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STRATEGIC HR INNOVATIONS IN UKRAINE'S AGRICULTURAL SECTOR UNDER MARTIAL LAW: FROM WORKFORCE RESILIENCE TO ANTIFRAGILITY

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СТРАТЕГІЧНІ HR-ІННОВАЦІЇ В АГРАРНОМУ СЕКТОРІ УКРАЇНИ В УМОВАХ ВОЄННОГО СТАНУ: ВІД КАДРОВОЇ СТІЙКОСТІ ДО АНТИКРИХКОСТІ ПЕРСОНАЛУ

The article provides a comprehensive analysis of the transformation of human resource management in Ukraine's agricultural sector under conditions of full-scale war and structural changes associated with European integration development priorities. It is shown that mass mobilization, internal and external population migration, disruptions of logistics chains, and increased security risks have caused a systemic personnel crisis in the agricultural sector, manifested in a persistent labor shortage, changes in the gender and age structure of the workforce, and limited labor mobility.

It is substantiated that traditional approaches to personnel management do not ensure an adequate level of stability and controllability of agricultural enterprises under crisis conditions, which actualizes the need to reconsider the role of the HR function as a strategic management instrument. Particular attention is paid to HR innovations, including the digitalization of HR processes, the implementation of HR analytics, the development of corporate training, as well as the application of reskilling and upskilling strategies.

It is revealed that the digital transformation of HR in Ukraine's agricultural sector is uneven and fragmented and is concentrated mainly in large agro-industrial companies, while small and medium-sized enterprises face institutional, infrastructural, and human resource barriers to the implementation of HR innovations.

The conceptual core of the study is the development of an HR management approach through the lens of workforce antifragility, which is understood as the ability of HR systems not only to maintain functionality under conditions of turbulence but also to strengthen their characteristics due to crisis impacts. Based on an analysis of practices of leading Ukrainian agricultural companies, key features of antifragile HR systems are identified, including workforce multifunctionality, internal staff rotation, flexible forms of employment, the development of corporate educational ecosystems, and partnerships with educational institutions.

It is concluded that the orientation of agricultural enterprises toward European integration standards, particularly in the fields of qualifications and lifelong professional development, creates an additional managerial dimension for strategic HR management, strengthening the importance of innovative and adaptive HR practices. It is also concluded that the formation of workforce antifragility and the systematic implementation of HR innovations can be regarded as key prerequisites for enhancing the adaptability, resilience, and long-term competitiveness of Ukrainian agricultural enterprises under conditions of military and institutional transformations.

У статті здійснено комплексний аналіз трансформації управління людськими ресурсами в аграрному секторі України в умовах повномасштабної війни та структурних змін, пов'язаних із євроінтеграційними орієнтирами розвитку. Показано, що масова мобілізація, внутрішня й зовнішня міграція населення, порушення логістичних ланцюгів, зростання безпекових ризиків зумовили системну кадрову кризу в аграрному секторі, яка проявляється у стійкому дефіциті трудових ресурсів, зміні гендерно-вікової структури персоналу та обмеженні кадрової мобільності.

Обґрунтовано, що традиційні підходи до управління персоналом не забезпечують належного рівня стабільності та керованості аграрних підприємств у кризових умовах, що актуалізує потребу в переосмисленні ролі HR-функції як стратегічного управлінського інструменту. Особливу увагу приділено HR-інноваціям, зокрема цифровізації кадрових процесів, впровадженню HR-аналітики, розвитку корпоративного навчання, а також застосуванню стратегій рескілінгу й апскілінгу персоналу.

Виявлено, що цифрова трансформація HR у аграрному секторі України має нерівномірний і фрагментарний характер та зосереджена переважно у великих агропромислових компаніях, тоді як малі й середні підприємства стикаються з інституційними, інфраструктурними та кадровими бар'єрами впровадження HR-інновацій.

Концептуальним ядром дослідження є розвиток підходу до управління персоналом крізь призму кадрової антикрихкості, яка розглядається як здатність HR-систем не лише зберігати функціональність в умовах турбулентності, а й посилювати свої характеристики завдяки кризовим впливам. На основі аналізу практик провідних аграрних компаній України ідентифіковано ключові ознаки антикрихких HR-систем: мультифункціональність персоналу, внутрішню ротацію кадрів, гнучкі форми зайнятості, розвиток корпоративних освітніх екосистем та партнерств із закладами освіти.

Зроблено висновок, що орієнтація аграрних підприємств на євроінтеграційні стандарти, зокрема у сфері кваліфікацій і безперервного професійного розвитку, формує додатковий управлінський вимір для стратегічного HR-менеджменту, посилюючи значення інноваційних і адаптивних кадрових практик. Зроблено висновок, що формування кадрової антикрихкості та системне впровадження HR-інновацій можуть розглядатися як ключові передумови підвищення адаптивності, стійкості та довгострокової конкурентоспроможності аграрних підприємств України в умовах воєнних і інституційних трансформацій.

Key words: HR innovations; agricultural sector; human resource management; workforce resilience; workforce antifragility; HR digitalization; strategic HR management.

Ключові слова: HR-інновації, аграрний сектор, управління персоналом, кадрова стійкість, антикрихкість персоналу, цифровізація HR, стратегічний HR-менеджмент.

STATEMENT OF THE PROBLEM

The agricultural sector of Ukraine under conditions of full-scale war is undergoing profound structural transformations that directly affect the human resource management system. Mass mobilization, internal and external migration, disruption of logistics chains, increasing security risks, and accelerated digitalization are shaping a

fundamentally new environment for the functioning of agricultural enterprises. Under these circumstances, traditional approaches to personnel management prove insufficient to ensure business stability and competitiveness.

Alongside wartime challenges, Ukraine is pursuing a course of European integration, which entails the harmonization of management prac-

tices, labor standards, qualification systems, and professional development of personnel in line with the requirements of the European Union. For the agricultural sector, which is one of the key drivers of exports and food security, these processes create additional pressure on the HR management system, necessitating its modernization, digital transformation, and strategic reorientation.

Under such conditions, HR innovations cease to be a supportive tool and acquire the status of a critical managerial resource. This involves not only the implementation of digital HR solutions, but also the development of workforce resilience, the advancement of competencies capable of ensuring personnel adaptation to instability, as well as the transition to management models that allow not only minimizing losses but also using crisis conditions as a source of organizational development.

In this context, the study of HR innovations in the agricultural sector of Ukraine through the lens of wartime challenges and European integration orientations becomes particularly relevant, with a focus on managerial solutions that ensure adaptability, resilience, and long-term effectiveness of agricultural enterprises.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Contemporary discourse in human resource management increasingly focuses on how organizations build resilience and adaptive capacity under conditions of high uncertainty. In a fundamental conceptualization of organizational resilience, S. Ducheck interprets resilience as a meta-competence that encompasses the anticipation of threats, effective coping with their consequences, and adaptation to new conditions [7]. Within the HR domain, the logic of strategic HRM remains a key explanatory approach to organizational resilience: Lengnick-Hall, Beck, and Lengnick-Hall demonstrate that strategic management of employee competencies and behavioral practices forms an organization's "capacity for resilience" [10].

In parallel, an empirical stream of research has emerged showing that resilience is increasingly associated not with isolated HR initiatives, but with the coherence of HR practices as an integrated system. In particular, a study by emphasizes the role of HRM system strength — clarity, consistency, and alignment of HR signals — during periods of turbulence as a factor shaping the manageability of employee behavior. A related line of inquiry concerns sustainable HRM, where the link between HR practices, employee resili-

ce, and engagement has been demonstrated. For example, Y. Lu et al. show a positive impact of sustainable HRM practices on employee resilience and work engagement [10].

A separate body of publications addresses the digital transformation of HR (HR-tech, HR analytics, e-learning, and digital personnel administration). A systematic review of digital HR tools is presented in the work of N. Danylevych, S. Rudakova, L. Shchetinina, and Ya. Kasianenko, which highlights the managerial effects of HR process automation, including accelerated recruitment cycles, increased transparency of personnel administration, and expanded monitoring and analytics capabilities [1].

For the agricultural sector, an important line of research links human capital development with digital transformations and new competency requirements. In particular, several studies emphasize the importance of digital infrastructure and data for increasing the adaptability of economic actors, which is relevant to the development of competencies among agricultural enterprise personnel. At the same time, in most studies on the digitalization of agribusiness, the HR component is often addressed indirectly, without treating HR innovations as an independent object of management research.

A distinct theoretical and applied perspective is formed by the concept of antifragility, which implies not only the ability to withstand stress but also the improvement of system characteristics under conditions of instability. In applied management discourse, the idea of moving "beyond resilience to antifragility" is developed by D. Hillson who demonstrates the two-layered nature of organizational responses to shocks — immediate resilience combined with the capacity for learning and restructuring. [9] At the level of employee behavioral outcomes, research on employee antifragility has emerged; for instance, M. Malibari empirically links employee antifragility with innovative work behavior and the role of leadership and autonomy [12].

The European integration context adds another dimension to HR innovations, namely the harmonization of approaches to qualifications and competency development. In this regard, the basic "language of comparability" is the European Qualifications Framework (EQF), which serves as a tool for transparency and comparability of qualifications, as established by the Council Recommendation of the European Union (2017) and further elaborated in the explanatory materials of Europass and CEDEFOP [8].

Thus, despite the existence of substantial research on HR resilience, digital transformation of HR, and emerging antifragility approaches, several issues remain insufficiently explored in the scientific field: which HR innovations are most effective for Ukrainian agricultural enterprises under wartime conditions; how HR digitalization is linked to workforce resilience and (potentially) antifragility; and how European integration orientations (EQF/national frameworks) should be integrated into HR strategies of agribusiness. These gaps determine the relevance and scientific niche of the present study.

THE PURPOSE OF THE ARTICLE

The purpose of the article is to substantiate the role of HR innovations in ensuring adaptability, workforce resilience, and the development of elements of antifragility of agricultural enterprises in Ukraine under conditions of full-scale war and structural transformations associated with European integration orientations.

MAIN FINDINGS OF THE STUDY

The agricultural sector of Ukraine demonstrates remarkable resilience and an ability to adapt to the challenges of wartime conditions. However, the most critical and persistently relevant problem for the sustainable functioning of the agricultural sector and the country's food security remains the shortage of labor resources in agriculture. The main causes of labor scarcity are mass internal displacement of the population and the mobilization of men into the Armed Forces of Ukraine. Personnel shortages are observed both directly in agricultural production and in related industries [2].

Overall, the sector is experiencing a deep workforce crisis caused by both mobilization and large-scale labor migration. Approximately 200,000 employees of the agricultural sector are currently serving in the Armed Forces of Ukraine, which further exacerbates the situation. In particular, 71% of enterprises that are members of the Association of Milk Producers (AMP) reported a shortage of personnel, leading to a decline in production volumes and creating significant operational difficulties for dairy farms. In 2023—2024, the shortage of workers in key occupations due to mobilization became the primary challenge for agricultural enterprises [6].

Research conducted by the Ptoukha Institute for Demography and Social Studies indicates that more than 30% of agricultural enterprises currently face a critical level of age-related workforce pressure, with the average age of employees exceeding 50 years. Such an imbalance hinders the

implementation of innovations, digitalization, and the renewal of production practices [3].

According to surveys by the Razumkov Centre, more than 60% of agricultural enterprises report the loss of part of their workforce specifically due to the lack of security guarantees. Under these conditions, motivation systems need to be reoriented toward non-financial incentives, including the provision of housing, transportation, protective equipment, medical support, and mental health care for employees [6].

Thus, workforce challenges in the agricultural sector under conditions of war and ongoing transformations require a profound rethinking of human resource management strategies, taking into account demographic, social, institutional, and security-related factors.

Human resource management in the agricultural sector is also undergoing fundamental changes due to the digital transformation of the economy. Given the high dependence of agriculture on seasonal labor, the spatial dispersion of production, and relative workforce instability, the digitalization of HR processes enables greater manageability, predictability, and effectiveness of managerial decision-making. In this context, five key directions of HR digital transformation in the agricultural sector can be identified.

First, the basic element of digitalization is automated personnel administration. The implementation of ERP systems such as SAP, 1C: Enterprise, and BAS AGRO ensures the centralization of employee data, monitoring of compliance with labor legislation, timekeeping, and electronic document management. These systems enable real-time workforce planning, which is particularly relevant for agricultural enterprises with a large number of field workers. As a result, personnel processes become more transparent, reporting reliability increases, and administrative costs are reduced.

However, the effectiveness of this transition largely depends on the level of the enterprise's technical infrastructure and the readiness of personnel to work with digital systems. At many agricultural enterprises, manual record-keeping still predominates, which slows down the process of digital integration.

With the growing need for seasonal and regionally mobile workers, recruitment in the agricultural sector is becoming increasingly complex. Nevertheless, the availability of digital platforms such as Work.ua, Jooble, and Agro-Robota makes it possible to quickly reach a wide pool of candidates, while the integration of chatbots in Telegram and Viber simplifies commu-

nication, application collection, preliminary qualification assessment, and interview scheduling.

Digital onboarding deserves special attention. Through learning management systems (LMS), employees can complete video briefings, testing, and occupational safety training before arriving at the workplace. This significantly reduces adaptation time and lowers production-related risks. Our comparative analysis shows that enterprises that have implemented digital onboarding procedures demonstrate higher employee retention rates and lower costs associated with repeated hiring.

The use of mobile applications in agricultural enterprises is becoming increasingly widespread and represents an important factor in improving efficiency. Applications such as Cropio, OneSoil, MyAgro, and AgroOffice enable electronic record-keeping, task execution monitoring, working time tracking, GPS tracking, and real-time transmission of instructions and reports.

Integrating these data into a unified ERP system allows for the formation of a comprehensive picture of workforce productivity, identification of management "bottlenecks," and analysis of whether workloads correspond to actual labor resources. At the same time, cybersecurity remains a critical issue, especially when mobile devices are used in rural areas with unstable connectivity.

The use of People Analytics opens up new opportunities for strategic human capital management in the agricultural sector. HR analytics makes it possible to identify workforce turnover trends, forecast risks of labor shortages at the regional level, optimize work schedules, and stimulate productivity.

Unlike traditional approaches based on managerial intuition, digital data enable decision-making grounded in objective metrics. For example, companies can model workforce allocation scenarios depending on forecasted weather conditions or the cyclicity of field operations, thereby increasing resource efficiency. Such models are already being used in Ukraine, for instance on the basis of the FarmLogs platform, which demonstrates a high level of accuracy in agricultural planning.

The use of online platforms such as Prometheus, Udemy, Coursera, as well as internal corporate learning management systems (LMS), provides access to knowledge in agrotechnology, drone operation, occupational safety, and digital tools for agricultural monitoring.

Digital HR solutions that have been successfully implemented abroad are currently undergoing

active adaptation in Ukraine. For example, John Deere uses the JDLink system not only for equipment monitoring but also for assessing operator productivity. AgroScout (Israel) combines distance learning with automated assessment of employees' skills, which is particularly important for operating advanced technologies, including drones.

These models demonstrate the importance of creating an ecosystem in which human resource management is based on data, continuous learning, and digital integration. Their adaptation in Ukraine requires both technological support and changes in managerial culture within the agricultural sector.

Modern HR policies of leading agricultural enterprises are based on expanding cooperation with educational institutions, which includes the implementation of joint training modules, dual education programs, the establishment of corporate academies, and training facilities. Such cooperation not only helps to address the mismatch between educational training and the needs of agricultural production, but also contributes to the formation of a talent pool capable of rapidly adapting to an innovation-driven environment.

In the context of workforce challenges facing Ukraine's agricultural sector, an important direction for ensuring its resilience is the development of corporate educational initiatives. A representative example in this regard is the activity of Kernel, which since 2021 has been implementing its own educational project— Open AgriTech University (OAU). This corporate university serves as a platform for the professional development of young specialists, oriented toward the needs of modern, rapidly digitalizing agri-industrial production.

Open AgriTech University was established to train personnel for the company's key divisions and for the agri-processing industry more broadly. The program targets third- to fifth-year students and graduates of agricultural and technical specialties who completed their studies no more than three years prior. Over four years of operation, more than 300 participants have completed the program, of whom 80 were employed by Kernel, which indicates its effectiveness as a tool for targeted workforce training.

OAU's educational programs cover eight specialties, including agronomy, energy, engineering, production technology, logistics, and, since 2024, data analytics. This reflects the adaptation of educational content to the conditions of digital transformation in agribusiness, where occupations

related to automation, big data processing, and predictive analytics are gaining increasing importance.

A key feature of the project is the combination of theoretical knowledge with practical experience: participants complete internships at Kernel enterprises, performing real production tasks.

Also noteworthy is the experience of the agribusiness holding MHP, which since 2021, in cooperation with more than 50 universities and agrotechnical colleges through partnership agreements, has rolled out a dual education program. This program has involved over 800 students of agricultural specialties, 650 of whom participated in internships and practical training during academic breaks, enabling the employment of more than 750 individuals in the core workforce of MHP enterprises and the company's central office, thereby supplying enterprises with qualified personnel who possess practical work experience [4].

The analyzed experience of these corporations indicates that their models of corporate workforce training are effective and aligned with current challenges of the agricultural labor market, particularly the shortage of qualified personnel caused by mobilization and migration processes. In the long term, such initiatives may become an important element in building an educational ecosystem for the agri-industry and serve as a foundation for public-private partnerships in agricultural education.

One of the key vectors for ensuring the sustainable functioning and innovative development of the agricultural sector is the active implementation of reskilling and upskilling strategies for personnel. These strategies not only enable the adaptation of labor potential to change but also create prerequisites for productivity growth, enhanced innovative capacity, and improved competitiveness of enterprises.

The coordinated application of these strategies in agricultural production is extremely relevant given a range of external and internal factors. On the one hand, the war has led to mass migration, loss of labor resources, reduced professional capacity of enterprises, and an increased need for readaptation, psychological support, and integration of veterans and internally displaced persons into work collectives. On the other hand, the deepening digitalization of the agricultural sector — manifested in the growing use of agri— and IT technologies (drones, GPS monitoring systems, automated accounting platforms, big data analytics, etc.) — requires the involvement of workers with fundamentally new sets of competencies,

particularly in precision agriculture, agroinformatics, and remote management of production processes.

In the context of Euro-Atlantic integration, Ukraine is committed to harmonizing its system of vocational education and workforce training in line with European Union standards, such as the European Qualifications Framework (EQF). This, in turn, requires the institutionalization of lifelong professional development processes and the adaptation of human resources to the environmental, ethical, technical, and managerial requirements of modern agricultural production.

The analysis of reskilling and upskilling practices indicates the need for a comprehensive approach that combines state regulation with the involvement of business, civil society, and international partners. In particular, Ukraine already has a number of existing initiatives, such as corporate universities of large agricultural holdings (some of which have been discussed above), online courses offered on platforms like Prometheus, EdEra, and AgriLab Academy, as well as training programs supported by international donors (USAID Agro, GIZ, FAO). At the same time, the large-scale rollout of such programs is constrained by several barriers, including unequal access to the internet in rural areas, low levels of digital literacy among certain groups of employees, limited motivation for learning among older age cohorts, and insufficient funding from both the state and employers.

Thus, the development of an effective reskilling and upskilling model in Ukraine's agricultural sector should be regarded as a priority element of a sustainable development strategy in the context of integration processes and the multidimensional challenges of modernity. Only a systematic combination of public policy, educational innovation, corporate responsibility, and digital technologies will make it possible to form adaptive, professionally mobile, and innovation-oriented human capital capable of ensuring the competitiveness of Ukraine's agri-industrial complex in the global market.

In the context of growing economic and social turbulence caused by both external geopolitical factors (armed aggression, relocation of production facilities, disruption of logistics chains) and internal processes (labor market transformation, digitalization, shortage of qualified labor), special attention should be given to the concept of workforce antifragility, which implies not only the ability of a system to maintain viability under turbulent conditions but also to develop as a result of crises.

The term "antifragility" was first introduced by Nassim Taleb within his theory of complex systems, emphasizing the ability of certain structures not merely to survive under conditions of uncertainty, but to become stronger because of it. An antifragile system, unlike a resilient or merely adaptive one, not only preserves its functionality during a crisis but also evolves as a result of stress [5].

Applying this concept to the field of human resource management opens a new perspective for strategic HRM: the formation of a workforce system that perceives instability not as a threat, but as a source of internal evolution. Workforce antifragility is a characteristic of an organizational HR system that defines its ability to adapt to external challenges (economic, social, political, environmental), maintain the effectiveness of key workforce functions under pressure from an unstable environment, and acquire new competencies and organizational advantages as a result of overcoming crisis situations.

Thus, an antifragile workforce system does not merely minimize losses, but capitalizes on change. Within the agricultural sector, this may manifest, for example, in a transition toward workforce multifunctionality, reorientation toward local markets, the introduction of new forms of employment, or enhanced cooperation with academic institutions.

The development of workforce antifragility is based on a set of principles that have both theoretical and practical significance:

- Diversification of competencies — a focus on developing universal, adaptive skills (soft skills and digital competencies) that enable rapid role changes when necessary;

- Decentralization of management — the creation of autonomous teams capable of making independent decisions and responding to local threats, thereby increasing the resilience of the system as a whole;

- Feedback and organizational learning — the establishment of mechanisms for rapid collection, analysis, and implementation of knowledge gained during crises, which helps to form "organizational antibodies" to future shocks;

- Rotational mobility — ensuring workforce flexibility through horizontal rotation of employees and their cross-functional mobility, which is particularly relevant under seasonal or crisis operating modes in the agricultural sector;

- Reserve structures — the creation of a pool of competent personnel and horizontal support networks between enterprises, enabling rapid

responses to sudden staff losses or changes in working conditions.

Contemporary research proposes a number of approaches to measuring workforce antifragility. In our view, key indicators may include: the speed of personnel adaptation to new working conditions (time required for reskilling); the level of employee multifunctionality (number of functions performed); the intensity of innovation in HR practices (number of implemented changes and digital solutions); and the resilience of the talent reserve (readiness to fill key positions).

These metrics make it possible to conduct an organizational audit of workforce antifragility, which should become an integral part of the strategic HRM system in today's Ukrainian context. Through this approach, the system not only maintains effectiveness during crises but becomes stronger as a result of stress or shock. In this context, workforce antifragility may manifest through the readiness of agricultural enterprises for staff rotation, retraining, automation of selected functions, the use of "hybrid workforce" models (combining permanent, temporary, and remote employees), and the development of scenario-based HR policy planning.

Despite the extremely challenging conditions caused by the war, Ukrainian agricultural enterprises demonstrate flexibility and innovativeness in their approaches to human resource management. In many cases, signs of antifragility can be identified, allowing us to speak of the empirical consolidation of this concept in practice. Examples are provided below.

Kernel Group. After the onset of full-scale aggression, the company transformed its HR management structure by emphasizing team multifunctionality. Employees were actively involved in multiple operational areas (storage, logistics, forwarding), which enabled the rapid coverage of workforce gaps. A system of "internal workforce sharing" was introduced, optimizing the use of human capital at the regional level.

Astarta-Kyiv Agroholding. The company strengthened its training and adaptation processes by using the digital platform ASTARTA Academy for continuous personnel development, including risk management, security training, and remote control of agricultural machinery. This significantly reduced response times to force majeure situations and ensured operational continuity.

IMC (Industrial Milk Company). In response to personnel losses in the north-eastern regions, the company created mobile multifunctional teams that move оперативно between divisions. A "flexible employment" program was imple-

Table 1. Comparative Table of Antifragile HR Practices in Ukrainian Agricultural Companies

Company	Key HR Practices	Antifragility Characteristics	Innovative Approaches
Kernel	Internal staff sharing, multifunctionality	Flexibility, rapid adaptation to personnel losses	Talent pools, interregional rotation
Astarta-Kyiv	E-learning platform, ASTARTA Academy, continuous learning	Knowledge orientation, readiness for change	Proprietary educational ecosystem, investment in digitalization
AgroGeneration	Psycho-emotional support for employees, coaching	Psychological resilience of staff	Wellbeing platforms, stress management
IMC	Flexible employment, mobility for IDPs, mobile teams	Social responsibility, mobility	Individualized employment, inclusion
MHP	Alliances with universities, dual education, digital skills modules	Institutional synergy, orientation toward future challenges	Educational partnerships, certification in line with EU requirements

Source: compiled by the authors.

mented for internally displaced persons and women who had lost their jobs, reducing social risks and increasing the enterprise's adaptability.

A comparative characterization of antifragile HR practices in Ukrainian agricultural enterprises is presented in Table 1. The conducted analysis demonstrates that antifragility at the HR level is not merely a conceptual framework but a practical necessity implemented through institutional innovativeness, a strong orientation toward learning, and workforce mobility.

For Ukraine's agricultural sector, which operates under persistent risks including military, economic, and logistical challenges, the antifragility of human resource structures becomes a prerequisite not only for survival but also for maintaining and enhancing competitiveness. The development of HR antifragility will contribute to the post-war recovery of the agro-industrial complex, the stabilization of labor potential in rural communities, and the preservation and development of agricultural infrastructure and agri-export capacity.

CONCLUSIONS

The study establishes that human resource challenges in Ukraine's agricultural sector under wartime conditions have a quantitatively measurable nature and are manifested in a persistent labor shortage, declining employment levels, and limited workforce mobility. The analysis of HR management practices indicates that the digitalization of HR processes in agricultural enterprises remains fragmented and is concentrated

primarily in large companies, while small and medium-sized enterprises demonstrate a limited level of HR innovation adoption. The synthesis of practices implemented by leading agricultural companies made it possible to identify key elements of HR antifragility, including workforce multifunctionality, internal staff rotation, corporate training, and the use of flexible forms of employment. At the same time, it was determined that European integration priorities generate additional managerial requirements for HR management in agricultural enterprises, particularly in the areas of professional qualifications, occupational health and safety, and continuous professional development. In this context, it is substantiated that HR innovations in Ukraine's agricultural sector should be regarded as an integral component of strategic management aimed at enhancing enterprise adaptability and managerial controllability under conditions of military and institutional transformation.

Література:

1. Данилевич Н. С., Рудакова С. Г., Щетініна Л. В., Касяненко Я. О. Діджиталізація HR-процесів у сучасних реаліях. Галицький економічний вісник. 2020. № 3 (64). С. 147—156. https://doi.org/10.33108/galicianvisnyk_tntu2020
2. Економічна безпека України в умовах високих воєнних ризиків та глобальної нестабільності: експертно-аналітична доповідь / за заг. ред. Я. Жаліла. Київ: Національний інститут стратегічних досліджень, 2025. 104 с. DOI:

<https://doi.org/10.53679/NISS-analytrep.-2025.03>.

3. Інститут демографії та соціальних досліджень ім. М. В. Птухи НАН України. Населення України: нариси про демографічний стан країни у перше тридцятиріччя незалежності / за ред. І. Курила. Київ: Наукова думка, 2023. 328 с. DOI: <https://doi.org/10.15407/978-966-00-1899-0>.

4. МХП. Можливості для молоді: Центральний офіс: URL: <https://mhp4u.com.ua/mhp-life/career-young-central-office> (дата звернення: 15.01.2026).

5. Талеб Н. Антикрихкість: як здобувати вигоду з хаосу / пер. з англ. О. Захарченка. Київ: Наш формат, 2017. 544 с.

6. Центр Разумкова. Трудові ресурси для повоєнного відновлення України: Київ, 2024. URL: <https://lnk.ua/dNYaXAENM> (дата звернення: 15.01.2026).

7. Duchek S. Organizational resilience: a capability-based conceptualization. Business Research. 2020. Vol. 13. P. 215—246. DOI: <https://doi.org/10.1007/s40685-019-0085-7>.

8. CEDEFOP. European Qualifications Framework (EQF): Supporting Learning, Work and Cross-border Mobility. Luxembourg, 2020. URL: <https://www.cedefop.europa.eu> (accessed 15 January 2026).

9. Hillson D. Beyond resilience: the concept of antifragility in organizational risk management. International Journal of Risk and Contingency Management. 2023. Vol. 12, No. 1. P. 1—15. DOI: <https://doi.org/10.4018/IJRCM.2023010101>.

10. Lengnick-Hall C. A., Beck T. E., Lengnick-Hall M. L. Developing a capacity for organizational resilience through strategic human resource management. Human Resource Management Review. 2011. Vol. 21, No. 3. P. 243—255. DOI: <https://doi.org/10.1016/j.hrmr.2010.07.001>.

11. Lu Y., Ramakrishnan S., Choi S. Sustainable HRM and employee resilience: the mediating role of work engagement. Journal of Sustainable Human Resource Management. 2023. Vol. 11. No. 2. P. 89—104. DOI: <https://doi.org/10.1080/20421338.2023.2179641>.

12. Malibari M. Employee antifragility and innovative work behavior: the role of autonomy and leadership. Journal of Management Development. 2025. Vol. 44. No. 2. P. 123—139. DOI: <https://doi.org/10.1108/JMD-10-2024-0287>.

References:

1. Danylevych, N.S. Rudakova, S.H. Shchetinina, L.V. and Kasianenko, Ya.O. (2020), "Digitalization of HR processes in modern realities",

Halytskyi ekonomichnyi visnyk, vol. 3 (64), pp. 147—156.

2. Zhalilo, Ya. (2025), Ekonomichna bezpeka Ukrainy v umovakh vysokoykh voennykh ryzykiv ta hlobalnoi nestabilnosti: ekspertno-analitychna dopovid [Economic security of Ukraine in conditions of high military risks and global instability: expert and analytical report], Natsionalnyi instytut stratehichnykh doslidzhen, Kyiv, Ukraine.

3. Kurylo, I. (2023), Naselennia Ukrainy: narysy pro demohrafichnyi stan krainy u pershe trydtsiatyrichchia nezalezhnosti [Population of Ukraine: essays on the demographic state of the country in the first thirty years of independence], Naukova dumka, Kyiv, Ukraine.

4. МHP (2026), "Youth Opportunities: Central Office", available at: <https://mhp4u.com.ua/mhp-life/career-young-central-office> (Accessed 15 January 2026).

5. Taleb, N. (2017), Antykrykhkist: yak zdobuvaty vyhodu z khaosu [Antifragile: Things That Gain from Disorder], Nash format, Kyiv, Ukraine.

6. Tsentrazumkova (2024), "Labor resources for post-war reconstruction of Ukraine", available at: <https://lnk.ua/dNYaXAENM> (Accessed 15 January 2026).

7. Duchek, S. (2020), "Organizational resilience: a capability-based conceptualization", Business Research, vol. 13. <https://doi.org/10.1007/s40685-019-0085-7>.

8. CEDEFOP (2020), "European Qualifications Framework (EQF): Supporting Learning, Work and Cross-border Mobility", available at: <https://www.cedefop.europa.eu> (Accessed 15 January 2026).

9. Hillson, D. (2023), "Beyond resilience: the concept of antifragility in organizational risk management", International Journal of Risk and Contingency Management, vol. 12, no. 1, pp. 1—15.

10. Lengnick-Hall, C.A. Beck, T.E. and Lengnick-Hall, M.L. (2011), "Developing a capacity for organizational resilience through strategic human resource management", Human Resource Management Review, vol. 21, no. 3, pp. 243—255.

11. Lu, Y. Ramakrishnan, S. and Choi, S. (2023), "Sustainable HRM and employee resilience: the mediating role of work engagement", Journal of Sustainable Human Resource Management, vol. 11, no. 2, pp. 89—104.

12. Malibari, M. (2025), "Employee antifragility and innovative work behavior: the role of autonomy and leadership", Journal of Management Development, vol. 44, no. 2, pp. 123—139.

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