unmanned aerial vehicles over long distances will be possible when two key conditions are met:

- Standardization and certification; The new EU legislation is based on unmanned aerial vehicles that will correspond to one of the classes (C0, C1, C2,...). Aircraft that obtain one of the required markings will be required to be certified by a notifying authority, which will verify them in accordance with applicable standards. As the EU standards that drones must meet have not yet been developed, it is impossible to certify these aircraft. As a result, only low-risk operations may be carried out with all currently available unmanned aerial vehicles (industrially and privately manufactured), which in the case of long-distance flying outside the pilot's field of vision means flying over a sparsely populated area in closed airspace.
- Lower airspace management; Unmanned aerial vehicles typically fly at altitudes up to 120m above the ground in uncontrolled airspace where visual flight rules apply. This means that pilots of aircraft see each other and avoid each other on that basis. Because drones are small and cannot be seen by other airspace users, all responsibility for avoiding a collision lies with the pilot of the drone. A remote pilot can ensure collision avoidance only when the drone is in its field of vision. The solution brought by the future is a new type of U-Space, in which remote identification and a contract with the operator of this airspace will be mandatory for all users. In such an airspace, the operator will take over the tasks of air traffic control, take care to avoid collisions between users and provide priority to aircraft on emergency flights (e.g. rescue helicopter). As part of the current airspace management, it is already possible to close parts of the airspace in which it would be possible to safely test the flights of unmanned aircraft over long distances. A step forward would be the possibility of reserving part of the airspace for the duration of the operation, which operators could perform in a simple and fast way, and the final solution will be U-Space. Businesses and individuals who would like to operate longer flights with drones have no influence on the development of standards, which is likely to be time-consuming, and all the conditions for a test run of U-Space airspace have already been met.

The new EU legislation sets clear conditions that must be met by drone system operators and the conditions for conducting operations with different levels of risk. Low-risk operations are already possible today over long distances (flying out of sight over a sparsely populated area in closed airspace), and more risky operations will be possible with the arrival of appropriate standards and the establishment of the necessary infrastructure (U-Space). The new EU legislation is designed in a modern way with a view to the future, but unfortunately, it is not yet fully feasible. As the rules are very complex, it is crucial that drone system operators start setting up the organizational structure, staff training and operations with drone systems at the highest possible level in a timely manner, as this will make the transition to a higher level fast and secure.

For delivery purposes, we test different types of drones, which differ in both range and payload. In the initial phase, we test multicopters with a maximum flight time of around 45 minutes (which in theory means distances of up to 30 km) and VTOL systems (a combination of a fixed-wing aircraft and a multicopter) that can fly in electric versions for two hours or more (meaning also more than 150 km range).

Increasing the payload weight reduces the flight time, so it is crucial to capture the right ratio between aircraft size / weight, flight time / range and payload weight. Since the vast majority of shipments (despite the expansion of the online store) fall into the class up to 2 kg, most delivery drones are currently optimized for such cargoes.

City logistics providers are being put in a high pressure due to cost-efficient and consumer-oriented delivery of e-commerce products. City logistics aims at the fast and reliable transportation of goods. The complexity of planning operations requires sophisticated planning systems, setting up on quantitative optimization models. Citizens come to the forefront with their desires and needs and raise the quality of their lives with an emphasis on a healthy environment, economic prosperity and social justice. All of the above must be taken into account if we want to implement delivery drones also into city delivery.

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THE COVID-19 IMPACT ON THE FOOD AND TEXTILE INDUSTRY: LESSONS LEARNED

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Abstract The Covid-19 virus pandemic has crippled life as we know it. The virus is still spreading, and life is still not normal. Of course, various industries are crippled. Supply chains will need to become more resilient in the future to possible recurrence of incidents like the pandemic of Covid-19. In this article, we will present how the Covid-19 virus pandemic has affected the food and textile industries. We have reviewed what measures were made at the start of the pandemic and how these industries have adapted to them. We also reviewed how the measures will affect supply chains and how they should operate in the future to withstand possible recurring emergencies such as the Covid-19 pandemic. We also compared the benefits of local in global supply chains, because in food supply chains the issue needs to be addressed and the Covid-19 virus pandemic can encourage consumers to buy locally produced food. It turned out that the Asian textile industry is largely dependent on western countries and has fallen into a major crisis with a massive drop in orders.

Keywords:
COVID-19,
pandemic,
food
industry,
textile
industry,
supply
chain
management,
inventory
management

1 Introduction

Covid-19 virus caused by the coronavirus SARS-CoV-2 is a rapidly transmitted disease whose first confirmed infections date back to December 2019. On 11 March 2020, the World Health Organization declared a pandemic, meaning that the Covid-19 virus was present on several continents around the world. The first infections were thought to be related to the so-called sea markets with live animals in Wuhan, China (Galanakis, 2020). Influenza-like symptoms of Covid-19 usually occur 5 to 7 days after infection. Among others the symptoms include fever, shortness of breath, cough, headache, sore throat, feeling tired and loss of taste and smell.

The Covid-19 pandemic has hampered processes in almost all areas, forcing companies to make rapid changes to the ongoing practices of their processes. The changes were felt by all stakeholders, and if we take the food industry as an example, on the one hand consumers felt tighter hygiene conditions when entering stores and reduced supply of products on the shelves, and on the other hand suppliers due to stock purchasing and tighter border measures meaning that suppliers have had problems with supplying the goods. The Covid-19 virus pandemic is one of the so-called black swan events, which are unpredictable events that go beyond what is normally expected of situations and can have serious consequences. Such events are characterized by extreme rarity and the impact of Covid-19 virus on supply chains can be compared to the situation during World War II (Chakraborty & Maity, 2020). Hoping to smooth the curve of Covid-19 infections, governments around the world have taken various measures, such as closing borders with neighboring countries, travel restrictions and lockdowns.

For example, at the outbreak of the Covid-19 virus pandemic, the agricultural sector landed in the test, which was forced to adapt to the situation when demand for hotels and restaurants fell, so that they started selling directly to end consumers. Various government measures, such as quarantine, the ban on unnecessary travel, have further affected the availability of workers, with marked consequences mainly for perishable goods such as meat and vegetables (Maria Nicola, 2020). Even though people were shopping with intentions to have home stock, food supply in stores has stabilized rapidly, as it is one of the key systems that needs to be maintained to ensure food security. Despite the measures already mentioned, which weakened the available labor in the agricultural sector, in principle everything was provided

through the provision of basic foodstuffs. However, the situation was different when it comes to goods that are imported or exported, because when the borders were closed, international trade was paralyzed, but this situation also stabilized with the health measures taken into account (Siche, 2020).

In this article, we will highlight some industries and compare the impact of the Covid-19 pandemic on them. We will review how individual industries have adapted to the pandemic and what losses have been caused by the Covid-19 pandemic. We will also review how supply chains in different industries are expected to change in order to be prepared for possible re-emergencies such as those caused by the Covid-19 pandemic.

2 Methodology

We began the study by reviewing the basic data of the Covid-19 virus. The research examined food industry and textile industry, as well as the impact of the pandemic on the supply chains of these industries. We decided on such an approach because food and drink are existential goods, and we are also interested in what is happening with the textile industry, which is not necessarily necessary for everyday life. With the help of articles from the online databases ScienceDirect and Google Scholar, we obtained literature on the state of these industries and supply chains, as well as predictions of what is expected to change in individual industries in the future to be more resilient to possible new emergencies such as Covid-19 pandemic.

In calculating the differences between the second quarter of 2020 and the same period last year, we obtained data using the MarketWatch online database, which offers the latest stock, financial and business data. We compared the revenues and inventories of companies from all three considered industries. Before the research, we set some hypotheses:

- The food industry has not experienced a significant difference in revenue,
- Inventories in the textile industry have not changed significantly.

In conclusion, we summarized the findings and gave the possibilities for further research, and we also confirmed or refuted the hypotheses.

3 Results

3.1 Food industry

At the time of the Covid-19 pandemic, the resilience of food supply chains was at the forefront, as it was the food supply chains that had to adapt quickly to emergencies and consumer demand and their panicky shopping in quantities that were not a constant practice before the pandemic and at the same time consumers also changed their shopping habits to some extent. However, the offer was paralyzed due to various measures to contain the virus. There was a shortage of manpower, and disruptions in transportation and entire supply chains in general (Hobbs, 2020). Despite governments all through ensured that food would not run out, panicked shopping continued. However, because food supply chains mostly operate on a just-in-time delivery system, such consumer behavior has led to short-term situations where certain products were not in stock (Martin-Neuning & Ruby, 2020). After the initial shock of demand, supply chains stabilized again and there were no more stock outages.

The closure of restaurants, bars and hotels has also contributed to the increased demand of food products, since every fifth meal in the EU is not prepared at home (iriworldwide, 2018). However, supply chains that supply hotels and restaurants may not be suitable for supplying shops due to the way food is packaged and due to the different distribution infrastructure. The adjustment of such supply chains is time consuming and, among other things, this caused store shelves to be completely empty at times. However, the long-term effects on food supply chains are likely to be seen as a result of lower personal incomes of consumers. To some extent, the needs for certain products may also change, as consumers will become more sensitive to product prices and will replace expensive products with alternatives. Such consumer behavior, if certain products will no longer be of interest to them, can help to shrink food supply chains with a goal of cost optimization (Hobbs, 2020). Winners of the pandemic who found new business opportunities during the pandemic are for example farmers who took the opportunity when certain products were in short supply in shops and gained new customers, a certain share of whom will certainly continue to buy from them in the future. Also, smaller losses were experienced by those supply chains that were able to adapt quickly, such as suppliers of hotels, restaurants and bars that began to supply smaller stores through network

distribution. Of course, the costs of such supplies are higher, but they have made up for this with higher margins. Such a system meant the victory of both the supplier and the store, because although the store had less earnings due to the supplier's higher margins, it at least had it by selling. Because otherwise the store shelves could be empty.

During the Covid-19 pandemic, the demand for online food orders and home delivery increased dramatically. Such food delivery can be extremely beneficial for vulnerable groups of people, i.e. the elderly and those with chronic illnesses. This way of posture also contributes to social distancing. However, the sudden increase in demand for home delivery of food has become a challenge, as the systems could hardly or have not been able to cope with the sudden expansion of orders, which was reflected in long queues or no possibility to order at all. Such an ordering system requires investment in infrastructure, staff, and sufficient delivery capacity (Ritter & Pedersen, 2020). With the sudden work cessation of various companies during the general quarantine, there was a large number of people who could be transferred to jobs in food supply chains, such as staff in shops, warehouses and also in food delivery. If, during the pandemic, online orders and food delivery came to life to the point where providers were unable to fulfill orders effectively, it will be interesting to see whether the trend of online shopping will continue after the Covid-19 spread or will the consumers return to traditional in-store shopping.

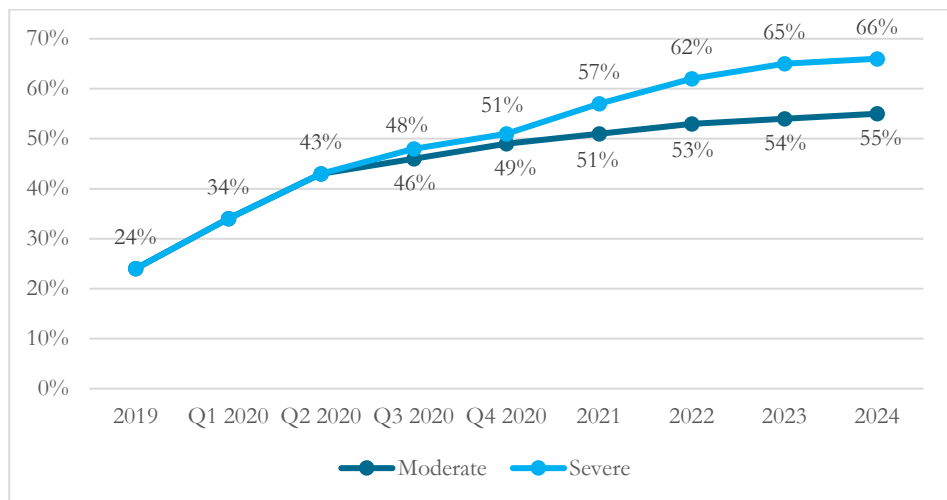


Figure 1: Forecast of online food sales in the US.

(Source: Keyes, 2020)

Figure 1 shows the forecast for the United States, how many people are expected to use online food ordering. The moderate forecast shows how online ordering could increase if the spread of the Covid-19 virus in the third quarter of 2020 were to be curbed to some extent. However, if the virus spreads until a reliable vaccine is available, online food ordering is expected to grow as shown by the lighter curve (severe) (Keyes, 2020). Since the spreading of the Covid-19 virus does not slow down for the time being (worldometer.info, 2020), it is expected that online food ordering will continue to increase in the United States and elsewhere. However, the growth of online orders does not only apply only to the food industry, but also to shopping in all areas.

As food supply chains had to adapt rapidly to consumer panic shopping and the changing market due to various measures to curb the spread of infections, so-called supply chains operating more locally became more and more mentioned. In situations at the start of the pandemic, when store shelves were empty and long queues of waiting consumers lined up in front of stores, many opted for an alternative, such as local food producers. In the short term, local food producers are better able to respond to higher consumer demand, as they tend to have a higher supply of products than demand. In addition, locally grown foods do not need to be transported, which means that locally grown foods have more nutrients. In the future, supply chains with local suppliers will certainly be more resilient to import disruptions or systemic breakdowns due to prolonged border congestion (Corr, 2020). Otherwise, interest in local food is already to some extent an established consumer trend, for which there are many different motives, namely social, environmental and health benefits. As a result, consumers are willing to pay a slightly higher price for locally grown products. The Covid-19 pandemic has cast doubt on the safety and reliability of the existing food system in some parts of the world. As a result, interest in locally produced food will increase, as secure and healthy food certainly mean the most to consumers (Hobbs, 2020). On the other hand, price and convenience still remain the driving force of consumers, and although the current Covid-19 crisis may boost local consumption, we will only see over time the extent to which local food will change the fundamental economy of the food sector (Scanlon, Van Acker, & Yada, 2020).

Table 1: Advantages of different food supply chains.

(Source: King, Hand, & Gómez, 2015, Grunewald, 2020, own research)

Local supply chains	Global supply chains
Preservation of local landscapes and family farms.	Greater diversity of supply due to the fact that the availability of products is not seasonally limited.
Strengthening the local and regional economy.	Lower product price.
Providing fresh, higher quality products.	Ability to cover outages of local products in the event of local weather disasters (hail, drought, frost).
Better supply chain control.	Labor stability (During the pandemic, many seasonal workers dropped out at the local level due to movement restrictions).
Due to shorter transport routes, food contains more nutrients, vitamins and minerals.	
Many times, locally grown food is grown without the use of pesticides.	
More suitable for people with various eating disorders and allergies.	

Table 2 shows a comparison of revenues of major global companies in the food and beverage industry. The table shows that the studied companies generated on average 3 % less revenue in the second quarter of this year compared to last year's second quarter. As a result of consumer panic shopping at the start of the pandemic, revenue increased mainly for meat companies. Anheuser-Busch and Coca-Cola generated 18 % and 29 % less revenue, respectively. Such a business statement is due to the fact that during the pandemic, people focused on buying essential food and thus put luxury foods on the sidelines.

Table 2: Demonstration of differences in revenues and stocks in the food industry.

(Source: MarketWatch, 2020, own research)

Food and beverage industry	Revenue	Inventory
Nestlé	-9%	3%
PepsiCo, Inc.	-3%	8%
Anheuser-Busch InBev	-18%	-6%
JBS	27%	34%
Tyson Foods	-8%	-6%
Archer Daniels Midland Company	0%	-8%
The Coca-Cola Company	-29%	3%
Kraft Heinz Company	4%	-8%
Mondelez International	-2%	-1%
Smithfield Foods/WH Group	11%	-10%
Average	-3%	1%

Table 2 also shows a comparison of inventories of the reviewed food industry companies. The Brazilian meat processing company JBS had as much as 34 % more inventory compared to last year. This can be attributed to the fact that virus prevention measures have not started at the same time around the world, so that companies in other parts of the world were able to monitor developments around the world and prepare accordingly.

The Covid-19 pandemic has crippled food supply chains around the world and those responsible must work towards maintaining and making supply chains more resilient. The just in time system of supply is reliable and efficient under normal circumstances, and the resulting pandemic situation suggests that such system is weak in the short-term disruptions caused by increased demand in consumer panic purchases. However, when the panic shopping ended or decreased, the supply chains with delays still proved to be responsive. Effective supply chain responsiveness is a key indicator of its resilience or stability, so measures will be even more important in the future, which, together with strategic inventory and order management plans and strong and reliable relationships, will shape the resilience of food supply chains (Oecd, 2020). Good relationships within the supply chain build trust and thus greater flexibility in responding to the supply chain's response to unexpected changes in demand and unexpected supply disruptions. Businesses would also be more resilient if they had so-called reserve suppliers to cover supply in the event of a failure of primary suppliers. Of course, these should be positioned across different geographical locations so that companies with a map of back-up suppliers can react quickly in the event of outages. In the future, when the spread of

Covid-19 is curbed, supply chains will be able to make a thorough analysis of what worked well in times of crisis and where processes failed, and how stronger partnerships within supply chains could be established to be prepared for possible future emergencies (Lopes de Sousa Jabbour, et al., 2020).

Table 3: Measures for the future.

(Source: own research)

Local supply chains	Healthier and fuller food and supporting the local economy.
Integrated Supply Chain Management	Companies could quickly react to the failure of certain products by creating a map of spare suppliers, thus increasing the responsiveness of the supply chain. Another option is to remove problematic products from the offer, which would mean a more manageable product range, less risk and lower costs.
Organic food production	Less impact on climate change which causes local weather disasters, resulting in less product loss locally.
Automation of Production	Machines reduce the dependence of food production on migrant workers. Also, with automated production, better traceability is possible to help uncover potential bottlenecks in the supply chain.

3.2 Textile industry

Most global supply chains in the textile industry start in Asia. For example, the United States imports as much as 73 % of textile products from Asian countries (Panigrahi, Ashutosh, Mehta, & Pasricha, 2020). Asia relies on the textile industry, as machinery and technology are manageable and can be learned quickly, with India and China being the first and third largest cotton producers in the world (Statista, 2019). The value of the Indian textile sector alone is 200 billion USD and is projected to grow to 350 billion USD by 2024. In 2018 and 2019, this represented 3 % of India’s gross domestic product, 13 % of industrial production and 12 % of total export earnings (Panigrahi, Ashutosh, Mehta, & Pasricha, 2020). Bangladesh is the second largest exporter of clothing after China with a 6,4 % global share. The textile industry contributes 16 % to Bangladesh’s total gross domestic product and as much as 80 % of total exports (Majumdar & Sinha, 2018). Vietnam is the third largest exporter of clothing with a global share of 6,2 % (Nguyen & Le, 2020). It can be seen that the textile industry in the countries of South and Southeast Asia plays

one of the key roles in the economy and employment (Majumdar, Shaw, & Kumar Sinha, 2020).

For the sustainability of supply chains in the textile industry, it is important to consider three branches of sustainability, namely economic, social and environmental. In this way, a balance is maintained between profit, environment and people or employees (De Brito, Carbone, & Meunier Blanquart, 2008). Ensuring social sustainability increases, among other things, the operational results and financial success of organizations in the supply chain. In reality, however, it is social sustainability that has been most overlooked in textile supply chains, especially in developing countries. Low wages, forced overtime, poor health and safety conditions at work are common practices in textile supply chains in developing countries, although it is these workers who contribute enormously to the economy of countries (D'Ambrogio, 2014). The Covid-19 pandemic in the textile industry in Asia has triggered a so-called drip effect in supply chains. The supply of raw materials was interrupted in January 2020 due to the closure of Wuhan, which clothing manufacturers tried to replace with purchases from local suppliers. However, demand for clothing fell sharply as Europe lockdown took effect in the second week of March 2020. Global brands have responded to the situation by canceling orders or postponing payments. The textile industry, however, came to a halt in Asia in the last week of March 2020 (Majumdar, Shaw, & Kumar Sinha, 2020). The unexpected Covid-19 virus pandemic has created a situation in the Asian textile and clothing industry where demand, supply and production have been disrupted and limited (RetailEconomicTimesIndiaTimes, 2020). In Bangladesh, orders worth 3,17 billion USD were canceled, directly affecting 2,27 million workers employed in the Bangladesh textile industry (Majumdar, Shaw, & Kumar Sinha, 2020). This is an indication that the demand for clothing before the Covid-19 virus pandemic was much higher than our need. We do not need 100 pieces of clothing, but for example, 20 pieces of clothing are enough. Reducing mass consumption would also help reduce the negative environmental impacts resulting from the production of clothing throughout the process, from the raw material to the final product.

In textile supply chains, brands have dominant bargaining power. For the most part, brands dictate the price and terms of delivery. Brands maintain their margins over the years and shift the burden of cost reduction to suppliers. As a result, cost competition between suppliers leads to lower already low salaries of employees, and

at the same time suppliers assume almost all business risks, as brands usually pay when goods are delivered, so the supplier must pay the costs of raw materials and labor early. In the wake of the Covid-19 virus pandemic, brands took advantage of this and canceled or postponed orders that were already under execution or had been completed. Suppliers were forced to make enormous discounts in order to get at least part of the money. During the pandemic, as many as 72 % to 91 % of customers refused to pay fabric and production costs to suppliers in Bangladesh. Regardless of the relationship in the supply chain, suppliers have little choice but to continue because of the fear of losing a business (Majumdar, Shaw & Kumar Sinha, 2020).

In India, as many as 58 % of textile companies were prepared to adapt to the pandemic situation by starting to sew the equipment needed in the Covid-19 virus pandemic, such as masks, gloves, sheets and hospital pajamas. The companies needed assistance in acquiring machinery and labor training, which they did not get and as a result, companies lost business despite the desire to produce the products needed during the pandemic. As a result, between April and June 2020, as many as 50 % of textile companies in India were no longer functional (Panigrahi, Ashutosh, Mehta, & Pasricha, 2020). In addition to dependence on developed countries, various inability to adapt to the new situation has led to the dysfunction of companies. Developing countries need to change their business system in such a way that they are no longer so dependent on developed countries, as possible recurrences, such as the Covid-19 pandemic or the intensified trade wars, will lead to a recurrence of the situation caused by a pandemic. For example, India exports as much as 35 % of its total textile exports to the three countries. These are the United States, the United Arab Emirates and the United Kingdom. Also Bangladesh, which accounts for 60 % of the textile industry's exports to the United States, the United Kingdom, Spain, France and Germany. (World Intergrated Trade Solution, 2019). China has managed to adapt in a way that has increased the demand of its citizens for their products. On the other hand, in Bangladesh, where textile exports account for more than 80 % of their total exports, they will have to find much more effective solutions, as it is impossible for their own citizens to replace a more visible share of exports by purchasing their products.

Table 4 shows the difference in corporate revenues between the second quarter of 2019 and the second quarter of this year. On average, brands in the textile industry generated 38 % less revenue in the second quarter of this year. The luxury brand Louis Vuitton deviates the most from the average, from which we can conclude that the pandemic did not affect the buyers of luxury brands so much, or that the company adapted to the emergency situation by producing protective equipment.

Table 4: Display of differences in revenues, stocks and share values in the textile industry.

(Source: MarketWatch, 2020, own research)

Textile industry	Revenue	Inventory	Stock
Inditex	-44%	-10%	-16%
Nike	-35%	31%	0%
LVMH	-15%	19%	4%
TJX Companies	-52%	-2%	-16%
Hermes	-24%	34%	11%
H&M	-50%	-1%	0%
Kering	-30%	14%	-7%
Adidas	-35%	46%	-11%
L Brands	-37%	10%	-54%
VF Corp	-54%	370%	-29%
Average	-38%	51%	-12%

Table 4 also shows a comparison of inventories in the second quarter of this year and the same period in 2019. The American company VF Corporation had as much as 370 % more inventories in the second quarter of this year than in the same period in 2019. Despite the fact that brands have canceled orders at the beginning of the pandemic the inventories increased compared to last year. As far as the value of stocks, we can see from the table that the value of stocks for L Brands fell by as much as 54 % and for VF Corp by 29 % in the same period compared to last year. For luxury brands such as Hermes and Louis Vuitton, the value of stock increased by 11 % and 4 % .

Table 5: Causes and possible measures to increase the resilience of textile industry supply chains.

(Source: own research)

Causes	Strength of influence	Improvement measures	Significance of the measure
Majority export	Very large	Sales in your own country	Very important
Late payments	Large	Shorter payout deadlines	Important
Inflexibility	Very large	Business plan for emergencies	Very important
Awareness	Very large	Monitoring events around the world	Very important

Table 5 shows the causes of the situation in the textile industries in Asian countries and measures to increase the resilience of supply chains in the future. Countries like Bangladesh export most textile products and are consequently dependent on other countries. Although such a trend before the Covid-19 virus pandemic proved to be profitable, it completely failed during the pandemic, as demand for products from the textile industry declined due to various measures in foreign markets. In such cases, countries like Bangladesh should encourage the sale of products on their soil, as China has done. Certainly, domestic sales cannot replace exports, but they can mitigate losses to some extent. The supply chains of the textile industry, and above all suppliers, were harmed during the pandemic due to late payments and cancellations of orders. Already, brands were paying suppliers with a delay, and as a result, suppliers were left without payment. Here, the solution is a possible mutual agreement between brands and suppliers on a shorter payment period. An important factor for paralyzed supply chains in the Asian textile industry was also lack of information. When China closed its production plants, they turned to other suppliers in other Asian countries, but soon after that other, developed countries also passed into lockdown. Asian producers were left with large inventories and unpaid bills. If they were better informed about the actions around the world, they could be better prepared for the situation.

4 Conclusion remarks

Covid-19 virus infections are still spreading around the world and although supply chains have picked up from the initial shock to some extent they are still operating truncated. The food industry was not expected to suffer excessive revenue losses during the pandemic, which is understandable, as consumers had to take care of livelihoods despite the low income in the pandemic, and this confirms the hypothesis that the food industry had the lowest losses among the industries concerned. The time after the pandemic will show how supply chains in the food industry will change in the future, whether they will become more and more local, or whether they will remain global or more regional- global. During the study, we found that the share of Asian exports in the textile industry represents the vast majority of the total. During the Covid-19 pandemic, Asian suppliers of large brands were the most disadvantaged. Because the following have a lot of bargaining power and do not leave suppliers much choice and dictate the course of mutual cooperation. Prior to the research, we hypothesized that the amount of brand inventory would not change significantly during the pandemic, but we found that they had as much as 51 % more inventory compared to last year's second quarter. Although brands massively shifted and canceled orders during the pandemic, inventory levels are very high compared to last year.

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THE ROLE OF DIGITAL PLATFORM IN WASTE RECOVERY IN THE FOOD SUPPLY CHAIN

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Abstract Food waste is generally seen as highly unethical. Recycling food waste requires establishing information-sharing channels in the food supply chain. However, the lack of relationship between suppliers and potential demanders hinders the delivery of waste products, conceptualized as "structural holes" in social network research. The food recovery digital platform in the food supply chain acts as a market intermediary to bridge the communication at the two ends of the structural holes, fulfilling the function of "brokers", which has been proven in the transaction cost theory to reduce the transaction costs and improve the performance of the supply chain. However, related research on digital platforms and supply chains ignores this new type of brokerage. This research combines network research, transaction cost research, and supply chain research and explores the role of food recovery platforms in food waste problems in the food supply chain.

Keywords:

structural holes, digital platforms, food waste recovery, supply chains, cost



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1 Introduction

The Food and Agriculture Organization of the United Nations stated that one-third of the global food produced by humans every year is wasted (FAO, 2017). Studies on sustainable supply chains have shown the lack of communication channels between supply chain participants hinders the transfer and recycling of waste (Schanes et al., 2018). Social network research provides a theoretical basis for this and conceptualizes it as "structural holes" (Burt, 2004). Social network scholars have also proposed the supplementary concept of "brokers" to describe organizations or individuals that build bridges between organizations to fill structural holes.

Nowadays, digital platforms in the food supply chain can establish more connections than other brokers through market intermediary functions and external network effects. However, the role and impact of inter-organizational connections and information sharing established by the brokerage function in the supply chain have not yet been clarified. In terms of precisely explaining the structural holes of the food recycling supply chain and how digital platform organizations act as brokers to promote waste recycling, research has not yet caught up with practice. This research helps bridge this gap by exploring existing food recovery platforms and food recycling-related supply chains. In sum, this research explores structural holes and the role of brokerage of the food recovery digital platform in the food supply chain.

2 Literature review

2.1 Food Wasted in the Food Supply Chain

The importance of waste recycling has led people to re-explore the traditional supply chain concept. The literature on food waste shows the importance of complex interrelationships among different stages of the food chain (Chaboud and Daviron, 2017; De Steur et al, 2016; Gustavsson et al., 2011; Mena et al., 2011). The fight against food waste depends on the creation of connections along the chain, which expands the chain's integration capacity, linking actors who have goods at risk with actors capable of using these inputs (Ciulli et al., 2019).

In addition, scholars related to circular economy have also expanded the traditional concept of waste based on the waste-as-food principle (Murray et al., 2017). According to this concept, waste also includes products that are produced but not sold, not consumed, or at the end of their life cycle. This expanded waste concept means that when a supply chain participant's "waste" can become a potential resource for other supply chain participants, the value of "waste" can be realized through the recollection, redistribution and reuse of the supply chain. (Murray et al., 2017). In the food supply chain, structural holes between supply chain participants hinder recycling efficiency and large-scale waste recycling. Both the supply and demand sides influence the formation of structural holes. In addition, the solution to food waste also hindered by geographical restrictions (Garrone et al., 2016). A new type of supply chain participant: the digital platform organization, seems to be able to break the deadlock to some extent. With the development and dissemination of digital platforms, food waste and food recycling solutions are no longer very local, temporary or accidental measures.

2.2 Food Recovery Digital Platform

The food recovery platform focuses on establishing connections between suppliers and food waste beneficiaries, promoting the recycling and reuse of food waste while reducing the negative impact of waste on society and the environment (Michelini et al., 2018; Ciulli et al., 2019). Start-ups that have been established around the world include Too Good To Go and OLIO. The success of these platforms shows that the organization of the digital platform business model can promote the sustainable development and transformation of the food industry and act as a tool for social changers when entering the food industry (Acquier and Carbone, 2018).

Researchers related to the sharing economy define the food recovery platform as a sharing economy which brings challenges and controversies. First, scholars have disputes over the conceptualization of the sharing economy (Schor, 2016; Acquier et al., 2017). Secondly, the business model of the food recovery platform seems to be different from the mainstream concept of the sharing economy. The latter means that commodity owners provide other consumers with opportunities for underutilized commodities (Frenken and Schor, 2017), which means that the ownership of this commodity does not seem to have changed. In addition, according

to the research of Ciulli et al. (2019), the food recovery platform plays a variety of roles in the food supply chain, not just the sharing of goods.

2.3 Structural Hole and Brokers

Social network theory draws people's attention to "Missing relations" (Burt et al., 2013) through the concept of "structural holes". The existence of "structural holes" means that the participants in the network "have an uneven connection with each other" and therefore cannot share information (Burt, 2007; Ellis, 2003). Social network scholars believe that when people focus on activities within their own group, they create loopholes in the information flow between groups (Burt et al., 2013).

Social network scholars also proposed to bridge the holes in the network structure through brokerage (Burt, 2004). The broker connects two or more unrelated participants in the network and builds a bridge for them to communicate information and knowledge. Scholars explored how different types of participants can become brokers and facilitate the establishment of connections between organizations and organizations or between organizations and individuals including individual employees (Manning and Roessler, 2014), non-governmental organizations (Kaine and Josserand, 2018) or government agencies (Stadtler and Probst, 2012). Based on the structural holes and brokers theory, this research emphasizes the importance of inter-organizational knowledge and information communication in the food supply chain and explores the role of digital platform as a new type of brokers.

3 Research methodology

3.1 Research approach

This research adopts a mixed-methods research approach. In qualitative research part, this research adopts an inductive interpretive theory method to construct the theoretical framework (Gioia et al., 2013; Shah and Corley, 2006). This research method is suitable for the current situation where the research on food recovery platform organizations cannot keep up with practice. In addition, research literature in different fields can provide theoretical guidance for food recovery platform

organizations. Therefore, this research builds a theoretical framework for the food recovery platform to solve the food waste problem:

The food supply chain has structural holes, and the food recovery digital platform can act as brokers to bridge structural holes, which means establishing communication channels between the supply and demand sides and promote information sharing. Information sharing reduces the cooperation cost between the two parties and the uncertainty of the supply chain, so it reduces transaction cost and improves food recycling performance.

In terms of quantitative research, this study measures the promotion of information sharing by food recovery digital platforms as brokers. The scope of information refers to the information transmitted by both parties through the digital platform, including information exchange between the two parties for transaction purposes and private information that is not directly related to the transaction. The measurement of information sharing refers to the six indicators adopted by Li et al. (2006).

3.2 Data Sources and Sampling

The main data collection unit of this study is the food recovery platform organization in the food supply chain. Considering the classification of food recovery platform organizations by Michelini et al. (2018) and Ciulli et al. (2019), the food recovery platform organizations in this research will include the following types:

- Business-to-Business (B2B), both the supplier and the demander (requester) of food waste are corporate organizations;
- Business-to-Consumer (B2C), digital platforms match food waste to suppliers and consumers; Business-to-NGO (B2NGO), the suppliers are companies that provide food waste, and the recipients are non-governmental charitable organizations;
- Consumer-to-Consumer (C2C), digital platforms are dedicated to promoting the flow of food waste between consumers.

4 Contributions

4.1 Theocratical contributions

For the research on social networks, this research contributes to the theory of structural holes and brokers and promotes the application of these theories in the supply chain through the research on the new type of brokers- the digital platform. In addition, this research combines transaction cost theory with brokerage related research to contribute to the development of transaction cost theory in the supply chain. Finally, this research contributes to sustainable circular supply chain research by investigating the impact of digital platforms.

4.2 Practical contributions

This research has practical implications for relevant practitioners, digital platforms, and policymakers in the food recycling industry. First, identifying structural holes in the food supply chain can help improve inter-organizational communication and information sharing with practitioners related to food recycling. Secondly, this research helps policymakers understand and position the functions and advantages of digital platforms and provide corresponding support for the development of digital platforms. In addition, this research also brings inspiration to other digital platforms in the supply chain to explore future functions and development directions.

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VPLIV EPIDEMIJE NA KONZUMACIJO VIN IN VINSKI TURIZEM SLOVENIJE KOT EVROPSKE GASTRONOMSKE REGIJE 2021

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Povzetek Vino je končni produkt fermentacije grozdnega soka, ki ga človeštvo prideluje že od Antike. V naše kraje je vinska trta našla pot preko Rimljanov, z njimi pa se je širila po celotnem Sredozemlju. Vinogradništvo in vinarstvo sta v Sloveniji nadvse pomembni panogi, o tem priča tudi dejstvo, da Slovenci gojimo kar 48 sort vinske trte. Kar se tiče vina v povezavi s turizmom, se lahko navežemo na pojem vinski turizem. Obiskovanje kleti, prireditve in degustacij je način, kako kulturo vina predstaviti turistu. Razvoj vinskega turizma zahteva celostni pristop in pa nujno medsektorsko povezovanje ter sodelovanje. Vinski turizem je tesno povezan tudi z drugimi oblikami turizma, predvsem gastronomskega. V Sloveniji je razvoj vinskega turizma šele na začetku, vendar pa imamo zelo dobre predispozicije za njegov razcvet. Vino je v deželah z visoko razvito kulinariko nadvse cenjeno in predvsem nepogrešljivo ob kulinariki. Glede na vrsto delimo vina na bela in rdeča, po sladkorni stopnji pa poznamo štiri stopnje – suho, polsuho, polsladko in sladko vino. Slovensko vinogradništvo je zelo razširjeno v Podravju, Primorju in Posavju. Pridelovalci fermentirajo grozdni sok, nato pa ga pustijo zoreti v sodih ali cisternah.

Ključne besede:

vinska
kultura,
vinski
turizem,
pridelava
vina,
vinogradništvo,
vinarstvo,
koronavirus
(SARS-CoV-2)

THE IMPACT OF THE EPIDEMIC ON WINE CONSUMPTION AND WINE TOURISM IN SLOVENIA AS A EUROPEAN GASTRONOMIC REGION 2021

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Abstract Wine is the final product of the fermentation of grape juice, which has been produced by mankind since antiquity. The wine found its way to our region via the Romans, and spread with them throughout the Mediterranean. Viticulture and wine-making are very important industries in Slovenia, as evidenced by the fact that Slovenians grow 48 grape varieties. As far as wine is concerned in connection with tourism, we can relate to the concept of wine tourism. Visiting the cellars, events and tastings is a way to present the wine culture to the tourists. The development of wine tourism requires an integrated approach, and the necessary cross-sectoral integration and cooperation.

Keywords:
wine
culture,
wine
tourism,
wine
production,
viticulture,
winemaking,
koronavirus
(SARS-CoV-2)

Wine tourism is also closely related to other forms of tourism, especially gastronomic. In Slovenia, the development of wine tourism is just beginning, but we have very good predispositions for it to flourish. Wine is highly appreciated in countries with a highly developed cuisine and, above all, is indispensable for delicious dishes. Depending on the type of wine, we divide them into white and red, and according to the sugar level, we have four levels - dry, semi-dry, semi-sweet and sweet.

1 Uvod

Vinogradništvo je pomembna kmetijska panoga, ki spremlja človeka že več tisočletij in prinaša odlične možnosti za zaslužek in gospodarjenje. Večinoma vinogradništvo povezujemo s trgovino, gostinstvom in turizmom. S pomočjo te panoge se lahko kraji, regije in celo države bolje razvijajo in prinašajo dodano vrednost v prostor. Vino je skozi zgodovino postajalo velik del človeške kulture pitja. Skozi tisočletja je tehnologija priprave tega žlahtnega napitka učila nadobudne vinogradnike in vinarje, kako povezovati ljudi preko hrane in pijače. V povezavi z vinogradništvom se je vzpostavil tudi vinski turizem, ki je glavni sestavni element tega članka. Brez turizma se vinski okoliši ne bi mogli predstaviti v vsem svojem sijaju. Mnogo je ljubiteljev, ki jih pritegne vinorodni okoliš zgolj zaradi barvite zgodovine in zanimivih, inovativnih idej, s katerimi vinarji in vinogradniki oglašujejo svoje kleti in proizvode. Kadar je potrošnik zadovoljen, se v prostor rad vrača in s tem širi dober glas o ponudbi, naravi in doživetjih. V letu 2021, ko Slovenija nosi naziv Evropska gastronomska regija, pa so se v različnih prostorih Slovenije razvili mnogi projekti, ki predstavljajo vsebine eno-gastronomske ponudbe in doživetij.

Kljub vsemu temu pa je nemogoče spregledati, da sta leti 2020 in 2021 zaznamovani s popolnoma drugimi prioritetami, ki potiskajo pomen turizma v ne nujno obliko potrošnje in da bo tudi leto 2022 stigmatizirano s turistično pohabljenostjo ter (morebiti) vprašanji turističnega okrevanja, in šele nato nadaljnega razvoja. Slovenski turizem v teh dveh letih pretežno životari na račun državne pomoči v obliki nadomestil za izpad prihodkov. Isto velja za vinski turizem, ki pa ima že daljšo zgodovino boja za preživetje, predvsem v omejeni sposobnosti negovanja kulture pitja alkohola, ki rezultira v državnih omejitvenih ukrepih in močni abstinenčni propagandi dela javnosti. Slovensko vinarstvo tako postaja deloma izvozno, deloma pa se usmerja v dopolnilno obliko kmetijske dejavnosti, saj zaradi omenjenih dejstev ne zagotavlja normalnega preživetja malim in srednje velikim vinarjem. Epidemija koronavirusa (SARS-CoV-2) je z zaprtjem ekonomskih panog ter meja marsikje zadala dodatni udarec, ki tako kot v drugih panogah usmerja vinarje, da razmislijo o lastnih razvojnih potencialih, prioritetah, zmožnostih in priložnostih.

2 Teoretične osnove

Izredne situacije v okolju – epidemija/pandemija

Razlika med epidemijo in pandemijo je zelo preprosta – epidemija je izraz za nenaden izbruh in hitro širjenje bolezni v človeški populaciji, v kateri močno presega normalno obolevnost, pandemija pa je izraz za epidemično stanje neke nalezljive bolezni, kadar se ta razširi na velikem geografskem območju (Delo, 2021). WHO (World Health Organization) je določila kriterije, da epidemija postane pandemija, ko je bolezen za določeno populacijo nova, se nekontrolirano širi in povzroča resne zdravstvene težave pri ljudeh. V zgodovini je bilo človeštvo priča kar nekaj izbruhom bolezni, ki so terjala veliko žrtev. Črne koze in tuberkuloza, predvsem kuga, ki je v 14. stoletju vzela okoli 75 milijonov ljudi. Danes je med nami še vedno prisoten virus HIV oz. AIDS, ki prizadene imunski sistem posameznika, sledijo pa mu različna obolenja z gripo, ki niso prav nič nedolžna. Od 20. stoletja dalje so zabeležili štiri pandemije gripe. Najhujša je bila španska gripa, ki jo je povzročil virus H1N1. Za posledicami obolenja je takrat umrlo okoli 40 milijonov ljudi. Leta 2009 smo se s tem virusom ponovno srečali, v obliki podtipa, imenovanega prašičja gripa (STA, ms/vb, 2020).

Vpliv epidemije koronavirusa (SARS-CoV-2) na življenje ljudi

Leto 2020 je bilo zaznamovano s pandemijo, ki je močno prizadejala tudi Slovenijo. Nova zdravstvena grožnja je spremenila in omejila življenje ljudi, predvsem z izdajo ukrepov, ki so vodili v omejitve gibanja ter zbiranja ljudi na javnih mestih. Spremembe so povzročile stanje, v katerem se slovenski narod še ni znašel – negotovost, obremenitve, novi izzivi in zaskrbljenost za svoje zdravje in zdravje bližnjih. Poleg splošne krize se tu pojavljajo vprašanja o samih učinkih pandemije in ukrepov preprečevanja širjenja bolezni na delovanje posameznika in njihove čustvene odzive na krizne situacije. Virusne epidemije vplivajo na duševno zdravje ljudi, ljudje so pod stresom, saj ne želijo prenesti okužbe (SARS-CoV-2) na svoje bližnje. Samo stanje ni vplivalo le na spremenjene okoliščine življenja ljudi, temveč tudi na ekonomske, socialne in psihološke aspekte, saj so določeni veliko bolj stresni kakor drugi. Morda so najbolj kritična skupina, ki potrebuje raznolikost in večji spekter doživljanja otroci in mladostniki, ki so v času epidemije tega močno prikrajšani. V teh časih je morda res pričakovano, da so ljudje zaskrbljeni in

prestrašeni, imajo večje težave pri opravljanju dejavnosti, ki so jih morda prej že obvladovali. Posledice, ki jih prinašajo omejitve gibanja in spremembe pri načinu življenja predstavljajo velike težave na področju duševnega zdravja za celotno populacijo, tako starostnike kot tudi mladostnike. Če povzamemo, tuje izkušnje iz preteklosti nakazujejo, da nezmožnost obiskovanja šol in javnih ustanov, veliko omejevanje socialnih stikov in predvsem gibanja pri celotni populaciji ljudi povzroča dolgotrajne posledice na področju telesnega in duševnega zdravja (Dobnik Renko, Janjušević, Kreft Hausmeister, Lampret, Mikuž, Mlinarič, Pristovnik, 2020, str. 2 – 8).

Vpliv koronavirusa (SARS-CoV-2) na konzumacijo vin in vinski turizem

Epidemija koronavirusa (SARS-CoV-2) je močno spremenila trende v svetovnem gospodarstvu. Končna ocena vpliva koronavirusa (SARS-CoV-2) na vinsko in vinarsko industrijo, kot na vse druge panoge, je še zelo oddaljena. Vendar pa je nemogoče spregledati prve rezultate raziskav (glej npr. Canavati et al., 2020), ki dajejo jasno vedeti, da ne bo nič več, kot je bilo in da se mora tudi vinarska industrija vprašati po prihodnosti po prelomu v vzorcu poslovanja. Tudi Cardebat et al. (2020) ugotavljajo, da je epidemija koronavirusa (SARS-CoV-2) na vinski trg vnesla neko novo realnost, kateri se bo potrebno prilagoditi. Med tem pa Dubois et al. (2021) jasno izpostavljajo eno izmed ključnih vprašanj prilagoditev, to so drugačni konzumacijski vzorci, ki so posledica vsesplošnega zaprtja gospodarstva in družbe. Številni drugi avtorji (v letih 2020 in 2021 je bilo objavljenih že na tisoče znanstvenih člankov, ki se navezujejo na vprašanje vinarstva ter vinskega turizma v pogojih koronavirusa (SARS-CoV-2) in po tem) naslavlja različne vidike sprememb v vinsko povezanih vzorcih, od sprememb vzorcev pitja, sprememb trgov, sprememb same vloge vina, sprememb odnosa do vina, psihologije družbe in vloge alkohola pod pogoji epidemije, sprememb turističnih zmožnosti in vzorcev idr. Vse to nakazuje, da tudi, če ni enotnega mnenja o vlogi koronavirusa (SARS-CoV-2) na vinarstvo in vinski turizem, je dejstvo, da je pandemija vplivala tudi na to področje in ga predruščila, čeprav v tem trenutku še ni enoznačnih odgovorov na vprašanje o naravi teh sprememb.

4 Metodologija in hipoteze

Vinski turizem je v okviru gastronskega razvoja Slovenije eden njegovih temeljnih vidikov, saj Slovenija sodi med tradicionalne vinorodne države na svetu. Članek skuša skozi analizo virov predstaviti stanje vinarstva in vinskega turizma v Sloveniji ter ga postaviti v okvir vpliva projekta Slovenije kot evropske gastronske regije 2021 in pojava epidemije koronavirusa (SARS-CoV-2). Prispevek je razdeljen v teoretični del, ki vsebuje predvsem analizo stanja slovenskega vinogradništva, vinarstva in vinskega turizma v svetu ter v empirični del, ki vsebuje intervjuje s slovenskimi vinarji treh vinorodnih dežel v Sloveniji in predstavlja osnovo razumevanja vpliva koronavirusa (SARS-CoV-2) na spremembe v vinarstvu, kot tudi zavedanje in pomen projekta Slovenije kot evropske gastronske regije v letu 2021 skozi anketno raziskavo. Na podlagi uvodnih ugotovitev lahko predpostavljamo, da pandemija koronavirusa (SARS-CoV-2) uničuje slovenski vinski turizem, kot tudi vinarstvo in industrijo ter da je naziv Evropske gastronske regije 2021, ki ga je prejela Slovenija, v dani situaciji relativno nepomemben in kot tak zamujena priložnost, za katero pa predhodno ni vedelo veliko ljudi.

5 Vino, vinogradništvo in vinarstvo v Sloveniji

Hitro spreminjanje turističnih trendov in tipov gostov bo sprožilo novo turistično realnost slovenskega podeželja. Pomembni bodo postali slovenski gostje, najbolj družine in posamezniki. Slovensko podeželje se bo moralo prilagoditi novim potrebam gospodarstva, predvsem bo potreben vložek v nove inovacije v ponudbi, potrebno bo večje povezovanje turističnih ponudnikov in večji poudarek na ponudbi domače, sveže, sezonske, kakovostne in ekološko pridelane hrane. Zaradi socialnega oddaljevanja in težnje ljudi po preživljanju časa v domačem poznanem okolju, bo napočil čas za podjetnike z inovativnimi idejami, ki bodo uresničevali želje slovenskega gosta, ki bo želel izkusiti dobrote domačega kraja oziroma države.

Mednarodne vinske sorte so v Sloveniji prisotne že skoraj 200 let, tako da so se prilagodile krajem in pokazale regionalne specifičnosti, večini vinarstva pa še vedno predstavljajo jedro pridelave. Kljub temu se vinske karte, tako domačih kot mednarodnih restavracij, vse bolj zapolnjujejo z lokalnimi vinskimi sortami. Slovenska vina so odlična, ravno zato ima Slovenija odlične predispozicije za vinski turizem. Goriška Brda so v zadnjih 15 letih doživela velik razcvet v razvoju, saj so

se na pravi način lotili zgodbe, kjer ne nudijo gostu le konzumacijo vina in ogleda kleti, temveč organizirajo dogodke in aktivnosti, ki gosta močno pritegnejo. Več zgodb kot lahko prodaš gostu, večjo ceno mu lahko zaračunaš. Tu obvelja predvsem pristop in srčnost, ki ju gostje drugje ne dobijo. Ravno zaradi tega bi morala biti cena Slovenskih izdelkov še višja. V turizmu se gre za ponujanje edinstvenosti in butičnosti, tu govorimo o majhni količini ponudnikov in ekskluzivnosti, ki prinese svojo ceno (Alič, 2021). Po oceni Uran Maravičeve (2021) naj bi prišli do predkoronskega stanja šele leta 2026, zaradi vseh ukrepov in omejitev, ki so močno ogrozili slovenski vinski turizem. »To je po zelo optimističnem izračunu, če bi se obseg gostov povečeval za 12,5 odstotka na leto, nočitve pa na letni ravni za 9,5 odstotka. A to se ne bo zgodilo, saj bo koronavirus jutri še vedno z nami. Po absolutnih številkah smo trenutno v letu 2010, torej nam je korona vzela deset let. Kar pa zadeva tuje turiste, smo lani padli nazaj v leto 2001« (Alič, 2021).

Sama kultura vina izvira iz dežel Srednjega vzhoda in je stara skoraj 9000 let. V naše kraje so vinsko trto prinesli Rimljani, saj se je prek njih širila po celem Sredozemlju. Le ti so vinu pripisovali posebno moč, uporabljali pa so ga tudi v zdravstvene namene. V Sloveniji je kultura vina prisotna že več kot 2000 let, o čemer pričajo najdeni arheološki ostanki (Šikovec, 1987, str. 8; Medved, 2006, str. 7). Morda zato tudi ne preseneča, da je prav Slovenija dom najstarejši trti na svetu. Po opravljenih meritvah strokovnjakov je trta stara najmanj 350 let (D.S., MMC RTV SLO, 20. 9. 2020). Prvotno se je grozdje uporabljalo le za pridelavo soka, šele kasneje pa tudi za pripravo vina. Za nastanek vina mora poteči alkoholno vrenje, dobro vino pa je rezultat skrbnega dela vinogradnika in vinarja. Rodi se že v vinogradu, neguje in dozori pa v kleti. Splošno delimo vino na rdeče in bele sorte, glede kakovosti vinske sorte pa v tri skupine – namizno vino, kakovostno vino in vrhunsko vino. Vrhunsko vino je vino najvišje kakovosti. H kakovosti vina veliko pripomore pestrost in raznolikost Slovenskega ozemlja in podnebje. Naravna raznolikost tal in makroklimatske ter mikroklimatske razmere, ki so posledica bližine Jadranskega morja, alpskega sveta in Panonske nižine, so privedle do pestre ponudbe okusov žlahtnih vin (Hieng, Slovenske novice, 2017).

Vinogradništvo ima velik gospodarski pomen in je zelo pomembna kmetijska panoga, ki ima dobre možnosti za donosno in predvsem uspešno gospodarjenje. Slovenija premore okoli 18.550 ha vinogradov. V registru je vpisanih le slabih 15.500 ha, ki so registrirani kot predelovalci. Vino se prideluje v devetih vinorodnih okoliših,

ki so združeni v tri vinorodne dežele - Primorsko, Posavje in Podravje. Letni pridelek obsega približno med 800.000 in 900.000 hl letno. Registriranih pridelovalcev vina, ki svoje vino stekleničijo je več kot 2300, v vsakem vinorodnem okolišu pa je tudi najmanj ena večja klet, ki grozdje odkupuje (Kovačec, 2020). V Sloveniji gojimo kar 48 sort vinske trte, med njimi prevladujejo bele sorte. Slovenski vinogradi ležijo na strmih legah, kar posledično pomeni dražjo pridelavo, a hkrati tudi bolj kakovosten pridelek grozdja. Delež kakovostnega vina predstavlja kar 70 % celotne pridelave. Ker je na našem trgu padla potrošnja vina, so slovenski vinarji primorani prodati več vina na tujih trgih (GOV, Vinogradništvo in vinarstvo, 23. 7. 2021).

Tabela 1: Količina pridelka po letih, prijavljena v register pridelovalcev grozdja in vina (v 1000 litrih, vir: RPGV, 23. 7. 2021)

2012	2013	2014	2015	2016	2017	2018	2019	2020
44.810	54.243	47.827	62.285	52.461	53.565	68.132	56.199	52.559

V Slovenijo se uvaža predvsem namizna vina, ki jih glede na strukturo pridelave in potrošnje, primanjkuje. Leta 2006 je bilo izvoženega 5,2 milijona litrov vina. Glavni trgi za izvažanje slovenskega vina so Hrvaška, Bosna in Hercegovina, Češka in ZDA. Kar se tiče uvoza, je bilo v Slovenijo uvoženih 6,2 milijona litrov vina. Glavne izvoznice za naš trg so Italija, Avstrija, Makedonija, Madžarska in Čile. Največja količina vina se pridelava v Franciji, sledijo pa ji Italija, Španija, ZDS, Argentina, Nemčija, Portugalska itd. (Vinska družba Slovenije, 2008).

Tabela 2: Uvoz/Izvoz (v 1000 L in EUR, vir: SURS, 2020)

		2014	2015	2016	2017	2018	2019	2020
Izvoz	v 1000 litrih	7.686	5.295	4.677	5.850	6.806	5.329	9.555
	v 1000 €	13.282	11.750	13.878	13.468	15.437	16.058	16.536
Uvoz	v 1000 litrih	12.971	13.953	13.391	12.049	10.945	9.745	8.686
	v 1000 €	13.422	14.868	12.981	13.298	13.982	12.624	12.313



Graf 1: Bilanca proizvodnje in potrošnje vina (v 1000 hl)

(Vir: SURS, 2019)

Do leta 1996 je obseg vinogradniških površin naraščal, potem pa začel rahlo upadati. Pridelki grozdja in vina so bili v posameznih letih zaradi majhnih sprememb v površini odvisni predvsem od vremenskih razmer. Po letu 1992 je bilo nekaj zelo bogatih letin (1993, 1997, 2002 in 2007), ki so napolnile kleti in vplivale na povečanje zalog vina ter posledično na znižanje cen grozdja in vina (GOV, Vinogradništvo in vinarstvo, 23. 7. 2021). Spomladi 2018 je bilo v register vpisanih 30.000 pridelovalcev grozdja in vina, ki so obdelovali 16.500 ha vinogradov. V register so prijaviili 52,5 milijonov litrov vina letnika 2017. Omenjena količina vina predstavlja uradno evidentirano količino vina, ki se v Sloveniji pojavlja na trgu. Poleg te količine je po ocenah Ministrstva za kmetijstvo, gozdarstvo in prehrano še približno 30 % vina, ki ga pridelajo manjši pridelovalci in naj bi bil namenjen samooskrbi pridelovalcev in njihovih družinskih članov (GOV, Vinogradništvo in vinarstvo, 23. 7. 2021). Največ površin vinogradov se nahaja v Podravju (več kot 40 %), nato sledi Primorje (40 %) na koncu pa je tu še Posavje. Nekaj manj kot 0,15 % površin vinogradov leži izven vinorodnih dežel. Največji vinorodni okoliš leži na Štajerskem, najmanjši pa v Beli krajini. Med rdečimi sortami so prevladovale sorte refošk, merlot, žametovka in cabernet sauvignon, ki so bile zasajene na skoraj 75 % površin z rdečimi sortami. Bele sorte pa so bile zasajene na okoli 68 % skupne površine vinogradov. Na več kot polovici površin z belimi sortami so bile zasajene sorte Laški rizling, Chardonnay, Sauvignon in Rebula (Plešivičnik, 2021).

5.1 Priložnosti za vinski turizem

Za vino in turizem velja prepričanje, da sta že od vseskozi povezana, vendar temu ni tako. Vino in vinorodne dežele kot primarna turistična ponudba in doživetje so sodobni fenomen. Zaradi velike vinsko-vinogradniške pridelave v deželah t.i. "Novega sveta" je turizem postal sestavni del vinskega posla. V Evropi in Sloveniji se povezovanje vinogradništva, vinarstva in turizma razvija šele dobri dve desetletji (Kerma in Gačnik 2020, str. 105.). Pojem vinski turizem večina avtorjev opredeljuje kot obiskovanje vinogradov, vinarjev, vinskih festivalov in drugih tovrstnih prireditev, pri katerih je v ospredju degustacija vin in obiskovanje ter doživljanje posebnosti določene vinske regije (Hall in Macionis, 1998 v Hall idr., 2000, str. 3.). Obravnavamo ga lahko iz treh vidikov, in sicer:

- kot strategijo, s katero turistične destinacije razvijejo in tržijo z vinom povezane atrakcije,
- kot obliko potrošniškega obnašanja, kjer potrošniki, ki jih zanimajo vino in vinske regije, takšne destinacije tudi obiskujejo,
- kot možno sredstvo vinarjev in vinskih kleti, da izobražujejo potrošnike vina in jim direktno prodajajo proizvode (Wade idr., 2006)

Skupaj s kulinaricnim, lahko vinski turizem umestimo v širši spekter kulturnega turizma. Obe vrsti turizma sta velikokrat deležni skupne obravnave. Ponudniki v vinskem turizmu se morajo osredotočiti predvsem na tipe vinskih turistov, da jim omogočijo edinstveno turistično doživetje in pa predvsem, da sebi zagotovijo dobiček in lažje trženje proizvodov. Hall in Macionis (1998) sta opredelila tri tipe vinskih turistov, in sicer: ljubitelje vina, zainteresirane za vino in radovedne turiste. K obisku določenih vinskih krajev jih spodbujajo notranji dejavniki, kot so želja po druženju in socialnimi interakcijami, pridobivanje novega znanja, in zunanji dejavniki, kot so ogledi vinskih kleti in degustacije ter atraktivne aktivnosti vinorodnih regij. V nadaljevanju predstavljamo ključne dejavnike za razvoj vinsko-turistične destinacije:

Tabela 3: Ključni dejavniki za razvoj vinsko-turistične destinacije

(Kerma in Gačnik 2020, str. 107, po Getz in Brown, 2006, str. 156)

	Ključni dejavniki	Povezane značilnosti
Osrednji vinski proizvod	Obiskovalcem prijazne kleti, poučeno osebje, vinski festivali, znane vinske kleti.	Večje število odprtih vinskih kleti, znamenita vina, vodeni ogledi.
Kulturni proizvod	Edinstvena namestitev z regionalnim karakterjem, odlična lokalna kulinarika, tradicionalni vinski kraji.	Specializirane trgovine oz. tržnice s ponudbo lokalnih pridelkov.
Imidž destinacije	Atraktivna pokrajina, prijetno podnebje, zmerne cene namestitve, dostopnost informacij, dobro označene vinske poti.	Velika izbira aktivnosti, možnosti rekreacije na prostem.

Veliko vlogo pri razvoju in oblikovanju vinskega turizma predstavlja tudi terroir. Izraz, ki ga je težko prevesti iz originalne francoščine, ima več pomenov, v splošnem bi lahko rekli, da gre za identiteto vinske regije. Leta 2010 je Mednarodna organizacija za vinsko trto in vino sprejela uradno definicijo pojma: *Vinogradniški terroir je pojem, ki se nanaša na določeno območje, kjer se kolektivno znanje o vzajemnem delovanju med opredeljivim fizikalnim in biološkim okoljem ter uporabljenim vinogradniško-vinarsko prakso razvije, s tem pa zagotavlja različne značilnosti pridelkov in proizvodov, ki imajo svoje poreklo na tem območju. Terroir vključuje edinstvene značilnosti tal, topografije, podnebja, pokrajine in biodiverzitet (Uradni prevod SDVVŠ – Strokovnega društva vinogradnikov in vinarjev Slovenije)¹.*

Ko govorimo o vinskem turizmu, je terroir pomemben predvsem iz vidika oblikovanja in načrtovanja promocije vinske regije. Pri pojmu terroir velja prepričanje, da vsako vino vsebuje značilnosti določenega okolja, v katerem je dozorelo grozdje za pridelavo le-tega in da je terroir geografski koncept, ki daje vinu smisel prostora in ga dela drugačnega od vin, pridelanih v drugih vinskih regijah. Tako je smiselno sklepati, da se mora turistična ponudba navezovati tudi na druge edinstvene in specifične aspekte regije, ki bi dvigovali regionalno zavest.

¹ Definicija se v originalu glasi: »Vitivincultural 'terroir' is a concept which refers to an area in which collective knowledge of the interactions between the identifiable physical and biological environment and applied vitivincultural practices develops, providing distinctive characteristics for the products originating from this area. 'Terroir' includes specific soil, topography, climate, landscape characteristics and biodiversity features.« (OIV, 2010).

Vinska kultura se navezuje predvsem na način življenja z vinom, kar pomeni način, kako vino dojemamo v povezavi s kakovostnim življenjskim slogom. Če v vinu vidimo zgolj pijačo, ga tudi pijemo v neustreznih količinah in okoliščinah. To privede, da se zdrav napitek prelevi v škodljivo pijačo našemu zdravju. Medved (1997, str. 11) meni, da v deželah, kjer je kulinarčna kultura visoko razvita, pojmujejo vino kot njen neločljivi del. Kadar vino in hrana nastopata vzajemno, se spodbujata in nastopata kot celota, vrednost hrane in pijače pa se viša in na novo odkriva. V Sloveniji potrebujemo še nekaj časa, da se bo dosegla nova raven v razmišljanju in na praktičnem nivoju. Slovenci imamo ustaljene navade in predstave glede vina, ki jih bo zelo težko izkoreniniti. Iz preteklosti prihaja navada, da se vino pije doma za žejo, delno tudi za krepčilo ob težkem delu. Zaradi napredka je naporenega fizičnega dela vse manj, toda navada je marsikje ostala, zato se tudi veliko gostincev še vedno drži pravila, da mora gost imeti vedno poln kozarec in večina jih to počne, da prodajo čim več vina. Z razvojem dejavnosti se spreminja tudi gostilniška kultura, saj mora biti danes dober gostinec izobražen, razgledan in mora vedeti, kaj ponuja. Ne smemo pozabiti na slab vzorec, ki je v naši kulturi prisoten že dolgo časa, da kdor ne zmore spiti veliko, je manj vreden. Pojav le tega se občutno zmanjšuje, vendar še vedno ni popolnoma izkoreninjen. Pomembno vlogo ima tudi vinski list, ki je pomemben sestavni in neločljivi del kulinarčne filozofije. Danes je že marsikje ozaveščenost glede vinske kulture večja, kar pomeni, da bomo s tem skozi čas povzdignili slovenska vina na novo raven. Vino je kultura, saj je potrebno veliko znanja in modrosti za doseg dobrega in zdravega vina. Vino je kultura tudi zato, ker mora vino zoreti v snažnem in čistem prostoru, kjer se toči v sterilizirane steklenice in ustrezne kozarce, posledično pa se ga mora tudi spoštljivo uživati (Medved, 1997, str. 11). Pri tem velja poudariti, da se kultura pitja vina in potrošnja v času epidemije koronavirusa (SARS-CoV-2) bistveno spremenila.

5.1.1 Vinski turizem v Sloveniji

V Sloveniji imamo tri vinorodne dežele in devet vinorodnih okolišev: Vinorodna dežela Podravje (vinorodni okoliš Prekmurje, vinorodni okoliš Štajerska), Vinorodna dežela Posavje (vinorodni okoliš Bizeljsko Sremič, vinorodni okoliš Dolenjska, vinorodni okoliš Bela krajina) in Vinorodno deželo Primorje (vinorodni okoliš Goriška Brda, vinorodni okoliš Vipavska dolina, vinorodni okoliš Krasi, vinorodni okoliš Slovenska Istra).

V Sloveniji ima vinski turizem kratko zgodovino, začne se namreč v 90-ih letih prejšnjega stoletja s promocijo vinogradniško-vinarskega turizma s strani Turistične zveze Slovenije in Zveze društev vinogradnikov in vinarjev Slovenije. Razvoj podeželja in razvoj vinsko-turističnih cest kot del vinogradniško-vinskega turizma se je začel izvajati kot nacionalni projekt Ministrstva za kmetijstvo, gozdarstvo in prehrano RS, z zasnovo vinskih cest (Kerma in Gačnik, 2020, str. 116, po Bojnc in Korpar, 2005, str. 196). Med vinski turizem štejemo vinsko-turistične ceste, organizirane izlete in prenočišča v vinorodnih regijah, enološka doživetja in izobraževanja, vinske muzeje, vinske praznike in festivale, degustacije vin, obiske vinskih kleti, sejme in strokovne prireditve. Ponudniki teh storitev so povečini gostinci, turistične kmetije in vinske kleti. Priložnosti za vinski turizem je v Sloveniji veliko, a so premalo izkoriščene, tako da v Sloveniji obstajajo potenciali za nadaljnji razvoj turistične ponudbe, primerljive z drugimi evropskimi državami. Za razvoj vinskega turizma lahko izpostavimo naslednje najpomembnejše segmente:

- vinorodna dežela/destinacija/vinorodna kulturna krajina,
- vinogradi in vinske kleti (male in velike),
- vinska praznovanja, prireditve, festivali,
- vinske/vinsko-turistične ceste/poti
- vinski hoteli,
- vinoteke,
- vinski bari,
- vinski/vinogradniški/vinarski muzeji, galerije, zbirke, razstave. (Gačnik, 2019).

Kreiranje celostne razvojne vizije in strategije ter interdisciplinarno in medresorsko povezovanje ostajata velika neizkoriščena deviza za dvig mednarodne konkurenčnosti in prepoznavnosti vinskega turizma na Slovenskem (Gačnik, 2014). Slovenija ima pri razvoju in ohranjanju vinskega turizma veliko prednost, saj je naša kulturna krajina in kulturna dediščina zelo ohranjena, prav tako pa imamo več kot 2000 let staro kulturo vina. Z raziskovanjem možnosti nadaljnjega razvoja vinskega in gastronomskega turizma na kmetijah se trenutno ukvarjajo raziskovalci iz treh slovenskih univerz - Univerze v Mariboru, Univerze v Ljubljani in Univerze na Primorskem). S projektom VINGATUR želijo okrepiti prisotnost in povečati konkurenčnost turističnih kmetij v kontekstu razvoja vinskega in gastronomskega

turizma v Sloveniji. Projekt bo velik prispevek v znanosti in stroki, ki bo predlagal tudi konkretne strateške ukrepe za spodbujanje povezovanja, dviga kompetenc, izboljšanje trženja in valorizacije neizkoriščenih virov, kar bo tudi podlaga za sprejem ustreznih podpornih ukrepov. Pri tem ima veliko vlogo tudi projekt Turizem v zidanicah, ki se načrtovano razvija predvsem v Vinorodni deželi Posavje.

Ko pomislimo na vinski turizem, je navadno prva asociacija prav obisk vinskih kleti oziroma zidanic, ki so temeljno izhodišče, saj ponujajo dober vpogled v diagnostiko stanja vinskih turistov na terenu. Vendar pa v Sloveniji vinske kleti oziroma zidanice niso edine relevantne pri preučevanju izkušenj vinskih turistov. Zelo pomembno vlogo igra tudi nesnovna dediščina vinogradništva in vinarstva ter kultura vina, ki se kaže skozi naš vsakdanji in praznični način življenja ter kulturo, ki je zaznamovala naš odnos do vina. Pri tem velja poudariti različna praznovanja, kot so martinovanja, postavljanje klopotcev, trgatve ter z vinom in trto povezane svetnike (sv. Martin, sv. Urban, Štefanovo ...). Bogastvo vinske kulture se v Sloveniji odraža tudi v številu kulinarčnih prireditev in festivalov, kjer Gačnik (2014) izpostavlja deset različnih tipov, usmerjenih v predstavljanje kulture vina in vinskih posebnosti:

1. posamezno vinsko sorto (traminec, refošk ...),
2. poseben tip/zvrst vina (oranžna vina, penine ...),
3. izbrano vino in tradicionalne kmetijske izdelke/pridelke (pršut in teran ...),
4. vino v kontekstu kompleksnih gastronomskih prireditev (VinDel ...),
5. izbran kraj, vinski okoliš ali vinsko regijo (Salon Jeruzalem ...),
6. vino v povezavi z umetnostjo (Dnevi poezije in vina ...),
7. izobraževalne in družabne prireditve (študentski festival Vino ni voda na Ptuju ...),
8. rekreativne prireditve (nordijska hoja v Svečini ...),
9. izbore za vinske kraljice (nacionalne, regijske, lokalne, izbrane vinske sorte),
10. novodobne prireditve, ki temeljijo na dediščini vinogradništva in vinarstva.

Kot menita Kerma in Gačnik (2020, str. 118-124), je kot atrakcije za Slovenijo potrebno omeniti nacionalno himno-Zdravljico, ki časti vinsko trto in povezuje evropske narode, najstarejšo trto na svetu z več kot 450-letno zgodovino in največje vinsko kraljestvo, ki zajema nacionalno vinsko kraljico, regijske in lokalne vinske kraljice, vinske kraljice posameznih vinskih sort, vinsko princeso in dva vinska kralja posameznih vinskih sort. Med atrakcije oziroma fenomen lahko dodamo tudi

novodobne vinske fontane v Slovenski Istri, na Štajerskem in na Dolenjskem. Na Slovenskem imamo tudi nekaj ponudnikov butičnih nastanitev v obliki apartmajev ali sob, med drugim tudi na vinogradniških turističnih kmetijah. Pomembne so tudi vinske turistične ceste in poti, ki vplivajo na razvoj vinogradništva in vinarstva, in sicer kot dopolnilna dejavnost na manjših kmetijah. Posamezne vinorodne regije in kraji se s pomočjo vinsko-turističnih cest, ponekod tudi zidanic, promovirajo kot kulturno, gospodarsko in turistično zanimiv prostor, kar jim omogoča prodajo izdelkov in promocijo.

Razvoj vinskega turizma v Sloveniji zahteva celostni interdisciplinarni raziskovalni pristop ter medsektorsko povezovanje in sodelovanje. Le tako bomo lahko v prihodnje konkurirali na tem področju bolj razvitim evropskim državam. Pomembno je izpostavljanje domačih in avtohtonih vinskih sort ter usmeritev v trajnostno, lokalno, butično in ekološko vinogradništvo, vinarstvo in vinski turizem. Vinski turizem je potrebno povezati z drugimi vrstami turizma ter zagotoviti avtentičnost ponudbe, pri čemer je pomembna nadgradnja vinske arhitekture z identiteto lokalnega okolja in elementi sodobnosti. Razvoj turističnih dejavnosti pa mora biti usklajen in načrtovan skladno z uresničljivimi možnostmi in sprejemljivostjo fizičnih, gospodarskih in družbenih dejavnikov okolja, kakor meni Koščak (Pavlakovič idr., 2019), v katerem se odvija preobrazba oziroma uvajanje novih gospodarskih dejavnosti. Meni, da je pri vsem tem pomemben uravnotežen razvoj, saj le tako zagotavlja dolgoročno izkoriščanje in uporabo lokalnih danosti ter pri tem njihovo varovanje za prihodnje generacije, pri čemer je treba upoštevati mejne zmogljivosti v okolju, ki se kažejo v obliki fizično-ekoloških, demografskih in političnoekonomskih parametrov.

5.1.2 Vinski turizem v svetu

V **Franciji** se je vinski turizem začel intenzivno razvijati od leta 1980 naprej, ko so pridelovalci vin začeli svoje kleti odpirati za obiskovalce z namenom direktne prodaje vin (Hall idr., 2000). Francija se za razvoj vinskega turizma poslužuje dveh strategij: 1. velika vlaganja v turistično infrastrukturo, 2. povezovanje v različne mreže vinskih združenj in klubov kot je recimo Veliki vinski klub v dvorcu Languedoc (Petrovič in Pivac 2009, str. 169). Pri Franciji je vredno omeniti Vignoble et Découvertes, nacionalno vinsko turistično znamko oz. certifikat, ki zajema 36 vinorodnih območij in je zelo uspešen način označevanja in povezovanja med

vinskimi ponudniki. Najbolj znana vsem v Franciji pa je verjetno pokrajina Šampanija (Champagne), ki je s svojo tradicijo in unikatno pridelavo šampanjcev uvrščena tudi na UNESCO-v seznam svetovne kulturne dediščine. Na seznamu ji dela družbo tudi ena izmed vinskih prestolnic sveta- Bordeaux. Pohvalijo se lahko z izjemnim vinskim muzejem, ki je posvečen kulturi vina - La Cité du Vin (Kerma in Gačnik, 2020, str. 113).

V **Italiji** se vinski turizem razvija od leta 1993 in Italija je lahko drugim državam vzgled dobre prakse v razvoju vinskega turizma. Vinski turizem se razvija pod okriljem Movimento del Turismo del Vino (Italijansko vinsko-turistično gibanje), katerega glavni cilji so promocija vinske kulture; podpora turizmu v vinorodnih regijah, usposabljanje ponudnikov s turističnimi znanji in storitvami; krepitev ekonomskih in zaposlitvenih možnosti v regijah (Kerma in Gačnik, 2020, str. 115). V Italiji se skozi leto odvija tudi veliko prireditev na tematiko vina, najbolj znana je »Cantine Aperte« (Odprte kleti).

Na **Madžarskem** je verjetno najbolj poznana vinska regija Tokaj. Vino z istim imenom je nekdaj veljalo za zelo cenjeno na francoskih, ruskih in habsburških dvorih. Na Madžarskem je za vsako vinsko regijo posebej izdana knjižica, v kateri so navedeni podatki regije, od geografskih značilnosti, do turistične ponudbe. Velik poudarek pa dajejo tudi vinskim cestam, ki so primarni način vinskega turizma na Madžarskem.

Na **Hrvaškem** se vinski turizem dobro razvija šele od leta 2000 naprej, in sicer najbolj izrazito v Hrvaški Istri, kjer sezonske turiste privabljajo z mnogimi vinskimi cestami. Hrvaška Istra je bila leta 2015 po mnenju ameriške revije Wine Enthusiast izbrana kot ena najboljših desetih vinskih destinacij na svetu (Kerma, 2018, str. 49).

V sosednji **Avstriji** so po škandalu »Weinskandal« bili primorani postaviti nove temelje in sistem DAC (Districtus Austriae Controllatus), ki je ena najstrožjih zakonodaj zaščite porekla ter kakovosti vina na svetu. Avstrijski vinarji so zaradi potreb trga svojim vinom dodajali dietilenglikol, da bi jih naredili bolj bela in sladka. Škandal je čez noč porušil celotno vinsko industrijo države (povzeto po Kerma in Gačnik, 2020, str. 46). Vinski turizem z vidika promocije in trženja avstrijskih vin postaja vedno bolj prepoznaven in cenjen. Avstrija se v povezavi s turizmom danes

lahko pohvali z izjemnimi vinskimi cestami ter vinsko infrastrukturo, kjer letno zabeležijo približno dva milijona domačih in tujih vinsko-kulinaričnih turistov.

5.2 Priložnosti Slovenije kot Evropske gastronomske regije 2021

Sloveniji je skozi obdobje zadnjih let uspelo najti svoje mesto na svetovnem kulinaričnem zemljevidu ter postati ena od iskanih in železih eno-gastronomskih destinacij. V letošnjem letu, ko Slovenija predseduje Svetu Evropske unije pod sloganom »Skupaj. Odporna. Evropa.«, se ponaša z nazivom Evropska gastronomska regija 2021, saj prav eno-gastronomija postaja vse pomembnejši del slovenske turistične ponudbe. Naziv »Evropska gastronomska regija« podeljuje Mednarodni inštitut za gastronomijo, kulturo, umetnost in turizem z namenom, da bi povečali prepoznavnost pomena kulturnih in kulinaričnih posebnosti. S projektom »Evropska gastronomska regija« (Slovenska turistična organizacija, 2020) spodbujajo ustvarjalnost in inovativnost v kulinariki ter osveščajo o boljši prehrani, tako pa izboljšujejo standarde trajnostnega in družbeno odgovornega turizma (Colarič-Jakše, Pinterič v Raspar, 2021). Zelo pomembno je kombiniranje posameznih sort vin z jedmi v kompetentnosti vinskih svetovalcev - sommeljerjev, posebno izobraženih gostinskih delavcev, ki znajo svetovati, kako najbolje kombinirati posamezne jedi z vini. Sommelier mora dobro poznati vso zgodbo o vinu – kako je nastalo, kakšne so njegove lastnosti, zgodovinske, kulturne, biološke, sociološke in zdravstvene razsežnosti te pijače, veliko pa mora vedeti tudi o kulinariki. Osnovno pravilo, ki še vedno velja pa je - belo vino – lažje jedi (belo meso, ribe) in rdeče vino – prekajeno meso, divjačina (Sabadin, str. 8, 2009). Sabadin (2009, str. 8) meni, da se trendi spreminjajo, saj ljudje uživajo količinsko vedno manj, a bolj izbrano, kakovostno lokalno, ekološko in sezonsko hrano. Spreminjajo se tudi načini priprave hrane in iskanje same harmonije med jedjo in vinom, pri čemer različne kombinacije hrane in vina spodbujajo konzumenta, da spoznava senzorične sposobnosti vseh svojih čutil.



Slika 1: Logotip projekta Slovenija – Evropska gastronomska regija 2021

(Vir: Slovenska turistična organizacija)

Prav gotovo zaradi epidemije širših družbenih in globalnih razsežnosti odmevnost projekta Slovenija – Evropska gastronomska regija 2021 ovira nabor ukrepov v zvezi z zagotavljanjem javnega zdravja, tako da bo eno-gastronomska podoba Slovenije precej okrnjena in ne dovolj izkoriščena priložnost, toda perspektive in izzivi za razvoj bodo tudi po izteku tega obdobja in naziva. To dokazujejo zaposleni na področju gostinsko-turistične dejavnosti, ki so se s svojo inovativnostjo in iznajdljivostjo prilagodili novim razmeram. Namen vseobsežnega projekta je namreč prispevati k trajnostnemu razvoju eno-gastronomije, sodelovanju podeželskih in urbanih območij, lokalni samooskrbi, kakovosti življenja, pomena prehrane za zdravje ter zagotavljanju podpore kmetij in manjšim podjetjem, s tem pa tudi vsesplošnemu povezovanju, mreženju in ustvarjanju integralnih turističnih proizvodov, da se eno-gastronomija povzdigne na še višjo raven. Prav to pa so usmeritve na poti do kakovostne trajnostne gastronomije, predstavljene skozi koncept Zelene sheme slovenskega turizma, nadgrajene z znakom Slovenia Green Cuisine in ozaveščanjem z izobraževanji, informiranjem ter preverjanjem usidranosti znanja, običajev in navad.

6 Raziskava z razpravo - Vpliv epidemije koronavirusa (SARS-CoV-2) na konzumacijo vin in vinski turizem Slovenije kot Evropske gastronomske regije 2021

V sklopu priprave prispevka smo izvedli raziskavo med tremi vinogradniki iz različnih vinorodnih dežel. Vprašanja so se nanašala na aktualne problematike koronavirusne epidemije v povezavi z dejavnostjo vinogradništva. Prvi intervjuvanec prihaja iz vinorodne dežele Podravje, iz vinorodnega okoliša Prekmurje, drugi intervjuvanec iz vinorodne dežele Posavje, iz vinorodnega okoliša Dolenjska, tretji pa iz Vinorodne dežele Primorska, iz vinorodnega okoliša Vipavska dolina. V nadaljevanju predstavljamo rezultate raziskave:

- **Kako ste se soočili z epidemijo koronavirusa (SARS-CoV-2) na vaši vinogradniški kmetiji?**

Vinogradnik iz Vinorodne dežele Podravje: V začetni fazi nas je epidemija korona virusa vse zelo prizadejala. Leta 2020 smo imeli izpad dohodka 80 %. Kmetje, ki imamo kombinirane kmetije, smo izpadli pri pomoči s strani države, ker nismo mogli realno prikazati izgube na več področjih, kot recimo v našem primeru

na področju živinoreje in vinogradništva. Leta 2021 smo se za malenkost prebili iz največje krize, ker so se odprle turistične kmetije in gostilne. Manjše vinogradniške posesti smo bile na bistveno slabšem položaju, kot velike, kajti slednje so bile deležne dodatnih ukrepov, nas manjše pridelovalce pa so nekako spregledali. Posledično so se zmanjšali prihodki, tudi zaradi dodatnih stroškov. V našem primeru, in verjetno je tudi pri drugih tako, smo bili primorani zmanjšati vinogradniške površine, in sicer iz 16.000 trsov na 10.000.

Vinogradnik iz Vinorodne dežele Posavje: V času epidemije se je občutno zmanjšala prodaja vin, a letos so bile tudi zaradi pozebe zaloge manjše, s tem pa tudi izpad prihodka, iskali smo notranje rezerve, ustavile so se predvidene investicije. Tisti, ki imajo urejeno spletno prodajo vin in drugih proizvodov, so bili prav gotovo v prednosti, pa tudi tisti, ki imajo možnost, da vina in druge proizvode dostavijo odjemalcem na dom.

Vinogradnik iz Vinorodne dežele Primorska: Država je relativno hitro reagirala na ustvarjen zastoj gospodarstva v prvem valu in zagotovila neko obliko kritja izpada prihodka, pri čemer so jo bolje odnesli tisti, ki imajo prihodek zgolj iz ene dejavnosti, med tem ko kmetije, ki ustvarjajo prihodek iz različnih dejavnosti, niso mogli uveljaviti izpada iz vseh področij. Sami smo v tem pogledu zagotovili optimizacijo nadomestil in se deloma preusmerili v projekte, ki bodo povečali bodočo dodano vrednost kmetije, hkrati pa določene izpade pokrili z iskanjem novih odjemalcev, katerih država ni omejila v poslovanju. Deloma smo tudi preusmerili načrte pridelave vina in okrnili nabor sort na tiste, po katerih naši odjemalci bolj povprašujejo.

- **Kako epidemija koronavirusa (SARS-CoV-2) vpliva na promocijo in trženje vin?**

Vinogradnik iz Vinorodne dežele Podravje: Promocija se je dejansko povečala, ker smo bili primorani iskati nove tržne niše, saj zaradi epidemije po ustaljenih konceptih ni več šlo. To je bila mogoče edina pozitivna usmeritev celotne situacije. Iskali smo druge možnosti prodaje, vendar pa se te ne morejo primerjati s prakso pred epidemijo. Stare prodajne poti so se pretrgale, ker so bile gostilne in drugi turistični objekti zaprti, posledično pa smo ostali brez večine kupcev oziroma odjemalcev.

Vinogradnik iz Vinorodne dežele Posavje: V času epidemije se je promocija vin in s tem tudi trženje nekoliko ustavilo. Po drugi strani pa ugotavljamo, da so se ljudje, ki so imeli malo več časa, pričeli nekoliko bolj zanimati za vina. Ni jim vseeno, kakšno vino konzumirajo in kakšna je njegova kakovost. V tem času so se v marsikaterih gospodinjstvih osredotočali na pripravo jedi v krogu družine in poleg inovativnih kulinarčnih krožnikov iskali tudi ustrezne okuse vin ter to objavljali na družbenih omrežjih.

Vinogradnik iz Vinorodne dežele Primorska: Učinki pandemije na promocijo so precej odvisni od primarnih trgov. Vinarji, ki prodajajo svoja vina predvsem v gostinstvu, so bili prisiljeni iskati nove odjemalce in so s tega vidika morali povečati promocijo. Vinarji, ki so svoja vina prodajali trgovskim verigam, so bili pred tem obvarovani, tisti, ki pa vina prodajajo pretežno končnim odjemalcem (pri čemer je vinarstvo za njih najpogosteje zgolj ena izmed dejavnosti), v tem pogledu niso imeli večjih težav, razen procesa logistike. Pri mednarodnem prometu je prišlo do nekih zastojev, ki pa so države zaradi lastnih ekonomskih in proračunskih interesov sanirale do smiselnega nivoja že po prvem valu epidemije.

– **Kaj epidemija koronavirusa (SARS-CoV-2) pomeni za vinski turizem?**

Vinogradnik iz Vinorodne dežele Podravje: Kot za vse oblike turizma je obdobje epidemije prineslo zmanjšanje porabe vin, konzumacije vin in negativni vpliv na vinski turizem. Do sredine leta 2020 turistov zaradi omejitev za zaježitev epidemije skorajda ni bilo. Prepovedana so bila druženja, gostinski obrati so bili zaprti, v veljavi je bilo veliko ukrepov, ki so zelo omejevali turizem. Čez čas se je stanje nekoliko izboljšalo, predvsem zaradi obiska slovenskih turistov. Trenutno pa so problemi spet glede PCT pogojev, saj je za vstop in obisk skorajda vseh ustanov in dejavnosti potreben PCT, kar spet za sabo potegne nemalo problemov glede organizacije in samega obiska turistov.

Vinogradnik iz Vinorodne dežele Posavje: Vinski turizem spada med manj množične oblike turizma in v času epidemije so se manj množične oblike turizma izkazale za bolj odporne kot množične. Ljudje so iskali butičnost v ponudbi, družinske turistične točke in neobljudene destinacije. Za vinski turizem bi epidemija lahko predstavljala priložnost.

Vinogradnik iz Vinorodne dežele Primorska: Vinski turizem je turizem in zanj veljajo iste zakonitosti, kot za preostalo turistično dejavnost v posamezni državi. Če je zaprto ali omejeno, potem je zaprto in omejeno. Ključno vprašanje je, kako je ponudnik dejavnosti vinskega turizma (ki je, roko na srce, redko samo vinar) ocenil situacijo. Dolgoročno lahko epidemija zmanjša obseg pridelave vina za domače potrošnike, saj se vinarji, ki se širijo, usmerjajo predvsem na tuje trge, med tem ko preostali zmanjšujejo obseg vinogradov in se preusmerjajo v druge dejavnosti ali pa se oddaljujejo od kmetijstva v celoti.

- **Ali menite, da se je v tem obdobju spremenila kultura pitja vina in navade potrošnikov oziroma gostov?**

Vinogradnik iz Vinorodne dežele Podravje: Mislim, da ne bistveno, kultura pitja vina je prisotna, gostje so mogoče malo bolj previdni glede zagotavljanja varnosti svojega zdravja, sicer pa v navadah in kulturi pitja vina ne vidim velikih sprememb.

Vinogradnik iz Vinorodne dežele Posavje: Vsaka izredna situacija spremeni obnašanje ljudi, v kakšno smer in kaj pa pokaže čas. V obdobju epidemije se je zmanjšalo druženje med ljudmi, zaustavile ali okrnile so se nekatere aktivnosti, mnoge bo celo težko obuditi. Ob takšnih prelomnicah se družba nekoliko spremeni, na ponudnikih pa je, da se tem novim socialnim danostim prilagodimo. Prav gotovo pa to ni trenutni proces, pač pa se bodo posledice tega še nekaj časa dogajale in čutile.

Vinogradnik iz Vinorodne dežele Primorska: Večjih razlik na tem področju ni, bil je nek negotov čas, ki se je zaradi zaprtja turizma poznal tudi pri načinu konzumacije alkohola, kar pa ni toliko vezano na pivske vzorce, kot na vzorce zapiranja družbe.

- **V letošnjem letu je Slovenija nosilka naziva Evropska gastronomska regija, kjer imajo posebno mesto tudi vina, predvsem v sožitju s kulinariko. Kako menite, da epidemija koronavirusa (SARS-CoV-2) vpliva na ta projekt?**

Vinogradnik iz Vinorodne dežele Podravje: Tukaj bi spet izpostavil ukrepe za zaježitev epidemije. Sam projekt v času epidemije ne more na polno zaživeti. Vseeno se soočamo z omejitvami, ki negativno vplivajo na vse dejavnosti, vpete v ta projekt. Država že od začetka preostro reagira na gostinstvo in turizem, posledice se bodo poznale še dolgo. Projekt Slovenija - Evropska gastronomska regija 2021 je odlična

priložnost za Slovenijo, da se dokaže tudi v globalnem pomenu. Če se dotaknem vina, kot osrednjega proizvoda, imamo bistveno premajhne cene glede na kakovost. Za vrhunske dosežke smo preslabo povezani z drugimi, nikakor ne moremo konkurirati z večjimi multinacionalkami, pa čeprav imamo odlične naravne danosti.

Vinogradnik iz Vinorodne dežele Posavje: Pri gastronomskih zadevah gre za doživetja, teh družbenih je v času epidemije manj, so pa bila bolj prisotna v družinskih okoljih. Po drugi strani pa je projekt Evropska gastronomska regija velika priložnost, ki jo je treba izkoristiti.

Vinogradnik iz Vinorodne dežele Primorska: Epidemija ni bistveno vplivala na ta projekt, saj se tovrstni nacionalni projekti zgolj minimalno prebijejo do individualnih razvojnih prioritet posameznih nosilcev kmetijske in prehranske dejavnosti. Govor o takšni ali drugačni vlogi vina in kulinarike je pretežno farizejski, saj smo razprti med uvoženo ceneno hrano ter bistveno bolj odmevnimi kampanjami države, ki namesto kulture pitja promovirajo abstinenco. Edini vpliv v tem smislu je, da je zaprtje turistične industrije izničilo napore za promocijo tradicionalne kulinarike.

- **Kako vidite prihodnost na področju konzumacije vin in vinskega turizma v času epidemije in po njej?**

Vinogradnik iz Vinorodne dežele Podravje: Glede na pritiske politike in lobije proti alkoholu se tudi konzumacija vina bistveno zmanjšuje. Če se epidemija čudežno konča, bo stanje šlo sčasoma na boljše. Vendar pa moramo biti pri reševanju posledic enotni. Veliko je odvisno tudi od države in ne nas samih, kajti investicije za blaženje posledic so velike in potrebno se je osredotočiti tako na velike, kot tudi manjše vinogradniške ponudnike. Tukaj bi omenil tudi višjo stopnjo mehanizacije, ki ima velike prednosti, na nekaterih področjih, kot je recimo vinski turizem, pa se kažejo tudi slabosti. Z mehanizacijo se izgublja pristen človeški stik, ki pa je v turističnih panogah najbolj pomemben za pridobivanje gostov. Za našo kmetijo lahko povem, da bomo sčasoma opuščali vinogradništvo in se primarno usmerili v prašičerejo. Odločitev je bilo težko sprejeti, vendar je to za nas nekako najbolj smiselno.

Vinogradnik iz Vinorodne dežele Posavje: Konzumacija vin bo v prihodnje usmerjena v nizko porabo vin s poudarkom na kakovosti vin v sožitju s kulinariko. Tudi v Sloveniji dajemo vse več poudarka področju enologije in gastronomije, vinom in kulinariki – sožitju vin in kulinarike. Po epidemiji lahko predvsem manjše, družinske oblike vinskega turizma, pridobijo na dodani vrednosti, tudi v povezavi z drugimi oblikami turizma.

Vinogradnik iz Vinorodne dežele Primorska: Glede na splošne usmeritve družbe in države je čas vinogradništva minil. Ponudba uvoženega poceni vina odmika povprečnega potrošnika od slovenskega vinarja. Na drugi strani pa je ekonomsko neučinkovito pridelovati visoko kakovostna vina za pretirano ceno v družbi, katere namen ni okušanje, temveč opijanje. Čeprav se postavljajo novi vinogradi je mogoče pričakovati, da se bo mnogo vinarjev, ki so usmerjeni predvsem v slovenskega kupca, dejavnosti odpovedalo, nekaj jih bo končalo po naravni poti, drugi se bodo preusmerili v druge dejavnosti. Glede kulture pitja po pandemiji bo Slovenija še vedno stala na dveh bregovih - med državnim omejevanjem porabe alkohola in družbenim opijanjem, z nekaterimi izjemami, ki bodo promovirale odgovorno pitje in vinsko kulturo. Je pa seveda v zavoženi družbi težko pričakovati hitre spremembe na področju prehranske kulture, ne glede na to ali govorimo o vinu ali o pomenu domače hrane.

S študenti na Visoki šoli za upravljanje podeželja GRM Novo mesto in Višji strokovni šoli Grma Novo mesto – centra biotehnike in turizma smo že v letu 2020 izvedli raziskavo, s katero smo želeli ugotoviti, kako so anketiranci ozaveščeni oziroma seznanjeni, da bo Slovenija leta 2021 nosilka naziva *Evropska gastronomska regija*, saj ima pri tej nominaciji veliko vlogo ravno eno-gastronomska ponudba in vsebine, ki se manifestirajo v tem nazivu za krepitev dejavnosti. Na anketo je odgovorilo 228 anketirancev, od tega je bilo 154 - 68 % žensk in 67 - 29 % moških, 7,3 % - 7 oseb pa se ni hotelo opredeliti. Največ 38 % - 87 anketirancev v starostni skupini med 31. in 50. letom, med 21. in 30. letom je bilo na drugem mestu po številu odgovorov 26 % - 61 anketirancev, nad 51. letom starosti jih je na vprašanje odgovorilo 23 % - 52 oseb in le 12 % - 28 oseb je bilo starih med 15 in 20 let.



Graf 2: Ali poznamo dejstvo »Slovenija - evropska gastronomska regija 2021

Iz Grafa 2 je razvidno, da 148 oseb - 65 % ni vedelo, da bo Slovenija leta 2021 nosilka naziva Evropska gastronomska regija, le 78 oseb - 35 % jih je bilo s tem seznanjenih. Anketiranci navajajo, da si Slovenija z nazivom Evropska gastronomska regija 2021 prizadeva doseči boljšo kakovost življenja v regiji s poudarjanjem edinstvene kulinarične in vinske kulture, izobraževanja za zdravo in sonaravno življenje ter spodbujanjem inovativnosti v eno-gastronomiji, kar bo še tesneje medsektorsko spodbudilo k soustvarjanju, povezovanju in mreženju področja prehranske politike, gastronomije, gostinstva, turizma, vinarstva, kmetijstva, izobraževanja, zdravja in trajnostnih načel v kulturnem, socialnem, doživljajskem, podnebnem, okoljskem in ekonomskem smislu. Gostinsko-turistični delavci menijo, da gostje v Sloveniji še posebej cenijo neokrnjeno naravo, doživetja, zgodbe, lokalnost, avtentičnost, butičnost, gostoljubnost in edinstvene izkušnje, kar vse slovenski prostor ponuja. Navajajo tudi, da gostje v Sloveniji pogosto izpostavljajo tudi kakovosten življenjski slog, individualnost v pristopu in skrben odnos do narave, saj se Slovenija vse bolj uveljavlja na globalnem zemljevidu kot odličen eno-gastronomski cilj.

Epidemija koronavirusa (SARS-CoV-2) je v mnogih pogledih prelomni dogodek, ki ga je mogoče enačiti z učinkom epidemije španske gripe, ki ima še komaj kakšnega pričevalca. Drugi takšen prelomni dogodek, predvsem z vidika Slovenije, je druga svetovna vojna. Od takrat dalje pa država in družba ni doživela tako intenzivne, omejujoče in dolgotrajne preizkušnje. Zaradi tega je sorazmerno točno trditi, da je

za pretežni del populacije to kolektivna travma, ki bo puščala dolgoročne posledice, ne glede na osebno vključenost. Enake posledice veljajo tudi za turizem, vinarstvo in druge gospodarske panoge - dolgoročne, travmatične in nepredvidljive. V okviru Slovenije kot evropske gastronomske regije 2021 je pandemija v veliki meri izničila vpliv samega projekta, ker mu je na začetku odvzela pet mesecev delovanja ter ga po »relativno normalnih« štirih poletnih mesecih obsodila na životarjenje v omejeni odprtosti družbe, ki se lahko v novembru in decembru 2021 ponovno dodatno zapre. Konzumacija vina je z vsemi omejitvami že pred pandemijo podvržena logiki konzumacije alkohola in vsaj moralno kriminalizirana, kot državni odgovor na družbeno nespoštljiv odnos do alkoholnih pijač. Proti-epidemijsko zapiranje družbe je konzumacijo vina še dodatno potisnilo v ilegalno - včasih dobesedno, s popolno prepovedjo strežbe alkoholnih pijač, včasih zgolj posredno, z omejevanjem drugih dejavnosti, katere spremlja tudi konzumacija vin. Podobne trende lahko zaznamo tudi pri hrani, ko je celo za tisti del družbe, ki si lahko obrok zunaj finančno privošči, slednje postalo nedosegljivo. Posledično smo bili dve leti priča ne zgolj omejevanju, temveč demontaži tako turizma kot tudi tradicionalne gastronomije. To se je pokazalo že s krizo na področju dostopnosti ustreznih turističnih delavcev, ki se je po maju 2020 poglobila, na drugi strani pa z močnim družbenim sporočilom na nekatere državne omejitve (izpolnjevanje pogoja PCT- preboleli, cepljeni, testirani, uveljavljenega dne 15. 9. 2021), na katere je družba odgovorila z delno zaustavitvijo turističnega sektorja, do časa, ko ni prišlo do tihega konsenza med turistično politiko in potrošniki, da je preverjanje pogoja PCT domena pristojnih služb, kar je deloma sprostilo odnos, pa čeprav za ceno potencialnega neizpolnjevanja predpisov.

V smislu Slovenije kot Evropske gastronomske regije 2021 lahko sicer nanizamo nekatere dosežke in presežke elitne gastronomije, ki Slovenijo razume pretežno kot geografsko lokacijo, čeprav je pomemben faktor slovenske turistične promocije. V smislu splošne gastronomske slike pa je leto 2021 prej zaton slovenskega gastronomskega turizma, ki ga zaznamuje upad kakovosti in raznolikosti ponudbe, v kombinaciji z dvigom cen.

7 Zaključek

Slovenija ima dolgo vinsko in vinarsko tradicijo, ki je utemeljena na geografski legi države. Slednja omogoča pestrost vinskih sort, katerih predelava v vino ima potencial za doseganje visoke kakovosti in odličnosti pridelanih vin. Na tej osnovi ima Slovenija dobre predispozicije za nadaljnji razvoj vinskega turizma ter prepoznavno podobo kot svetovne vinske in s tem tudi turistične destinacije. Enako velja tudi za prehranski preplet, ki združuje mediteransko, kontinentalno, alpsko in balkansko kuhinjo, pri čemer so bili vsi ti elementi prepoznani v nazivu Slovenije kot evropske gastronomske regije v letu 2021. Ta laskavi pristavek je prišel v času pandemije širših družbenih in globalnih razsežnosti, ki ga ni nihče predvideval, čeprav so že dlje časa prihajala globalna opozorila, da bo do tega prišlo. Pandemija koronavirusa (SARS-CoV-2) v letu 2020, ki je bila prisotna tudi v letu 2021 in bo nedvomno tudi v letu 2022, je, ironično, Sloveniji odvzela sijaj prej omenjenega naziva. Država je v interesu varovanja javnega zdravja najprej, in najbolj tesno, zaprla turistične dejavnosti, med katerimi je tudi vinski turizem, kar je v nadaljevanju vplivalo tudi na spremenjene in poenostavljene prehranske vzorce, ki eno-gastronomiji odvzemajo položaj spretnosti in umetnosti ter jo vračajo na enostavni nivo prehranskega vzorca prebivalcev, živečih na določenem območju. V tem pogledu lahko ne zgolj pritrdimo tezi, da je pandemija koronavirusa (SARS-CoV-2) negativno vplivala na vinski turizem ter okrnila pomen naziva Slovenije kot evropske gastronomske regije, temveč lahko dodamo tudi, da je prišlo najverjetneje do globljih strukturnih premikov, ki bodo v bodoče imeli dodaten negativen vpliv na razvoj Slovenije kot svetovne vinske regije. Nadaljnja raziskovalna pozornost bi morala biti tako usmerjena v bolj sistematično spremljanje slovenskega vinogradništva in vinskega turizma, ne zgolj z vidika tehničnih parametrov, količine in kakovosti, temveč tudi z vidika zaznavanja odnosa na terenu do stanja v vinogradništvu in vinarstvu oziroma kot osnove, ki bi služila približevanju razvojnih priložnosti kmetijstvu. Pa ne zgolj v tehnološkem, temveč tudi v družbenem smislu, saj pandemija nakazuje potrebe po družbeni redefiniciji odnosa do kmetijstva in prehranske samozadostnosti.

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SPODBUDE IN NALOŽBE V PRIMARNEM PROIZVODNEM SEKTORJU MED GLOBALNO PANDEMIJO

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Povzetek Naložbe so osnova za rast in razvoj primarne proizvodnje ter izboljšanje njene konkurenčnosti na domačem in mednarodnem trgu. S seboj pa prinašajo negotovost in visoko stopnjo tveganja, saj od trenutka naložbe do učinka njene donosnosti običajno mine precej časa. Spodbude države so izjemno pomembne tudi za razvoj lokalne primarne proizvodnje in kmetijstva. Trenutne razmere, ki jih povzročata globalna pandemija covid-19, so močno vplivale na razvoj primarne proizvodnje in kmetijstva kot njenega pomembnega dela. Nesporno je, da bodo negativni učinki pandemije ogromni in bodo trajali dlje časa, zato je potrebna ustrezna analiza investicijskih projektov, strategij in spodbud na osnovi ocene razvojnih možnosti primarne proizvodnje. Na uspešno uresničitev naložb vplivajo številni dejavniki, tako notranji kot zunanji. Na mnoge gospodarske subjekte ni mogoče vplivati, v dinamičnem gospodarskem okolju pa se pojavljajo številni drugi, nepredvideni dejavniki, ki lahko odločilno vplivajo na prihodnje poslovanje in preživetje primarne proizvodnje v okviru kmetijske proizvodnje. Kot nadomestna metoda izboljšanja poslovanja gospodarskih subjektov pomemben položaj v sodobni družbi zavzema krožno gospodarstvo. Vsekakor lahko slednje uporabimo kot pozitiven ekonomski model za oživitev primarne proizvodnje in odpravo posledic krize zaradi pandemije covid-19.

Ključne besede:

naložbe,
spodbude,
pandemija,
kmetijske
zadruge,
krožno
gospodarstvo



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INCENTIVES AND INVESTMENTS IN THE PRIMARY PRODUCTION SECTOR IN THE PERIOD OF GLOBAL PANDEMIC

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Abstract Investments are the basis for the growth and development of primary production and the improvement of its competitiveness in the local and international market. Investments bring with them uncertainty and a high degree of risk, because from the moment of investment to the effect of return on investment, it is usually a long period of time. Incentives from the state are also of great importance for the development of local primary production and agriculture. The current situation that caused the global pandemic of the covid-19 virus has significantly affected the development of primary production and agriculture as a significant part of it. It is indisputable that the negative effects of the pandemic will be huge and will last for a longer period of time. Therefore, an appropriate analysis of investment projects, strategies and incentives based on the assessment of the development possibilities of primary production is necessary. Numerous factors, internal and external, have an impact on the successful realization of investments. It cannot affect many private entities, and in a dynamic economic environment, many other, unforeseen factors appear, which can determine the future business and the survival of primary production within agricultural production.

Keywords:
investments,
incentives,
pandemic,
agricultural
cooperatives,
circular
economy

1 Uvod

Od izbruha pandemije covida-19, torej od konca leta 2019 do sredine marca 2021, je umrlo več kot 2,7 milijona ljudi, svetovno gospodarstvo pa se je v letu 2020 skrčilo za neverjetnih 4,3 %. Milijon delovnih mest je že izgubljenih, če se bo kriza nadaljevala, pa bo predvidoma 130 milijonov ljudi živelo v skrajni revščini. Gre za grozljive številke, ki kažejo na ogromne izzive in človeško trpljenje, ki jih povzroča pandemija, težko pa je napovedati konec pandemije in ponuditi zanesljive modele gospodarskega razvoja po njej. (Janković in sod., 2021) Pandemija je zaznamovala in pustila močne sledi v globalnem gospodarstvu in na vseh področjih človeškega delovanja. V Srbiji je najbolj vplivala na področja turizma in gostinstva, uvoza surovin in logistike ter povečala povpraševanje po domačih izdelkih in osnovnih živilih.

Sposobnost podjetja, kmetijske zadruge ali kmetije, da na osnovi naložb v obstoječih razmerah dinamičnega gospodarskega okolja zagotavlja svojo rast in razvoj, je odvisna od obstoječega tržnega položaja, finančne moči, kadrovske strukture in sprejetega koncepta upravljanja. Prizadevanja gospodarskih subjektov za izboljšanje položaja se kažejo v vztrajnosti, da pod vplivom različnih dejavnikov izkoristijo izzive prihodnjih sprememb. Zato je bistvo naložbenega načrtovanja raziskovanje sprememb zunanjih in notranjih dejavnikov, ki na koncu vplivajo na proces z naložbami ali spodbudami.

Vsaki fazi življenjskega cikla gospodarskega subjekta, tudi če gre za kmetijske zadruge ali kmetije, ki se ukvarjajo s primarno proizvodnjo, ustreza neka naložbena strategija. Analiza razvojnih možnosti naj bo osnova za izbiro ustrezne naložbene strategije. To je potrebno, ker številni dejavniki, notranji in zunanji, omejujejo naložbene procese. Naložbeni proces je večplastna poslovna dejavnost, ki upošteva dolgoročni značaj naložbenih projektov ter časovno razliko med naložbami in naložbenimi učinki. Prav tako so spremljajoči dejavniki vsakega naložbenega projekta velika soodvisnost med naložbami in financiranjem ter tveganje in negotovost glede njihove izvedbe, ki je v globalni pandemiji izjemno izrazita.

Za načrtovanje naložb in spodbud lahko uporabimo krožno gospodarstvo kot pozitiven ekonomski model za oživetev primarne proizvodnje in odpravo posledic krize zaradi pandemije covida-19.

2 Kmetijske zadruge

Sodobno dogajanje na trgu vpliva na razvoj delovanja posameznikov prek zadrug. Te nastajajo z združevanjem posameznikov in jih v najširšem smislu razumemo kot sredstvo za zadovoljevanje njihovih individualnih potreb. (Cvijanović in sod., 2016) V zasebnem sektorju se dejavnosti izvajajo prek gospodarskih subjektov, katerih osnovni cilj je ustvarjanje čim večjega dobička, medtem ko je v združenem sektorju gospodarski subjekt v osnovni vlogi izvajanja dejavnosti. Pojem združnega premoženja je opredeljen kot združevanje zasebnega in osebnega premoženja posameznikov za skupni cilj. V širšem smislu je zadruga samostojen gospodarski subjekt, ki nastane z združevanjem izključno fizičnih oseb za izboljšanje njihovih gospodarskih in drugih interesov, njihov cilj pa ni pridobivanje dobička, temveč zadovoljevanje potreb njenih članov. (Knežević, 2007)

Po podatkih Zadružnega biroja Srbije je bilo leta 2017 registriranih 2600 zadrug vseh vrst, od tega 1548 kmetijskih. Po podatkih Agencije za privredne registre Republike Srbije je kot aktivnih registriranih 1568 kmetijskih zadrug, od tega jih približno 1100 oddaja finančna poročila.

	2019	2020	Indeks 2019=100%
Bruto vrednost	5.559	5.815	104,61
Vrednost biljne proizvodnje	3.681	3.937	106,95
Ratarstvo i povrtarstvo	2.975	3.181	101,67
Žita	1.647	1.831	106,92
Industrijsko bilje	595	623	104,71
Povrće	476	470	98,74
Krmno bilje	257	257	100,00
Voćarstvo	642	693	107,94
Vinogradarstvo	64	63	98,44
Stočarstvo	1.878	1.878	101,08
Govedarstvo	770	770	101,45
Svinjarstvo	641	641	102,23
Ovčarstvo	155	155	96,88
Živinarstvo	289	289	103,96
Pčelarstvo	23	23	67,65
Vrednost ječma, ovsa, 50% kukuruza i krmnog bilja	845	959	
Neto vrednost	4.620	4.856	105,11

Slika 1: Rezultati realizirane bruto in neto vrednosti realizirane kmetijske proizvodnje z dinamiko rasti za leto 2020

(Vir: Izračunano na osnovi baze podatkov SRS o realizirani kmetijski proizvodnji. Avtor: Vojislav Stanković)

Če sklepamo po podatkih na sliki, je trg kmetijskih pridelkov v neposredni povezavi s povpraševanjem zaradi posledic pandemije; v nekaterih državah so se cene kmetijskih pridelkov zvišale. Srbija je v letu 2020 zabeležila skupno povečanje bruto in neto vrednosti realizirane kmetijske proizvodnje glede na leto 2019, torej leto pred začetkom pandemije.

Čeprav za zadruge in kmetijsko gospodarstvo v primerjavi z drugimi gospodarskimi subjekti dobiček ni končni cilj, ima vsak član zadrug predvsem cilj povečanja lastnega dobička in naložb, zato je zamisel posameznih članov zadruge vsekakor mogoče povezati z naložbeno in razvojno politiko gospodarskih subjektov ene družbe.

3 Naložbe in spodbude v primarnem proizvodnem sektorju

3.1 Pomen naložb za razvojno politiko gospodarskih subjektov

Naložbe pomenijo izpolnitev razvojne politike gospodarskih subjektov, zato je treba biti osredotočen na resnične cilje in zagotoviti njihovo izvajanje. Naložbe so pomemben dejavnik razvoja podjetij, gospodarstva in družbe kot celote. Rast podjetij je pogosto neposredno odvisna od obsega naložb in njihove učinkovitosti. Naložbena vlaganja so večplasten in dinamičen proces ter niso učinkovita brez usmerjanja k opredeljenemu cilju. Določanje naložbene strategije podjetjem ponuja načine za doseganje dolgoročnih ciljev rasti in razvoja.

Predmet naložbe je lahko različen. Naložbeni projekt bi moral omogočati sprejemanje premišljene naložbene odločitve ter je sredstvo za uresničitev strategije rasti in poslovnega načrta. Naložbeni projekt vključuje in določa različne analize in dejavnosti od nastanka naložbene zamisli do njene uresničitve. (Đuričin in Lončar, 2007)

Namen naložb je doseči zelene učinke, ki so lahko različni glede na vrsto naložbe in cilje, ki jih je treba doseči. Ocenjevanje naložbenih priložnosti je običajno drago in zahteva velika finančna sredstva za zbiranje informacij in njihovo analizo. Uspešni naložbeni projekti so odvisni tudi od ustvarjalnosti, navdušenja, izkušenj in znanja menedžerjev, ki so vključeni in odgovorni za opredeljevanje, izvajanje in analizo teh projektov. (Pike in Dobins, 1987)

Glede na vrsto naložbene odločitve so naslednje značilnosti skupne in uporabne za vsa podjetja (Joksimović-Žarkić in sod., 2013):

- dolgoročnost naložbenih projektov,
- časovni zamik med naložbami in naložbenimi učinki,
- soodvisnost med naložbami in financiranjem,
- tveganje in negotovost.

3.2 Spodbujevalni dejavniki za naložbe

Okolje je edinstvena, dinamična in večplastna sila, s katero se podjetje sooča prek različnih izzivov, priložnosti in groženj. Okoljski dejavniki, ki spodbujajo naložbeni proces, so lahko ukrepi skupnosti, zakonodaja, razvoj znanosti in tehnologije, razvoj prodajnih in nabavnih trgov, položaj podjetja v panogi glede na konkurenco, faza življenjskega cikla industrije, v kateri je družba trenutno, ter stopnja razvitosti finančnih trgov in njegovih instrumentov. (Todorović in sod., 1997) Omenjenih dejavnikov ni mogoče nadzorovati, vendar jih je treba pravočasno predvideti in uporabiti z vidika vpliva na prihodnje poslovanje. Zato je pomembno oceniti njihove hitrost nastanka, gotovost nastanka in trajanje, saj je na osnovi tega mogoče načrtovati odziv gospodarskega subjekta v naslednjem načrtovalnem obdobju.

Socialne skupnosti in zakonodaja s spodbujevalnimi ukrepi (kot so nižje davčne stopnje ali druge spodbude) lahko vplivajo na povečanje naložb. Za srbsko gospodarstvo lahko povemo, da so bili na začetku aprila 2020 predstavljeni štirje sklopi gospodarskih ukrepov, katerih glavni cilj je bil ublažiti negativne posledice pandemije covid-19. Vključeni ukrepi:

- ukrepi davčne politike: odlog plačila davkov in prispevkov od plač ter nadomestilo plač, odlog plačila akontacije davka od dobička in neposredne finančne spodbude;
- neposredna pomoč podjetjem za zaposlene: neposredna pomoč podjetnikom, malim in srednje velikim podjetjem ter pavšalnim davkoplačevalcem z izplačilom minimalnih plač za zaposlene;

- ukrepi za likvidnost gospodarstva: podpora gospodarstvu prek Sklada za razvoj Republike Srbije in jamstvena shema za podporo gospodarstvu prek bank;
- drugi ukrepi: izplačilo gotovine vsem polnoletnim državljanom v višini 100 evrov in moratorij na posojila bankam.

Dosežena stopnja gospodarske razvitosti in odprtost gospodarstva do drugih držav lahko pomembno spodbudita tudi naložbe. Vpliv znanosti in tehnologije je glede ustvarjanja ugodnih naložbenih priložnosti najhitrejši. Tehnološki razvoj ustvarja priložnosti za uvajanje novih naložbenih metod z možnostjo ustvarjanja novih trgov in spreminjanja konkurenčnega položaja. Stabilnost finančnih trgov je dejavnik, ki spodbuja naložbeni proces, saj njegovo delovanje ustvarja priložnost za pregledno in hitro zaznavanje ter primerjavo donosnosti kapitala, vloženega v podjetja v različnih gospodarskih sektorjih, s čimer delujemo v smeri boljše postavitve finančnih in resničnih virov v domačem gospodarstvu.

Moč relativnega konkurenčnega položaja podjetja določajo naslednji dejavniki:

- tržni delež podjetja in edinstvenost;
- moč in
- število značilnih kompetenc znotraj podjetja.

Tržni delež podjetja je v neposredni povezavi z donosnostjo naložbe gospodarskega subjekta. Večji kot je tržni delež podjetja, močnejši je njegov konkurenčni položaj in večja je donosnost prihodnjih naložb. Velik tržni delež podjetjem zagotavlja koristi, ki temeljijo na širini ekonomije, kot je znižanje stroškov, na svetovni in nacionalni ravni. Pomemben dejavnik, ki vpliva na naložbeno privlačnost, je rezultat, ki je predstavljen skozi faze življenjskega cikla panoge ali industrije. Vsaka faza ima različne posledice za naložbena sredstva, da bi se dosegla konkurenčna prednost.

Avtorja Hill in Jones (1998) podajata pregled razmerja med fazo življenjskega cikla, konkurenčnim položajem in naložbeno strategijo na ravni poslovanja, kar je razvidno s tabele 1.

Tabela 1: Izbira naložbene strategije na kateri koli ravni poslovanja

(Vir: Hill in Jones, 1998, str. 205).

Faza življenjskega cikla industrije	Močan konkurenčni položaj	Šibek konkurenčni položaj
Embrionalna faza	Strategija gradnje tržnega deleža	Strategija gradnje tržnega deleža
Faza rasti	Strategija rasti	Strategija koncentracije trga
Faza prilagajanja	Strategija povečanja tržnega deleža	Strategija koncentracije trga ali žetev/likvidacijo
Faza zrelosti	Strategija vzdrževanja ali dobička	Strategija žetve ali likvidacije/dezinvestiranja
Faza upada	Tržna koncentracija ali strategija žetve (oslabitev sredstev)	Strategija za preobrat, likvidacijo ali dezinvestiranje

Vsaka od omenjenih faz življenjskega cikla industrijske panoge se lahko preslika na naložbeno strategijo razvoja gospodarskih subjektov v okviru primarne proizvodnje – kmetijskih zadrug in kmetij. Tako je v embrionalni fazi, ne glede na konkurenčni položaj, poudarek na strategiji gradnje tržnega deleža, kar samodejno vodi do velikih naložbenih potreb in večjih količin kapitala. V fazi rasti si prizadevamo ohraniti relativne konkurenčne položaje na trgu in, če je le mogoče, rasti skupaj s trgom. Za gospodarske subjekte z močnim konkurenčnim položajem, ki si prizadevajo povečati tržni delež, je v tej fazi ustrezna strategija rasti.

V fazi rasti se naložbene odločitve sprejemajo na poslovni ravni, povezane pa so z relativnimi prednostmi strategije diferenciacije, nizkocenovne strategije ali strategije osredotočenosti, vse glede na finančne potrebe in relativen konkurenčni položaj. Zato so potrebna finančna sredstva, ki bodo vložena v razvoj nove prodajne in tržne strategije. Podjetja s šibkim konkurenčnim položajem v tej fazi, da bi sledila rasti trga, uporabljajo strategijo koncentracije trga.

Te faze življenjskega cikla industrije, ki so podane kot primer, imajo različne posledice za izbiro naložbenih možnosti, ki stremijo k doseganju konkurenčne uspešnosti. Konkurenca je najmočnejša v fazi iztiskanja, najmanj pa v embrionalni fazi. Nasprotno pa so naložbene potrebe največje v embrionalni fazi, ki zato deluje kot spodbuda za naložbeni proces.

Spodobnost gospodarskih subjektov, da kar najbolje izkoristijo svojo notranjo moč in moč za prihodnjo rast, je najpomembnejša spodbuda za rast. Šteje se, da so najpomembnejši spodbujevalni dejavniki tisti, ki so povezani s finančnimi, virskimi (človeškimi, organizacijskimi in fizičnimi viri) in raziskovalno-razvojnimi zmožnostmi podjetja.

Zaradi močnega zavedanja, dejavnikov in prizadevanj iz zunanjega okolja, je proces internacionalizacije in globalizacije postal sinonim za čas, v katerem živimo. To ni samo vzrok, ampak tudi posledica izrazitega razvoja različnih oblik mednarodnega poslovnega sodelovanja skozi vse večjo stopnjo medsebojne povezanosti širokega kroga udeležencev sodobnega življenja. Pod vplivom internacionalizacije poslovanja in vstopa na tuje trge se povečujeta obseg in sestava dejavnosti podjetja, kar je neposredna spodbuda za njegovo razvojno obnašanje in naložbe. Predpogoj za premišljeno izbiro strategije internacionalizacije in oblikovanje mehanizma za njeno izvajanje je čim bolj natančno oceniti privlačnost posameznih trgov ter kritične dejavnike za učinkovito in uspešno poslovanje.

Te težnje (ustvarjanje zavezništev vseh vrst) se pospešujejo predvsem z mehanizmi izmenjave idej, izkušenj in sposobnosti. Razvija se »strategija glede na države in trg izdelkov«. Pozornost je usmerjena v najboljšo možno razporeditev naložb po državah, podjetjih, izdelkih, tržnih segmentih in poslovnih funkcijah, da bi povečali dobiček. (Todorović, 1998, str. 168). Tako se skozi globalno razmišljanje o trgih in možnostih najboljše možne razporeditve virov spodbuja naložbeni proces in krepí razvojna zmožnost podjetja. Odprtost proti tujemu kapitalu je tudi olajšava za države v razvoju, ki lahko postanejo del globalnega prostora, seveda z vsemi priložnostmi in nevarnostmi, ki v njem obstajajo.

4 Model krožnega gospodarstva (CE – angl. *circular economy*) – predlog strategije za okrevanje primarnega sektorja

Krožno gospodarstvo (CE) je prepoznano kot pozitiven gospodarski model za celotno družbo, saj prispeva k boju proti podnebnim spremembam, zmanjšuje onesnaževanje in trajnostno uporablja vire. CE je sistem, v katerem se ustvarja nova vrednost z najmanjšo možno proizvodnjo odpadkov ter zmanjšano porabo energije in naravnih virov. Osnova tega poslovnega modela je varčevanje. Inovativni poslovni modeli krožnega gospodarstva bogatijo lokalno proizvodnjo, zmanjšujejo

Predelovalna industrija, živilstvo in kmetijstvo, embalažna panoga in gradbeništvo so bili opredeljeni kot prednostni sektorji. Vključeni so tudi v verigo ključnih proizvodnih vrednostnih verig v načrtu EU za krožno gospodarstvo.

Obstoječe kmetijske prakse temeljijo na linearnem modelu »vzemi – naredi – zavrzi« in so zato velika grožnja za okolje in biotsko raznovrstnost. Negativni vplivi kmetijstva se odražajo na vodnih virih, spremenjeni rabi zemljišč, degradaciji tal in odpadkih.

Ocenjuje se, da se v Srbiji letno zavrže okoli 250.000 ton hrane, ki jo sestavljajo predvsem sadje in zelenjava (30 %), pekovski izdelki (20 %) ter perutnina in ribe. Bolj krožen pristop v kmetijskih praksah bo zahteval zmanjšanje zunanjih vložkov za kmetijsko proizvodnjo, zaprtje krogotoka hranil in zmanjšanje negativnih vplivov na okolje z odpravo izpustov (odpadne vode) in površinskega odtoka.

Organizacija za prehrano in kmetijstvo (FAO) opredeljuje pet glavnih možnosti za spodbujanje krožnih praks v kmetijstvu:

- ponovna uporaba vode;
- recikliranje vode za namakanje;
- natančno kmetijstvo (uskladitev vložkov z dejanskimi potrebami po pridelkih);
- uporaba organskih gnojil, proizvedenih iz organskih odpadkov, in
- bioenergija, proizvedena iz biogoriv.

Glede na to, da ima kmetijstvo v primarni proizvodnji velike možnosti, razvoj kmetijstva zagotovo prispeva h gospodarski rasti države. Krožno gospodarstvo je eden od modelov, ki ga Evropska unija priporoča kot dobro prakso za rast in razvoj gospodarstva države, zato lahko ima pomembno vlogo pri premagovanju krize, ki jo povzročajo posledice pandemije covid-19. Izboljšanje in posodobitev kmetijstva v Srbiji bi morala biti prednostna naloga, saj ima Srbija odlične pogoje za raznoliko kmetijsko proizvodnjo z veliko izvozno zmogljivostjo.

Načrt za krožno gospodarstvo v Srbiji predlaga krepitev krožnosti v kmetijskem in živilskem sektorju z gradnjo in spodbujanjem boljšega odnosa med živilsko industrijo in kmetijsko panogo kot dobaviteljem surovin. To med drugim zahteva gradnjo ustreznih vrednostnih verig ter spodbujanje regionalnih grozdov in zadrug. Krepitev ekonomsko-tržne povezave med dobavitelji in proizvajalci lahko poveča storilnost podjetij, ki delujejo v teh sektorjih, in bo pripomogla k spodbujanju izvozno usmerjene ekološke pridelave kot gospodarskega potenciala Srbije. (Kamberović in sod., 2020)

5 Zaključek

Naložbene strategije so osnovni način uresničevanja ciljev rasti in razvoja gospodarskih subjektov, kmetijskih zadrug in kmetij ter ohranjanja in izboljševanja njihove konkurenčne prednosti. Uporaba sodobnih metod upravljanja naložb omogoča gospodarskim subjektom hitro in ustrezno odzivanje na priložnosti in grožnje iz okolja, premišljeno uporabo razpoložljivih virov ter oblikovanje novih projektov in programov za prihodnje poslovanje. Na uspešnost naložbenega projekta vplivajo številni notranji in zunanji dejavniki. Naložbe torej s seboj prinašajo tveganje in negotovost, saj je časovna razdalja med naložbami in njihovimi učinki pogosto zelo dolga. Vse to pogojuje, da se v naložbeni proces lahko vstopi samo na osnovi resne analize razvojnih možnosti, ob upoštevanju spodbujevalnih dejavnikov in možnosti za uspešnost tega procesa. Spodbude od države ravno tako pomagajo in podpirajo krepitev gospodarstva skozi natančno načrtovane strategije. Ena od rešitev za naložbeni načrt je krožno gospodarstvo, ki ga lahko uporabimo kot pozitiven ekonomski model za oživitve primarne proizvodnje in odpravo posledic krize, ki jo je povzročila pandemija covid-19.

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POTROŠNJA LOKALNO PRIDELANE HRANE V SLOVENIJI MED PANDEMIJO COVID-19

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Povzetek V Sloveniji se, tako kot drugod po svetu, soočamo s širjenjem virusa SARS-CoV-2, ki je vplival na različna področja naših življenj. Eno izmed področij, ki je bilo prizadeto so tudi oskrbovalne verige živil in zaupanje potrošnikov v oskrbo z živili. V Sloveniji so potrošniki že pred pandemijo v veliki meri kupovali lokalno pridelana živila, so pa raziskave, ki so bile izvedene pred našo, kljub temu zaznale povečanje zaupanja slovenskih potrošnikov do lokalno pridelane hrane zaradi pandemije in njenih posledic. V članku predstavljamo raziskavo, izvedeno meseca oktobra 2021, s katero smo želeli preveriti kakšen je odnos do lokalno pridelane hrane v Sloveniji v času pandemije. Na podlagi pregleda raziskav ostalih avtorjev in naše lastne raziskave, lahko potrdimo, da je pandemija okrepila zaupanje potrošnikov v lokalno pridelana živila.

Ključne besede:

COVID-19,
kratke
oskrbovalne
verige,
lokalno
pridelana
hrana,
potrošnik,
samooskrba

CONSUMPTION OF LOCALLY PRODUCED FOOD IN SLOVENIA DURING THE COVID-19 PANDEMIC

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Abstract In Slovenia, as elsewhere in the world, we face the spread of the SARS-CoV-2 virus, which has affected various areas of our lives. One of the areas affected are also food supply chains and consumers trust in the food supply. Before the pandemic, consumers in Slovenia primarily bought locally produced food. Still, research conducted before ours showed an increase in Slovenian consumers' trust in locally produced food due to the pandemic and its consequences. In this article, we present a survey conducted in October 2021, with which we wanted to check the attitude towards locally produced food in Slovenia during the pandemic. Based on a review of research by other authors and our research, we can confirm that the pandemic has strengthened consumer confidence in locally grown foods.

Keywords:

pandemic,
short
supply
chains,
locally
grown
food,
consumer,
self-sufficiency

1 Uvod

Ko se pojavijo lokalni ali mednarodni nepredvidljivi dogodki, lahko ti dogodki vplivajo na različne deležnike, ki so vključeni v lokalne in regionalne oskrbovalne verige hrane. Njihov vpliv je v veliko primerih negativen, saj preprečujejo učinkovito delovanje oskrbovalnih verig (Sabates-Wheeler et al., 2008; Harvey et al., 2014). Posledice lahko vodijo v pomanjkanje hrane ali pa nihanje cen živil (Béné, 2020). Poleg višjih cen živil lahko ob takšnih dogodkih pričakujemo tudi nekoliko manj pestro izbiro živil na trgovinskih policah (»Vrtičkanje v času krize« [Naša super hrana], b. d.).

Trenutno se cel svet spopada s pandemijo COVID-19 (SARS-CoV-2), ki se je začela decembra 2019 v kitajskem mestu Wuhan (Zhu et al., 2020). Virus se je hitro širil po celotnem svetu in 11. marca 2020 je Svetovna zdravstvena organizacija (World Health Organization - WHO) razglasila globalno pandemijo (Aloi et al., 2020). V Sloveniji so prvi primer okužbe zaznali 4. marca 2020 (I. A., STA [Delo], 3. marec 2021).

Na začetku izbruha virusa COVID-19 je hrana pridobila na pomenu, potrošniki so se namreč ustrašili, da v nekem trenutku hrane ne bo več mogoče dobiti, zato se je povpraševanje po živilskih izdelkih tako povečalo, da so se nekatere trgovinske police hitro izpraznile (Skalkos, Kosma, Chasioti et al., 2021).

Po mnenju znanstvenikov bomo v prihodnosti še večkrat priča dogodkom, kot so pandemije, ekološke katastrofe in podnebne spremembe (Bakalis et al., 2020), zanesljive kratke oskrbovalne verige bodo tako postajale vedno pomembnejše za izpolnjevanje potreb potrošnikov. Kratke oskrbovalne verige oz. lokalne oskrbovalne verige so v primerjavi z običajnimi oskrbovalnimi verigami manj občutljive na prekinitve in motnje v oskrbovalnih verigah. Ravno iz tega razloga so kratke oskrbovalne verige v času pandemije pridobile večje zaupanje potrošnikov (Palau-Saumell et al., 2021).

V tem članku bomo predstavili rezultate raziskave, ki smo jo izvedli meseca oktobra 2021, z namenom preveriti kakšna je potrošnja lokalno pridelanih živil v Sloveniji v času pandemije COVID-19. Tezi, ki ju želimo preveriti sta:

- Pandemija COVID-19 je povečala zaupanje slovenskih potrošnikov v lokalno pridelana živila.
- Pridelava lastnih živil se je v času pandemije povečala.

Raziskava je bila izvedena s pomočjo spletnega anketnega vprašalnika. V nadaljevanju v drugem poglavju predstavimo pojem lokalno pridelanih živil. V poglavju 3 sledi kratek pregled raziskav na področju odnosa do lokalno pridelanih živil v času pred pandemijo in med pandemijo po svetu in v Sloveniji. V poglavju 4 je natančno opisana metodologija raziskave, v poglavju 5 pa so predstavljeni rezultati. Članek se zaključi z diskusijo, kjer povežemo demografske podatke z nekaterimi vsebinskimi odgovori sodelujočih ter zaključkom, kjer predlagamo ponovitev raziskave v času povišanja cen hrane in ostalih potrebščin v Republiki Sloveniji.

2 Lokalno pridelana živila

Pojem lokalno pridelanih živil se nanaša na živila, ki so proizvedena, prodana in porabljena na določenem geografskem območju. Kako veliko je to območje, je odvisno od velikosti regije (Risku-Norja et al., 2008). Avtor Brown (2003) definira lokalna živila kot tista živila, ki izvirajo iz istega upravnega območja kakor potrošnik. Kot upravno območje lahko upoštevamo okrožje ali državo (Selfa & Qazi, 2005). V Sloveniji velja splošna definicija, da je lokalni trg okolje, ki je od porabnika oddaljeno do okoli 60 kilometrov (»Lokalna oskrba s hrano in vrtnarjenje« [NIJZ], 18. junij 2020), Zakon o kmetijstvu (Ur. L. RS, št. 45/08, 57/12, 90/12 – ZdZPVHVVR, 26/14, 32/15, 27/17, 22/18, 86/21 – odl. US in 123/21) pa opredeljuje lokalni trg kot celotno območje Republike Slovenije (velja za kmetijske pridelke in živila).

Lokalno pridelana živila so okusnejša od živil, ki prepotujejo dolge razdalje (Khan in Prior, 2010). Z daljšanjem oskrbovalne verige od pridelovalca do končnega uporabnika se namreč zniža vsebnost vitaminov v hrani (predvsem vitamina C, A, B in E) (»Pomen lokalne hrane in načelo kratkih oskrbovalnih verig v dobavi živil« [RS gov.si], b. d.). Poleg tega ima lokalno pridelana hrana tudi pozitivne posledice za lokalno skupnost, saj lokalna proizvodnja hrane potrebuje lokalno zaposlovanje, kar krepi regionalno gospodarstvo (Hinrichs, 2003). Pozitivne posledice se čutijo tudi pri ohranitvi in razvoju podeželja ter regionalnemu razvoju (»Pomen lokalne hrane in načelo kratkih oskrbovalnih verig v dobavi živil« [RS gov.si], b. d.). Poleg naštetih

prednosti potrošniki lokalno pridelana živila prepoznajo kot živila z boljšim okusom, večjo svežino ter višjo kakovostjo (Golob, Burger, Tuškej Lovšin & Podnar, 2018).

3 Pomen lokalno pridelanih živil med pandemijo COVID-19

Ukrepi za zajezitev širjenja virusa, ki so jih sprejemale države (omejitve gibanja tudi za delovno silo), so povzročili motnje v pridelavi hrane ter v logističnih procesih, povezanih z dobavo živil. S tem so postavili izziv, kako kljub vsem oviram zagotoviti zadostno, cenovno dostopno in s hranili bogato hrano za potrošnike (Bakalis et al., 2020). Motnje v preskrbi s hrano imajo negativne posledice predvsem za prebivalce, katerih finančno stanje je slabše (Béné, 2020; Van der Ploeg, 2020).

Razpoložljivost živil na nekem trgu vpliva na prehranske navade potrošnikov. Še posebej v času pandemij je dobro zagotoviti, da prehrana, ki je voljo potrošnikom, zagotavlja potrebna makro in mikrohranila (Bakalis et al., 2020).

Za omilitev posledic kriz avtor Lal (2020) predlaga, da je na ravni držav potrebno sprejemati ukrepe za zmanjšanje količin odpadkov živil po celotni oskrbovalni verigi, začeti uporabljati odpornejše živilske vrste in krepiti rast lokalnih kmetijskih zmogljivosti. Slednje je mogoče tudi z domačim vrtnarjenjem in mestnim kmetijstvom.

Zgodne študije ugotavljajo, da je pandemija spremenila navade potrošnikov glede potrošnje hrane (Palau-Saumell et al., 2021).

3.1 Potrošnja lokalnih živil v tujini

Podjetje The Nielsen Company (ZDA), LCC. (2020) je v sklopu svoje raziskave ugotovilo, da se je med časom pandemije za 300 % povečala prodaja mleka in mlečnih izdelkov. Višjo prodajo je zaznati tudi pri izdelkih, kot so konzervirana tuna, konzerviran ali posušen fižol, testenine in prigrizki z daljšim rokom trajanja.

Med pandemijo so se ljudje v večji meri kot prej odločali za peko kruha in ostalih pekovskih izdelkov doma, posledično pa je na trgovinskih policah zmanjkovalo moke in kvasa (Bakalis et al., 2020).

Buto, Brumă, Tanasă in ostali (2020) so s pomočjo anketnega vprašalnika raziskovali spremembe v nakupovalnem vedenju potrošnikov sveže zelenjave v Romuniji. Ugotovili so, da se potrošniki zaradi pandemije v večji meri odločajo za nakup zelenjave, dostavljene neposredno od pridelovalcev, kakor pred pandemijo. Kar 60 % vseh sodelujočih v raziskavi je izrazilo svojo namero, da nakupovanje preko kratkih oskrbovalnih verig ohrani tudi po zaključeni krizi s COVID-19.

3.2 Potrošnja lokalnih živil v Sloveniji

V Sloveniji so bili potrošniki že pred začetkom pandemije zavezani lokalnim živilom, kar potrjujejo nekateri avtorji. Avtorica Rojšek (2001) je v svoji raziskavi potrdila hipotezo, da večina slovenskih potrošnikov kupuje slovenske izdelke. Potrdila je tudi zvestobo slovenskih potrošnikov do izbranih slovenskih blagovnih znamk, razlike v zvestobi med mlajšimi in starejšimi potrošniki pa ni potrdila.

Leta 2012 je Evropska komisija izvedla raziskavo med slovenskimi potrošniki, iz katere je razvidno, da je izvor živil pomemben za 81 % sodelujočih, pri nakupu pa označbo za kakovost preveri približno polovica sodelujočih, vendar le občasno (Evropska komisija, 2012). V letu 2018 je pri raziskavi 51 % sodelujočih potrdilo, da pri nakupih živil vedno preverijo, ali je živilo slovenskega izvora (Zorko, 2018).

Kljub predhodno visokemu zavedanju o pomembnosti lokalne pridelave, se je ta v času širjenja virusa še nekoliko okrepila. Inštitut za nutricionistko je v okviru mednarodne raziskave Food-Covid-19 ugotovil, da so se prebivalci Slovenije med pandemijo bolj začeli zavedati pomembnosti trajnostnega prehranjevanja in smotrne porabe virov. Ljudje se zdaj bolj zavedajo pomembnosti načrtovanja obrokov, pripravljanja seznama živil za nakupe, pravilnega shranjevanja kupljenih živil ter shranjevanja ostankov hrane (»Vpliv epidemije na prehranjevalne navade v drugem valu manjšik« [Naša super hrana], 19. 2. 2021). Znatno se je povečalo zanimanje za nakupovanje hrane pri lokalnih ponudnikih. Pri svežem sadju in zelenjavi je bilo zaznati 152 % rast nakupovanja z dostavo na dom.

4 Metodologija

Raziskava temelji na anketnem vprašalniku, ki je bil sestavljen v spletnem okolju za anketiranje 1Ka Arnes. Anketo smo aktivirali 6. oktobra 2021, z izvajanjem pa smo zaključili 14. oktobra 2021. Anketni vprašalnik je bil sestavljen iz 24 vprašanj, izmed katerih je 10 vprašanj namenjenih demografskim podatkom anketiranih (spol, starost, izobrazba, zaposlitev, število članov v gospodinjstvu, tip naselja, regija bivanja, tip prebivališča, porabljen znesek za hrano in neto dohodek). Ostalih 14 vprašanj je bilo namenjenih preverjanju odnosa anketirancev do lokalnih živil in sprememb zaradi situacije s pandemijo.

Anketo smo med sodelujoče razširili s pomočjo družbenih omrežij in preko e-pošte. Sodelovanje v raziskavi je bilo prostovoljno. Na nagovor ankete je kliknilo 346 ljudi, 279 izmed teh je anketo tudi začelo reševati. Izmed tistih, ki so anketo začeli reševati, je bilo 45 takšnih, ki ankete niso rešili do konca, zato smo jih iz analize izvzeli, saj nam brez vseh podatkov njihovi delni odgovori za uspešno izvedeno raziskavo ne koristijo.

Po koncu zbiranja podatkov smo podatke izvozili v programsko opremo Microsoft Excel in jih statistično ovrednotili, da bi odgovorili na zastavljena raziskovalna vprašanja.

5 Rezultati

5.1 Demografski podatki anketirancev

Po izločitvi nepopolno rešenih anket je ostalo 234 takšnih, ki smo jih lahko vključili v končno analizo. V anketi je sodelovala manj kot petina moških (13,68 %), 86,32 % sodelujočih v raziskavi pa so predstavljale ženske. Starost najmlajšega anketiranca je bila 20 let, najstarejšega pa 75 let. Povprečna starost vseh anketiranih je 41,44 let. Podrobnejša frekvenčna porazdelitev anketiranih po letih je predstavljena v tabeli 1.

Tabela 1: Starost anketiranih

	Frekvenca	Odstotek [%]
Do 25 let	8	3,42
25 – 35 let	52	22,22
35 – 45 let	88	37,61
45 – 55 let	50	21,37
55 – 65 let	22	9,4
Nad 65 let	10	4,27
Ni podatka	4	1,71
Skupaj	234	100

vir: lasten vir

Predpostavili smo, da stopnja izobrazbe vpliva na odnos do lokalno pridelanih živil, zato smo v anketni vprašalnik vključili tudi vprašanje o najvišji doseženi stopnji izobrazbe. Najvišji odstotek anketiranih je dosegel srednješolsko izobrazbo, sledijo pa anketirani z univerzitetno izobrazbo. Najmanj je takšnih, ki niso zaključili osnovne šole in tistih, ki imajo zaključeno le osnovno šolo. Podrobnejša frekvenčna porazdelitev izobrazbe anketiranih je predstavljena v tabeli 2.

Tabela 2: Izobrazba anketiranih

	Frekvenca	Odstotek [%]
Nedokončana osnovna šola	2	0,85
Dokončana osnovna šola	4	1,71
Poklicna šola	12	5,13
Srednja šola	66	28,21
Višješolska izobrazba	30	12,82
Visokošolska izobrazba	32	13,68
Univerzitetna izobrazba	48	20,51
Magisterij	24	10,26
Doktorat	14	5,98
Ni podatka	2	0,85
Skupaj	234	100

vir: lasten vir

Anketirane smo vprašali po njihovem zaposlitvenem statusu. Največji delež anketiranih (64,10 %) je zaposlenih, v našo raziskavo pa nismo zajeli nikogar, ki bi bil kmetovalec ali nezmožen opravljanja dela zaradi različnih vzrokov. Kot drugi (nenaveden) status sta dve anketirani osebi navedli porodniški dopust. Podrobnejša frekvenčna porazdelitev zaposlitvenega statusa anketiranih je prikazana v tabeli 3.

Tabela 3: Zaposlitveni status anketiranih

	Frekvenca	Odstotek [%]
Zaposlen/a	150	64,10
Samozaposlen/a	24	10,26
Brezposeln/a	10	4,27
Upokojenec/ka	18	7,69
Dijak/inja ali študent/ka	12	5,13
Gospodinjec/gospodinja	14	5,98
Drug status	2	0,85
Brez odgovora	4	1,71
Skupaj	234	100

vir: lasten vir

Predvidevali smo, da na potrošnjo lokalno pridelanih živil vpliva tudi število ljudi v gospodinjstvu. Najvišje število anketiranih živi v gospodinjstvu s tremi člani (33,33 %). V raziskavo smo vključili tudi nekaj anketiranih, ki živijo v gospodinjstvih z več člani (6, 7 in 9 članov gospodinjstva). Podrobnejšo frekvenčno porazdelitev prikazujemo v tabeli 4.

Tabela 4: Število članov v gospodinjstvu

	Frekvenca	Odstotek [%]
1 član	10	4,27
2 člana	60	25,64
3 člani	78	33,33
4 člani	56	23,93
5 članov	11	4,70
6 članov	10	4,27
7 članov	6	2,56
9 članov	1	0,43
Ni odgovora	2	0,85
Skupaj	234	100

vir: lasten vir

Na možnost pridelave živil doma in na dostopnost do ponudnikov živil vsekakor vpliva tudi lokacija bivanja. Kot je razvidno iz tabele 5, največ sodelujočih v raziskavi živi v vasi/kraju/trgu s 500 – 2000 prebivalci, sledijo pa anketirani, ki živijo v krajih z 2.000 – 10.000 prebivalcev. Najmanj anketiranih prihaja iz Maribora.

Tabela 5: Tip naselja

	Frekvenca	Odstotek [%]
Hiša na samem, zaselek ali manjša vas z do 500 prebivalci	36	15,38
Vas, kraj, trg s 500 - 2.000 prebivalci	68	29,06
2.000-10.000 prebivalcev	40	17,09
Več kot 10.000 prebivalcev	32	13,68
Maribor	24	10,26
Ljubljana	32	13,68
Ni odgovora	2	0,85
Skupaj	234	100

vir: lasten vir

V povezavi s predhodnim vprašanjem je tudi vprašanje o regiji bivanja. V raziskavo smo zajeli največ prebivalcev Osrednje-slovenske regije (25,64 %) in Savinjske regije (23,08 %). Najmanj jih prihaja iz Zasavske regije (0,85 %) ter Pomurske, Koroško in Notranjsko-kraške regije (1,71 %). Podrobnejša frekvenčna razdelitev glede na regijo bivanja je prikazana v tabeli 6.

Tabela 6: Regija bivanja

	Frekvenca	Odstotek [%]
Pomurska regija	4	1,71
Podravska regija	36	15,38
Koroška regija	4	1,71
Savinjska regija	54	23,08
Zasavska regija	2	0,85
Spodnjeposavska regija	8	3,42
Jugovzhodna regija	14	5,98
Osrednje-slovenska regija	60	25,64
Gorenjska regija	30	12,82
Notranjsko-kraška regija	4	1,71
Goriška regija	10	4,27
Obalno-kraška regija	6	2,56
Ni odgovora	2	0,85
Skupaj	234	100

vir: lasten vir

Na zmožnost pridelave lastnih živil vpliva tudi tip bivališča. Kakor je razvidno iz tabele 7, smo v raziskavo zajeli največji delež anketiranih, ki živijo v hiši z vrtom (42,74 %), sledijo pa anketirani, ki živijo v bloku ali pa večstanovanjski hiši (36,75 %). Najmanjši delež anketiranih živi v hiši brez lastnih zunanjih površin (2,56 %).

Tabela 7: Tip prebivališča

	Frekvenca	Odstotek [%]
Hiša s kmetijskimi površinami	34	14,53
Hiša z vrtom	100	42,74
Hiša brez lastnih zunanjih površin	6	2,56
Stanovanje v bloku/večstanovanjski hiši	86	36,75
Drugo	4	1,71
Brez odgovora	4	1,71
Skupaj	234	100

vir: lasten vir

Na vprašanje za znesek, ki ga anketirani porabijo za nakup hrane v enem mesecu, nam je odgovorilo le 50 % vseh anketiranih. Najmanjši znesek, ki so ga anketirani navedli, je 50 €. Najvišji znesek pa 1.000 €. Povprečni znesek, ki ga anketirani porabijo za nakup hrane pa je 373,49 €. Podrobnejša frekvenčna porazdelitev je predstavljena v tabeli 8.

Tabela 8: Znesek za nakup hrane

	Frekvenca	Odstotek [%]
Do 200 €	10	4,27
200 – 500 €	82	35,04
500 – 800 €	34	14,53
Nad 800 €	6	2,56
Brez odgovora	102	43,59
Skupaj	234	100

vir: lasten vir

Zmožnost za nakup lokalnih živil, ki so velikokrat nekoliko višjega cenovnega razreda kakor znamke velikih trgovcev, je odvisna tudi od finančnega stanja posameznika. Zadnje demografsko vprašanje se je tako navezovalo ravno na neto znesek, ki ga imajo v gospodinjstvu na voljo. Kot je razvidno iz tabele 9, smo v vzorec raziskave zajeli gospodinjstva, ki imajo nekoliko višji dohodek.

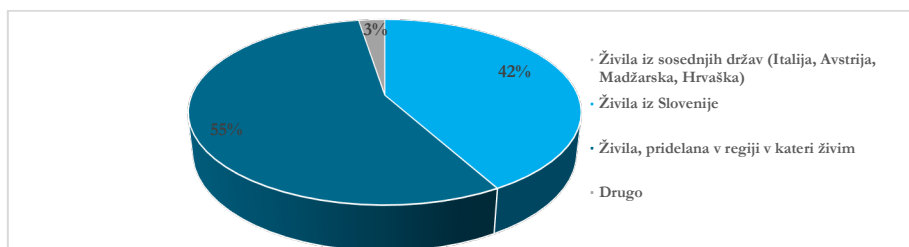
Tabela 9: Znesek gospodinjstva

	Frekvenca	Odstotek [%]
500 – 700 €	6	2,56
700 – 900 €	4	1,71
900 – 1.100 €	16	6,84
1.100 – 1.300 €	12	5,13
1.300 – 1.500 €	14	5,98
1.500 – 1.700 €	22	9,40
1.700 – 1.900 €	16	6,84
Več kot 1.900 €	88	37,61
Brez odgovora	56	23,93
Skupaj	234	100

vir: lasten vir

5.2 Odnos do lokalno pridelanih živil v Sloveniji

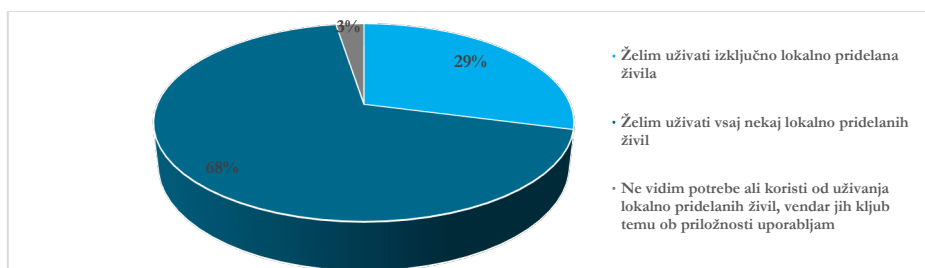
S prvim vsebinskim vprašanjem smo anketirane vprašali, kaj za njih predstavlja lokalno pridelano živilo. Iz priprave teoretičnega dela raziskave smo namreč ugotovili, da enotne definicije za »lokalno« ni oz. da se le-ta razlikuje glede na geografsko umeščenost. V Sloveniji je z zakonom o kmetijstvu določeno, da je lokalni trg celotno geografsko območje Republike Slovenije. Kakor je vidno na sliki 1, lokalno pridelana živila vsi sodelujoči v raziskavi omejujejo vsaj z mejo države Slovenije. Odgovor, da so lokalno pridelana živila tista živila, ki se pridelajo v Sloveniji, je namreč izbralo 98 sodelujočih (41,88 %), odgovor da so to živila, ki so pridelana v regiji, v kateri prebivamo pa 130 sodelujočih (55,55 %). Med odgovori drugo so anketirani poudarili, da je pri lokalno pridelanih živilih pomembno na kakšen način so pridelana in kdo jih pridelava.



Slika 1: Pomen lokalno pridelanih živil

(Vir: lasten.)

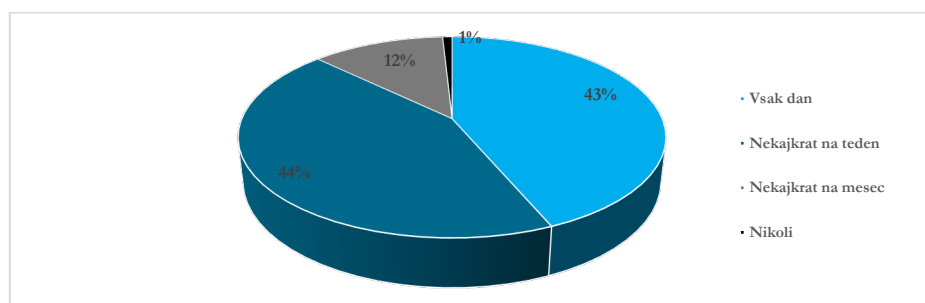
Slika 2 prikazuje kakšen odnos imajo sodelujoči v raziskavi do lokalno pridelanih živil. Največ odgovorov sodelujočih je bilo, da želijo v svoj jedilnik uvrstiti vsaj nekaj lokalno pridelanih živil – ta odgovor je izbralo 160 sodelujočih (68,38 %). Približno tretjina sodelujočih želi uživati izključno lokalno pridelana živila (29,06 %). 2,56 % sodelujočih pa lokalno pridelana živila uživa le priložnostno. V anketnem vprašalniku je bil na voljo tudi odgovor »Ne vidim potrebe ali koristi od uživanja lokalno pridelanih živil in jih nikoli ne uporabljam«, vendar se zanj nihče izmed sodelujočih ni odločil.



Slika 2: Odnos do lokalno pridelanih živil

(Vir: lasten.)

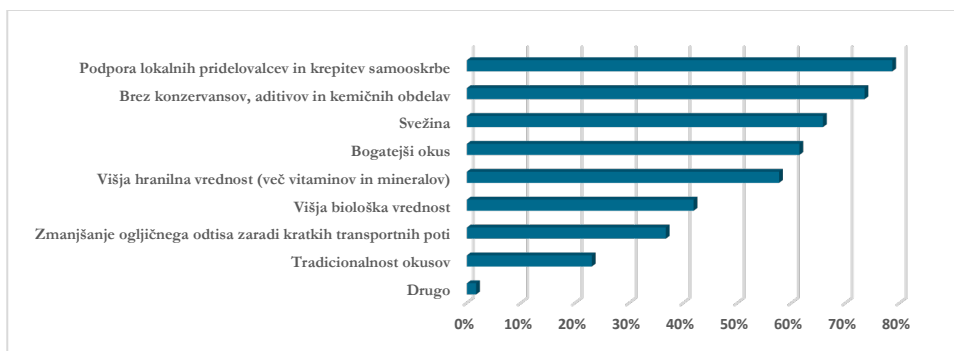
Slika 3 prikazuje pogostost uživanja lokalnih živil. Vsakodnevno so lokalno pridelana živila na krožnikih 102 sodelujočih v raziskavi (43,59 %), ravno takšen odstotek jih lokalno pridelana živila uživa nekajkrat na teden. Nekajkrat na mesec po njih poseže 28 sodelujočih (11,97 %).



Slika 3: Pogostost uživanja lokalnih živil

(Vir: lasten.)

Preverili smo, kakšni so razlogi za uživanje lokalno pridelanih živil. Kot je razvidno iz slike 4, se največ sodelujočih v raziskavi (184 oz. 78,63 %) za lokalno pridelana živila odloča zaradi podpore lokalnim pridelovalcem in krepiteve samooskrbe. 73,50 % lokalno pridelana živila uporablja, saj so brez konzervansov, aditivov in niso kemično obdelana. Več kot 50 % vseh sodelujočih se za lokalna živila odloča tudi zaradi svežine (65,81 %), bogatejšega okusa (61,45 %) in višje hranilne vrednosti (57,69 %). Med druge razloge so sodelujoči zapisali, da se za lokalna živila odločajo zaradi zaupanja v lokalne pridelovalce, ki je večje kakor zaupanje velikim koncernom in boj proti globalnim podjetjem.



Slika 4: Razlogi za uživanje lokalne prehrane

(Vir: lasten.)

V povezavi s potrošnjo lokalno pridelanih živil smo v anketo vključili tudi vprašanje, pri katerem so sodelujoči za vsako izmed 18-ih v naprej definiranih skupin živil (zelenjava, sadje, meso, ribe, kruh, testenine, mleko, jogurti, siri, moka in žita, med, marmelade, sokovi, čaji, vina, žganje, pivo ter jajca) navedli kje jih kupujejo v zadnje pol leta.

Najvišji odstotek sodelujočih zelenjavo pridelava doma (40%), ravno tako marmelade (43 %). Sadje največji delež sodelujočih kupi v trgovinah, kjer vseeno preverijo, če gre za domačo znamko (34 %). Ko gre za meso, ga največji delež sodelujočih kupi na bližnjih kmetijah (31 %), ravno tako največ sodelujočih na bližnjih kmetijah kupi jajca (46 %). Nekoliko manj kot polovica sodelujočih (43 %) ribe kupi v trgovinah, vendar so pri tem pozorni na to, da so ribe slovenskega izvora, enako je s kruhom (41 %), testeninami (54 %), mlekom (64 %), jogurti (64 %), siri (54 %), mokami ter žiti (48 %), sokovi (33 %), vini (36 %) ter pivom (70 %). Med 38 % sodelujočih dobi

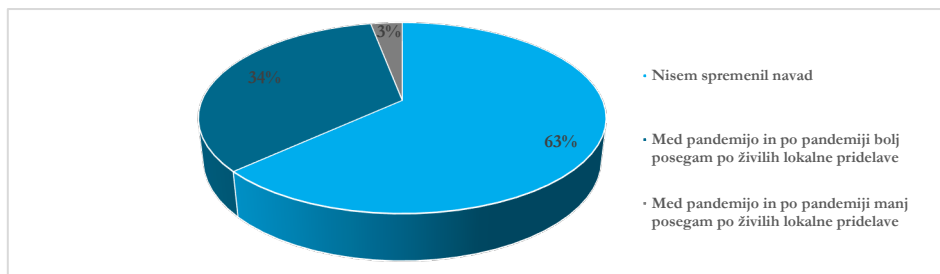
pri sorodnikih ali znancih, ki ga pridelujejo sami, ravno tako žganje (32 %). Pri čajih 33 % sodelujočih opravi nakup v trgovinah, pri čemer pazijo na to, da kupijo slovensko znamko čajev, enak odstotek sodelujočih pa si čaje pripravi doma.

Zanimivo je, da v raziskavo nismo zajeli potrošnikov, ki bi opravljali spletne nakupe pri večjih trgovcih (na ta način opravi nakup le 1 %, in sicer gre za ribe, testenine, mleko, jogurte in sire) ter tiste, ki opravijo spletni nakup pri ponudnikih, kot je Zeleni zabojček (2 % na ta način kupi sadje ter moke in žita, po 1 % pa kruh, med, čaje, vina ter piva). Podrobnejši rezultati, kje posamezne izdelke v zadnje pol leta kupujejo sodelujoči v naši raziskavi, se nahajajo v tabeli, uvrščeni med priloge.

Pripravljeno je bilo tudi vprašanje, ki je sodelujoče prosilo, da nam zaupajo razlog, zakaj je uživanje lokalno pridelanih živil zanje nepomembno. Ker predhodno nihče izmed sodelujočih ni izrazil, da ne vidi potrebe ali koristi od lokalno pridelanih živil, nihče izmed sodelujočih ni odgovarjal na to vprašanje.

5.3 Spremembe zaradi pandemije COVID-19

Več kot polovica sodelujočih v raziskavi (63,18 %) meni, da zaradi pandemije ni spremenila navad glede oskrbe z lokalno pridelanimi živili. 33,83 % (68) sodelujočih zaradi pandemije bolj posega po živilih lokalne pridelave. Le 3 % (6) sodelujočih zaradi epidemije posega po lokalnih živilih v manjšem obsegu kakor pred pandemijo (slika 5).



Slika 5: Spremembe navad povezanih z oskrbo z lokalnimi živili zaradi pandemije

(Vir: lasten.)

Sodelujoče, ki so na vprašanje, ali so pri sebi zaznali spremembe zaradi pandemije v odnosu do potrošnje lokalnih živil, smo prosili, da poleg tabele, kjer so navedli, kje posamezne skupine živil kupujejo v zadnje pol leta, izpolnijo še tabelo, kje so kupovali posamezne skupine izdelkov pred pandemijo. Na vprašanje je odgovarjalo le 37 sodelujočih, podrobnejša distribucija odgovorov za vprašanje pa se nahaja v tabeli v prilogah.

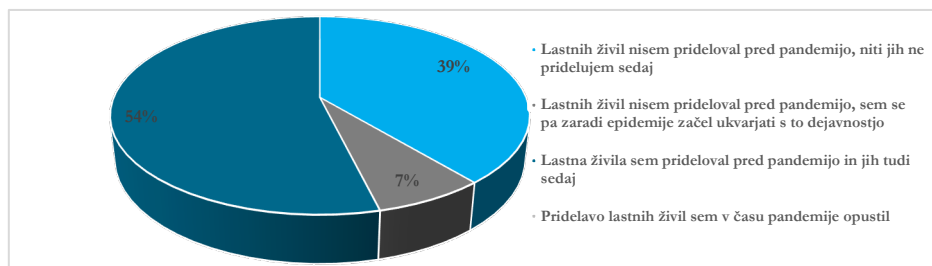
Tabela 10 prikazuje spremembo v odstotkih pri nakupu posameznih skupin živil pred in po pandemiji v Sloveniji (v analizi upoštevanih le 37 sodelujočih). Pri skoraj vseh skupinah živil (razen pri mleku in pivu) je zaznati povišano nakupovanje domačih znamk v trgovinah. Pri določenih skupinah živil se je zmanjšalo nakupovanje na tržnicah (zelenjava, sadje, ribe, kruh, testenine, siri, moka, žita, med, ter jajca). Negativen trend je zaznati tudi pri nakupu nekaterih skupin živil na bližnjih kmetijah. Zmanjšal se je tudi delež tistih, ki si določene skupine živil pridelajo sami ali pa jih dobijo od svojih sorodnikov/znancev. Zanimivo je, da se je v manjšem odstotku povečal nakup uvoženih znamk določenih skupin živil v trgovinah. Manjši je le odstotek tistih, ki kupujejo jajc uvoženih znamk.

Tabela 10: Sprememba v nakupovalnih navadah pred pandemijo in v obdobju zadnjega pol leta

(Vir: lasten.)

	Hipermarketi, marketi in manjše trgovine (domače znamke)	Spletni nakup (večji trgovci)	Spletni nakup (Zeleni zabojček)	Trgovine z lokalno ponudbo	Tržnice	Bližnje kmetije	Pridelam sam/a	Dobim od sorodnikov/znancev, ki jo pridelajo sami	Hipermarketi, marketi in manjše trgovine (uvožene znamke)
Zelenjava	35,56 %			5,41 %	-20,84 %	-5,19 %	-13,2 %	-12,73 %	10,81 %
Sadje	22,55 %				-18,21 %	-2,49 %		-7,47 %	5,62 %
Meso	24,54 %	2,94 %		-5,71 %		-8,24 %	-2,77 %	-19,66 %	8,91 %
Ribe	0,61 %	3,03 %		0,35 %	-5,37 %	0,17 %			1,21 %
Kruh	16,81 %			-2,19 %	-2,63 %		-9,65 %	-2,49 %	0,15 %
Testenine	8,77 %	0,15 %		-2,34 %	-2,63 %	-5,26 %	0,15 %		1,17 %
Mleko	-0,87 %	2,86 %		0,16 %		-5,32 %	0,08 %		3,1 %
Jogurti	2,06 %			-2,54 %		-2,7 %			3,17 %
Siri	4,76 %			0,32 %	-2,78 %	0,08 %			2,38 %
Moka, žita	13,51 %			-5,41 %	-2,7 %	-5,41 %		-2,7 %	2,7 %
Med	22,05 %			-2,56 %	-7,89 %	-4,84 %		-9,46 %	2,7 %
Marmelade	0,85 %			-2,63 %		0,14 %	-4,84 %	-4,34 %	10,81 %
Sokovi	4,44 %			-0,16 %			-3,33 %	-6,27 %	5,32 %
Čaji	6,98 %	2,78 %	-2,7 %	-2,55 %		-2,7 %	-5,11 %	-5,11 %	8,41 %
Vina	7,58 %			-2,85 %		0,36 %	0,36 %	-5,53 %	0,09 %
Žganje	11,79 %			-0,1 %		-9,88 %	-0,4 %	-7,46 %	6,05 %
Pivo	-0,89 %			-2,76 %					3,65
Jajca	19,80 %			3,85 %	-3,7 %	-17,09 %	0,14 %	-14,53 %	-11,54 %

Vir lokalno pridelanih živil je vsekakor tudi samooskrba. Več kot polovica vseh sodelujočih (53,85 %) je lastna živila samostojno pridelovala že pred pandemijo in jih tudi sedaj. 38,89 % sodelujočih ne prideluje lastnih živil. 7,26 % sodelujočih pa se je s pridelavo živil začelo ukvarjati ravno med pandemijo (slika 6).



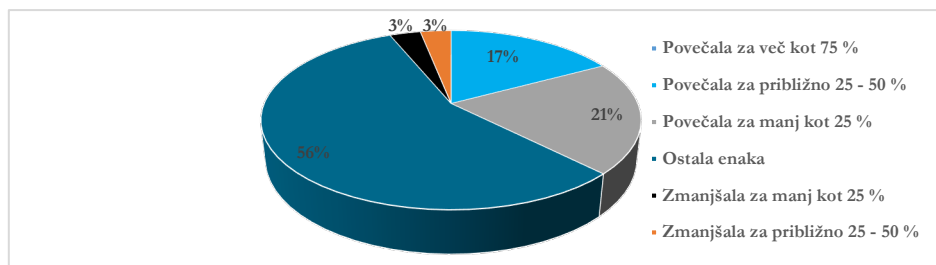
Slika 6: Spremembe v pridelavi lastnih živil zaradi pandemije

(Vir: lasten.)

Sodelujoče, ki so odgovorili, da so se med pandemijo začeli ukvarjati z lastno pridelavo, smo prosili, da nam zaupajo razlog za to odločitev in katera živila pridelujejo. Dobili smo sedem odgovorov:

- »Še bolj mi je postalo jasno, kako lahko bolje vplivam na svoje zdravje in svojo okolico. Pridelujem nekaj zelenjave (paradižnik in kumarice), svoj sok in rastlinsko mleko.«
- »Zaradi težnje po samooskrbi pridelujem zelenjavo na vrtu.«
- »Manj hodim v trgovine.«
- »Imam več časa, pridelujem zelenjavo in jagode.«
- »Razlog je selitev na podeželje ravno v času pandemije, poleg tega pa zaradi večje biotske vrednosti domačih živil. Pridelujem zelenjavo, nekaj sadja, delam domače marmelade in vložena živila.«
- »Razlog je nakup hiše, kjer imam sedaj vrt. Pridelujem lastno zelenjavo.«
- »Imam več časa, predvsem pa je razlog zdravje in pridelava ekoloških živil za ozimnico.«

Vse sodelujoče, ki so odgovorili, da so se s pridelovanjem lastnih živil ukvarjali pred pandemijo in jih še vedno pridelujejo, smo prosili, da nam zaupajo, ali se je njihova lastna pridelava povečala ali zmanjšala. Pri več kot polovici sodelujočih, ki se z lastno pridelavo ukvarja, je količina pridelave ostala enaka kot pred pandemijo. Pri 41 % sodelujočih pa se je količina pridelane hrane povečala (slika 7).



Slika 7: Spremembe v pridelavi zaradi pandemije

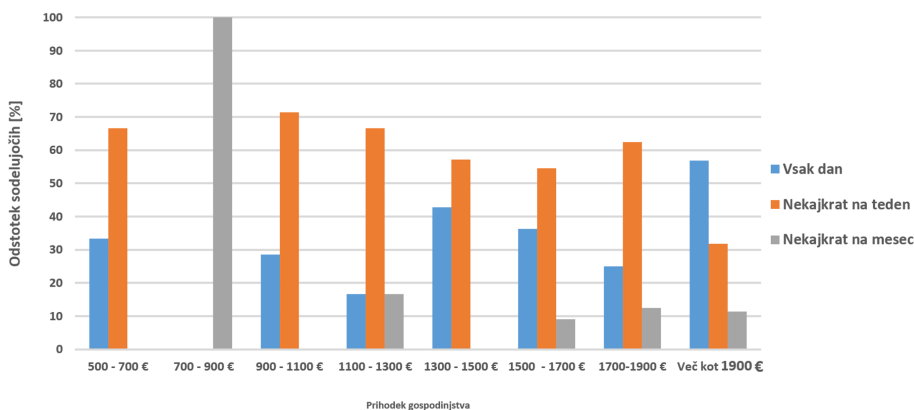
(Vir: lasten.)

6 Diskusija

V našo raziskavo smo zajeli 243 prebivalcev Republike Slovenije, ki so v celoti izpolnili pripravljene anketni vprašalniki o lokalno pridelanih živilih. V vzorcu, ki smo ga zajeli, prevladujejo predvsem ženske. Ženske se tudi navadno v večji meri odločajo za reševanje anketnih vprašalnikov. Približno 60 % vseh sodelujočih je starih med 25 in 45 let. V vzorcu prevladujejo zaposleni posamezniki, s čimer je povezan tudi neto dohodek gospodinjstev, kjer prevladujejo gospodinjstva, ki imajo mesečni dohodek nad 1.500 €. Glede na izobrazbeno strukturo sodelujočih v naši raziskavi lahko zaključimo, da tematike, povezane z lokalno pridelanih živilih v Sloveniji, bolj zanimajo višje izobražene posameznike. Enako so ugotovili tudi avtorji Colarič Jakše, Kavšek in Obolnar (2020) v svoji raziskavi, povezani z lokalno pridelano hrano.

Prebivalci Republike Slovenije vedo, kaj pomenijo lokalno pridelana živila, saj so vsi sodelujoči v naši raziskavi lokalno pridelana živila opredelili kot živila, ki so pridelana na območju Slovenije ali na še ožjem, regionalnem področju. Dobro poznavanje lokalnih živil potrjuje tudi raziskava avtorjev Colarič Jakše, Kavšek in Obolnar (2020), kjer je 96 % sodelujočih v njihovi raziskavi ravno tako opredelilo lokalno, kot tisto, kar je pridelano na območju Slovenije.

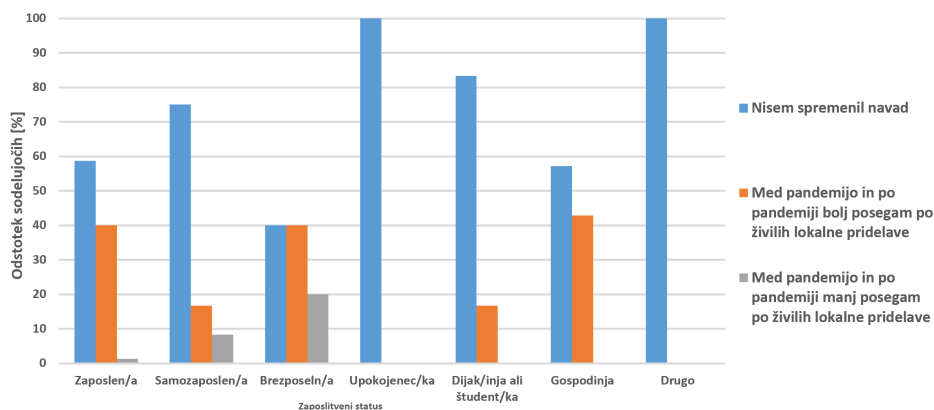
Predpostavili smo, da višina dohodka vpliva na odnos do lokalno pridelanih živil in do pogostosti uživanja le-teh. Slika 8 prikazuje pogostost uživanja lokalno pridelanih živil glede na prihodke gospodinjstva. Iz grafa ni možno zaznati trendov.



Slika 8: Vpliv dohodka v gospodinjstvu na pogostost uživanja lokalno pridelane hrane
(Vir: lasten.)

Tisti z najnižjimi dohodki uživajo lokalno pridelana živila nekajkrat na teden ali pa vsak dan. Med udeleženci, ki sodijo v skupino z najnižjimi dohodki je približno 67 % takšnih, ki nekatera živila pridelujejo sami. Med udeleženci, ki imajo mesečno 700 - 900 € dohodka v gospodinjstvu, lokalno pridelana živila vsi uživajo le nekajkrat na mesec. Analiza lastne pridelave v povezavi z neto dohodkom pa je pokazala, da v tej skupini nihče ne prideluje lastnih živil. Najvišji odstotek tistih, ki lokalna živila uživajo vsak dan je med udeleženci z najvišjimi prihodki, svoja živila v tej skupini prideluje 50 % udeležencev. Najvišji odstotek udeležencev, ki pridelujejo lastna živila je med udeleženci z dohodkom gospodinjstva med 1.300 € in 1.500 €, kjer vsi uživajo lokalno pridelana živila vsaj enkrat na teden ali pa vsak dan.

Slika 9 prikazuje vpliv zaposlitvenega statusa na spremenjene navade glede uživanja lokalno pridelanih živil. Tudi tukaj ne opazimo jasnih trendov. Pričakovano je, da tisti, ki niso zaposleni, v času pandemije, ko so cene živil narasle, manj posegajo po živilih lokalne pridelave.



Slika 9: Vpliv zaposlitve na spremembe glede navad z lokalnimi živili
(Vir: lasten.)

Kljub temu, da med brezposelnimi najdemo najvišji delež tistih, ki se v manjši meri odločajo za uživanje lokalno pridelanih živil, je med njimi tudi visok delež tistih, ki po tovrstnih živilih posegajo v večji meri kakor pred pandemijo. Razlog za to je v visokem odstotku brezposelnih, ki pridelujejo lastna živila. Takšnih je namreč 40 % vseh sodelujočih brezposelnih. 20 % jih je lastna živila pridelovalo že pred pandemijo, 20 % pa jih je s pridelavo pričelo med pandemijo. Manjši odstotek nižje potrošnje lokalno pridelanih živil je zaznati tudi med samozaposlenimi in zaposlenimi. Udeleženci, ki so upokojeni ali pa so kot zaposlitveni status navedli drugo, niso spremenili navad glede uživanja lokalno pridelanih živil, nihče med njimi pa v času pandemije ni začel z lastno pridelavo. Najvišji odstotek (14,3 %) udeležencev, ki so pričeli z lastno pridelavo je med dijaki oz. študenti, kjer vidimo tudi, da približno enak odstotek sodelujočih iz te skupine med pandemijo bolj posega po živilih lokalne pridelave.

Več kot polovica sodelujočih v naši raziskavi se je s pridelavo lastnih živil ukvarjala že pred začetkom pandemije in se s pridelavo ukvarja tudi sedaj. Približno 7 % sodelujočih pa se je z lastno pridelavo pričelo ukvarjati v času pandemije. Tabela 11 prikazuje pridelavo lastnih živil glede na zaposlitveni status sodelujočih. Največji delež tistih, ki pridelujejo lastna živila je med upokojenci – 88 % vseh sodelujočih upokojencev namreč prideluje vsaj nekaj lastnih živil, sledijo pa jim dijaki oz. študenti. Najmanjši delež tistih, ki sami pridelujejo živila je med brezposelnimi udeleženci raziskave.

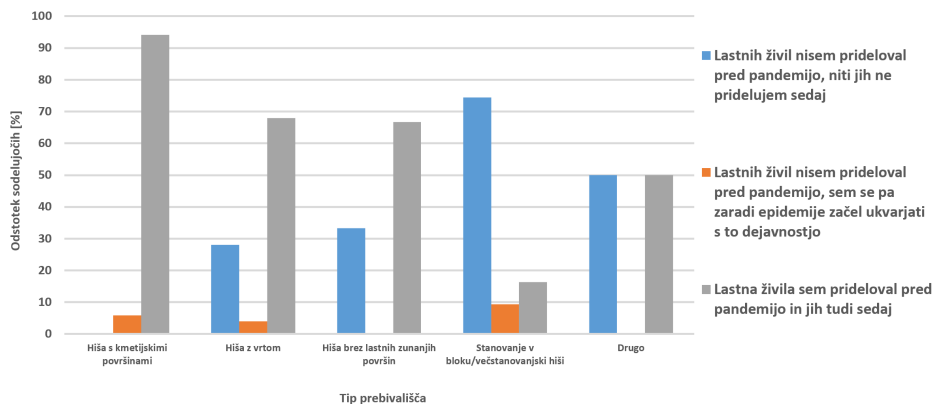
Tabela 11: Pridelava lastnih živil glede na zaposlitveni status

(Vir: lasten.)

	Lastnih živil ne pridelujem [%]	Lastna živila pridelujem [%]	Skupaj [%]
Zaposlen/a	48,68	51,32	100
Samozaposlen/a	33,33	66,67	100
Brezposeln/a	60	40	100
Upokojenec/ka	11,11	88,89	100
Dijak/inja ali študent/ka	14,29	85,71	100
Gospodinjec/gospodinja	28,57	71,43	100

Glede na našo raziskavo in visok delež (86 %) sodelujočih v raziskavi avtorjev Colarič Jakše, Kavšek in Obolnar (2020), lahko trdimo, da prebivalci Slovenije v veliki meri skrbijo za samooskrbo.

Preverili smo tudi kako vpliva tip prebivališča na spremembo glede pridelovanja lastnih živil (slika 10). Med sodelujočimi, ki živijo v hiši s kmetijskimi površinami ni nikogar, ki lastnih živil ne bi prideloval. Je pa med njimi približno 5 % takšnih, ki so s pridelavo pričeli šele med pandemijo. S pridelavo so med pandemijo pričeli tudi sodelujoči, ki živijo v hiši z vrtom in stanovanju v bloku/večstanovanjski hiši.

**Slika 10: Vpliv tipa bivališča na spremembe glede pridelovanja lastnih živil**

(Vir: lasten.)

7 Zaključek

Raziskava, ki smo jo izvedli meseca oktobra 2021, je potrdila predhodno izvedene raziskave drugih avtorjev, da so prebivalci Republike Slovenije pri nakupovanju živil pozorni na lokalno pridelana živila in da jih raje kupujejo kot tuje blagovne znamke (Rojšek, 2001; Zorko, 2018). Pandemija virusa COVID-19, ki je marca 2020 prizadela tudi Slovenijo, je med prebivalci še okrepila zaupanje v domača, lokalno pridelana živila (»Vpliv epidemije na prehranjevalne navade v drugem valu manjši« [Naša super hrana], 19. 2. 2021).

Z nakupom živil so tesno povezani tudi čuti. Lokalno pridelana živila potrošniki povezujejo z višjo kvaliteto, večjo svežino ter boljšim okusom (Golob, Burger, Tuškej Lovšin & Podnar, 2018), kar želijo ob nakupu tudi sami preveriti. Raziskava v Romuniji je pokazala, da navkljub spremembam zaradi pandemije, potrošniki želijo še vedno biti neposredno in čutno vključeni v postopek izbire in nakupa izdelkov (Buto et al., 2020). Torej da se želijo prehrambnih izdelkov pred odločitvijo nakupom dotakniti in s čuti preveriti njihove lastnosti. Podobno je pokazala tudi naša raziskava, kjer smo ugotovili, da skoraj nihče izmed sodelujočih živil ne naroča preko spleta.

Postavljeni tezi lahko na podlagi pregleda obstoječih raziskav in lastne raziskave potrdimo. Pandemija COVID-19 je vsekakor povečala zaupanje slovenskih potrošnikov v lokalno pridelana živila, ravno tako se je v času pandemije povečala pridelava lastnih živil.

V prihodnosti bi bilo raziskavo zanimivo ponoviti, saj se Slovenija sooča s podražitvijo hrane, ki so povezane s podražitvijo cen osnovnih materialov, transporta in embalaže (Lončar, 1. september 2021). Na ta način bi lahko preverili kako na potrošnjo lokalno pridelanih živil vplivajo rasti cen.

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*Priloga 1***Anketni vprašalnik**

Spoštovani, na Fakulteti za logistiko izvajamo anketo, povezano s spremembami v potrošnji lokalno pridelane hrane zaradi pandemije COVID-19. Prosili bi vas, če si vzamete približno 8 minut ter rešite kratko anketo. Veselimo se vaših odzivov. Vaše mnenje zelo cenimo.

1. Kaj za vas pomeni izraz lokalno pridelana živila?
 - a) Živila iz sosednjih držav (Italija, Avstrija, Madžarska, Hrvaška)
 - b) Živila iz Slovenije
 - c) Živila, pridelana v regiji v kateri živim
 - d) Drugo (zapišite kaj za vas pomenijo lokalno pridelana živila): _____

2. Katera trditev vas najbolj opiše?
 - a) Želim uživati izključno lokalno pridelana živila
 - b) Želim uživati vsaj nekaj lokalno pridelanih živil
 - c) Ne vidim potrebe ali koristi od uživanja lokalno pridelanih živil, vendar jih kljub temu ob priložnosti uporabljam
 - d) Ne vidim potrebe ali koristi od uživanja lokalno pridelanih živil in jih nikoli ne uporabljam

3. Kako pogosto uživate lokalno pridelana živila?
 - a) Vsak dan
 - b) Nekajkrat na teden
 - c) Nekajkrat na mesec
 - d) Nikoli

4. Kateri so tisti dejavniki, ki vas prepričajo v uživanje lokalno pridelanih živil?
(Možnih več odgovorov)
- a) Višja biološka vrednost
 - b) Višja hranilna vrednost (več vitaminov in mineralov)
 - c) Bogatejši okus
 - d) Svežina
 - e) Brez konzervansov, aditivov in kemičnih obdelav
 - f) Tradicionalnost okusov
 - g) Podpora lokalnih pridelovalcev in krepitev samooskrbe
 - h) Zmanjšanje ogljičnega odtisa zaradi kratkih transportnih poti
 - i) Drugo: _____
5. Ali je pandemija COVID-19 spremenila vaše navade glede oskrbovanja z živili lokalne pridelave?
- a) Nisem spremenil navad
 - b) Med pandemijo in po pandemiji bolj posegam po živilih lokalne pridelave
 - c) Med pandemijo in po pandemiji manj posegam po živilih lokalne pridelave

8. Ste zaradi pandemije COVID-19 pričeli/opustili lastno pridelavo živil?
- a) Lastnih živil nisem prideloval pred pandemijo, niti jih ne pridelujem sedaj
 - b) Lastnih živil nisem prideloval pred pandemijo, sem se pa zaradi epidemije začel ukvarjati s to dejavnostjo
 - c) Lastna živila sem prideloval pred pandemijo in jih tudi sedaj
 - d) Pridelavo lastnih živil sem v času pandemije opustil
9. Prosimo zaupajte nam razlog, zakaj ste začeli pridelovati svoja živila med pandemijo in katero skupino živil pridelujete.
-

10. Se je količina živil, ki ste jih pridelali v času pandemije povečala ali zmanjšala?

- a) Povečala za več kot 75 %
- b) Povečala za približno 25 - 50 %
- c) Povečala za manj kot 25 %
- d) Ostala enaka
- e) Zmanjšala za manj kot 25 %
- f) Zmanjšala za približno 25 - 50 %
- g) Zmanjšala za več kot 75 %

11. Prosimo zaupajte nam razlog, zakaj ste opustili pridelavo lastnih živil med pandemijo in katero skupino živil ste opustili.

12. Na katere pridelovalce in predelovalce (konkretne "blagovne znamke") se najprej spomnite, ko pomislite na lokalno pridelano hrano?

13. Prosimo, zaupajte nam, zakaj je uživanje lokalno pridelanih živil za vas nepomembno.

- a) Lokalno pridelana živila nimajo boljšega vpliva na moje zdravje
- b) Lokalno pridelana živila so dražja od uvoženih živil
- c) Lokalno pridelana živila mi niso dostopna (živim predaleč od kmetij/tržnic)
- d) Drugo (prosimo navedite razlog): _____

Najlepša hvala za vaše odgovore. Prišli ste do konca vsebinskega dela anketnega vprašalnika. Prosimo bi vas le še za nekaj vaših demografskih podatkov.

14. Spol:

- a) Ženska
- b) Moški

15. Prosimo, zaupajte nam vašo starost: _____

16. Kakšna je vaša najvišja dokončana izobrazba?

- a) Nedokončana osnovna šola
- b) Dokončana osnovna šola
- c) Poklicna šola
- d) Srednja šola
- e) Višješolska izobrazba
- f) Visokošolska izobrazba
- g) Univerzitetna izobrazba
- h) Magisterij
- i) Doktorat

17. Kakšen je vaš trenutni zaposlitveni status?

- a) Zaposlen/a
- b) Samozaposlen/a
- c) Brezposeln/a
- d) Upokojenec/ka

- e) Dijak/inja ali študent/ka
- f) Gospodinja
- g) Kmetovalec
- h) Nezmožen/a za delo zaradi bolezni/invalidnosti
- i) Drug status (prosimo navedite): _____

18. Koliko članov šteje vaše gospodinjstvo?

- a) 1 član
- b) 2 člana
- c) 3 člani
- d) 4 člani
- e) Več kot 4 člani (prosimo, vpišite št. članov): _____

19. V kakšnem tipu naselja živite?

- a) Hiša na samem, zaselek ali manjša vada z do 500 prebivalci
- b) Vas, kraj, trg z 500 - 2.000 prebivalci
- c) 2.000-10.000 prebivalcev
- d) Več kot 10.000 prebivalcev
- e) Maribor
- f) Ljubljana

20. V kateri regiji prebivate?

- a) Pomurska regija
- b) Podravska regija
- c) Koroška regija
- d) Savinjska regija
- e) Zasavska regija
- f) Spodnjeosavska regija
- g) Jugovzhodna regija
- h) Osrednjeslovenska regija
- i) Gorenjska regija
- j) Notranjsko - kraška regija
- k) Goriška regija

l) Obalno - kraška regija

21. Kje živite?

- a) Hiša z kmetijskimi površinami
- b) Hiša z vrtom
- c) Hiša brez lastnih zunanjih površin
- d) Stanovanje v bloku/večstanovanjski hiši
- e) Drugo (prosimo zapišite): _____

22. Nam prosimo zaupate kolikšen znesek približno porabite za hrano?

23. Bi nam prosimo zaupali kolikšen približno je mesečni neto dohodek vašega gospodinjstva, to je dohodek vseh članov gospodinjstva skupaj (v evrih)

- a) do 500 evrov
- b) 500 - 700 evrov
- c) 700 - 900 evrov
- d) 900 - 1.100 evrov
- e) 1.100 - 1.300 evrov
- f) 1.300 - 1.500 evrov
- g) 1.500 - 1.700 evrov
- h) 1.700 - 1.900 evrov
- i) Več kot 1.900 evrov
- j) Ne vem
- k) Ne želim odgovoriti

Odgovorili ste na vsa vprašanja v tej anketi. Hvala za sodelovanje.

Analiza vprašanja: Kako se oskrbujete s posameznimi skupinami živil v zadnje pol leta? Če se pri določeni skupini živil poslužujete različnih načinov za oskrbo, izberite najpogostejšega.

	Hipermarketi, marketi in manjše trgovine (domače znamke)	Spletni nakup (večji trgovci)	Spletni nakup (Zeleni zabojček)	Trgovine z lokalno ponudbo	Tržnice	Bližnje kmetije	Pridelam sam/a	Dobim od sorodnikov/znancev, ki jo pridelajo sami	Hipermarketi, marketi in manjše trgovine (uvožene znamke)	Skupaj
Zelenjava	20 16 %	0 0 %	0 0 %	3 2 %	23 19 %	11 9 %	40 32 %	23 19 %	4 3 %	124 100 %
Sadje	42 34 %	0 0 %	2 2 %	7 6 %	19 15 %	13 10 %	16 13 %	16 13 %	9 7 %	124 100 %
Meso	31 27 %	0 0 %	0 0 %	11 9 %	4 3 %	36 31 %	7 6 %	24 21 %	3 3 %	116 100 %
Ribe	50 43 %	1 1 %	0 0 %	8 7 %	25 23 %	3 3 %	0 0 %	2 2 %	22 20 %	111 100 %
Kruh	51 41 %	0 0 %	1 1 %	18 15 %	4 3 %	0 0 %	39 32 %	5 4 %	4 4 %	123 100 %
Testenine	67 54 %	1 1 %	0 0 %	15 12 %	1 1 %	5 4 %	10 8 %	0 0 %	24 20 %	123 100 %
Mleko	74 64 %	1 1 %	0 0 %	4 3 %	4 3 %	22 19 %	2 2 %	2 2 %	7 6 %	116 100 %
Jogurti	74 64 %	1 1 %	0 0 %	9 8 %	5 4 %	14 12 %	1 1 %	0 0 %	11 10 %	115 100 %
Siri	61 54 %	1 1 %	0 0 %	10 9 %	9 8 %	17 15 %	1 1 %	0 0 %	15 13 %	114 100 %
Moka, žita	59 48 %	0 0 %	2 2 %	22 18 %	5 4 %	19 16 %	1 1 %	5 4 %	9 7 %	112 100 %
Med	11 9 %	0 0 %	1 1 %	8 7 %	16 13 %	36 30 %	2 2 %	46 38 %	0 0 %	120 100 %

	Hipermarketi, marketi in manjše trgovine (domače znamke)	Spletni nakup (večji trgovci)	Spletni nakup (Zeleni zabojček)	Trgovine z lokalno ponudbo	Tržnice	Bližnje kmetije	Pridelam sam/a	Dobim od sorodnikov/znancev, ki jo pridelajo sami	Hipermarketi, marketi in manjše trgovine (uvožene znamke)	Skupaj
Marmelade	23 19 %	0 0 %	0 0 %	3 2 %	2 2 %	2 2 %	52 43 %	35 29 %	4 3 %	121 100 %
Sokovi	38 33 %	0 0 %	0 0 %	8 7 %	1 1 %	1 1 %	34 30 %	20 17 %	13 11 %	115 100 %
Čaji	39 33 %	0 0 %	1 1 %	9 8 %	2 2 %	5 4 %	39 33 %	11 9 %	14 12 %	120 100 %
Vina	39 36 %	0 0 %	1 1 %	9 8 %	0 0 %	13 12 %	14 13 %	25 23 %	7 6 %	108 100 %
Žganje	20 19 %	0 0 %	0 0 %	3 3 %	2 2 %	17 16 %	18 17 %	34 32 %	12 11 %	106 100 %
Pivo	77 70 %	0 0 %	1 1 %	12 11 %	0 0 %	0 0 %	0 0 %	0 0 %	20 18 %	110 100 %
Jajca	12 13 %	0 0 %	0 0 %	1 1 %	7 7 %	44 46 %	13 14 %	17 18 %	1 1 %	95 100 %
Drugo:	10 56 %	0 0 %	0 0 %	2 11 %	0 0 %	1 6 %	0 0 %	0 0 %	5 28 %	18 100 %

Analiza vprašanja: Kako ste se oskrbeli s posameznimi skupinami živil pred pandemijo COVID-19? Če se pri določeni skupini živil poslužujete različnih načinov za oskrbo, izberite najpogostejšega.

	Hipermarketi, marketi in manjše trgovine (domače znamke)	Spletni nakup (večji trgovci)	Spletni nakup (Zeleni zabojček)	Trgovine z lokalno ponudbo	Tržnice	Bližnje kmetije	Pridelam sam/a	Dobim od sorodnikov/znancev, ki jo pridelajo sami	Hipermarketi, marketi in manjše trgovine (uvožene znamke)	Skupaj
Zelenjava	20 45 %	0 0 %	0 0 %	4 9 %	3 7 %	1 2 %	5 11 %	6 14 %	5 11 %	44 100 %
Sadje	22 51 %	0 0 %	0 0 %	2 5 %	4 9 %	2 5 %	1 2 %	6 14 %	6 14 %	43 100 %
Meso	21 53 %	1 3 %	0 0 %	0 0 %	0 0 %	7 18 %	1 3 %	5 13 %	5 13 %	40 100 %
Ribe	21 54 %	1 3 %	0 0 %	4 10 %	4 10 %	1 3 %	0 0 %	0 0 %	8 21 %	39 100 %
Kruh	28 67 %	0 0 %	0 0 %	4 10 %	0 0 %	0 0 %	7 17 %	1 2 %	2 5 %	42 100 %
Testenine	26 62 %	1 2 %	0 0 %	3 7 %	0 0 %	0 0 %	2 5 %	0 0 %	10 24 %	42 100 %
Mleko	27 66 %	2 5 %	0 0 %	2 5 %	0 0 %	4 10 %	1 2 %	0 0 %	5 12 %	41 100 %
Jogurti	30 73 %	1 2 %	0 0 %	3 7 %	0 0 %	1 2 %	0 0 %	0 0 %	6 15 %	41 100 %
Siri	27 66 %	1 2 %	0 0 %	5 12 %	0 0 %	1 2 %	0 0 %	0 0 %	7 17 %	41 100 %
Moka, žita	25 58 %	0 0 %	0 0 %	5 12 %	0 0 %	4 9 %	0 0 %	2 5 %	7 16 %	43 100 %
Med	14 33 %	0 0 %	0 0 %	2 5 %	0 0 %	6 14 %	1 2 %	19 44 %	1 2 %	43 100 %

LOGISTIKA PRI IZPELJAVI PREVERJANJ NPK-JEV V GOZDARSTVU

MATJAŽ TURK

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Povzetek NPK se na kmetijski šoli Grm Novo mesto odvija že od leta 2014. Na področju gozdarstva izvajamo tri vrste NPK-ja: gozdar sekač, gozdar traktorist in gozdar gojitelj. Znanje se preverja tako s praktičnim kot tudi s teoretičnih preizkusom. Razpise in člane komisij, ki ocenjujejo kandidate, odobri Razvojni in informacijski center v Ljubljani. Na preizkus NPK-jev se prijavljajo posamezniki, ki potrebujejo ustrezno poklicno kvalifikacijo iz področja gozdarstva. NPK-ji omogočajo hitrejšo prilagajanje zahtevam trga, saj kvalificirane delavce dobimo v precej krajšem času. Delavce lahko pridobimo tudi iz drugih poklicev. Kandidat mora za prijavo na preizkus izpolnjevati splošne zakonsko predpisane pogoje. Pred preizkusom NPK-ja se za prijavitelje pripravi tudi ustrezne tečaje iz posameznega področja, kjer se kandidate podrobneje seznanijo s praktičnim in teoretičnim znanjem ter zahtevam preizkusa. Tečaji niso obvezni, vendar so predvsem zaradi zahtevnosti preizkusov priporočljivi. Organizator preizkusov znanja mora poleg ustreznega delovišča poskrbeti tudi za vso ustrezno tehnično opremo, ki jo pri izpeljavi praktičnega preizkusa potrebujemo. V času SARS-CoV-2 mora organizator poskrbeti za upoštevanje vseh zahtev NIJZ-ja in s tem zagotoviti delovno okolje, ki preprečuje širjenje virusa. Pri tem moramo upoštevati zaščitno opremo, varnostno razdaljo, ustrezne načine prevoza na delovišče itd.

Ključne besede:

Nacionalna poklicna kvalifikacija (NPK), gozdar sekač, gozdar traktorist, gozdar gojitelj, SARS-CoV-2

LOGISTICS OF NPK (NATIONAL PROFESSIONAL QUALIFICATIONS) VERIFICATIONS IN FORESTRY

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Abstract NPK has been taking place at the Grm Novo mesto agricultural school since 2014. In forestry, we implement three types of NPK: forester cutter, forester tractor driver and forester grower. Knowledge is tested by both practical and theoretical tests. Tenders and members of commissions evaluating candidates are approved by the RIC in Ljubljana. Individuals who need a relevant professional qualification in forestry apply for the NPK tests. NPKs enable faster adaptation to market demands, because we get skilled workers in a much shorter time. Workers can also be recruited from other professions. The candidate must meet the general legally prescribed conditions in order to apply for the test. Prior to the NPK test are prepared appropriate courses for applicants in an individual area, where candidates are acquainted in more detail with practical and theoretical knowledge and test requirements. Courses are not mandatory, but are recommended mainly due to the complexity of the tests. In addition to the appropriate work site, the organizer of these tests must also take care of all the appropriate technical equipment that is needed to carry out the practical test.

Keywords:

NPK,
forester
cutter,
forester
tractor
driver,
forester
grower,
SARS-CoV-2

1 Uvod

Nacionalna poklicna kvalifikacija (v nadaljevanju: NPK) je bila leta 2000 formalno uveljavljena z Zakonom o nacionalnih poklicnih kvalifikacijah (Uradni list RS, št. 1/07 – uradno prečiščeno besedilo in 85/09). Leta 2001 so se začeli prvič podeljevati javnoveljavni certifikati o NPK-jih. Cilj tega sistema je sprva bil certificiranje industrijskih delavcev brez poklicnih kvalifikacij. Kasneje pa je usklajevanje z evropskimi smernicami sistema NPK ta sistem vse bolj povzegal vlogo priznavanja neformalnega in priložnostnega učenja. Po vzorcu evropskih smernic naj bi visoka ravnem formalizacije in institucionalizacije delovanja sistema NPK prispevala tudi k njegovi verodostojnosti in s tem k ustvarjanju zaupanja vseh ključnih akterjev, ki v njem prepoznavajo svoje interese. V današnjem času pa ta sistem predstavlja enega izmed najbolj uveljavljenih načinov vrednotenja učinkov neformalnega in priložnostnega učenja (Drofenik Klement, 2011).

Kandidati lahko NPK dosežejo na dva načina. Prvi je po sistemu šolskega izobraževanja, drugi pa s priznavanjem neformalno in priložnostno pridobljenih znanj. Na področju gozdarstva kandidati pridobivajo certifikate na osnovi uspešno opravljenega preizkusa znanja. Ta način omogoča priznavanje poklicnih kvalifikacij ne glede na način in učna okolja, v katerih so bila pridobljena (Drofenik Klement, 2011).

NPK-ji omogočajo hitrejšo prilagajanje zahtevam trga, saj kvalificirane delavce dobimo v precej krajšem času. Delavci, ki že opravljajo nek poklic lahko s pomočjo NPK-jev na hiter način pridobijo še enega ali več. Na osnovi tega lahko delavci, ki imajo že izkušnje iz gozdarstva in so to znanje pridobili pri delu v svojem gozdu ali pri pomoči lastnikom drugih gozdnih površin, tako na dokaj hiter način pridobijo ustrezno poklicno kvalifikacijo (Drofenik Klement, 2011).

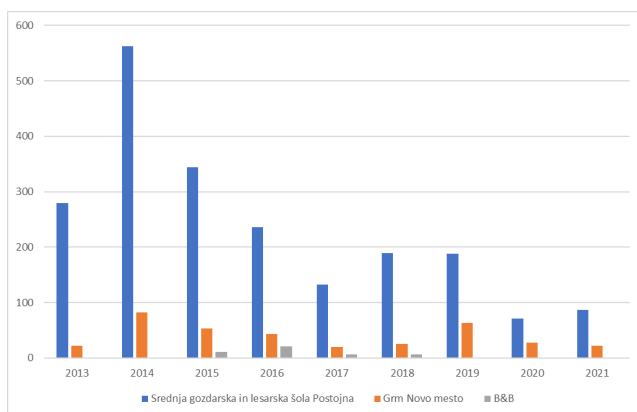
Na izobraževalni ustanovi Grm Novo mesto se s področja gozdarstva opravljajo trije različni preizkusi znanja s področja NPK gozdar sekač, gozdar traktorist in gozdar gojitelj. Z izvajanjem NPK s področja gozdarstva smo v izobraževalni ustanovi Grm Novo mesto pričeli leta 2014. Preizkusi znanja so sestavljeni iz praktičnega in teoretičnega preizkusa. Pri gozdarju sekaču se zahteva pravilno in usmerjeno podiranje enega drevesa s kleščenjem, krojenjem in izdelavo gozdnega reda. Pri gozdarju traktoristu je preizkus sestavljen iz ustnega preverjanja praktičnega znanja, izvajanja prazne vožnje, zbiranja tovora, izvajanja polne vožnje in rampanja

lesa ter preverjanja teoretičnega znanja. Gozdar gojitelj pa mora prikazati znanje iz prepoznavanja drevesnih in grmovnih vrst ter opraviti nego gozda na površini enega ara, ter opraviti še teoretični preizkus. Če kandidati uspešno opravijo s praktičnim delom, sledi še teoretični preizkus znanja iz posameznega področja.

2 Izvajanje NPK-jev iz področja gozdarstva v Sloveniji

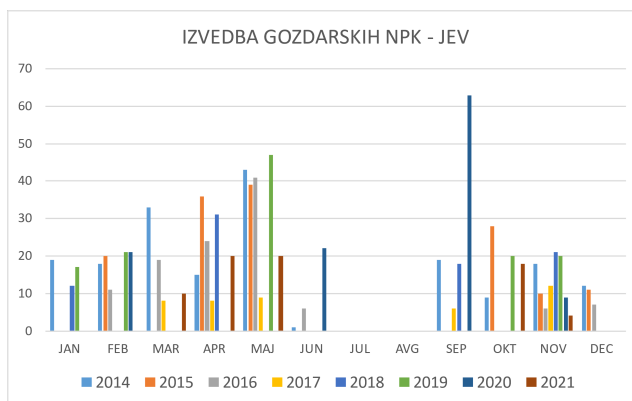
Poklic gozdarja sekača je eden od fizično najbolj napornih in tudi nevarnih poklicev v Evropi. Kljub ustrezni zaščitni opremi, ustreznemu teoretičnemu ter praktičnemu znanju, se vsem nevarnostim, ki prežijo na delavca, ne da izogniti. Delavci delajo z živo naravo, zaradi tega je določene dejavnike, ki vplivajo na samo varnost, zelo težko, v določenih primerih pa celo nemogoče, točno določiti. Posledično zaradi tega prihaja do lažjih in tudi težjih poškodb. Poleg tega, delamo z delovnimi sredstvi, ki škodljivo vplivajo na zdravje samega delavca, ki opravlja delo v gozdu. Takšno delo velikokrat otežujejo tudi vremenske razmere. Zato pri gozdarjih sekačih in traktoristih prihaja do raznih poklicnih obolenj.

Izobraževalne ustanove, ki izvajajo NPK-je s področja gozdarstva, so Srednja gozdarska in lesarska šola Postojna, B&B in Grm Novo mesto. Od leta 2013 do leta 2021 je Srednja gozdarska in lesarska šola Postojna opravila večinski delež NPK-jev. V tem času je bila kmetijska šola Grm Novo mesto šele na začetku uveljavljanja pri izvajanju nacionalnih poklicnih kvalifikacijah. Na osnovi kvalitetnega dela pri izvajanju tečajev in preizkusov NPK-jev v nadaljnjih letih beležimo vse večje število kandidatov, ki so si za ustanovo izobraževanja izbrali Grm Novo mesto.



Graf 1: Razporeditev kandidatov po letih (od 2013 do 2021)

Zaradi epidemije SARS-CoV-2 v letu 2020 (marec, april, maj, december) ter januarja in februarja 2021 nismo izvajali preizkusov znanj NPK-jev v gozdarstvu na Grmu Novo mesto. V tem obdobju ocenjujemo, da bi lahko usposobili približno sto kandidatov. Poleg zmanjšane števila kandidatov pa nam je neizvajanje preizkusov in tečajev povzročilo težave pri izpeljavi letnih količin poseka lesa, saj so odločbe o poseku lesa določene na enoletno obdobje. Neposekane količine lesa smo zato morali posekati in iz gozda spraviti v okviru dela na posestvu Grm Novo mesto.



Graf 2: Izvedba gozdarskih NPK-jev na Grmu Novo mesto (od 2014 do 2021)

3 Potek prijave na NPK-je v gozdarstvu

Komu so namenjene nacionalne poklicne kvalifikacije? V večji meri so namenjene odraslim, ki nimajo veljavne listine o poklicni ali strokovni izobrazbi, odraslim, ki imajo poklicne kompetence (izkušnje, znanje, spretnosti) in tistim, ki želijo napredovati v poklicni karieri, ne da bi morali za to pridobiti tudi višjo raven poklicne izobrazbe (RIC, b.d. (a)).

Ko se kandidat odloči za pristop k opravljanju NPK-ja za gozdarja sekača mora izpolnjevati splošne pogoje, ki so:

- starost najmanj 18 let,
- najmanj dokončana osnovnošolska izobrazba,
- posebnost je pri gozdarju traktoristu, ki potrebuje še vozniško dovoljenje za vožnjo motornih vozil kategorije F (NPK GRM, b.d.)

K obvezni dokumentaciji spada prijavnica za preverjanje iz NPK, kopija spričevala, Europass življenjepis ter pri gozdarju traktoristu kopija vozniškega izpita za F kategorijo. Kandidat lahko posreduje tudi drugo dokumentacijo, in sicer:

- potrdila o usposabljanjih na področju sečnje dreves,
- referenčna pisma, v katerih delodajalci potrdijo strokovne reference,
- pogodbe o opravljanju del v gozdovih,
- fotokopijo delovne knjižice ali dovoljenje o zaposlitvi, v katerem je razviden datum zaposlitve oziroma delovne izkušnje na strokovnem področju ali
- izpisek iz poslovnega registra AJ PES (samostojni podjetniki) ali odločbo o registrirani dopolnilni dejavnosti (dopolnilna dejavnost na kmetiji),
- izpisek Zavoda za zdravstveno zavarovanje Slovenije o statusu prijavitelja (NPK GRM, b.d.)

Kandidat posreduje vso obvezno dokumentacijo na Grm Novo mesto, kjer svetovalec preveri dokazila, ki jih mora kandidat predložiti v postopku in s katerimi dokazuje izpolnjevanje vstopnih dokumentov.

Ko je zbrana in preverjena vsa potrebna dokumentacija posameznih kandidatov in ko je takšnih kandidatov dovolj, Grm Novo mesto zaprosi za določitev termina izpeljave preverjanja znanja na Razvojno izobraževalni center (v nadaljevanju: RIC) v Ljubljani. RIC nato določi termin izvedbe in komisijo, ki bo izvajala preverjanje.

Kraj preverjanja nacionalnih poklicnih kvalifikacij ter rok za prijavo in odjavo izvajalec sporoči Državnemu izpitnemu centru ter jih objavi na straneh Nacionalnega informacijskega središča za poklicne kvalifikacije. Izvajalec mora razpisati rok za preverjanje in potrjevanje nacionalnih poklicnih kvalifikacij ter preverjanje in potrjevanje ob prijavi kandidata tudi izvesti, in to vsaj enkrat v dvanajstih mesecih. Če izvajalec vsaj enkrat v dvanajstih mesecih ne razpiše roka za preverjanje in potrjevanje nacionalnih poklicnih kvalifikacij, se izbriše iz registra za nacionalno poklicno kvalifikacijo, za katero rok ni bil razpisan. Za izvajalce začne veljati obveza razpisa roka za preverjanje nacionalnih poklicnih kvalifikacij z dnevom pravnomočnosti odločbe o vpisu v register (RIC, b.d. (b)).

Za vse tri oblike NPK-jev iz področja gozdarstva se v okviru izobraževanja odraslih izvajajo tudi ustrezni tečaji, pri katerih kandidati pridobijo ustrezno praktično in teoretično znanje, ki je potrebno za posamezni preizkus. Tečaji za sam preizkus NPK-jev niso obvezni, so pa zaradi zahtevnosti preizkusa priporočljivi. Kandidat se lahko prijavi na preizkus znanja tudi brez tega, ne da bi predhodno opravil kakršenkoli tečaj iz področja gozdarstva.

4 Komisija

Komisija je sestavljena iz treh članov. Eden mora imeti najmanj visokošolsko izobrazbo, drugi višjo strokovno in tretji srednjo strokovno izobrazbo s področja gozdarstva. Vsi trije člani komisije pa morajo imeti s področja gozdarstva tudi 5 let delovnih izkušenj. (NRP, b.d.).

Licenco za člane komisije lahko pridobi kdor izpolnjuje predpisane pogoje z zakonom, ki ureja Nacionalne poklicne kvalifikacije (NRP, b.d.).

5 Dodatni ukrepi v času SARS-CoV-2

Člani komisije, kandidati in osebe, ki v skladu s pravnimi določili lahko spremljajo postopek preverjanja in potrjevanja NPK, morajo upoštevati higienska priporočila NIJZ-ja. V postopku lahko sodelujejo samo zdrave osebe, brez znakov akutne okužbe dihal, ki pred izvajanjem preizkusa podpišejo ustrezno izjavo (Higienska priporočila za izvedbo postopkov preverjanja in potrjevanja nacionalnih poklicnih kvalifikacij (NPK), 2020).

5.1 Zaščitna oprema

Udeleženci postopka preverjanja in potrjevanja NPK v objektu izvajalca nosijo zaščitne maske ves čas zadrževanja v objektu. Pri izvajanju preizkusa na prostem, kjer je možno vzdrževati razdaljo večjo od dveh metrov, nošenje zaščitne maske ni potrebno. Vsi prisotni pri preizkusu morajo biti seznanjeni s pravilnim načinom nošenja in snemanja maske. Maske je potrebno občasno menjati, in sicer na dve do tri ure. V zaprtem prostoru je potrebno tudi razkuževanje rok. Največje število kandidatov pri posameznem preizkusu je zaradi SARS-CoV-2 omejeno na največ 15 kandidatov (Higienska priporočila za izvedbo postopkov preverjanja in potrjevanja nacionalnih poklicnih kvalifikacij (NPK), 2020).

6 Logistika izpeljave NPK-jev v gozdarstvu

Za izvedbo NPK-jev iz področja gozdarstva se pred začetkom izvedejo tečaji iz vseh področji (gozdar sekač, gozdar traktorist, gozdar gojitelj). Najprej se izvede seznanitev s kandidati s teoretičnim znanjem. Nato sledi predstavitev posameznih delovnih operacij glede na vrsto NPK-ja. Gozdarji sekači se na varno delo z motorno žago pripravljajo na poligonu. Gozdarji traktoristi pa se ravno tako na poligonu seznanijo z upravljanjem gozdarskega traktorja in delovanjem gozdarskega vitla in dalinskega upravljalca. Ko kandidati osvojijo določena znanja o upravljanju z gozdarsko mehanizacijo nadaljujejo z izobraževanjem na terenu, kjer pod nadzorom opravljajo delo gozdarja sekača in traktorista. Po usposabljanju nato sledi preizkus.

6.1 Priprava objekta

Gozdna površina, na kateri se izvaja preverjanje NPK-ja, naj bi bila na nezahtevnem terenu. Na tej površini je potrebno zagotoviti odkazilo dreves, ki ga izvede Zavod za gozdove in za ta poseg izda tudi primerno odločbo. Drevesa naj bi bila ustreznih premerov, da omogočajo izvedbo različnih tehnik podiranja. Pred pričetkom praktičnega preizkusa se drevesa oštevilči glede na število kandidatov, ki dnevno pristopijo k preizkusu znanja. Kandidati pred začetkom izvajanja praktičnega dela izžrebajo številko drevesa, ki ga v nadaljevanju posekajo, oklestijo in skrojijo.

6.2 Priprava orodja in ustrezne zaščitne opreme

Organizator preverjanja nacionalne poklicne kvalifikacije (v našem primeru Grm Novo mesto), mora zagotoviti sledečo materialno opremo:

- ustrezne profesionalne motorne žage (prenosni motorni vitel, model ali shematski prikaz prereza motorne žage),
- ročno orodje (klini za naganjanje drevesa, hidravlični klin za naganjanje drevesa, sekira, obračalnik, naganjalni vzvod, posoda za gorivo in mazivo, cepin, žični nateg, odpiralni škripec, sidrni pas, sekaški meter, ponjava za sproščanje obviselih dreves, komplet za vzdrževanje motorne žage: pile za brušenje motorne žage, kombinirani ključ, regulacijski izvijač, mazilo za vodilno kolesce na letvi, opozorilni znaki za nevarnost označitev delovišča ob prometnicah),

- vozila (kombinirano ali osebno vozilo z zabojnikom za prevažanje učnih pripomočkov in članov spremljevalne ekipe ter članov komisije),
- osebno varovalno opremo (varovalna čelada z glušniki in vizirjem po ustreznih evropskih standardih, varovalni čevlji po ustreznih evropskih standardih, varovalna obleka po ustreznih evropskih standardih, varovalne rokavice, komplet opreme za prvo pomoč) (NRP, b.d.).

6.3 Potek preverjanja NPK-ja gozdar sekač

Pred začetkom preverjanja predsednik komisije s pregledom osebnih dokumentov preveri prisotne kandidate. Sledi preverjanje ustreznosti zaščitne opreme kandidata, gozdarskega orodja in varnostnih elementov na motorni žagi. Kandidate se seznanijo s potekom preverjanja samega preizkusa in z načinom ocenjevanja ter točkovanja napak, ki jih kandidat pri delu naredi. Po seznanitvi s potekom ocenjevanja in žrebanju dreves kandidati odidejo v gozd, kjer začnejo z izvedbo preizkusa.

Nepravilnosti, ki jih kandidati naredijo pri delu se ocenjujejo s tremi stopnjami napak:

- z lažjo napako, ki predstavlja 20 kazenskih točk in
- s težjo napako, ki je 35 kazenskih točk ter
- s smrtno napako, ki predstavlja izločilni kriterij.

Če kandidat doseže več kot 100 kazenskih točk ali se mu primeri izločilni kriterij, mora nemudoma zapustiti delovišče. Zaradi nemotenege procesa nadaljnje izvedbe preizkusov, mora organizator preizkusa dokončati in izdelati drevo, katerega je izdeloval padli kandidat. Če kandidat med samim delom ni presegel kritičnega števila točk, po opravljenem praktičnem delu sledi še ustni zagovor, ki ga mora ravno tako uspešno opraviti. V primeru, da kandidat na ustnem zagovoru ne doseže ustreznega števila točk, mora izpit v celoti ponovno opraviti. Ob uspešnem zaključku pridobi ustrezno potrdilo, ki služi kot dokazilo o uspešno opravljenem NPK-ju.



Slika 1: Podiranje drevesa (levo) in krojenje gozdnih sortimentov (desno)
(Vir: lasten.)

Področje ocenjevanja	Merila	Delež (%)	Ustrezno	Neustrezno
IZEDBA	Glej spodaj	55		
POSTOPKI IN ELEMENTI DELA		IZVEDBA (OZNAČI Z »X«)		
		PRAVILNA	NAPAČNA LAŽJA TEŽJA NAPAKA NAPAKA	
7. Podiranje drevesa				
7.1	Določitev težišča drevesa glede na predvideno smer podiranja			
7.2	Napačna določitev smeri podiranja			
7.3	Določitev smeri umika			
7.4	Glede na gnilost drevesa, mora pričeti z zasekom višje			
Zasek				
7.5	Višina panja (1/3 premera panja)			
7.6	Horizontalnost reza (iz vertikale več kot 2 cm)			
7.7	Kot zaseka <input type="checkbox"/> večji od 50° <input type="checkbox"/> manj kot 30°			
7.8	Globina zaseka Označi z x: <input type="checkbox"/> težišče nazaj (več kot ¼ premera na panju), <input type="checkbox"/> težišče naprej (manj kot ¼ premera na panju) <input type="checkbox"/> manj kot 1/6 premera na panju <input type="checkbox"/> več kot 1/3 premera na panju			
7.9	Ujemanje rezov <input type="checkbox"/> neujemanje na sredini več kot 2 cm <input type="checkbox"/> neujemanje ob strani več kot 2 cm <input type="checkbox"/> prekratka linija zaseka			
7.10	Dvojna linija zaseka (tetiva večja od 3 cm)			
7.11 Korekcija zaseka (vpiše se pod točke 7.6 do 7.9 s pripisom K)				
7.12	Globina zaseka več kot ½ premera drevesa na panju.		IZLOČILNI KRITERIJ	
7.13	Poškodba na hlotu zaradi neprežaganih lesnih vlaken ščetine na panju			
Podžaganje				
7.14	Opozorilo (1. opozorilo; pazi podiram!)			
7.15	Napačen način podžaganja drevesa Obkroži: ni pustil Pete/mesto začetka podžaganja		IZLOČILNI KRITERIJ	

	PRAVILNA	NAPAČNA LAŽJA TEŽJA NAPAKA NAPAKA	
7.16 Višina podžagovanja v razmerju na premer drevesa na panju			
Komisija lahko določi lažjo ali težjo napako; Lažja napaka = če je višina podžagovanja 50 % do 100 % višja od idealne (1/10 premera drevesa na panju). Težja napaka = če je višina podžagovanja nižja od 2 cm ali če je višina podžagovanja 100 % višja od idealne (1/10 premera drevesa na panju).			
7.17 Negativna višina		IZLOČILNI KRITERIJ	
7.18 Ni pravočasno vstavil klin, nepravilno mesto vstavitve klina, ni vstavil klina			
7.19 Opozorilo (2. opozorilo; pazi podiram!)			
7.20 Širina ščetine (vzporedna) v razmerju na premer drevesa na panju.			
Komisija lahko določi lažjo ali težjo napako; Lažja napaka = če je širina ščetine od 50% do 100 % večja od idealne (1/10 premera drevesa na panju). Težja napaka = če je širina ščetine na enem mestu tanjša od 2 cm ali če je širina ščetine 100 % večja od idealne (1/10 premera drevesa na panju).			
7.21 Širina ščetine (trikotna) Označi z x: <input type="checkbox"/> obrnjen trikotnik <input type="checkbox"/> ni trikotne ščetine <input type="checkbox"/> dvojna trikotna ščetina			
7.22 Prežagana ščetina		IZLOČILNI KRITERIJ	
7.23 Na sredini ravnine podžagovanja pustil neprežagan del			
7.24 Klinjanje in naganjanje Označi z x: <input type="checkbox"/> neenakomerno udarjanje s sekiro <input type="checkbox"/> poškoduje klin <input type="checkbox"/> zlomi klin <input type="checkbox"/> ni učinkovitega zamaha			
7.25 Drevo ne pade po tem, ko je sekač izrabil vso naganjalno opremo, ki jo ima na voljo in/oziroma ne pozna ali ne zmore ustreznega/varnega načina nadaljevanja podiranja!		IZLOČILNI KRITERIJ	
7.26 Opozorilo (3. opozorilo; pazi pada!)			
7.27 Smer umika (v nevarno območje premalo v varno smer, v padcu drevesa prehaja preko nevarne cone)		IZLOČILNI KRITERIJ	
7.28 Padec v pravilno smer (na 15 metrih več kot 2m levo ali desno izven)		IZLOČILNI KRITERIJ	
7.29 Drevo obvisi		IZLOČILNI KRITERIJ	

POSTOPKI IN ELEMENTI DELA	IZVEDBA (OZNAČI Z »X«)		
	PRAVILNA	NAPAČNA LAŽJA NAPAKA	TEŽJA NAPAKA
8. Izdelava in kleščenje			
8.1. Obdelava korenovca in ščetine			
8.2. V strmini, izvaja kleščenje iz spodnje strani			
8.3. Vodenje žage in položaj kandidata: Označi z x: <input type="checkbox"/> ne preprijema motorne žage, <input type="checkbox"/> ukrivljena drža hrbtenice, <input type="checkbox"/> ≤ 30 % vej oklesti na rokah, <input type="checkbox"/> ne klesti s polnim plinom, <input type="checkbox"/> krčevita drža mot. žage, <input type="checkbox"/> žago postavlja pravokotno na os debla			
8.4. Kvaliteta kleščanja (štrclji vej daljši od 1 cm merjeno od lubja)			
Krojenje			
8.5. Merjenje dolžin sortimenta igl. (napaka večja od 5 cm)			
8.6. Ni upošteval minimalnega premera za hlod (loči hlodovino od celuloze pri 23 cm in več)			
8.7. Ni upošteval napake sredine (gnilobe ≤ 10 %)			
8.8. Neupoštevanje napak pri krojenju listavcev: Označi z x: <input type="checkbox"/> uporablja meter, <input type="checkbox"/> nepravilno izločene hlače, <input type="checkbox"/> ne loči hloda od drv <input type="checkbox"/> ne izdelava optimalnih GLS <input type="checkbox"/> s krojenjem razvrednoti kakovost debla			
Prežagovanje			
8.9. Izbira stojišča (prežaguje iz spodnje strani)		IZLOČILNI KRITERIJ	
8.10. Letev motome žage stisne sortiment			
8.11. Ujemanje rezov (več kot 2 cm)			
8.12. Poškodbe zaradi nepravilnosti pri prežagovanju poklina več kot 20 cm vzdolž debla)			
8.13. Gozdni red (nepopolni)			

Slika 2: Del zapisnika preizkusa NPK za gozdar sekač

Vir: (RIC, b.d. (c))

6.4 Potek preverjanja NPK-ja gozdar traktorist

Pred začetkom izvajanja preverjanja NPK-ja gozdar traktorist mora organizator poskrbeti za ustrezno število gozdnih sortimentov, ki jih bodo kandidati spravljali iz gozda. V primeru, da se rampni prostori nahajajo ob javnih površinah, je potrebno postaviti opozorilne table in v primeru, da se nahaja na nepreglednem delu vozišča, postaviti tudi fizično zaporo. Kandidati lahko preizkus opravljajo s pomočjo gozdarskega traktorja, ki ga priskrbi izvajalec NPK-ja (v našem primeru Grm Novo mesto) ali pa preizkus opravljajo na svojih gozdarskih traktorjih, ki morajo biti v skladu z vsemi varnostnimi predpisi, vendar se te možnosti po navadi ne poslužujejo. Preizkus znanja sestoji iz treh delnih preizkusov.

Na začetku je kandidat preizkušen v praktičnem znanju, kjer mora komisiji odgovoriti na 10 zastavljenih vprašanj, ki se ocenjujejo z lažjo in težjo napako. Na osnovi teh vprašanj komisija oceni, če je kandidat dovolj usposobljen za opravljanje praktičnega dela. Nato sledi praktični preizkus. Kandidat opravi en cikel spravila gozdnih sortimentov. Po uspešnem zaključku tega dela, kandidat opravi še ustno preverjanje teoretičnega znanja. Pri opravljanju praktičnega preizkusa znanja, kandidat potrebuje popolno gozdarsko zaščitno opremo.



Slika 3: Nepravilno rampanje lesa

(Vir: lasten.)



Slika 4: Zbiranje gozdnih sortimentov
(Vir: lasten.)

Področje ocenjevanja	Merila	Delež (%)	Ustrezno	Neustrezno
NAČRTOVANJE IN PRIPRAVE NALOGE	Glej spodaj	15		
POSTOPKI IN ELEMENTI DELA		IZVEDBA (OZNAČI Z »X«)		
		PRAVILNA	NAPAČNA LAŽJA TEŽJA NAPAKA NAPAKA	
1. Priprava opreme in kandidata na delo				
<i>1.1 Opravi dnevni pregled traktorja (opíše in pokaže)</i>				
<i>Navodila za ocenjevanje: v kolikor kandidatu manjka en pregled-lažja napaka, dva pregleda ali več-težja napaka.</i>				
<i>1.2 Vstavi vezalne verižice v drsnik (nepravilna stran ali dolžina med drsnikom in kavljem verižice (manj kot 1 meter) je lažja napaka)</i>				
<i>1.3 Pokaže prvi in zadnji drsnik</i>				
<i>1.4 Opravi vezanje enega sortimenta</i>				
<i>1.5 Opravi vezanje osmice</i>				
<i>1.6 Opravi zapenjanje verižice (pravilno obrnjen kavelj) pri usmerjen podiranju drevesa s pomočjo vitla (traktor je nižje in/ali višje mesta vezanja verižice)</i>				
<i>1.7 Predstavi sidrni pas (nosilnost in različne načine vezanja)</i>				
<i>1.8 Opravi izvlačevanje vrvi iz bobna (nošenje verižic)</i>				
<i>1.9 Prikaže možnosti povečevanja moči vitla z uporabo odpiralnega škripca (škripec na hlod)</i>				
<i>1.10 Pojasni lastnosti verižice (debelina, dolžina, oblika) Pojasni lastnosti vrvi (debelina, pletenje, lastnosti)</i>				
2. Uporaba OVO				
<i>2.1 Uporaba rokavic čelade oburve obleke (v in izven traktorja) (obkroži)</i>				
3. Osnovna pravila pri delu in prazna vožnja				
<i>3.1 Nastavitev sedeža glede na traktoristovo velikost</i>				
<i>3.2 Vžiganje traktorja</i>				

Področje ocenjevanja	Merila	Delež (%)	Ustrezno	Neustrezno
IZEDBA	Glej spodaj	55		
POSTOPKI IN ELEMENTI DELA		IZVEDBA (OZNAČI Z »X«)		
		PRAVILNA	NAPAČNA LAŽJA TEŽJA NAPAKA NAPAKA	
3. Osnovna pravila pri delu in prazna vožnja				
3.1 Prazna vožnja po vlakih v gozd Obkroži: prehitro prepočasi				
3.2 Uporaba diferencialne zapore				
3.3 Obračanje traktorja v gozdu Označi z x: <input type="checkbox"/> med več možnostmi izbere najmanj ustrezno mesto za obračanje <input type="checkbox"/> poškoduje okolico obračanja – drevesa <input type="checkbox"/> obračanje traktorja na izpostavljenem mestu (možnost zdrsa trak. pod vlaklo) <input type="checkbox"/> zapelje tudi z zadnjim delom traktorja iz vlake <input type="checkbox"/> ne uporablja zavore pri obračanju trakt.				
3.4 Postavitev in sidranje traktorja Označi z x: <input type="checkbox"/> neuporaba ročne zavore (premik trakt. med privlačenjem) <input type="checkbox"/> iz enega mesta bi lahko razvlačil obe vrvi <input type="checkbox"/> mesto sidranja izven vlake <input type="checkbox"/> ne spusti/premalo sidra z zadnjo desko <input type="checkbox"/> pri nagibu $\geq 20\%$ ne spusti prednje deske				
3.5 Osnovno stojišče trakt. pri začetku razvlačevanja vrvi - glede na bremena (komisija obkroži) <input type="checkbox"/> 1 vrvi: kot privlačenja večji od 40° <input type="checkbox"/> 2 vrvi: kot privlačenja večji od 40°				
4. Lastnosti bremena (komisija obkroži)				
Povprečni volumen sortimenta: pod $0,5 \text{ m}^3$ $0,5 \text{ do } 1 \text{ m}^3$ nad 1 m^3				
Glede na situacijo, bi lahko kandidat varno vlekel skupno breme velikosti (vpiše komisija) _____ m^3				
V dani situaciji kandidat vleče (vpiše komisija) _____ m^3				
Drevesna vrsta bremen: iglavci listavci mešano				
Povprečna razdalja zbiranja lesa: do 20m do 30 m nad 30 m				
Razdalja vlačjenja: do 200m do 400m nad 400m				
Smer vlačjenja: ravno navzgor navzdol				
5. Privlačenje in zbiranje lesa				
5.1 Terenske razmere (komisija obkroži) Privlačenje: ravno navzgor navzdol				

POSTOPKI IN ELEMENTI DELA	IZVEDBA (OZNAČI Z »X«)					
	PRAVILNA		NAPAČNA			
	L	D	LAŽJA NAPAKA		TEŽJA NAPAKA	
Boben in vrv gledano v zadnji del traktorja	L	D	L	D	L	D
5.2 Razvlačevanje vrvi – ergonomija						
5.3 Upošteva vrstni red drsnikov (prvi proti zadnjemu)						
5.4 Vezanje breme Označi z x: <input type="checkbox"/> napačno obrnjen kavelj <input type="checkbox"/> več kot 5 členov verige med drsnikom in kavljem <input type="checkbox"/> breme zapeto več kot 50 cm nazaj od čela <input type="checkbox"/> breme zapeto manj kot 20 cm od čela <input type="checkbox"/> verigo snema iz drsnika, brez vzroka <input type="checkbox"/> ni izbral vseh vezalni verižic <input type="checkbox"/> kavelj verižice zapet na napačni strani bremena glede na smer privlačevanja <input type="checkbox"/> sotimenta se s čeli dotikata in sta napačno vezana						
<i>Navodila za ocenjevanje: V primeru ponavljanja napake se šteje vse napake, ki jih je kandidat naredil in se vpiše v zapisnik (primer: če je kandidat pri treh verižicah pri vezanju lesa 3-krat narobe obrnil kavelj, se šteje za 3 lažje napake):</i>						
5.5 Vezanje bremena kot privlačevanja med drsnikom in vrvjo $\geq 45^\circ$						
5.6 Vezanje osmice Označi z x: <input type="checkbox"/> napačno obrnjen kavelj verižice <input type="checkbox"/> kavelj verižice zapet med sortimenti <input type="checkbox"/> v osmici debel in droben sortiment (razlika v debelini več kot 20 cm) <input type="checkbox"/> v osmici dolg in kratek sortiment (krajši sortiment meri manj kot 3 m)						
5.7 Pregleda okolico pred začetkom privlačevanja						
5.8 Stojišče pri privlačevanju Označi z x: <input type="checkbox"/> pri privlačevanju ne vidi traktorja <input type="checkbox"/> ne vidi smeri (vlečne poti oz. ovir na vlečni poti) pri privlačevanju bremena						
5.9 Stojišče pri privlačevanju (izbere mesto, kjer je neposredno ogrožena njegova varnost) Označi z x: <input type="checkbox"/> neposredno ob bremenu, stoji na bremenu <input type="checkbox"/> neposredno ob bremenu (istočasno uporablja dalj. upravlj. in cepin ali drži za vezalno verižico oz. žično vrv) <input type="checkbox"/> ob strani v dosegu bremena ali žične vrvi <input type="checkbox"/> neposredno zadaj za bremenom (pri privlačevanju navzgor !!) <input type="checkbox"/> spredaj (med traktorjem in tovorom – za zadnjim traktorskim kolesom) <input type="checkbox"/> spredaj (neposredno ob notranji strani traktorja pri privlačevanju pod kotom – možnost prevrnitve traktorja na delavca) <input type="checkbox"/> pod bremenom (na strmimi)	IZLOČILNI KRITERIJ					

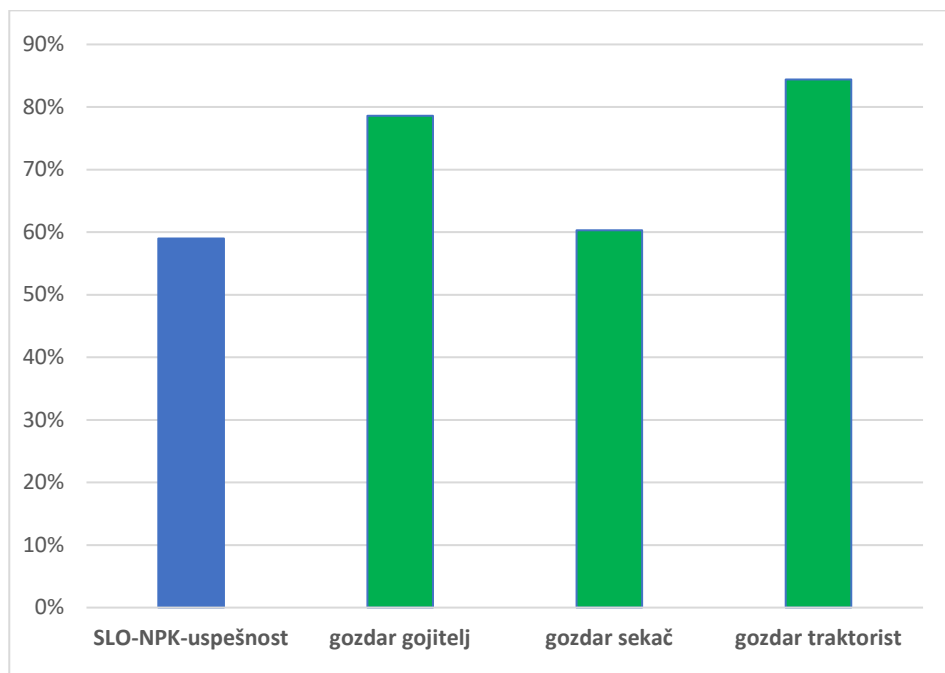
POSTOPKI IN ELEMENTI DELA	IZVEDBA (OZNAČI Z »X«)					
	PRAVILNA		NAPAČNA			
	L	D	LAŽJA NAPAKA	TEŽJA NAPAKA	L	D
Boben in vrv gledano v zadnji del traktorja						
5.10 <i>Sinhrona uporaba daljinskega upravljavca (sklopka, zavora, plin)</i>						
5.11 <i>Rešitev zataknenega tovora</i> Označi z x: <input type="checkbox"/> napaka kandidata (ni pravočasno ustavil breme pri privlačenju) <input type="checkbox"/> ni uporabil škripca ni uporabil cepina <input type="checkbox"/> pri odpuščanju zavore se je vrv preveč odvila in kandidat ni pravočasno odpravil napake <input type="checkbox"/> napačno ali ni zasukal vezalne verižice <input type="checkbox"/> napačno ali ni prestavil traktorja						
5.12 <i>Uporaba škripca kot smerno kolo</i> Označi z x: <input type="checkbox"/> traktor ni obrnjen proti škripcu <input type="checkbox"/> neuporaba sidrnega pasu <input type="checkbox"/> napačno izbrano sidrno drevo						
5.13 <i>Uporaba škripca za povečanje vlečne moči</i> Označi z x: <input type="checkbox"/> nepravilna postavitev škripca <input type="checkbox"/> nepravilna izvedba vezave/vpetja škripca z verižico						
5.14 <i>Pri uporabi škripca izbere stojišče v nevarnem trikotniku</i>	IZLOČILNI KRITERIJ					
5.15 <i>Obremenjenost obeh bobnov z bremeni</i>						
6. Polna vožnja						
6.1 <i>Tovor – razdalja med tovorom in zadnjo desko</i>						
6.2 <i>Uporaba zavor, za krmiljenje traktorja</i>						
6.3 <i>Vleka lesa s traktorjem</i> Označi z x: <input type="checkbox"/> pri speljevanju menjalna ročica ni v prestavi <input type="checkbox"/> prevelika hitrost traktorja pri polni vožnji <input type="checkbox"/> napačna izbira prestave (navzgor, navzdol) <input type="checkbox"/> ne znižuje težišča traktorja s spuščanjem in dvigovanjem zadnje deske <input type="checkbox"/> zaradi neuporabe zavor ali pretežkega tovora zapelje z označene vlake						
6.4 <i>Pretežek tovor in ponovno privlačenje bremena</i> Označi z x: <input type="checkbox"/> pri odpuščanju zavore se je vrv preveč odvila in kandidat ni odpravil napake <input type="checkbox"/> sprostil oba bobna, čeprav ni bilo potrebno <input type="checkbox"/> napačno sidranje traktorja <input type="checkbox"/> zaporedje privlačenja obeh vrv						
6.5 <i>Pretežek tovor in ponovno privlačenje bremena</i> Označi z x: <input type="checkbox"/> zataknitev tovora (eden za drugim)						
6.6 <i>Kandidat napravi zaradi preobremenjenega tovora več kot 20 cm globoko kolesno jamo</i>						
7. Sortiranje in rampanje lesa						
7.1 <i>Odmik traktorja najmanj 2 metra od spuščenega Tovora</i>						
7.2 <i>Odpenjanje tovora</i>						

Slika 5: Del zapisnika preizkusa NPK za gozdar traktorist

Vir: (RIC, b.d. (d))

7 Kazalniki izvajanja NPK-jev v gozdarstvu v Sloveniji

Povprečna uspešnost vseh opravljenih NPK-jev v Sloveniji je 59 % glede na vse prijavljene kandidate. Ostali trije grafi predstavljajo uspešnost NPK-jev na področju gozdarstva v kmetijski šoli Grm Novo mesto. Iz grafa je razvidno, da je največja uspešnost pri NPK-ju gozdar traktorist, temu sledi NPK gozdar gojitelj. Najnižje povprečje je pri NPK gozdar sekač, vendar pa je ta številka še vedno višja od slovenskega povprečja o uspešnosti NPK-jev na področju gozdarstva.



Graf 3: Uspešnost opravljenih NPK-jev v gozdarstvu

8 Zaključek

Posamezniki, ki uspešno opravijo preizkus NPK-ja, so s tem profesionalno usposobljeni za delo v gozdu. S pridobljeno kvalifikacijo, lahko odprejo s. p., d. o. o. ali pa se zaposlijo v katerikoli delovni organizaciji, ki opravlja storitve s pridobivanja gozdnih, oziroma lesnih sortimentov. Kmetje lahko s to kvalifikacijo odprejo dopolnilno dejavnost na kmetiji, ki jim zagotavlja dodaten vir prihodka v času njihove mrtve sezone. NPK kvalifikacija prinaša določeno število točk pri

državnih razpisih glede nakupa gozdarske mehanizacije, česar se kmetje pogosto poslužujejo.

Potek preizkusov NPK-jev v času SARS-CoV-2 predstavlja še dodatno otežitev, predvsem organizatorjem teh preizkusov, saj so stroški zaradi manjših skupin večji, hkrati pa mora izvajalec zagotavljati tudi potrebne varnostne ukrepe za preprečevanje okužb. Eden izmed organizacijskih problemov, je mešanje dijakov oziroma kandidatov in članov komisije, zaradi tega, je potrebno organizirati ločene prevoze, za posamezne skupine. Ustrezne ukrepe, pa je treba upoštevati tudi pri dostavi in razdeljevanju malice.

Veliko odgovornost pri izvajanju in ocenjevanju NPK-jev nosijo tudi člani komisije, saj v času praktičnega preizkusa odgovarjajo za varnost posameznega kandidata. Ravno tako morajo na osnovi enega podrtega drevesa ali enega pravilnega spravnega cikla oceniti ali je kandidat usposobljen za profesionalno opravljanje tega dela. Zaradi tega je komisija pri ocenjevanju posameznih delovnih operacij zelo natančna in dosledna. Posamezni parametri varnega in usmerjenega podiranja, se po končanem podiranju drevesa merijo na milimeter natančno. Zato je uspešnost preizkusov v gozdarstvu slabša, kot pri ostalih NPK-jih v drugih kmetijskih dejavnostih, saj člani komisije s svojim podpisom jamčijo za to, da je kandidat profesionalno usposobljen za upravljanje posameznega gozdarskega dela.

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XV. INTERNATIONAL CONFERENCE ON LOGISTICS IN AGRICULTURE 2021: CONFERENCE PROCEEDINGS

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Abstract The 15th International Conference on Logistics in Agriculture, which has been organized by the Municipality of Sevnica, Grm Novo mesto - Biotechnics and Tourism Center, Faculty of Logistics, University of Maribor, Landscape Governance College GRM and Cooperative Union of Slovenia has this year's central theme the Influence of Covid on Logistics in Agriculture. The conference has become traditional and pays attention to the ways for different views of logistics in connection with agriculture. That is why we/the organizers have invited lecturers on the topic Impact of climate change in agriculture.

Keywords:

logistics,
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governance,
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