Czech University of Life Sciences Prague

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Book of Abstracts

SUSTAINABLE DEVELOPMENT IN WARTIME UKRAINE AND THE WORLD

Sumy State University

Dnipro State Agrarian and Economic University

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The project aims to enhance the potential of PhD students in Ukraine by advancing their skills and knowledge about qualitative research and providing grant funding and the environment and tools for its guided practical implementation.

The goals are:

1) to advance the skills and knowledge of PhD students in Ukraine in terms of designing and conducting qualitative research, applying for grants for it, developing international cooperation and multidisciplinary research;

2) to create an environment where the PhD students will get the older mentor from their university and from abroad, mini-grant funding, an opportunity to work in an international team and access to advanced knowledge and equipment during a study tour;

3) to comprehensively support the establishment of international research teams able to design qualitative research and publish their results in indexed journals.

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Prof. Ing. David Herák, Ph.D.
Editor in Chief

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SECTION 1
LAND USE AND FORESTRY

DETERMINATION OF ECOSYSTEM SERVICES OF EUROPEAN LARCH USING THE I-TREE ECO MODEL

Iryna Siruk[1*], Viktoriia Kuchynska[1], Yurii Melnyk[1], Oleksandra Kozova[1]

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Abstract: (1) **Background:** I-Tree Eco is a free tool that can assess the benefits of tree species. The I-Tree Eco model was developed by the US Forest Service, Northern Research Station. I-Tree Eco assesses the ecosystem role of trees. This is a quick way to get useful information about trees that are growing in your community. The assessment of ecosystem services of European larch is of interest, since it is the most photosynthesizing tree species. (2) **Methods:** The research was carried out in Zhytomyr Region, Novohrad-Volyn District, in the State Enterprise "Horodnytske LH" botanical natural monument "Larch ". This territory covers an area of 36 hectares. The approximate age of larch plantations is 140-180 years. The height and diameter of 12 European Larch trees were measured. The height was recorded using a laser range finder-altimeter Nikon Forestry Pro II and a quadcopter квадрокоптера Mavic Air II. The following indicators were also recorded: diameter of the crown from west to east, from north to south, total height, crown top heig, crown base height, crown missing, crown light, land use. It is worth noting that the height of the tallest tree was 52.7 m., and the diameter of the thickest tree was 114 cm. This tree can be one of the tallest tree species in Ukraine. (3) **Results:** Data 12 trees analyzed using the i-Tree Eco model. After receiving the report in the program, it was established that 12 European larch trees accumulate 93.84 tons of carbon, produce 345.6 pounds of oxygen per / year, absorb 129.6 pounds of carbon per /year. The i-Tree Eco tool for evaluating individual trees makes it possible to materialize the ecosystem services of each of each tree. For example, one larch tree with a height of 50.3 m. absorbs CO_2 on 3.81$. (4) **Conclusions:** The obtained results are an important component of the climate system and play a major role in the assessment of the ecosystem services of woody species. I-Tree Eco is a tool that can be recommended to students, researchers, volunteers, sustainability officers, eco-activists, park ecologists and local communities. This application has a scientific, educational and cognitive role, increases the level of environmental awareness of society.

Keywords: ecosystem services of trees, European larch, I-Tree Eco model, carbon sequestration.

POPULATION METHODS IMPLEMENTATION OF ASARUM EUROPEAUM IN BEECH FOREST IN GOETTINGEN, GERMANY

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Abstract: (1) **Background:** By analyzing previous vegetation research of Goettingen forest we pointed out the plant species composition changes in the period 2010-2016, but there has not been any investigation based on population analysis yet. Nowadays population method of research plays a significant role in accounting for a variety of indicators that characterize the species' development under the conditions of a particular community. Our research deals with understanding the mechanisms of adaptations that exist at the population level of the organization against the background of forestry impacts. The research aim is to establish features and regularities of structural changes in the population typical for beech forests in Low Saxony, Germany, in terms of forestry use. (2) **Methods**: Our research is based on the classical geobotanical and population analysis methods. We used morphometric, vital, gradient analyses, and mathematical statistics methods to process field research materials. (3) **Results**: It was marked during the ontogenetic analysis of Asarum europaeum that all the investigated populations are not complete: 80% of populations do not have senile individuals, and 20% do not include the juvenile stage. It was found that a significant part of the early generative stage of the Asarum europaeum population is represented in the unmanaged forest. In contrast, in the forest plots of 40 and 70 years old tree species, the central part is devoted to the middle-aged and old generative stages, 31,25% and 34,33%, respectively. The vitality structure analysis investigated that herb layer species' vitality is remarkably higher in the unmanaged forest. (4) **Conclusions:** The study results of forest species populations contribute to the restoration and preservation of unique groups that are part of forest ecosystems. With the comprehensive population analysis approach, the critical point is to observe the consequences after the transformation of the living conditions of plants. Ontogenetic and vitality structures of Asarum europeaum show the great potential of further research of sustainability mechanisms in the Goettingen forest in terms of forestry use.

Keywords: forestry, Goettingen forest, population method, beech forest, Asarum europeaum.

SECTION 2
MEDICINE AND VETERINARY

THE INFLUENCE OF THE RICE WEEVIL ON THE PATHOGENICITY OF MYCOBACTERUM BOVIS

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Abstract: (1) **Background**: The problem of tuberculosis has been global for many decades all over the world [1]. Numerous studies by a number of scientists demonstrate the ability of insects to reserve, transfer and release opportunistic and pathogenic microorganisms, including mycobacteria (Fischer, Faulde 2013). However, until now, scientists have not conducted studies aimed at determining changes in the biological and pathogenic properties of the pathogen after passage through the insect body. Therefore, the aim of this work was to determine the effect of the rice weevil on the virulence of the pathogenic strain M. bovis. (2) **Methods**: To achieve the goal, biological, allergic, pathological-anatomical and histological research was carried out. Guinea pigs were divided into 8 groups, seven of which were subcutaneously infected with mycobacterial suspension, which was obtained as a result of passage of the pathogen through the body of the rice weevil, one group remained intact (control). During the experiment, guinea pigs were subjected to tuberculinization to determine the degree of sensitization. The life expectancy of each experimental group was determined, after the death of the guinea pigs, an autopsy was performed, determining the degree of damage to the internal organs. Pieces of pathological material were additionally selected for histological examination. (3) **Results**: The allergy test was positive in guinea pigs of all experimental groups. Death of animals was observed on 43-64 days. On the basis of the day of death of laboratory animals and the index of damage to internal organs, it was established that the most virulent were the cultures that were isolated during the stay of mycobacteria through rice weevils for 12 days. The death of laboratory animals in this group was registered 17.3% faster than in the group infected with the original culture, and the index of damage to internal organs was 1.2 times higher. Histological examination revealed changes characteristic of tuberculosis in the lungs, liver, spleen and lymph nodes of laboratory animals of all experimental groups. The control group of guinea pigs did not show any clinical and pathological-anatomical signs and was euthanized on the 90th day of the experiment. (4) **Conclusions**: The passage of a virulent strain of M. bovis through the rice weevil can lead to variation in the pathogenicity of the bacterium. Thus, infection of guinea pigs with cultures obtained after mycobacteria had been in the body of a

beetle for 12 days was accompanied by the death of laboratory animals 17.3% faster than the death of animals infected with the original culture of the pathogen (without passage through the body of the rice weevil).

Keywords: rice weevil, infection, tuberculosis, mycobacteria.

FEEDING ENCAPSULATED ANIONIC SALTS DURING LATE DRY PERIOD FOR EFFECT ON URINARY PH AND POSTPARTUM COMPLICATIONS

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Abstract: (1) **Background**: Feeding during the dry period affects the viability of offspring and milk yield in the next lactation. Proper feeding prevents difficult calving, metabolic disorders, increases fertility and improves the quality of colostrum. **The purpose of the research:** to study the effect of feeding encapsulated calcium chloride during the late dry period on urine pH and postpartum complications in cows. (2) **Methods**: The study was conducted on 44 dry cows of the Novoselytsia farm. Dry cows received encapsulated calcium chloride starting from 21 days before calving at 130 grams/head/day. Urine pH was measured at the beginning of the late dry period, after 5 and 10 days of starting the usage of product and before calving. During the studies was carried out the urine pH control and control of postpartum complications (hypocalcemia, retained placenta and displaced abomasum). *The composition of the diet:* in the control group: alfalfa hay, corn silage, wheat straw, ground corn, sunflower meal and soybean meal, premix; and in the trial group: the same diet and added encapsulated calcium chloride. DCAB of the control diet was +170 mEq/kg, and in the trial diet – 50 mEq/kg. *Formulation of diets according to DCAB.* Recent research studies suggest that the ideal DCAB for late dry cows is in the range of -75 to -200 mEq/kg of dry matter. The extreme variability in mineral content of forages, dry period feed should be analyzed for Na, K, Cl and S. The target level of the total diet can usually be achieved by adding several hundred grams of negative DCAB minerals per day in late dry period. Anionic salts are quite tasteless, so to achieve reasonable anion intakes, it is important to feed these minerals in combination with other more palatable ingredients or to use encapsulated anionic salts, which does not have an unpleasant taste.

It was controlled next indicators:

- urine pH control;
- hypocalcemia;
- displaced abomasum;
- retained placenta.

(3) **Results**: Implementation of the encapsulated anionic salts in the diet of late dry period significantly reduced urine pH after only 5 days. The following results were obtained: 21 days before calving (the beginning of the trial), urine pH in the control - 8.2 and the trial - 8.2; 15 days before calving, urine pH in the control - 8.1 and the trial - 6.8; 5 days before calving, urine pH in the control - 8.0 and the trial - 6.5; 1 day before calving, urine pH in the control - 7.9 and the trial - 6.3. It was noted positive dynamics of influence on the reduction of cases of hypocalcemia (control - 11.4%, trial - 2.3%), retained placenta (control - 18.2%, trial - 4.5%) and displaced abomasum (control - 6.8%, trial - 2.3%). (4) **Conclusions**: It can be concluded that the correction of rations of late dry period according to the cation-anion difference to negative values (DCAB) with the encapsulated anionic salts, allows to alleviate the calvings, reduce the number of metabolic disorders, improve health and reproductive functions cows.

Keywords: hypocalcemia; anionic salt; DCAB.

MENTAL WELL-BEING OF MEDICAL STUDENTS DURING THE COVID-19 PANDEMIC AND DISTANCE LEARNING

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Abstract: (1) **Background**: Distance learning, due to the COVID-19 lockdown, might affect the mental health of students by limiting their social activity and communication. This study aimed to investigate the mental well-being of medical students during the COVID-19 pandemic in relation to the gender and nationality of the respondents. (2) **Methods**: The questionnaire survey study was conducted at the Academic and Research Medical Institute of Sumy State University in the period from January 2021 to January 2022. In this study, a total of 220 second-year course medical students (55% women and 45% men) responded to the survey. Among the surveyed students, 33% of students were from Ukraine, 35% – from India, and 33% – from African countries. The average age of the students was 18 – 22 years old. The General Health Questionnaire-28 (GHQ-28) was used to examine the mental well-being of medical students. A total score of > 8 (out of possible 28) was considered a manifestation of mental health disorders. The data analysis was performed using PAST statistical software v4.05. To evaluate the type of data distribution, we used the Shapiro-Wilk W test. To analyze the differences in the data, we used the Mann–Whitney test. (3) **Results**: It was found that 62% of surveyed medical students had a total score of more than 8, which indicated a probable psycho-emotional disorder. The average score of the GHQ-28 was 9.1. There was no significant difference in the total GHQ

score (> 8) between students from different countries, as well as between men and women. The main psycho-emotional disorder in the majority of students was social dysfunction, which was associated with limited social activity during lockdown. The results of our study showed that 64% of medical students had manifestations of social dysfunction. The prevalence of social dysfunction was higher in men than in women: 69% and 59%, respectively. The highest incidence of social dysfunction was registered among men from India (68%) and African countries (72%). This study identified that the frequency of somatic symptom manifestations in medical students was 35%, anxiety, and insomnia – 45%, and depression – 15%. The number of men with depression was more than 2 times higher than that of women. Depression was most common among students from Africa (23%), less often among students from Ukraine (8%). (4) **Conclusions:** This study showed that the most of the surveyed medical students had mental health disturbances during the COVID-19 pandemic and distance learning. Foreign students studying remotely far away from home had a higher incidence of social dysfunction and depression compared to Ukrainian students. Analysis and consideration of aspects of medical students' mental health during COVID-19 will help to develop strategies for improving the psycho-emotional state of students, taking into account gender, cultural and religious differences, and national characteristics.

Keywords: mental well-being, medical students, General Health Questionnaire, COVID-19, distance learning.

DETERMINATION OF THE LEVEL OF FECAL CALPROTECTIN AND INTESTINAL MICROBIOME IN CHILDREN OF THE NEONATAL PERIOD

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Abstract: It's commonly known that neonatal bowel microbiome can influenced all of organs and systems of children. Intestinal microbial composition can predeterminate inflammation reaction and homeostasis and some neonates had increasing level of fecal calprotectin which is predictor of inflammation. It's so important to researched connection of the level of fecal calprotectin and changes of intestinal microbiome. (1) **Background:** Determination the level of inflammatory response and the formation of the bowel microbiome of neonates by defining the level of fecal calprotectin (FC) and the composition of the bowel microbiome. (2) **Methods:** 32 newborns were studied. After birth, children were healthy, without pathologies. To determine fecal calprotectin levels, feces were collected three times in the second, third, and fifth weeks of life, respectively.

The feces were examined using an enzyme-linked immunosorbent assay to determine the level of FC in mg/l. To study the composition of the microbiome, feces were collected three times in the second, third, and fifth weeks of life, respectively, and the culture method was used. All statistical data were processed using a standard statistical formula. (3) **Results:** Average values of gestational age were 38,63±1,29 weeks, weight was 3217,5±466,65 g, height was 51,16±2,59 cm. Level of Bifidobacterium a significantly enlarged was found for children aged 2 weeks- 8,9±1,44, for children aged 3 weeks - 8,43±1,55 and for children aged 5 weeks - 8,09±1,46, changes are significant (p=0.002), but significant difference was between 2 vs. 5 weeks of life. Lactobacilli number for neonates aged 2 weeks - 7,68±1,13 was increased than for neonates aged 3 weeks - 7,12±1,43 and neonates aged 5 weeks - 6,75±1,83, changes are significant (p=0.002), but significant difference was between 2 vs. 5 weeks of life. Total number of E.coli for newborns aged 2 weeks was 6,3±1,46, for newborns aged 3 weeks - 6,78±1,29 and for newborns aged 5 weeks - 6,46±1,17, at the same time, there was no significant difference between them. E.coli with weak enzymatic ability was lower for infants aged 2 weeks - 4,33±0,57, infants aged 3 weeks - 3,5±0,71 and infants aged 5 weeks - 3,33±0,57. And level of opportunistic pathogens for babies aged 2 weeks was 4,7±1,25, for babies aged 3 weeks - 4,4±1,02 and for babies aged 5 weeks - 4,28±1,15, no difference was found. Level of fecal calprotectin for neonates aged 2 weeks was 280,59±121,73 mg/l, neonates aged 3 weeks - 195,31±113,7 mg/l and neonates aged 5 weeks - 153,53±34,1 mg/l changes are significant, but there is a significant difference was between 2 vs. 3 weeks and 2 vs. 5 weeks of life, but no difference was found between 3 vs. 5 weeks of life. (4) **Conclusion:** Totally, the process of formation of the microbiome is accompanied by important changes in the functional processes of the bowel and leads to a decrease in all components of the microbiome at 5 weeks of age. Fecal calprotectin levels gradually decreased by 5 weeks of age, possibly due to stabilization of the bowel formation.

Keywords. Fecal calprotectin, intestinal microbiome, neonatal period.

USE OF PREPARATIONS TO REDUCE SOMATIC CELL COUNT IN MILK

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Abstract: (1) **Background:** Somatic cell count (SCC) is the most important safety criteria for milk. This rate increases in response to infection. Somatic cells are a factor that significantly reduces the quality of milk raw materials, on the one hand, and on the other hand, somatic cells can be considered as protection of the mammary gland from destructive processes caused by metabolites of pathogenic microflora. So, counting the

number of somatic cells is a modern, effective and informative method that must be used in the production of raw milk. To increase the level of milk hygiene, it is necessary to pay a lot of attention to the proper care of the udder and teats, as well as to the prevention of mastitis. Recently veterinarians apply the herbal remedies that do not harm animals or the sanitary quality of milk. Among others, for the mastitis prevention in cows they use the following phytopreparations: "Dbailyva doiarochka", "Nizhnodii". The aim of the study was to reduce the SCC in goat's milk by using drugs for cows' udders treatment in goats. (2) **Methods:** For 4 groups of animals (5 lactating goats in each) were formed for study. Goat milk samples were collected before milking for biochemical study. During 7 days before milking the first group goats' teats were wiped with freshly prepared solution of "MolSan", the second group goats' teats were greased with gel "Nizhnodii". The third group goats after milking were treated with ointment "Dbailyva doiarochka", and the control group goats were not treated. The physic-chemical composition of milk was determined by BentleyComby150 (USA) instrument. The tests were conducted in the Institute of Animal Husbandry of the National Academy of Sciences of Ukraine (Kharkiv), which is accredited according to the requirements of DSTU ISO / IEC 17025: 2006. (3) **Results**: The use of the phytopreparations did not change the organoleptic, physicochemical and biochemical parameters of goat milk. The SCC decreased in the first, second and third groups of goats. The SCC decreased with the use of "MolSan" by 37.6% (234±161 $\times 10^3$ cells/cm^3), the gel "Nizhnodii" – by 43.8% (226±181 $\times 10^3$ cells/cm^3), the ointment "Dbailyva doiarochka"- by 69% (613±228 $\times 10^3$ cells/cm^3) ($p<0.05$). The SCC increased in the control group by 8.6% (2300±696$\times 10^3$ cells/cm^3). (4) **Conclusions**: Phytopreparations (the ointment "Dbailyva doiarochka", the gel "Nizhnodii") and the solution for pre-milking washing of "MolSan" can be used treatment of the goats teats to improve the quality of milk, these drugs significantly reduce the SCC in the goat milk.

Keywords: milk, somatic cells, treatment of udder, quality and safety

SECTION 3
NANOTECHNOLOGY

MODES OF BEHAVIOR FERROMAGNETIC NANOPARTICLE SUSPENDED IN A VISCOUS LIQUID

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Abstract: We have studied the behavior of a ferromagnetic (FM) nanoparticle in a magnetic field at a range of dimensionless frequencies and amplitudes of 0.1-1.5 and obtained systemic types of similar behaviors of an ferromagnetic nanoparticle in certain areas of the mode maps. Mode maps were compiled in the coordinates horizontal frequency and vertical amplitude, and inside the map were recorded energy values or velocities that corresponded to the frequency–amplitude pair of the external magnetic field. The map is a color analogue of geographic maps, where the height relative to sea level is responsible for the color, and in our case the values relative to the upper and lower boundaries of all possible values on our mode maps were responsible for the distribution of colors. (1) **Background**: Regimizing the behavior of FM nanoparticles or nanofluids in a magnetic field is an important component for describing magnetic dynamics, which can be tested on real devices. Such modeling of modes will make it possible to make devices of a new generation, in which it will be possible to realize the study of the parameters of people and animals, the treatment and accurate modeling of prostheses, and also the production of new types of treatments. (2) **Methods**: The system of four equations (2.9)-(2.12) [https://doi.org/10.21272/ jnep.11(5).05021] with designations (2.13)-(2.16) have been solved using the 4th order Runge-Kutta method for the following system parameters $\alpha = 0.1$, $M = 228$ G, $\eta = 0.006$ and parameters of simulations: time was chosen step as 10^{-3} of the field period. The stable solutions were seek by the comparison of the trajectories on every 10^4 field periods, while the stable solution was not be found, or the maximum simulation time of 10^7 field periods was not be reached. The precession criterium was chosen as 10^{-5}. The initial conditions were chosen as $\vartheta = \vartheta_{in} = 0.005$, $\theta = \theta_{in} = 0.0051$, $\varphi = \varphi_{in} = 0.005$, $\phi = \phi_{in} = 3.14$ (3) **Results**: The simplest representation of homogeneous and inhomogeneous regimes can be expressed in angular dependences on time, where relatively stable values (seventh or eighth sign) of the polar angles of the easy and magnetic axes (vectors) will be responsible for the homogeneous regime, and any qualitative changes (at the level of the third or

fourth sign) from the uniform regime. For a complete description of the behavior of fm nanoparticles in a liquid under the action of a magnetic field, the frequency dependences are not enough, since they strongly depend on the optimal selection of the counting time, integration step, or numerical initial conditions (without changing the physical, viscosity, etc.), so the concept was proposed descriptions using a group of phase diagrams located in the same coordinate plane. (4) **Conclusions**: An increase in the amplitude leads to a smaller spread in the velocities between the vectors, and at amplitude values greater than 0.7 there is no spread of the velocities.

Keywords: nanofluid; nanoparticle; ferromagnetic fluid; stochastic dynamics; mode map; ferromagnetic mode; liquid ferromagnetic.

DETERMINATION THE BOUNDARIES OF THE REGIMES OF MOTION'S FERROMAGNETIC NANOPARTICLE IN A LIQUID UNDER THE INFLUENCE OF THE MAGNETIC FIELD

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Abstract: (1) **Background**: Decades of research have concentrated on the question of magnetic nanoparticles that are examined intensively in connection in differing applications due to their performance. It is now well established from various studies that the circular polarized magnetic field has resulted in the appearance of the nanoparticle's uniform and non-uniform precessions regimes. So far, however, there has been little discussion about dependencies between amplitude and frequency of the magnetic field, switched boundaries, and the emergence of new regimes. The study aims to assess the extent to the proximity of the reduced power loss, establish the limits of the transition process and other regimes. (2) **Methods**: The object of research is the ferromagnetic nanoparticle that is characterized by the anisotropy field and the magnetic moment of fixed magnitude. This particle is under the influence of a permanent magnetic field. The study's data were obtained numerically by solving the Landau-Lifshitz-Gilbert equation and other equations via the fourth-order of the Runge-Kutta method. In addition to that, Langevin, Fokker-Planck equations and on the concept of the effective Langevin equation are being used to optimize numerical simulation. In the end the power loss values were determined as a function of the field amplitude and frequency and analyze its dependence

on different regimes of forced precession induced by circularly and linearly polarized magnetic fields. (3) **Results**: This study aimed to gain a 3D amplitude-frequency-power loss graph, which makes it possible to determine the boundaries between the regimes of a nanoparticle. (4) **Conclusions**: In particular, the transition from the regions with a periodic or quasiperiodic transition to the region with quasiperiodic or chaotic transition in the downstate is accompanied by an abrupt or instance increase in power loss. In summary, it has been shown which particular conditions of the set of parameters can be obtained in either of a regime as mentioned earlier for magnetic hyperthermia.

Keywords: ferromagnetic nanoparticle, Landau-Lifshitz-Gilbert equation, Runge-Kutta method, magnetic field, uniform precession, magnetic moment, power loss, angular velocities, 3D graph.

SECTION 4
AGRICULTURE ENGINEERING

RATE OF LEGUMINOUS GRASSES MOISTURE RELEASE UNDER DYNAMIC CHANGES IN THE AIR PHYSICAL PARAMETERS

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Abstract: Physical and mechanical properties of the wilted leguminous grasses and the air, which significantly affect field mechanical losses during pressed hay harvesting with the use of intensive technologies were studied. Green mass of leguminous grasses has a certain hygroscopicity (w_p), which varies significantly depending on the physical parameters of air: temperature, humidity, wind speed (multiplicity of air exchange), light intensity, which affects the course of herb drying processes. (1) **Background:** The basic air parameters for intensive drying of conditioned leguminous grasses were determined in order to increase the rate of moisture release and to raise the adsorption capacity of air. (2) **Methods:** Selection of grass samples – randomly for each variant, air parameters control – MS6300 station + SM 206 Solar power meter + Perlight PLM-120M 3.6. Thermometer – non-contact, remote (Thermometer DT-380, –50^{0}C~+380^{0}C for the wilted mass). (3) **Results:** At a standard relative air humidity in the range of 65-75% (at the 10.2-16.8 air exchange rate), the equilibrium moisture content of the dried mass of pure alfalfa crops was 28.9 ± 1.8%, for the mass without preservatives – 25.3 ± 2.2% and for the mass with a chemical preservative (ProMeer, 6 l/t) – only 22.8 ± 2.5%. At the average +22.3~+24.9^{0}C daily temperatures, with the 12.4-15.2 rate of air exchange, with the 2440-5620 Lux illumination rate, the specific enthalpy of air for the warm period of the year (May-August) made up 54.6-62.8 kJ/kg. Average wind speed rise from 1.2-1.6 to 2.2-2.8 m/s increased the rate of moisture transfer by 6.5-48.8%, respectively. (4) **Conclusions:** Intensive field drying of leguminous grasses with high air exchange rates significantly accelerates the rate of moisture release of the mass. Applicator, local introduction of chemical preservatives with a high level of volatility accelerates the rate of moisture release of the mass at the final stages of drying to 1.25-2.12 %/h against 1.86-2.26 %/h on the control variant.

Key words: humidity, dry matter, air exchange, adsorption, diffusion, illumination, luxmeter, pyranometer.

EVALUATION OF SEEDS DAMAGE DURING POST-HARVEST HANDLING

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Abstract: In agriculture, sieves are present in many post-harvest and grain processing machines. It is the efficiency of such machines that determines the quantity and quality of yield, its preservation, and amount of food processing and production. The important problem is micro- and macrodamage of biological objects – seeds. Actual grain microdamages during post-harvest handling 35-40%, of which up to 23% is caused by grain cleaning and drying machines. The study on damage phenomena in sifting processes, taking into account devastation of biological material, as well as sieves, along with increasing productivity, reliability and energy efficiency. Reasons: repeated impact of cleaners during holes cleaning, grain-edge contact, impact of burrs: (1) **Background**: Seeds are subjected to mechanical impact in the form of hitting and friction – actual grain microdamages during post-harvest handling 35-40%. It leads to micro- and macrodamages to the shell surface and internal tissues of seeds. Actual grain microdamages during post-harvest handling 35-40%, of which up to 23% is caused by grain cleaning and drying machines. It leads to penetration of microorganisms and development of pathogenic microflora. – the risk of contamination is 10-12 times greater. The risk of contamination to damaged grains by microorganisms is 10-12 times greater. It leads to losses of food grain quality or sowing properties of seed material. A complex indicator for impact assessments of damage level on biological object will be seed biopotential realization coefficient; (2) **Methods**: Novelty in the study of mechanical seeds damage is in the methods and tasks of research. We conducted tomographic ultrasonic studies of seeds damage for identification of biological object of stress limits. Impact study of sieves parameters with holes of complex geometry on biological object particles damage. Analysis of impact on seeds damage will be done through biopotential realization coefficient; (3) **Results**: The conducted studies have shown the presence of different levels of damage to seeds during their cleaning and calibration. It was found that levels of micro- and macrodamage influence the seed's sowing properties. The variation ranges of biopotential realisation coefficient for different seeds depending on the damage level have been established; and (4) **Conclusions**: The obtained results will improve the efficiency of post-harvest processing of seeds and increase their yield.

Keywords: seeds 1, damage 2, sieves 3, biological potential 4, yield 5.

DIRECTION OF EFFICIENCY INCREASING OF SEED MATERIALS PNEUMATIC SEPARATION

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Abstract: The work focuses on increasing the efficiency of seed separation process in pneumatic separators. The preferred ways to increase the productivity of separators are oriented to increase width of working area, which causes an increase in overall dimensions of machines. Increasing the thickness of seed mixture layer in the working zones needs their even redistribution across width of the channel. Based on the assessment and the conducted analysis of research results the perspective direction of increasing the productivity of seed materials separation is justified by ensuring even supply of mixture to the working zones. Established ranges of variation of design and technological parameters of feeder and distributor separator's device taking into account seed materials properties; (1) **Background**: Increasing the productivity of pneumatic separators requires an increase of specific loading, which is determined by width and thickness of seed mixture layer. Seed mixture is fed to the working zone at an angle to direction of air flow. The thickness of seed mixture layer is a fixed value for a given quality of separation. The air flow is able to blow and effectively separate a certain thickness of seed material layer depending on crops and its properties. Modern seed cleaning machines - separators, have working zone width up to 2000 mm, which allows them to work with productivity up to 300 t/h. The feed of seed mixture is carried out with the help of gravity pipes in the center of separator. This situation requires even distribution and creation of a fixed layer thickness. Existing designs of distribution and feeding devices of pneumatic separators supply with unevenness up to 32%, which reduces the efficiency of their work; (2) **Methods**: The mathematical model of seed material movement on sloping surfaces and rheological laws were used in the work. Preliminary experiments were also conducted on laboratory equipment; (3) **Results**: The conducted studies have shown a positive effect from the use of feeding and distributing device, which is to ensure even distribution across separator's width in the range of 91-96%. This exceeds the effectiveness of existing indicators of seed material even distribution by 28-32% in the pneumatic separation channels of drum-type separators. Design parameters are set: slope angles and integrated width of slope surfaces of the device. Established dependence of specific load and evenness of seed material distribution taking into account its properties; and (4) **Conclusions**: The results will allow for improved seed separation efficiency by ensuring uniformity of seed material, which is supplied to the working zone of pneumatic separator. This makes it possible to increase separator productivity and ensure the required quality of seed material.

Keywords: seeds 1, air flow 2, working zone 3, separation 4, productivity 5.

RELIABILITY STUDIES OF SIEVES WITH HOLES OF COMPLEX GEOMETRIC SHAPE

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Abstract: The influence of parameters of technological loading, properties of grain mixes and constructive parameters of sieves on the values of the formed equivalent stresses and their durability is given. This determined the object of our research – the efficiency of sieves of agriculture. The change in equivalent stresses was studied both on serial sieves with basic holes and on new sieves with activators – innovative holes in the form of an epicycloid. The developed technique allows to analyze different designs of sieve openings by the criterion of their durability: (1) **Background**: The constant increase in the world population and food security requires research and increased efficiency of technological processes in many industries. Sieves are separate components of different materials by size. Productivity of machines with flat and cylindrical vibrating sieves with base holes on selected crops is reduced by equivalent productivity coefficient. In the example of buckwheat seed cleaning, we can see a 45% reduction in the machine's potential productivity. This is the first problem which we will be working on. The second problem is sieves reliability which is reduced because of: abrasive wear of biological objects; presence of vibration; hits of cleaning balls. Instead of basic holes will be used sieves with holes of complex geometry. Our study provides a comprehensive solution to all two problems; (2) **Methods**: The triangular holes are replaced by sieves with holes in the form of three fold epicycloid. A mathematical apparatus has been created for mathematical simulation of sifting process of biological object through holes of complex geometry. Finite element method based on Pro/ENGINEER product and research data is used to predict the durability of perforated sieves. Models are based on the analogy of granular medium movement with the hydrodynamics of bubbly liquid. The reliability study consists in determination of stress concentrators using the finite element method of the ABAQUS software. Describe briefly the main methods or treatments applied; (3) **Results**: Preliminary studies have shown that the new holes account for variations in the shape of buckwheat seeds and productivity of separator has increased by 40 to 55%. To increase the use of research results for other biological objects, it is planned to use shape coefficient. Preliminary results of changing the magnitude of stress concentrators of sieve with different holes

shapes proved the efficiency; and (4) **Conclusions**: Development of durability methods of perforated surfaces (sieves) requires approbation of the obtained method taking into account a number of factors: properties of sieves' materials, characters of loading and sieves' vibrations, differentiation of geometrical forms of sieves. The end result of the studies can be the use in practice of complex diagnostic parameters that characterize reliability and do not require measuring equipment.

Keywords: durability 1, perforated sieves 2, wear 3, finite element method 4, stress 5.

INVESTIGATION OF THE LEVEL OF CO_2 EMISSIONS FROM THE SOIL DURING FIELD CULTIVATION

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Abstract: The agriculture sector's role in greenhouse gas emissions is widely known but not well understood. More than one-quarter of the world's GHG emissions come from agriculture, forestry, and land-use change.

Tillage is considered a practice that favours CO2 emissions from arable lands since it improves the ventilation of the top-soils inducing a fast biological oxidation of the organic matter. The decomposition of the crop residues lead to an increase of the organic carbon content on the top layer of the soil, favouring its aggregation and stability. Accurate measurements of CO2 effluxes are required to assess whether a crop management technique is better than another in reducing the CO2 emission from soils. (1) **Background**: establish the level of CO_2 emissions into the environment with different types of main processing. (2) **Methods**: The static camera method was used to conduct the research. The research method includes measurements of CO2 emissions, temperature, humidity and wind strength. The study includes the methodology for determining the quality of technological operations (the degree of grinding of plant residues, the depth of processing, the degree of loosening, the presence of a plow sole). (3) **Results**: The results of measurements at the experimental field in Mykolaiv showed that the starting indicator of CO_2 emissions in Ducat 2.5, Lira XL and Ducat RST is the same. At the same time, it is 11% lower in Ducat UVT. At the same time, after an hour, the highest CO2 emission rate was recorded after

processing Ducat 2.5, which is equal to 746 m3 10-6. By 6.5% in Lira XL. Emissions dropped significantly by 19.9% after Ducat RST tillage. When working with Ducat UVT soil, the indicators steadily increase and are lower than Ducat 2.5 indicators by 14.5%. (4) **Conclusions**: Quantitative indicators of CO2 emissions had a significant impact:

- degree of grinding of plant residues;
- soil moisture;
- intensity of soil and residue mixing;
- degree of crushing of the upper soil layer.

The highest intensity of CO2 emissions after Ducat 2.5 indicates that the discs worked to the maximum depth, among the compared machines. Increasing moisture access to plant residues and the degree of mixing lead to intensification of emissions. In addition, it should be noted that double cultivation increased the intensity of emissions by increasing the depth of soil loosening in these places. The reduction in emissions after the Ducat UVT 6, in comparison with the test machines, characterizes the machine precisely as a soil rolling machine. But after passing a certain period of time, the gases still burst upwards and show a characteristic intensity, as in other machines. To obtain more meaningful conclusions, it is necessary to conduct research over a longer period of time. The research results showed that at the same level as CO_2 emissions, it is necessary to analyze the intensity of CH_4 and N_2O emissions. This will provide an opportunity to conduct a more thorough analysis of the vital activity of the soil environment when using various machines of the Lozova Machinery company.

Keywords carbon, the size of the residues, the percentage of incorporation, the working part of the agromachine.

ECONOMIC SECURITY OF THE DEVELOPMENT OF AGRARIAN FORMATIONS

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Abstract: To date, there is no clear definition of the definition of "economic security of the enterprise". In our opinion, the economic security of an enterprise, in particular an agricultural one, should be considered the availability of its resources and entrepreneurial abilities, which are used most effectively. And the ability to avoid possible risks and threats contributes to the achievement of the company's outlined goals and objectives in

accordance with the adopted development strategy. (1) **Background**: Strengthening the economic security of agrarian enterprises on the basis of a systematic and complex approach shows that this process takes place due to the influence of political, macroeconomic, mesoeconomic, microeconomic, ecological, scientific-technical, technological, legal, social-cultural, informational, natural-technogenic, demographic factors , moral-psychological orientation and provides for the implementation of a set of actions aimed at countering existing and possible future threats, using a set of principles, levers, tools, methods of a legal and informational nature to achieve the main goals of the enterprise. Investigating the peculiarities of the formation of economic security of agrarian enterprises on the basis of systemic and structural analysis, taking into account positive world experience, we state: globalization economic processes directly affect the state of all components of economic security and allow to determine the main threats and risks; (2) **Methods**: Elements of economic security can be considered: financial security; labor safety; information security and decision-making; social security and management culture; security of management and personnel; technical and technological safety; legal security; energy security; resource and raw material security; environmental safety, etc. The economic security management system of the enterprise should ensure timely detection of facts of various dangers, predict their consequences, determine methods of collecting information relevant for making decisions about further actions [1]. Thus, the economic security of the enterprise should be based on the principles of ensuring its rational level, which contributes to the progressive development of the economic system. Monitoring of the economic security of an agrarian formation is aimed at determining the efficiency of its production and economic activity. The main condition for ensuring the sustainable economic development of the enterprise is to make a profit [3]. (3) **Results**: The implementation of monitoring at the enterprises of the agro-industrial complex should take place according to the following stages:

1. through the identification of the business entity and the definition of the monitoring object;
2. through the formation of a system of technical and economic indicators for assessing the economic security of the enterprise, taking into account the specifics of its activity;
3. when determining the direction of prospective development of the enterprise by means of collecting and preparing information that characterizes the condition of the monitoring object;
4. modeling and forming scenarios or strategies for the development of the enterprise;
5. calculating the technical and economic indicators of the enterprise for the entire forecast period;
6. conducting an analysis of economic security indicators;
7. developing proposals for the prevention and elimination of threats to the economic security of the enterprise [2].

(4) **Conclusions**: In the modern period, enterprises operate in conditions of instability and instability, and these conditions have developed under the influence of the global economic crisis. This phenomenon affects the general decrease in the level of economic security of enterprises and the possibilities of their sustainable development.

The key to success in achieving the economic security of an agricultural enterprise should be risk management, or risk management, which consists of: forecasting the probability of the occurrence of various potential risks in the process of production functioning.

Keywords: economic security, enterprise development

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THE INFLUENCE OF ELECTROMAGNETIC RADIATION ON SOWING QUALITIES OF AGRICULTURAL CROPS

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Abstract: The article analyzes the impact of electromagnetic radiation (EMR) in the red (660 nm), blue (460 nm) ranges, and combined exposure, during 10 and 30 minutes for each. The obtained results showed that the most significant effect on the energy of germination and laboratory germination had a variant of the combined action of both the red and blue ranges for 30 minutes. (1) **Background**: The basis of the production of plant products is high-quality seed material, which ensures 40-45% of the realization of the plants biopotential. Recently, the use of physical methods to stimulate plant growth has become increasingly popular due to its less harmful impact on the environment. The purpose of the study was to conduct a theoretical substantiation of the parameters of electromagnetic radiation treatment on seed material. (2) **Methods**: Processing was carried out using semiconductor LED EMR sources with a wavelength of 660 nm (red range) and 460 nm

(blue range). The most common agricultural crops (winter wheat, corn, rapeseed) were chosen for the experiments. Unirradiated seeds were used as a control. The energy of germination and laboratory germination were studied. (3) **Results**: The most significant effect had a variant of the combined action for 30 minutes. Treatment for 10 minutes had almost no effect with all wavelengths. This may be due to the fact that the effect of EMR has a prolonged effect and may be showed later. In the comparison of different agricultural crops used in the experiment, the most noticeable effect was found in the case of corn. This can be explained by the size of the seed, which is the largest of corn, and therefore has the largest surface area. In second place are wheat and rapeseed, for which the difference with the control ranged within 2%. Overall, the increase in laboratory similarity in seed germination energy ranged from 1 to 9%, which is insignificant in laboratory conditions, but can have a significant effect in field research conditions, taking into account weather conditions and other growing factors. (4) **Conclusions**: Thus, it can be stated that the treatment of seeds with the combined effect of red (660 nm) and blue (460 nm) ranges for 30 minutes has an effect on the first stages of germination of agricultural crops. This effect was most pronounced on corn, compared to wheat and rapeseed, seeds.

Keywords: electromagnetic radiation, wavelength, agricultural crops, corn, rapeseed, winter wheat, seed treatment.

POWER CONSUMPTION OF SOWING COMPLEXES

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Abstract: (1) **Background**: Recently, more and more small farms have become in Ukraine. Their feature is that they mostly have a small area, up to 50 hectares. Consequently, the profitability of purchasing new planters for precision farming is low. However, farmers still want to work with modern machinery and use progressive technologies. Therefore, the Ukrainian company "Elvorti", which can satisfy the demand of farmers in terms of quality and price policy, has developed for the domestic consumer planters with the possibility of converting a mechanical drive to an electric one, which makes it possible to work with precision farming systems. However, after launching this project, a problem with difficult disk rotation was discovered. Such a problem could occur due to the insufficient power of the existing electric motors to drive the sowing disk. Therefore, the engineers of this company turned to the Sumy National Agrarian University with the technical task of solving this problem. (2) **Methods**: The data was obtained by

measuring the power indicator for the correct rotation of the disk, the sowing device was installed and connected to the stand. The sowing device from the Vega series planter was used, where the required power was measured using a digital volt-ampere meter with a shunt DSN-VC288C DC 0-100V/0-100A. (3) **Results**: After the power measurements, it was determined that the value was within 95-103 W. This parameter was higher than the indicators of electric motors used in this field. Its value is usually within 48-62 kW. To solve this problem, two methods are proposed:

– reducing the friction of the sowing disc by installing elements that reduce the frictional resistance;

– installation of more powerful electric motors, in order to exceed the indicator that was set.

(4) **Conclusions**: The problem of the power of electric motors in sowing complexes of the "Elvorti" company is solved quite simply. However, after replacing the electric motors of the sowing device with a more powerful one, there will be a problem of increasing the load on the tractor's electrical system. At the same time, it will affect the increase in fuel consumption by 5-7%. Therefore, a more acceptable solution to this problem is to reduce the friction of the sowing disc.

Keywords: sowing complex, power, sowing device, electric motor.

SECTION 5
SUSTAINABLE DEVELOPMENT

STARTUP ECOSYSTEM AS A BASIS FOR ENTREPRENEURSHIP DEVELOPMENT

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Abstract: (1) **Background**: Startups play a significant role in the development of entrepreneurship as a special form of activity aimed at innovative problem solving and meeting needs. Therefore, the question arises of forming a complete integrated ecosystem of entrepreneurship development, where the ecosystem of startups can be singled out separately. It is the aforementioned that determines the need to study the issue of the levels of startup ecosystems and support programs as a prerequisite for increasing entrepreneurial activity in Ukraine. (2) **Methods**: The research methodology involves the implementation of two blocks. The first block involves defining and justifying the content load of the main categories: startup, startup ecosystem; the second - a set of elements and levels of the startup ecosystem. For this purpose, a complex of analytical methods, grouping and structuring is used. Based on the methods of structural and logical generalization, analysis and synthesis, a vision is formed regarding possible options for structuring the startup ecosystem. Based on the grouping, the components of the startup ecosystem are substantiated and the number of its levels is determined. The next stage involves the use of modeling methods to build graphic models. (3) **Results**: A comparative analysis of the definition of the essence of the startup was carried out and established The characteristic distinguishing features of the startup, and the author's definition of the concept of "startup" is provided. The essence of the ecosystem and the start-up of the ecosystem are considered. The levels of the startup ecosystem are defined. An example of a local startup ecosystem is O.M. Beketov National University of Urban Economy in Kharkiv. The legal framework for supporting the development of entrepreneurship and startups at the international, national, and regional levels has been studied. Other types of support for entrepreneurship and the startup movement in Ukraine were analyzed. (4) **Conclusions**: Modern approaches of defining the category of "startup" concept were analyzed, which made it possible to form the author's vision of a startup as an initial stage of entrepreneurship, which is based on solving the problem by innovative ways and tools, which implementation involves the formation of economic and social value in high-risk conditions and the creation of a scalable business model. The modern startup ecosystem was investigated, and a level demarcation of entrepreneurship support was conducted.

Modern international funds, grants, and documents to support entrepreneurship and startups were reviewed. Support for entrepreneurship by state and local authorities was given, both in Ukraine and in other countries. It is proved that support for entrepreneurship is necessary at all levels of management, including at the regional level.

Keywords: startup, startup ecosystems, entrepreneurship, levels of startup ecosystem.

PROSPECTS FOR THE DEVELOPMENT OF AUTONOMOUS MONITORING STATIONS BASED ON RENEWABLE ENERGY SOURCES

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Abstract: (1) **Background:** In the conditions of frequent blackouts of the central power supply during military operations, there is a need to use additional power supplies, but special attention is paid to those based on renewable energy sources (RES), as they are ecological and reliable. To select optimal installations for collecting natural energy, it is necessary to have accurate data on meteorological parameters in a specific area for recent years, which are obtained with the help of monitoring stations. Uninterrupted monitoring of meteorological indicators is important in conditions of rapid climate change for more accurate forecasting of natural energy generation and rapid elimination of inclement weather. It should be noted that the use of solar energy has shown particular effectiveness during the pandemic quarantine, as the population began to use household appliances more during the daytime hours when the level of insolation has the highest indicators. This study aims to analyze the prospects for using RES in the power supply system of autonomous monitoring stations. (2) **Methods:** This work used comparative and analytical research methods to identify the advantages and disadvantages of modern power systems. (3) **Results:** Recently, more attention has been paid to the development of mobile monitoring stations, as they have lower maintenance costs and higher measurement accuracy due to their use directly at the test site. However, research is also being conducted to increase the autonomy of stationary monitoring stations, as they are used to regularly provide information on meteorological indicators. (4) **Conclusions:** Therefore, the development of RES-based power systems, including autonomous monitoring systems, is relevant, as it contributes to economic growth in times of crisis.

Keywords: renewable energy sources; autonomous monitoring stations; increasing efficiency.

THE INFLUENCE OF SOCIALLY ORIENTED CORPORATE CULTURE ON EMPLOYEE'S MOTIVATION IN INTERNATIONAL COMPANIES

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Abstract: The essence of corporate culture and its relationship with staff motivation at the enterprise is investigated. It is proved that socially oriented corporate culture is formed not so much by external attributes as by values, which are based on the motivation and development of each individual employee. It is revealed that the positions of employers are gradually transforming, becoming more socially oriented, so a modern manager should pay attention to building a corporate culture in order to get an effective motivation system at the enterprise. To achieve this, the beliefs of employees must coincide with the beliefs of the manager, which in turn must be identified with the goals of the company. (1) **Background:** The relevance of socially oriented corporate culture is becoming increasingly important in the management system of innovative development of the enterprise in the modern economic environment. Developing and creating a strong corporate culture is a complex process and there is no single technology to achieve success. One of the most important aspects of socially oriented corporate culture is encouraging employees to change. The business environment is constantly changing, and the challenge for management is to ensure that the organization adapts and evolves, and is ready to make adequate changes. *The purpose of this paper* is to determine the need to implement a socially oriented corporate culture of the company and the benefits that the company will receive in the future due to the corporate culture development. (2) **Methods:** analytical method, structural, logical and cognitive methods. (3) **Results:** Socially oriented corporate culture of the enterprise is closely connected with personnel management. Each management function (recruitment, motivation and evaluation, personnel formation) is connected with the task of corporate culture - to provide the employee with important, relevant, complete and transparent information concerning the current and planned activities of the enterprise, its mission and strategies. From these perspectives, functions of socially oriented corporate culture can be considered as follows: *informational, cognitive, regulatory, motivational, educational* [1, 2].

The influence of corporate culture on the activities of the organization should be considered in the unity of three areas, namely:

1. The impact of corporate culture on the processes taking place in the organization: communication processes and activities; decision-making, career and socialization processes; production and labor processes.

2. Influence of corporate culture on organizational behavior: individual behavior in the organization, motivation, social and psychological climate, group behavior.

3. The influence of corporate culture on the competitiveness of the organization is manifested in the formation of its positive reputation and attractive image among consumers, business partners, the public.

It should be noted that motivation and evaluation of employees are the key factors for effective corporate culture development. Firstly, everyone's work should be rewarded with fair remuneration. Secondly, each employee expects to be additionally appreciated in other ways: to perceive his/her individuality, to understand temporary problems, to promote self-development. Satisfaction of these expectations is perceived by employees as a manifestation of trust and respect, based on the fact that the company's management provides them with the necessary information and support. Employees want to be perceived as equal partners who contribute to the development of the enterprise [3]. (4) **Conclusions:** Summing up, it was found that there is a need to develop the areas of socially oriented corporate culture at enterprises. Corporate culture is an integral element of the staff motivation system that needs to be developed and maintained in the organization. Socially oriented corporate culture in the system of staff motivation should be considered as a strategic tool that allows orienting all departments of the enterprise and all employees to common goals, to increase the initiative of the staff, to ensure commitment to the common cause, and to facilitate communication.

Key words: corporate culture, motivation, employees, efficiency.

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STRATEGIC PLANNING OF THE DEVELOPMENT OF RECREATION CITY AREAS

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Abstract: Strategic planning of city development is a systematic decision-making process, focused on the community needs, and aimed to solve the most urgent local problems and to attain the optimal exploitation of competitive benefits, reasonably allocating available resources (time, funds, expert potential, material goods). (1) **Background**: The modern architectural environment must meet not only the basic requirements (functional and technological, physical and technical, artistic and compositional, sustainability, economic), but also fully satisfy the modern human needs. The growing demands of the population to increase and improve the recreational areas of various functional purposes determine the trends of the modern urban planning concepts. Thus, it is urgent to research the strategic directions for providing a universal and accessible environment. At the same time, the planning of open spaces, particularly parks and recreational areas, is a common problem in urban studies, especially in the case of territorial budget limitations. Therefore, the analysis and formulation of the main organizational aspects of rest and leisure places, green areas, and recreation areas in modern cities that would satisfy the needs of various population groups, including the elderly people, people with disabilities, and other less mobile population groups are relevant. The purpose of this work is to analyze the transformation concept of recreational zones on the Chernihiv city example. (2) **Methods**: An analysis of the social and planning aspects of the formation of a modern city was carried out. (3) **Results**: Analyzing the social aspect of the modern city formation it is necessary to highlight the existing deficit of recreation areas. Traditionally, in the post-Soviet space cities, little attention was paid to recreational areas, particularly city parks, squares, intra-block areas, sport fields and playgrounds; habitability issues had low priority. And whereas generally high quality projects are implemented for recreational area arrangement of the historical city centers, since among other things, tourism income depends on it, the organization of inter-block and intra-block territories, green zones still remains overlooked. The presence of recreational spaces not only improves the quality of life of the population, but also has a certain economic benefit. A keen landscaping scheme is of particular importance in the formation of recreational spaces, as it makes positive influence on the quality of life. A number of tasks were considered within the study framework: an analysis of factors and

methods for forming the transformation principles of recreational zones and the existing state of recreational areas along one of the city's central streets was carried out; transformation methods and concepts of recreational areas were proposed in accordance with the general development concept of the urban environment and the adopted strategy of the region development. (4) **Conclusions**: Strategic planning is necessary to understand the movement vector to achieve the desired goal. In this paper, using the Chernihiv city example, the analysis of the development concepts for recreational city areas is presented, and the existing issues and opportunities for their solution are considered within the framework of strategic goals for achieving comfortable and safe conditions for human life.

Keywords: city planning, recreation area, urban environment.

LEAN APPROACH IN HIGHER EDUCATION

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Abstract: The implementation of the Lean approach in production and service companies of Ukraine gives really positive results in the form of increased productivity, turnover, profitability, etc. The application of this concept in the field of education is not a sufficiently common practice. (1) **Background:** A student of higher education is a consumer of services provided by the university. Therefore, according to the concept of Lean, it is advisable to consider all the processes that form an educational service from the angle of actions that create value for the student. Such an analysis can be applied both to auxiliary administrative processes and directly to academic ones. (2) **Methods**: To optimize the educational process, the methodology of building a map of the current state is used. The search for 8 types of losses in the educational process allows you to eliminate the main unproductive losses and increase the value of the process of acquiring knowledge for the student. (3) **Results:** ***S***ince the lecture is one of the main educational processes, an attempt was made during the research to identify unproductive losses, namely: overproduction; excessive stocks; excessive (extra) processing; expectation; excessive transportation; excessive movements; defects; unused human potential that reduce the quality of the educational process. Losses from overproduction are associated with providing students with outdated information, a significant amount of it. That increases the time for information processing and memorization. Losses from excess inventory represent the impossibility of using theory

in practice. The knowledge that is not applied quickly loses its relevance. Excessive processing is an attempt to give students a maximum of information in a ready-made form that impairs the formation of critical thinking, the development of analytical abilities, and the ability to systematize facts. Losses from waiting in the educational process are associated with the disorganization of the teacher's workplace. Losses from excessive transportation are related to the physical movement in the space of the teacher himself, as well as everything necessary for teaching. With online learning, this type of loss can be significantly reduced. Redundant movements are associated with duplicating documents in paper form, searching for information that is not systematized, checking attendees, etc. Losses from defects as a result of insufficient amount of information, use of inefficient teaching methods, failure to take into account the initial level of knowledge of students before the start of the course, non-automated control of knowledge that requires manual processing of results, etc. Which entails an increase in the time for retaking exams and assessments. Losses from not using human potential are associated with teaching without taking into account the characteristics of the target audience, the lack of an individual approach, uneven distribution of the importance and volume of information. (4) **Conclusions**: The study of the world experience of Lean education and the implementation of the methodology in practice in Ukraine, along with the processes of granting greater autonomy to universities, can ensure higher competitiveness of higher educational institutions and truly ensure customer-oriented education.

Keywords: Lean, higher education, value, losses.

ECOLOGICAL CERTIFICATION AS THE ELEMENT OF ECOLOGICAL MARKETING

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Abstract: In the article the authors studied the features of mandatory and voluntary ecological certification of agricultural products as one of the areas of ecological marketing. The authors noticed the main ideas of the state environmental policy of Ukraine and the environmental standards and normative documents for its regulation. (1) **Background**: The experience of ecological certification for production and consumption of ecological products in Ukraine confirms the tendency of creating the quality and environmental management systems and eco-marketing. The purpose of the article is to study the

features of mandatory and voluntary ecological certification of agricultural products as one of the areas of ecological marketing. (2) **Methods**: The research was aimed at studying the theoretical foundations of ecological certification of agricultural products in Ukraine. For this, an analysis of the standards that regulate the process of certification was conducted. (3) **Results**: In the basic principles of the state environmental policy of Ukraine, one of the instruments of implementation of the environmental policy is environmental management and audit, ecological certification. The introduction of these tools will improve the environmental validity and efficiency of business entities; improve the environmental performance of products. The existing Ukrainian state product certification system already incorporates in its standards the provisions of ISO/IEC 7: 1994 "Guidelines for drafting of standards suitable for use for conformity assessment", ISO/IEC 28: 1982 "General rules for a model third-party certification system for products", ISO/IEC 60: 1994 "Conformity assessment — Code of good practice" etc. The process of ecological certification is ensured by the following Ukrainian standards: SSP ISO 14020: 2003 "Environmental labels and declarations. General principles"; SSP ISO 14021: 2016 "Eco-labels and declarations. Type II self-declaration"; SSP ISO 14024: 2002 "Eco-labels and declarations. Eco-labeling of type 1". Voluntary certification is an effective way of proving the high environmental quality of the product and informing the consumer about this. Such certification may be carried out only by an organization registered in accordance with the right to carry out such a procedure and is an authorized organization for accreditation of Ukraine. Mandatory ecological certification is carried out by the Environmental Certification and Marking Center in the following areas: Product categories; Service categories; "Green Office"; "Green Class". At the process of creating an effective system of ecological certification of agricultural products, it is important to take into account its specificity which is that this system aims to protect not only consumers from harmful and dangerous products, but also the environment from the harmful effects of these products, and the destructive activities on human. (4) **Conclusions**: The ecological certification solves a number of important tasks which ensure the rational use of natural resources such as: production of environmentally friendly agricultural products at all stages of their life cycle, control of product safety for the environment, life, health and property; development and implementation of environmentally friendly technological processes; creation of open competition in the united market; prevention of import of environmentally hazardous products, technologies, waste, services; integration of the national economy into the world market.

Keywords: agricultural products, ecological certification, ecological marketing.

ANALYSIS OF THE DIGITAL CONTENT QUALITY TO MEET THE NEEDS OF REFUGEES IN CZECH REPUBLIC: CASE OF UKRAINIANS

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Abstract: (1) **Background**: There is serious need in the hosting countries to integrate the refugees who come from other countries, representing different culture, education, professional and other backgrounds. The fastest tool to present the important guiding information is the Internet. The Russian aggression that pushed out about 11 million of Ukrainian refugees towards the EU, has put the questions first of the availability and accessibility of the relevant digital content, and then the questions about how much it meets the real needs of the refugees. The research goal was to determine the value-for-needs and its quality criteria for the official public web content generated for the Ukrainian refugees in Czech Republic. (2) **Methods**: It was based on the desk research supported by the survey of 54 Ukrainian refugees aged 13 and older, Google Trends analytics and digital content analysis. Basing on the web-resources research, they were grouped into 10 domains (visa related info, financial support, health related issues, education, language courses, employment, etc.) according to their focus. Assessment of their value in terms of meeting the refugees' needs was performed. (3) **Results**: The recommendations for the digital content designed for the refugees include among others: 1) 1) Translation into refugee's native language and proof-reading by the native speaker but not the one who has been living in a country significantly long before. 2) To place maximum of the topic-related information with relevant links to the original web-sources to find further info. 3) Explanatory sections should contain clear descriptions of the roadmaps how to act in certain situations, not only the references to the relevant legislation. 4) Update the information regularly. If it is not possible, put the working contact for inquiries. (4) **Conclusions**: Some of the conclusions include: the majority of websites aggregate the information from different sources; the biggest focus are legal issues, financial support and news; there are almost no local sites in Ukrainian version. Even if the website does not have a deliberately designed Ukrainian version, there is a webpage or section in Ukrainian, which is, however, often is not easily visible. The number of sources with refugees-related information in Czech language is 1,4 times bigger than in Ukrainian, 30% of the sources have been created by Czech government. 45% of the sources in Ukrainian language present the news that are often outdated, in Czech this share was only 10%, therefore search in Czech gives more update information for obtaining help.

Keywords: refugees; digital content; refugees integration.

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SECTION 6
PUBLIC ADMINISTRATION

ASSESSMENT OF DIGITAL TRANSFORMATION IN THE TERRITORIAL COMMUNITY OF CHERNIHIV BY SURVEY MEANS

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Abstract: A study of the impact of advanced technologies on positive transformations in the community and new opportunities for development was conducted, during which the hypothesis was tested whether the presence of electronic services makes people's lives more comfortable and the community digital. The systematization of the questionnaire data of 50 respondents made it possible to find out the frequency of use of electronic services, the level of satisfaction with digital services. (1) **Background**: Digitalization of a number of socio-economic spheres and industries is taking place in Ukraine. At the same time, the question arises whether modern electronic services are available to citizens? The purpose of the study is to analyze the current state of digitalization in the administrative center of Chernihiv region; (2) **Methods**: In order to conduct research on the use of digital technologies by residents of the Chernihiv community, a survey was conducted. For this purpose, a questionnaire was developed and 50 clients were interviewed within one branch of Privatbank, Nova Poshta, Ukrainian Railway; (3) **Results**: According to the PrivatBank website, there are almost 18 million Ukrainians who regularly use their services, and Privat24 digital bank currently has 13.5 million customers. This financial institution positioning itself as one of the most technological banks in Ukraine, which offers more than 176 digital services. All respondents of the PrivatBank branch surveyed in Chernihiv aged 16 and over 40 named the Privat24 application as the most useful digital service. Two of the interviewees pointed to the use of such an opportunity as paying for utility services, transferring funds. Six out of ten said they use a digital service every day. Generalized data from the questionnaires of the interviewed respondents in branch No. 2 of Nova Poshta in Chernihiv showed that 50% use the institution's services once a week, the other 50% - once a month. Fifteen out of twenty interviewed customers prefer the mobile application from the list of digital services. When answering the questionnaire's question about the level of the company's digital services, 70% of respondents chose the answer «Excellent», 30% «Good». Ukrainian Railways provides 82% of cargo and almost 50% of passenger transportation. The most useful digital service of Ukrainian Railway was named by 80%

of respondents as purchasing boarding pass through the service for purchasing electronic boarding passes and its mobile version. (4) **Conclusions**: The analysis of the research data proved that all the respondents are users of digital services. Satisfaction with digital services in institutions working in the banking, goods delivery, and passenger transportation sectors was rated as «Excellent» by the majority of respondents. This made it possible to confirm the assumption that a digital community is not made by the presence of services or technologies, but by the ability of people to use innovations that make life comfortable.

Keywords: digitalization; territorial communities; online service

PROBLEMS OF THE CUSTOMS AUTHORITY OF UKRAINE COMPARING WITH THE CUSTOMS AUTHORITIES OF EUROPEAN COUNTRIES

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Abstract: (1) **Background:** National security is an integral part of the functioning and development of a solid competitive state. It is a multicomponent and systematic; state power should apply maximum effort to ensure that national security is a single powerful mechanism with missing gaps in any field. The customs sphere is one of the components of national security, which is generally reflected in the state's economic development and its international position. Therefore, it is not surprising that in this area or not, the most criminal encroachments. With the growth and change of social relations, the offenses in the customs sphere are changing, the power of the state does not always have time to respond to them and apply measures to counteract them. (2) **Methods**: After analyzing statistical data on customs offenses in recent years, we concluded that their number every year increases, as well as the number of losses of the state budget increases. Considering globalization processes and the European integration direction, as well as Ukraine's aspirations to occupy a confident position in the international market, our state should be effective in this field. The purpose of the article is to compare the customs authority of Ukraine with the customs authorities of European countries and identify existing problems. (3) **Results:** Today, the main body that carries out the executive and administrative activities in the Customs Sphere and the field of counteraction to a customs offense is the State Customs Service of Ukraine and its territorial units. Regarding the problems of the customs authority of Ukraine, it is a permanent change in organizational form, the lack of normative definition of the State Customs Service of Ukraine as a law

enforcement agency, as well as the adoption of several normative legal acts, which sometimes contradict even to each other, caused several problems, the consequences of which we observe still. The authorities of our state should already decide on the model of the customs authority because reorganization almost every two years has negative consequences on its functioning as a whole. Therefore, it is expedient to intermit to foreign experience, and it should be noted that in most analyzed countries, customs authorities are law enforcement, which allows them to fully fulfill their tasks, to improve the quality of the legal mechanism for bringing to liability for violation of customs rules, while conducting operational-search activities. (4) **Conclusions:** Today, in an era when terrorism and other grave crimes operate on a cross-border and transnational basis, customs authorities are increasingly urgent to comply with nonfish tasks to improve the internal security. Thus, the customs face new problems: they must provide an uninterrupted traffic flow, apply the necessary control, on the one hand, as well as guarantee the protection of interests and security of the community citizens, on the other hand. To achieve the right balance between these requirements, customs procedures and control methods should be upgraded, and cooperation between different services should be strengthened. Only by using measures in the complex and control of the state for their effective implementation can Ukraine provide a sufficient level of customs safety. Still, it should be noted that even when implementing an effective policy, taking into account the present realities, the first tangible results can be observed only in a few years.

Keywords: customs authorities, the interaction of bodies, foreign experience, improvement.

FEATURES OF THE FORMATION AND SPECIFICS OF THE FUNCTIONING OF REGIONAL POLITICAL REGIMES IN UKRAINE (ON THE EXAMPLE OF TRANSCARPATHIA)

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Abstract: (1) **Background**: The supremacy of national-state goals in society in the conditions of full-scale aggression of imperialist Russia and the unity of citizens around the constitutional goal and practical steps of Ukraine's integration into European and Euro-Atlantic structures are not possible without improving the quality and speed of preparation and decision-making on important issues of state and social life, taking into account the

opinion of voters and the public, improving the activities of state authorities and local self-government bodies on the basis of good governance, consolidation, transparency and digital transformation. The study of the experience of the functioning of regional party-political structures at the crossroads of peacetime and wartime aims to analyze the mechanisms of interaction and partnership of the state executive and local self-government bodies with such political institutions as political parties and civil society organizations at the regional level of the Transcarpathian region. The obtained results can be used for the purpose of adaptation to wartime conditions of the system of implementation of constitutional norms involving citizens and members of political parties to participate in the management of state affairs. (2) **Methods**: The socio-economic factors of the pre-war region's development, the consequences of the administrative-territorial reform, financial and functional decentralization of power, and their influence on increasing the role of party organizations were analyzed. A significant factor in the evelopment of the regional political system was the legalization of the activities of parties that are nationwide in status and regional in content.
(3) **Results**: For the most part, the role of the majority of regional party branches in strategic planning for 2021-2027, the budget process, the activation of cross-border and international humanitarian cooperation, and the elimination of existing asymmetries in the socio-economic development of Ukraine and comparable border regions of EU member states appears to be constructive. The studied practices testify that in both peacetime and wartime socio-political organizations, created on an ethnic-regional basis in particular, are interested and active subjects of cross-border cooperation and promoters (through affiliated non-governmental organizations and parliamentary factions of territorial communities) of donor programs of European good-neighborhood, target programs of ancestral states and funds of the State Fund for Regional Development of Ukraine. Challenges and risks to the stability of the regional political regime are generated by established and new political factors. These include the historical, geospatial and fundamental difference between the models of sovereign development of Ukraine and neighboring EU countries. (4) **Conclusions**: On the eve of Russian aggression , the prerequisites for achieving strategic cohesion of regional elites and stability of the party-political regime were created. There is a consensus of party and public forces regarding the need to capitalize on the region's natural and recreational resources, increase the added value of the regional product, and the cooperation of all branches of government in the implementation of state support for regional development. Party centers and their partner public organizations are aware of the presence of interregional competition for investments and advanced technologies, considerable challenges for the unity and cohesion of territorial communities and regional political elites, which the implementation of the inertial scenario of the region's development entails.

Keywords: party organization, region, regional political regime, territorial community, cohesion of regional elites, model of sovereign development.

SECTION 7
ECONOMICS

INCREASING THE ECONOMIC EFFICIENCY OF THE USE OF THE MACHINE AND TRACTOR PARK

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Abstract: (1) **Background:** Increasing the efficiency of the use of existing tractors allows you to increase the amount of mechanized work, shorten the time of their execution, improve the mechanization of labor-intensive processes, and reduce the cost of production without increasing capital investments. Therefore, it is important to analyze the use of the tractor fleet in each farm. A comprehensive and objective assessment of the use of the tractor fleet is possible only with the help of an analytical complex system of indicators, the development of which is an important methodological issue. First, the system is conditioned by private technical and economic indicators characterizing the extensive and intensive loading of tractor fleets. The heavy load index characterizes the degree of utilization of the working time of the machine. They can be absolute. (2) **Methods:** The number of working days, shifts and hours of tractor operation during the analyzed time period; average shift duration.

Indicators can also be relative:

- tractor use (ratio of tractor-days to machine-days of the farm);
- coefficient of variation (the ratio of the number of shifts to the number of working days in the tractor fleet);

The coefficient of useful use of working time per day, changes (the ratio of useful working time to the time spent on wearing clothes). The general indicator for the characteristics of the operation of the tractor fleet is the integral coefficient of useful work.

(3) **Results:** One of the most important indicators of the efficiency of the tractor fleet is the traditional benchmark cost per hectare. It shows all aspects of tractor operation. It is related to operating costs and direct impact (amount of work performed). In addition to the listed technical and economic indicators, general indicators of the economy of agricultural production are used to evaluate the efficiency of the use of the tractor fleet — the yield of agricultural crops, labor productivity, cost of production, profit, profitability. However, it should be remembered that their cost depends not only on the technical level

of production, but also on other resources. The use of machines and tools must be carried out in accordance with the organizational and technical rules of their operation and technical drawings. Of great importance are the correct placement of units on the site, preparation of the workplace, breakdown of the herd, the method of movement of equipment, hourly and grid schedules, route planning. (4) **Conclusions:** Due to the reduction of time for the inevitable movement of equipment and labor during field work, the improvement of material benefits and responsibility of machine operators and other workers, the introduction of routine services, two-shift work, the use of economical high-speed and wide-grip units, grouping methods. , and more.

Increasing the machine utilization ratio of each enterprise is one of the main conditions for increasing labor productivity and reducing cost. Tractors and combine harvesters are the most important mechanical methods of production, and an increase in production is equivalent to an increase in quantity without an increase in cost. In every business, it is important to conduct an in-depth analysis of the operation of tractors and machines to identify opportunities for improving their productivity.

Keywords: loading of tractor fleets; operating costs; the machine utilization ratio.

THE INFLUENCE OF THE CONSTRUCTION INDUSTRY ON THE ENVIRONMENT

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Abstract: (1) **Background:** consideration and development of the theoretical foundations of the ecological and economic assessment of the negative consequences of the construction industry's impact on the environment are urgent issues, the development of which is carried out on the basis of the provisions of the economics of nature use and environmental protection, modern concepts of sustainable development. (2) **Methods:** the following methods of scientific research were used: system-structural analysis - to determine the essence and formalization of the structure of ecological and economic influences; the method of comparison and grouping - when studying the ecological and economic impact of the construction industry on the environment. (3) **Results**: for the successful implementation of measures to prevent and eliminate the negative impact of construction on the environment, the programs that include the specified measures should be comprehensive, and their financial support should be sufficient. The impact of construction industry enterprises on the environment is manifested in various aspects: First of all, at the initial stage of construction, the alienation of land, clearing of territories,

cutting of the vegetation layer and carrying out earthworks are carried out. The development of construction sites destroys the fertile soil layer and plant cover, leads to the radical destruction of biogeocenoses. Unfortunately, soil conservation measures (reclamation of agricultural land) increase the cost of construction. Secondly, construction production affects the environment and people through the production of construction materials (radioactivity, toxicity, dust generation are present), the operation of construction machines and transport, the organization and culture of production (the destruction of the ground cover by temporary access roads, the accumulation of toxic emissions in the atmosphere is observed machines and transport, the presence of noise, vibrations, electromagnetic fields). Thirdly, after the end of the construction process, a large amount of construction waste remains: in addition to garbage, more than 1 million tons of metal are lost annually in construction; 30% glass; up to 15% of cement; up to 17% of bricks go to waste as a battle, and 40% of bricks are characterized by various defects and damages. Annually, up to 2 million tons of asphalt concrete, which includes up to 120,000 tons of bitumen, as well as sand, gravel, and other materials, are accumulated in landfills [2]. The study of ecological processes shows that the greatest damage to the air basin in the area of construction works is caused by the operation of transport, heating equipment, and the use of building materials with aromatic additives that spread through the air and affect living organisms [3]. The construction industry pollutes the environment the most with earthwork and assembly-concrete works. They are associated with the transition of raw materials into certain states with different physical and mechanical properties. In addition, equipment of various levels of complexity, auxiliary mechanisms and modern technologies are used. In most cases, these processes contribute to the separation of polydisperse dust, gases and other pollutants [1]. (4) **Conclusions**: In order to reduce the negative impact on the environment and society, it is necessary to rationally combine economic and ecological components at the stage of development and adoption of construction projects by assessing potential environmental risks and impacts associated with the project.

Keywords: construction industry, environmental impact.

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THEORETICAL AND METHODOLOGICAL PRINCIPLES OF FORMATION OF ORGANIZATIONAL AND ECONOMIC MECHANISM OF CORPORATE SOCIAL RESPONSIBILITY MANAGEMENT

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Abstract: (1) **Background:** Organization goal is to increase the efficiency and productivity of the business and to maximize the shareholders' profit. In order to achieve sustainable success, the organisation should integrate economic, social and environmental expectations with goals of the organization. The study adopted the pyramid of CSR theory, triple bottom line theory and stakeholder theory to establish the principles of formation of organizational and economic mechanism of CSR management. Also, the study questions hypothesis that: there is relationship between corporate social responsibility (economic, social and environment) and organizational and economic management. (2) **Methods:** A total of 150 participants were selected from public and technical universities in Ghana for the study. The sample size was 108. The study adopted Analytical Hierarchy Process (AHP) method in designing the model. (3) **Results:** Results indicated that organizational and economic management are most effectively implemented through the mechanism such as high-quality standards, employee care, law-abiding, transparent business, observance of norms, creation of job and comfortable working conditions, environmental safety, formation of business culture, conformity to principles of sustainable development etc. (4) **Conclusion:** Organizational management should become a more inclusive concept involving various stakeholders, and ensuring that organizations are operating in an ethical and sustainable manner.

Keywords: corporate social responsibility, organizational, economic mechanism, stakeholders.

INNOVATIONS AND TECHNOLOGICAL STRUCTURES IN THE PARADIGM OF ECONOMIC DEVELOPMENT

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Abstract: At the beginning of the 21st century, the world economic system is actively forming a new paradigm of economic development, which significantly reduces the role of material and resource components of social production and increases the role of the intellectual component. The production, distribution and use of knowledge form the basis of the economy of a knowledge-based society. It is knowledge that forms technological structures and creates prerequisites for the further development of society. (1) **Background:** The modern development of economic systems is closely related to innovation and information. This trend is primarily caused by global changes in society in terms of information and technological development, which caused the formation of a new information (post-industrial) society. Innovative development is closely related to scientific, technical and informational revolutions, the emergence and development of technological systems. It is at this moment that man and his scientific and educational potential act as the driving factor of socio-economic progress. The active development of science is closely related to the industrial and information revolutions, the creation and functioning of technological systems. Thus, informational and industrial-technical revolutions, the core of which is knowledge and its practical application, are at the core of the new evolutionary development of society and the growth of its well-being. (2) **Methods:** We used the deductive method and historical review to analyze and compare information and technical revolutions. (3) **Results**: The use the information as a production resource that changes the paradigm of society's development and leads to economic growth, reducing the dependence of the country's economy on available natural resources. At the same time, information revolutions contribute to changes in technological systems. Technological structures are defined as an integrated sustainable set of connected productions, within which a closed macroeconomic cycle takes place, consisting of the extraction of primary production resources, all stages of their processing and the release of the corresponding final products. Its core is a system of basic technologies that have been used for a long time in most sectors of the economy. According to the scientists' conclusions, waves of technological development create completely new sectors and opportunities for investment and growth, and their development, in turn, stimulates the entire economy as a whole. Precisely the information component forms the core of technological systems and is the main condition for influencing structural changes and further economic growth. Hence, the focus on an innovative model of economic development should ensure an increase in funding for education, fundamental and applied science, measures for popularization

(marketing) and implementation of scientific developments. And this should be implemented primarily by the state innovation policy at the expense of the state budget. (4) **Conclusions**: The development of society and its well-being directly depends on the development of intellectual and scientific potential, the formation of technological structures and the introduction of innovations that shape the level of civilization. The basis of this development is education and science.

Keywords: Innovations, innovative development, information revolution, technological systems, scientific and educational potential.

PECULIARITIES OF CURRENCY RISK ASSESSMENT IN THE TOURISM INDUSTRY

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Abstract: (1) **Backgruond:** The tourism industry is considered the most profitable and at the same time the most risky direction of foreign economic activity. During tourism activity, a complex process of interaction between various sectors of the economy takes place and a significant influence of the international environment is determined. (2) **Methods:** All organizations in one way or another use different methods in managing currency risk. In general, there are 4 methods of currency risk management:

1. Hedging – selling risks of adverse exchange rate changes to another market participant.
2. Provisioning – compensation of loss from currency risk at the expense of created reserves.
3. Diversification – reduction of maximum possible losses for one event.
4. Control – control over the likelihood of risk occurrence or the organization's sensitivity to risk.

(3) **Result:** The tourism industry is affected by both the economic and the natural environment, which directly affects the existence of the subjects of tourism activity. Currency risk in relation to tourist enterprises that carry out foreign economic activities can be defined as a monetary expression of the probability of losses or underachievement of profit as a result of underestimated or incorrectly estimated by management subjects of the direct impact of exchange rate changes on the competitiveness of tourist services and the profitability of the tourist enterprise itself. At the same time, the level and type of currency risk for enterprises of the tourism industry depends on the geographical location.

While inbound and outbound tourism is characterized by a greater degree of both operational currency risk and economic currency risk, domestic tourism is characterized by only economic currency risk. (4) **Conclusion:** So, the quantitative assessment of the impact of exchange rate changes on the tourist enterprise can be conditionally divided into at least three stages, which are quite closely integrated with each other:

1. Quantification of currency risks in assets and liabilities denominated in foreign currency.

2. Quantitative assessment of operational, accounting and economic currency risks.

3. Quantitative assessment of the impact of exchange rate changes on each subsystem of the enterprise and on the enterprise as a whole system.

Also, the characteristics of the evaluation features of currency risk management make it possible to:

1) to investigate the complex and contradictory mechanism of the influence of currency risk on the activities of the enterprise of the tourism industry;

2) to provide a quantitative assessment of the impact of currency risks not only on the assets and liabilities of the tourist enterprise, but also to assess the operational, accounting and economic currency risk;

3) strive for new methods of managing risks in general and currency risks in particular with maximum consideration of the specifics of the tourism industry as a branch and tourist enterprise integrated into the dynamically developing world economy.

Keywords: tourism, currency risk, economy, exchange rate

STRATEGIES FOR THE COORDINATED DEVELOPMENT OF CHINA'S ECONOMY AND VOCATIONAL EDUCATION

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Abstract: (1) **Background** Vocational education, as an educational form closely related to social and economic development, is an important force to promote economic development and construction in the national education system. At present, China's economic development model shows a trend of regionalization, and the regionalization of economic development plays a huge role in promoting the characteristic development of vocational education, which is also an important guarantee to promote its sustainable development. Similarly, the development of regional economy can further promote the expansion of the scale of the vocational education system. Deepening the reform of the

vocational education system and mechanism, building a modern vocational education system, and adhering to the unique concept of running a school are also the common goals and aspirations of vocational education and economic development. (2) **Methods** This study mainly uses the literature method to review the development of appropriate quality management policies for vocational education in Chinese educational institutions. In China, in order to achieve a good evaluation effect and emphasize the effectiveness of evaluation, it is necessary to adopt appropriate evaluation methods for various types of evaluation objects in order to ensure the authenticity, reliability and effectiveness of evaluation results. The main purpose of the academic assessment and evaluation mechanism is to promote progress and improve the quality of learning so that vocational education better serves the development of the economy and society. Finally, this study also uses a case study to analyze the evaluation methods used in several quality management practices in vocational education. (3) **Results.** The strategy of coordinated development of economy and vocational education. The symbiotic and mutually reinforcing relationship between economy and vocational education. From the perspective of social and economic development, the interrelationship between vocational education level and China's economic development should reflect the internal law of close connection and mutual promotion, which requires the establishment and optimization of a sustainable vocational education policy and regulation system, and the implementation of various government policies to promote the sound development of vocational education. The administrative departments of governments at all levels should consciously give consideration to economic development and vocational education development, as an important development strategy, improve the overall understanding of these two tasks, and promote the coordinated development of the national vocational education system and the economy. At the same time, we should increase the publicity of these policies and regulations, and change the society's view on vocational education from a deeper psychological level, so as to truly promote the common development of vocational education and the economy. (4) **Conclusions.** As the relationship between vocational education and social and economic development is becoming closer and closer, in the process of their coordinated development, vocational colleges should make full and reasonable use of their public research resources, focus on strengthening basic research, application research design and curriculum development, and strive to build a professional research and teaching service network system that conforms to the characteristics of local economic development. Promote the coordinated development of vocational education and regional economy.

Keywords: Vocational education; economic; coordination; development.

ECO-SYSTEM TO SUPPORT ENTREPRENEURSHIP AND START-UPS IN POLAND

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Abstract: (1) **Background**: The basis of any economy is entrepreneurship and innovative business (sturt-ups), which ensure economic growth, create jobs and satisfy people's needs by creating goods and services. Accordingly, a necessary condition for the country's development is the development of an effective support system for the development of entrepreneurship and start-ups. The study's aim is to conduct an analysis of the eco-system to support entrepreneurship and start-ups in Poland.
(2) **Methods**: The research methodology is based on desk research - analysis of Polish legislation, analytical materials, statistics of Polish organizations, authorities, and scientific papers. Projects that have been implemented in the last 5 years or are being implemented in Poland now to support entrepreneurship and start-ups also were analyzed.
(3) **Results**: The study deals with Polish experience in infrastructure formation for entrepreneurship, start-up market, and implementation of start-up projects at the national and international investment markets. In the process of achieving the study objectives, systematization and generalization of the Polish experience in supporting start-up businesses in various forms realized: start-up incubators and accelerators, short-term projects and activities in support of start-ups, grants, conferences, and another meeting of participants of startup movement, educational projects, and crowdfunding platforms. The attention was focused on the prospects of the practical use of the start-up entrepreneurship mechanism as a successful model in modern conditions for sustainable business development. (4) **Conclusions**: Poland is an example of a country that pays special attention to the policy of supporting entrepreneurship and innovative business. Poland's business environment consists of various industry sectors, clusters, technology parks, and an extensive network of suppliers and subcontractors. Favorable conditions for investment have been created in Poland, in particular, 14 special economic zones and grant programs from the national authorities and the European Union are also provided. In order to mitigate the negative impact of the coronavirus pandemic on small business entities, the Government of Poland has adopted legislative initiatives, the so-called "Anti-Crisis Shields", which are aimed at ensuring the financial security of citizens and entrepreneurs, maintaining the employment of the population. For the period 2021-2027,

Poland received 180 billion euros from the European Union to finance programs for the development of local businesses. Measures supporting the financial liquidity of entrepreneurs by ensuring their access to loans and guarantees are introduced. Programs supporting the initiatives of forced migrants from Ukraine to start a business in Poland are implemented.

Keywords: entrepreneurial activity, start-ups, entrepreneurial ecosystem in Poland, fundraising, start-up incubators, accelerators, starting a business.

THE PLACE OF YOUTH MIGRATION IN THE STRUCTURE OF GLOBAL POPULATION

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Abstract: (1) **Background**: According to experts, by 2030 there will be 1.3 billion young people in the world. This speaks to the important role that youth will play, especially in developing countries, because 90% of the world's total youth population lives in them. Within the framework of a comprehensive systemic approach, world-building and dialogue of a global nature includes all aspects and dimensions of life - relations between generations, social, economic, political, ethnic, religious, civic, ideological, cultural and natural. Interest in studying the problems of youth migration is dictated by the influence of young people on the modern labor market. The socio-economic potential of any country depends on the labor activity of young people in particular, as they have the professional competencies needed by modern employers. (2) **Methods**: The research methodology includes as methods of the logical analysis, systematic method, induction and deduction. (3) **Results**: Young migrants represent more than 10% of the total number of 232 million international migrants and, as the most mobile social group, young people make up the bulk of annual migration movements. In absolute numbers, youth migrant stocks are larger today than they were 30 years ago, but the size of the 15–24 age group has increased at a slower pace than that of the 25–34 age group. In 2020, nearly 90 million migrants were between 15 and 34 years old, of which 36 percent belong to the 15–24 age group and 64 percent belong to the 25–34 age group, compared to around 52 million in 1990, of which 42 percent belong to the 15–24 age group and 58 percent to the 25–34 age group.10 Moreover, youth aged 15–24 represented 11 percent of the total migrant stocks and those aged 25–34, 20 percent. The share of migrants aged 35–44 continues to peak at 20 percent of total migrant stocks, before decreasing for the older age categories. The COVID-

19 pandemic has caused significant changes in migration flows. In particular, for OECD countries, the year 2020 became a historical minimum in international migration. Migrant remittances to low- and middle-income countries fell by 19.7% to $445 billion. According to the forecasts of the World Bank, there will be a decrease in the flow of remittances from migrants in Europe and Central Asia by 27.5%, Africa south of the Sahara by 23.1%, South Asia by 22.1%, in the countries of the Middle East and North Africa by 19.6%, Latin America and the Caribbean by 19.3%, East Asia and the Pacific Ocean by 13%. (4) **Conclusions** The study of the problems of youth migration arouses the interest of the scientific community, governments of countries and intergovernmental organizations in view of the potential influence of this demographic group on the prospects of socio-economic development of national economies. The labor activity of young people is a significant factor influencing the modern labor market, because it is young people who are the bearers of the competencies of the modern dimension. A comprehensive analysis of educational, intellectual, and labor migration flows, where youth is the subject, is a necessary element in the formation of reasonable forecasts regarding the development trajectories of individual countries as well as promising world-building algorithms.

Keywords: migration, young migrant; globalization, COVID-19, socio-economic development.

«GREEN» INVESTMENTS AS A FACTOR OF SUSTAINABLE DEVELOPMENT OF THE COUNTRY

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Abstract: Among the global economic, ecological and social problems of the modern environment of economic entities, it is very important to look for ways to improve and support the functional development of each sphere of activity. The balance of all structural elements of the country's development allows full use of all resource opportunities. It was determined that investments are one of the driving factors in the development of economic results. Thus, after analyzing various spheres of activity, it was found that «green» investments are a relevant niche for investing capital. This approach will make it possible to take a new step in accelerating the pace of sustainable development of Ukraine. «Green» Investments will allow the country to become potentially interesting for foreign parties. (1) **Background:** the purpose of the work is to study the effectiveness of the «green» investment policy as a priority direction for the sustainable development of the national economy. (2) **Methods**: the study of theoretical and practical problems of «green» investing in Ukraine

led to the need to apply both general scientific and special methods of knowledge, which together made it possible to comprehensively solve the tasks and clarify the essence of the «green» vector of the economy. (3) **Results**: it was determined that thanks to a rational approach to the determination of the priority sectors of receiving monetary income, the accumulation of an economically positive effect depends. the development of the «green» investment market is limited by a number of methodological problems characteristic of «green» projects (in particular, the lack of a clear definition of the concept of «green» in relation to economic processes) and characteristic of the financial sector as a whole (for example, insufficiently developed capital market technologies, difficulty of access to long-term «green» financial instruments), but has an unconditional and justified potential for increasing financial capital. (4) **Conclusions**: the obtained results can be used in the process of developing a strategy for the foreign economic development of Ukraine and evaluating the effectiveness of policy implementation in the field of «green» investment. This will make it possible to effectively use natural and financial resources with the maximum economic effect for the sustainable development of the country.

Keywords: «green» economy, «green» investments, sustainable development, investment, development, economic balance.

EXTERNAL AND INTERNAL FACTORS OF BUSINESS ACTIVITY

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Abstract: In order to increase the level of competitiveness, financial stability and further development of business entities of the Zaporizhzhia region, it is important to form the appropriate structure and amount of resources of the organization for the implementation of their previously defined goals. However, a change in certain conditions of the entrepreneurial internal and external environment mainly causes the need to adjust the development strategy, taking into account the influence of the factors that shape them. (1) **Background:** The current state of the development of globalization processes, the accelerated transformation of the world economy, the structural changes of the economy of Ukraine and its individual regions strengthen the identification of factors of the external and internal environment of entrepreneurial activity for business structures, regardless of the forms of ownership and types of activities. (2) **Methods:** We use the analytical methods for generalisations the external and internal factors of business activity. (3) **Results:** Entrepreneurial activity in the region is under the constant influence of various factors, including internal factors that depend on the entrepreneur himself and the

peculiarities of the internal organization, and external factors that are determined by the nature of the external environment. Factors of the internal business environment include production, personnel, finance and accounting, marketing, management organization, etc. Production and technological factors include the composition of machines and equipment, their progressiveness, level of physical and moral wear, intensity of use, technology and quality of service, composition and quality of raw materials and materials, application of high technologies; social factors unite the entire complex complex of relations between employees, their abilities, efforts and skills, attitude to work, motivation, behavior, organizational culture, professional ethics. The organization of management is the final and most important factor of the internal environment, the success of any business project depends on how cash flow management, financial monitoring, technological processes, and personnel policy are organized at the enterprise. The external environment of a business entity is a set of economic, political, legal, scientific and technical, communication, natural-geographical and other conditions and factors that directly or indirectly influence the activity of the business structure. External economic factors include the general level of economic development of the country or region, the level of market relations, competition, etc. (4) **Conclusions.** Identification of factors of the external environment is a prerequisite for the development of measures to minimize their negative impact. Variants of response of entrepreneurs to the realization of threats and dangers of the external environment can be: reduction of personnel, concurrent positions; liquidation of certain services and structural units; reduction of production; implementation of reserves to reduce the cost of production and increase profitability; diversification of activities; changing the organizational structure, improving the management system; modernization of technology and equipment, implementation of innovations. Thus, the exit of a business entity from a crisis state should be qualitative changes in the internal environment, in particular, improvement of the organizational structure, management system, production technology, etc.

Keywords: entrepreneurship, internal and external environment, factors.

ORGANIC PRODUCTION AS ONE OF THE TOOLS FOR ENSURING THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT

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Abstract: The paper outlines the main indicators of organic production in Ukraine and defines its role in ensuring the Sustainable Development Goals. (1) **Background**: Organic production is one of the most important directions for ensuring the principles

of sustainable development. The transition of agricultural producers to organic production can solve a number of problems associated with the intensive development of global food production. Every year, the culture of food consumption changes in Ukraine, which has a positive effect on the development of organic production. (2) **Methods**: The purpose of this research is to determine the role of organic production in ensuring sustainable development. (3) **Results:** Organic agriculture has been actively developing on the territory of Ukraine for the past five years and is becoming more and more popular among agricultural producers. This is evidenced by the main indicators of the activity of organic producers, such as the domestic market of organic products (5,181 thousand tons), the number of certified organic lands (422,299 hectares), the number of producers of organic products (528) and the dynamics of exports of organic products from Ukraine by volume (260 thousand tons). The main types of products manufactured in Ukraine are: milk, vegetables, fruits, oils (assortment), cereals, meat products. In the last five years, organic farming in the territory of Ukraine Such advantages of organic production as: ensuring the competitiveness of domestic producers of products on international markets, improving the quality of nutrition of the population; economic benefits stimulate agricultural producers to switch to more ecological farming methods. It should be noted that the rapid growth of organic production was the result of the initiated policy and support of the Ministry of Agrarian Policy of Ukraine. Since 2019, a number of legislative acts have been developed and put into effect, which encourage producers to switch from traditional to environmentally friendly agriculture. One of these documents is the Sustainable Development Strategy of Ukraine until 2030, which outlines the main tasks and stages of achieving the Sustainable Development Goals. As a tool for achieving these goals, organic production is relevant for many purposes: solving the issue of overcoming hunger, ensuring food security, transition to rational consumption of products and their production; restoration of the ecosystem. All these goals can be realized through the development of organic production in Ukraine. With the beginning of a full-scale war, organic production, like the entire agricultural industry, suffers and bears huge losses, since the main thing in organic production is access to land resources. In the conditions of active hostilities, producers partially lose access to land, supply chains of raw materials to producers are disrupted, and during the 2022 sowing season, some farmers did not have enough fuel to cultivate the land. It should be noted that hostilities also have a negative impact on the environment as a whole. (4) **Conclusions:** organic production ensures the fulfillment of many goals of Sustainable Development, therefore its development is relevant and requires further study.

Keywords: organic production, sustainable development, competitiveness.

AUTOMATION OF WORKFLOWS AS A WAY OF LEAN TRANSFORMATION

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Abstract: (1) **Background**: Lean manufacturing is a type of production when manufacturing process is based on an ideology of maximizing productivity while simultaneously minimizing waste within a manufacturing operation. According to the lean principles a waste is anything that doesn't add value that the customers are willing to pay for. James Womack and Daniel T. Jones in their book "Lean Thinking: Banish Waste and Create Wealth in Your Corporation" defined lean as "a way to do more and more with less and less - less human effort, less equipment, less time, and less space - while coming closer and closer to providing customers exactly what they want." Summarize the general meaning of lean is to identify and eliminate waste, from which quality and production times can be improved and costs reduced. This is one method of approaching lean manufacturing, but it can also be approached using the "Toyota Way", that is focused on improving workflows rather than waste. Both methods share the same principles, including: automation, continuous improvement, flexibility, load levelling, perfect first-time production or service quality, production flow and visual control, pull processing, supplier relationships, waste removal. Lean transformation is the process of introducing changes in manufacturing to maximize the flow of value produced for the customer. The research was focused on applying of automation in particular manufacturing workflow in order to introducing lean transformation via one of the lean principles. (2) **Methods**: The workflow analysis was used as a main method in the research. It was the process of examining a manufacturing's workflows, generally for the purpose of improving operational efficiency. As a result, the manufacturing workflows were divided into 3 categories depending on value adding and the possibility of withdrawal. Also, the conducted analysis allowed to complete the manufacturing workflows analysis template of current state. After eliminating the workflows that don't add any value it was developed the manufacturing workflows analysis template of future state based on it. (3) **Results**: Through research the degree of improvement of the main indicators was determined: the time of workflows was decreased; there was a need for fewer staff; the consumption of electricity was reduced. (4) **Conclusions**: In this way, the main indicators of lean transformation were achieved - wasteful activities are identified, removed and optimized for the help of applying of automation in particular manufacturing workflow.

Keywords: lean; waste; manufacturing workflow; manufacturing workflows analysis template.

RISK MANAGEMENT OF ENERGY ENTERPRISES IN THE CONDITIONS OF UKRAINE'S TRANSFORMATION TO A LOW-CARBON ECONOMY MODEL

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Abstract: (1) **Background**: Energy of Ukraine, as stated in the Energy Strategy of Ukraine for the period until 2035 "Security, energy efficiency, competitiveness", approved by the order of the Cabinet of Ministers dated 18.08.2017 No. 605-p, is an economic guarantee of state sovereignty, an element of proper governance, a reliable basis sustainable development of a competitive economy and an integral part of the European energy space. The vital activity and quality of most spheres of society's life, as well as the welfare of citizens, depend on its safe and stable functioning. (2) **Methods:** In the process of research, the regulatory and legal method, the monographic method and the generalization method were used. (3) **Results:** Understanding the existing problems in the electricity market, the government of Ukraine has already taken the first steps, in particular, to settle the issue of its liberalization. Thus, as of July 1, 2019, Law of Ukraine No. 2019-VIII "On the Electricity Market" (hereinafter - Law No. 2019-VIII) completed the introduction of a liberalized market in accordance with the norms of European legislation in the field of electricity. Therefore, by analogy with European countries, wholesale and retail electricity markets have been created in Ukraine, namely: the market of bilateral contracts, the market of bilateral contracts at free prices, the "day-ahead" market (hereinafter referred to as RDN), the balancing and intraday market (hereinafter referred to as VDR). However, the price restrictions on RDN and VDR determined by the NCRECP led to a drop in prices, which, first of all, complicated the situation of SE "Guaranteed Buyer" and led to a shortage of funds to compensate for low tariffs for the population, and also to the growth of debts to NPPs and TPPs, unprofitability of generating companies, increasing threats of their bankruptcy and outflow of investments from the industry. On the other hand, with the full-scale invasion of the Russian Federation on the territory of Ukraine, generating companies faced new challenges. Against the background of military operations in Ukraine, there was a drop in electricity consumption by 30-35%. Since the beginning of the war, 35.2 million m2 of housing, more than 200 enterprises, 580 health care institutions, 562 kindergartens, more than 200 administrative and technical buildings, 27 oil depots and 12 civilian airports have been destroyed or seized on the territory of Ukraine. Some industrial enterprises, which were the main consumers of electricity, stopped working. Small and medium-sized businesses either ceased their activities or were forced to relocate to the western regions. More than 6 million Ukrainians left Ukraine. All this led to a surplus of electrical energy even against the background of lost capacities. According to estimates, electricity generating companies lose over 1.3 billion hryvnias every month only due to the

migration of citizens. Instead, in order to accelerate the process of ESG-investing of energy enterprises, a favorable investment environment should be formed. (4) **Conclusions.** Implementation of the submitted proposals in practice will prevent the occurrence of risks and threats to the economic security of energy enterprises.

Keywords: economically secure future of energy companies, decarbonization process, ESG-investment

TRUST IN THE FINANCIAL SECTOR WITHIN THE CONTEXT OF INVESTMENT SUPPORT OF THE STATE BUDGET IN WARTIME UKRAINE

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Abstract: (1) **Background**: The national economy of Ukraine is currently experiencing a period of uncertainty due to social, political, and military challenges. The full-scale invasion of Russia in 2022 demonstrated the weaknesses of the financial system and significantly reduced the country's economic security level. The total deficit of the general fund budget for the nine months of war amounted to 10.4 billion dollars (USA) (NBU, 2022). In such conditions, trust in the financial sector can become a crucial tool for achieving economic security and the functioning of the state. Therefore, the purpose of the paper is to investigate the current state of trust in the financial sector in the context of investment support of the state budget in Wartime; (2) **Methods**: This research is based on general scientific methods. It uses a survey conducted by the face-to-face interview method by the Razumkov Center and the Ilko Kucheriv Foundation "Democratic Initiatives"; (3) **Results**: Trust in the financial sector is an essential basis of relations between economic entities, the tendency of the population to keep savings, the security of the banking system and the investment attractiveness of assets depends on its level. In the last ten years, a deep and entrenched crisis of trust in the financial sector has been observed in Ukraine. This situation is evidenced by all-Ukrainian survey data of the Razumkov Center and Ilko Kucheriv Foundation "Democratic Initiatives." In August 2021, the balance of trust in the NBU was -31% in commercial banks -52.5 (Razumkov Center, 2021). However, in August 2022, the situation changed radically; despite the difficult socio-economic situation, the balance of trust in the National Bank of Ukraine and commercial banks increased to -8% and -37%, respectively (Ilko Kucheriv Foundation, 2022). One of the reasons for such changes in trust in the financial sector is the government's decision to use tools to stimulate financial revenues to the state budget in the form of military bonds (Ministry of Finance, 2022). This type of bond turned out to be very effective because, in martial law conditions, everyone could buy military bonds under a simplified procedure and thus support the army and finance the state budget

deficit. At the end of August, 3.93 billion hryvnias were attracted to the state budget (Ministry of Finance, 2022). Such collaboration between the Ministry of Finance and the image of the military forces led to increased trust in the NBU and commercial banks since the desire to help the Armed Forces pushed entities to buy bonds through primary dealers - commercial banks. Thus, economic entities gained experience interacting with financial institutions and building trust in the financial sector; and (4) **Conclusions**: Thus, the experience of Ukraine demonstrates that increasing the level of trust in the financial sector in conditions of socio-economic uncertainty is possible by using practical tools. The introduction of military bonds by the government made it possible to attract investment support for the state budget and improve trust in the financial sector, which will positively impact economic indicators.

Keywords: trust; financial sector; state budget; military bonds; wartime.

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ECOSYSTEM APPROACH IN AGRIFOOD SME'S BUSINESS NETWORK DEVELOPMENT

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Abstract: (1) **Background:** The full scale foreign army invasion on the beginning of 2022 has changed the rules and approaches of doing agri-business in Ukraine. The micro and small agro-enterprises owned and lead by women who lost their business completely and were relocated inside of Ukraine or temporary left abroad became the object of this research. (2) **Methods:** This survey was conducted with the sociological method of target group research and combined questionnaire method, in particular

online - google form and direct phone calls. The research lasted from the April till September, 2022. (3) **Results:** In today's era of complete uncertainty and high market risks, Ukrainian women agricultural entrepreneurs with active life position united with other women-entrepreneurs and organized business communities with aim of joint support, surviving and development. Such business groups as the "SHE FARMS" Ukrainian Food Valley create an business environment according to the sharing economy principles (https://www.facebook.com/SHE.FARMS.ukrainian.food.valley). Business models modern agro-entrepreneurs work on remain Uber or eBay. Women-agro-entrepreneurs who haven't physical facilities, but still have knowledge, business contacts and practical experience provide professional consulting services to the former competitors. They also have the opportunity to outsource their production and supply production to retail under their own trade mark. In this case, entrepreneurs keep in touch with their customers. (4) **Conclusions:** The philosophy of coopetition when entrepreneurs work together and compete in the same time gives the space for collaboration and possibility for each market participant not only survive but to be economically resilient which is very important for the economy as the holistic system. Sharing economy business models might ensure business survival and development in the post-war economy period, which will require further research.

Keywords: ecosystem, coopetition, agrifood SME, business network, women business development

FORMING OF INVESTMENT POTENTIAL FOR THE CRISIS MANAGEMENT OF NATIONAL ECONOMY

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Abstract: (1) **Background**: The financial crisis caused by the war played the role of catalyst of development crisis management for Ukraine, impelling to the awareness – both at the level of public consciousness and domestic politics – necessity of change of model of economic management on the basis of forming investment potential. The investment potential has the ponderable role in providing of effective realization of modernization reforms. Forming of investment potential is the fundamental parameter of reproductive process, which determines possibilities of update of the fixed assets, realization of structural reforms, forming of base of steady long-term development of economy. The primary objective of this work is to make the conceptualisation of forming of investment potential for the crisis management of national economy of Ukraine in modern terms. (2) **Methods**: The main methods or treatments applied were the synthesis, induction and deduction, analysis, statistical treatment of

information , scientific abstracting. (3) **Results**: The investment potential for the crisis management of national economy should be understood as the system of specific elements, which is able to provide the organization of managed control system. It is presented as an aggregate of financial, material and technical, intellectual and informatively legal elements which a national economy has in the order and which are used for providing of investment development of country. Offered definition will enable completer and more expressly to engulf essence and terms of realization of investment development in the context of crisis management of economy of the country. (4) **Conclusions**: On providing of crisis management of economy of country reverse intercommunications have a fundamental influence between forming of investment potential, enterprise sector, public institutes and actions of public authorities, in relation to initiator and realization of structural changes in the economy of country. On this basis the well-proven necessity of development of mechanism of crisis management of economy of country, that allows to carry out effective mobilization it financial, scientifically technological and organizationally economic backlogs with the purpose of providing the dynamic ascending the vector of economic development in the conditions of decision of tasks modernization.

Keywords: investment potential 1; national economy 2; crisis management 3.

LOGISTICS ACTIVITIES OF TRANSPORT ENTERPRISES AND SUPPLY CHAIN MANAGEMENT IN INTERNATIONAL BUSINESS DURING THE RUSSIAN-UKRAINIAN WAR

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Abstract: (1) **Background**: The full-scale invasion of the Russian Federation on February 24 was life-changing and led to the difficult economic situation in Ukraine. The business found itself in a difficult position provided an understanding of the immediate transition of enterprises to emergency mode of operation. The field of business suffered greater losses than in two years of the pandemic. The issue of restructuring the logistics system is the second, after the problem of the Russian invasion military. The war led to a lack of sea transportation, which was supplied by according to approximate data, about 65% of all exports, blocking of air transport, deterioration functioning of railways and complicating the operation of road transport. In addition, many warehouses and logistics centers were bombed, and supplies of raw materials were cut off from the largest production cities through carrying out hostilities in the territories. Such conditions led to the following consequences: loss established logistics routes, an increase in delivery time, a significant increase in the price for transportation, reduction of product stocks in

warehouses. In the current situation, the issue of construction and optimization of new routes at minimum costs and with the highest productivity. Enterprises should find alternative options for building logistics, because the imperfection of logistics activity can cause forced closure of the company due to lack of opportunity to replenish stocks of material resources. (2) **Methods**: scientific and methodological aspects, practical tools of analysis, formation of the logistics strategy of the enterprise. This paper is carried out on publications in professional periodicals, materials of scientific all Ukrainian and international conferences on the definition and classification of financial crises, statistics and surveys, including the NBU, posted on the Internet. (3) **Results**: It is possible to single out several principles that are taken into account in today's conditions implementation of logistics activities: the goods must be located in one place; It is important to determine the exact time when the product will be ready for shipment and to inform the involved persons; Determine who and where will receive the cargo; Both sides of the transportation of goods must have contacts of each other to clarify the necessary situation if necessary. These measures help ensure a more or less stable operation of logistics enterprises. It is important to highlight that the functioning of the company's logistics directly depends on information flows. Information transfer at all stages during martial law in Ukraine implementation of logistics activities is non-stop. All participants involved in logistics activities are constantly receiving necessary information related to transportation. Maximum cargo transportation a correspondingly determined route is followed; and (4) **Conclusions:** So, summing up the above, we can say that under the conditions of the war, it is logistical activity is important both at the state level and at the business level. Despite the changes and difficulties, logistics are constantly working and will not stop. Now the logistics are coming the main aspect of ensuring the competitiveness of enterprises. Due to availability the latest approaches in logistics activities, the use of innovative software provision and modern equipment, companies were able to quickly respond to market changes and ensure effective operations during martial law.

Keywords: logistic, war in Ukraine, enterprises, economic, exports

FIFTH GENERATION ORGANIZATIONS: WHAT HAS CHANGED OVER THE LAST 60 YEARS?

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Abstract: (1) **Background:** Every time companies ask themselves the same question: “what should they do to increase sales, to get the trust of customers, and to expand the number of customers?”. No matter what historical times a company has lived in, they have always been interested in how to make more profit. Therefore, it is essential to

understand the external business environment in order to effectively build business processes in the company. This article analyzes the timeline of changes in generation management, allowing for a better overall understanding of market trends and the nature of the external environment changes over the last 60 years. As mentioned, J. Tidd (2006) technological and commercial innovation is central to the policy debate on the future of Europe in an era of globalization and fiscal and demographic constraints. Companies strive to be first and innovative. Today, new technologies have a strong competitive impact and influence the competitive dynamics of company. (2) **Methods:** The purpose off this paper to clarify the process of transforming the generation organizations from the theoretical perspectives and to determine the further growth vector. (3) **Results:** Literature review allowed to systematize the main periods of development of generation, to determine the trigger points in the company's performance and comprehension of market tendencies. The first model "technology-push model" (1960s) has its origins after the Second World War. In this model, everything starts from market research, product development, production and consequently marketing.This model is known as the linear model. The main disadvantage of technology-push model is it does not take into account the feedback needed to measure a company's performances. In the 1970s, the previous model was replaced by the market-pull model, which reframed innovation and a distinctive feature of this model was the encouragement of demand through innovation. A prime example of the 3rd generation model is the activities of Japanese technology companies, which have actively integrated management approaches, focus on long-term success through customer satisfaction. Such notable approaches include total quality management, lean production, just-in-time etc. The fourth-generation model (1990s) focused on connections and alliances. In high-tech industries, technology partners provide access not only to their own resources, but also to information obtained from other partners. Consequently, the extent to which external sources of resources and information benefit the focal firm depends on the firm's goals. The fifth generation of systems integration models highlights the value of systems integration, social capital and business networks in fostering collaborative knowledge creation across knowledge areas. It is argued that innovation emerges from the dynamic possibilities of managing resources and working in global networks to co-create new knowledge. The goal of systems integration is to organize and improve communication not only between an organization's internal systems, but also with the third parties it works with. System integration aids in speeding up the flow of information and cutting operating costs. (4) **Conclusions**: Over the last 60 years the generation organisations has changed dramatically. Today, companies actively involve customers in the creation of products, social capital and networking enables the creation of promising collaborations between partners. However, the most important ability for a company at any time will remain flexibility and resilience, which allows it to survive and adapt to a changing environment.

Keywords: fifth generation; social capital; network, innovation.

FORMATION OF AGRIBUSINESS MARKETING STRATEGY FOR THE PORTFOLIO OF ORGANIC PRODUCTS CONSUMER

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Abstract: (1) **Background:** Ukraine is a world supplier of agricultural products and occupies an important place in ensuring a sustainable food system and food security in the world. Due to the size of the country, including 42.7 million hectares of agricultural land, geographical location, proximity to potential international buyers and widespread fertile black soil, Ukraine has favorable conditions for organic production. However, with the ratification of the Sustainable Development Goals by Ukraine, a strategically important issue is the use of modern marketing by agribusiness. (2) **Methods:** The regression methods of economic and mathematical modeling, forecasting, monographic and generalization were used in the study. (3) **Results.** Currently, the largest countries-consumers of domestic organic products are the Netherlands (141 thousand tons), Germany (42 thousand tons), Great Britain (36.8 thousand tons), Italy (8.6 thousand tons), Austria (16.8 thousand tons), Poland (13.7 thousand tons), Switzerland (59.5 thousand tons), the USA (50 thousand tons) and some other countries (469 thousand tons in total). Ukrainian agricultural producers also export organic products to Australia and some Asian countries, in particular, China, Vietnam, India and Japan, as well as make the first deliveries of organic products to the Republic of Korea and Myanmar. According to research on the prospects for the development of the domestic organic market, conducted by Information Center Green Dossier, Organic Standard and Research Institute of Organic Agriculture (FiBL) on export data, Ukraine in 2021 ranked 2nd out of 124 countries selected for the ranking in terms of imports of organic products to the EU, thus entering the TOP 5 leading countries for the supply of organic products to the European market. The stimulus for the further development of the organic market is the Action Plan adopted by the European Commission aimed at achieving the goal of the "Green Deal" and its Strategies "From Farm to Fork" and Biodiversity Strategy to increase the area under organic production to 25% by 2030, as well as the growth of consumption of organic products and increasing consumer confidence in organic logos. To forecast the prospects for the development of agribusiness, statistical data for the period from 2004 - 2021 were processed and regression methods of economic and mathematical modeling were used, which allowed to establish that the projected volume of exports of meat products for 2030 will be 916. 3319 million USD and the confidence interval [749.4207; 1083.2432], and dairy products - 1973.645 million USD and the confidence interval [1585.0380; 2362.2520] with a reliability of 0.9. Therefore, Ukraine has a significant potential and opportunities for further development of exports of organic livestock products, which can bring quite good

profits to Ukrainian farmers, who in turn will receive resources for the development of agricultural production of both organic and traditional products, thereby increasing the supply of domestic goods, both in the domestic and foreign markets. (4) **Conclusions.** Implementation in practice of the submitted proposals for the formation of a marketing strategy of agribusiness for the consumer portfolio will help to stabilize their position in the market of organic products.

Keywords: organic products, marketing strategy, consumer portfolio of organic products.

M&A AS A TOOL OF GLOBAL COMPETITION

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Abstract: International companies are trying to reach a new level of business development or, conversely, in order to get rid of unprofitable assets, they resort to *mergers and acquisitions (M&A)* in the context of globalization of the modern economic system. Strategic motives for M&A transactions primarily related to rapid growth and access to intangible assets, namely human, structural and customer capital are considered in this paper. (1) **Background:** International mergers and acquisitions, the volume of which is growing every year, play an increasing role in the integration of national economies. The factors of strengthening the competitive position of TNCs through mergers and acquisitions, challenges and prospects of TNCs in the context of expanding their activities add relevance. *The purpose of this paper* is to substantiate necessity for strengthening the competitiveness of TNCs through mergers and acquisitions. (2) **Methods:** structural, logical and cognitive methods. (3) **Results:** Currently, in the context of globalization, competition is intensifying, many companies face significant challenges when trying to enter new markets, to obtain strategically important scarce resources and increase business capitalization, so, t*he main causes* of mergers and acquisitions of companies are the desire for growth; synergy, that is, in this case, the complementary effect of the assets of two or more firms are merged into one company. The global market of mergers and acquisitions is characterized by the following *features* of development: growth of the quantitative and value volume of transactions; the largest number and value of transactions is typical for the following industries: healthcare, energy, high technology, financial services, industrial and consumer goods; M&A transactions are widely concluded in developed countries of Western Europe, North America and Asia and Pacific regions. (4) **Conclusions:** Mergers and acquisitions are the reliable form of investment,

which makes it possible to strengthen competitive positions in the world market. Thus, there is an intensification of M&A at the present stage, or rather an increase in their quality and cost indicators, as well as the conclusion of the vastest and most costly transactions mainly by large corporations and powerful TNCs.

Key words: international mergers and acquisitions, competitiveness, multinational companies, globalization.

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CALENDAR ANOMALIES IN PASSION INVESTMENTS: PRICE PATTERNS AND PROFIT OPPORTUNITIES

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Abstract: (1) **Background**: This research considers market anomalies in the yet barely studied markets of passion investments. According to Efficient Market Hypothesis (EMH), price patterns cannot be exploited, however, there is evidence of the calendar effects in the traditional markets, which blemishes this statement. Similarly, this paper investigates whether the calendar effects are present on the markets of art, diamonds, stamps and fine wine and whether trading strategies with regard to those effects can be profitable. (2) **Methods**: The aforementioned goal of the study is reached with the aid of average analysis, ANOVA, Kruskal-Wallis, Mann-Whitney and Student's t-tests. Trading simulation approach is utilized to check the profitability of the calendar effects. (3) **Results**: The evidence for Month-of-the-Year Effects is strong for diamonds and fine wine with simulation indicating an abnormal profit opportunity. Turn-of-the-Month Effect is confirmed for diamonds market only, while Turn-of-the-Year Effect is refuted. The Halloween Effect is evident for arts and diamonds with solid abnormal profits. In terms of the Day-of-the- Week Effect, Mondays show tendencies for negative or weak returns, while Fridays for positive returns in diamonds and stamps markets.

Lastly, the exploitable trading strategies exist for the Quarter Effects in wine and art investment markets. (4) **Conclusions**: The presence of the calendar anomalies in the passion investment markets and existence of the profitable trading strategies that exploits them challenges the veracity of the EMH. The findings are congruent with those on the traditional investment markets.

Keywords: market anomalies; passion investment market; calendar effects; trading strategies, traditional market.

GLOBAL TRENDS IN THE INTERNATIONAL TRADE DEVELOPMENT: WARTIME UKRAINE'S ASPECT

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Abstract: This study considers the trends and problems of the international trade development, taking into consideration the global effect of military actions in Ukraine. The volume of exports and imports of various groups of countries of the world is compared. (1) **Background**: Taking into account international trade importance for the economy, it makes it possible to overcome the limitations of the national resources base and the narrowness of the domestic market, increase the possibilities for accumulation, industrialization, increase the rate of economic growth. *The purpose of the study* is to analyze the state of international trade, to determine the main trends of its development in modern conditions in the context of global effect of military actions in Ukraine. (2) **Methods**: comparative method, method of statistical analysis, and grouping. (3) **Results**: In 2020 world trade in goods was valued at close to US$17 trillion, while trade in services accounted for about US$5 trillion. Global trade has been severely affected by the COVID-19 pandemic [2]. Currently, 3/4 of the world's merchandise exports are accounted the three most powerful centers: Western Europe, North America, and Southeast Asia[3]. In 2020 developed countries' exports of goods was around US$9 trillion, while that of services added up to about US$3.5 trillion. In 2021, developing countries' exports summed up to almost US$7.9 trillion in regard to goods and about US$1.4 trillion in regard to services [2]. Despite fears that Ukraine could almost completely lose its presence in foreign markets, the real value of the reduction in trade turnover in the first half of 2022 was 21.3% compared to the same period in 2021. At the same time, the decline in exports was more significant (by 24%) than in imports (by 18.6%) [2,4]. According to the World Trade Organization, the hostilities in Ukraine have dealt a serious blow to the global economy, as they have led to higher food prices and reduced availability of goods

that Ukraine exports. Reduced supplies of grain and other food commodities have led to higher prices for agricultural commodities [1]. The trade performance across some categories of services dropped significantly during 2021, in particular for travel and transportation and small decreases in many other sectors. Moderate growth was observed in telecommunications and IT and financial services [2]. As for Ukraine, the loss of maritime traffic also affected trade with other countries during the war period. Trade with them was 34.5% less than in the first half of 2021, and their share decreased from 47.5% to 39.5 [2]. (4) **Conclusions**: The economic disruptions brought by COVID-19 resulted in a decline in international trade in goods and services of about 10 per cent. Trade in services declined considerably more than trade in goods. In the total structure of exports of goods of Ukraine, the share of the EU was 5%, and in the total structure of imports - 46.1% [2, 3, 4]. Also, the share of other countries in the geographical structure of Ukraine's foreign trade decreased from 47.5% to 39.5%.

Keywords: international trade, globalization, trends, goods, services, exports, imports.

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E-COMMERCE AND DIGITAL MARKETING IN THE SUSTAINABLE DEVELOPMENT OF UKRAINIAN ENTERPRISES

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Abstract: (1) **Background**: Significant and continuous growth of the digital economy and e-commerce is a global trend, which is appeared due to the increasing convenience of using information technologies in the everyday life. Usage of these trends is a significant opportunity for business development. Online shopping can save time

and money for customers, for sellers it is an opportunity to sell all over the world, significantly increasing market audience. The purpose of the study is to determine the trends in the participation of Ukrainian enterprises in e-commerce, and to formulate recommendations for their further development in this direction. (2) **Methods**: The method of economic analysis was used. (3) **Results**: According to calculations, the growth rate of global retail sales varies between 12-29% during 2017-2021, and shows stable growth. It is estimated that in 2040, 95% of all purchases in the world will be made through e-commerce. Therefore, inclusion even today in e-commerce operations has significant prospects. And if this trend is neglected, there is a huge probability of losing the market. The share of the number of Ukrainian enterprises that carried out e-commerce in the total number of enterprises is very small and fluctuates during 2018-2020 at the level of 4.8-5.0%, while there is no tendency for this indicator to grow. The volume share of sold products obtained from e-commerce fluctuates within 3.5-5.0% of the total volume of e-commerce, but here we can state a tendency of weak growth. Analytical portal Statista predicts the growth of e-commerce in Ukraine during 2021-2024 at the level of 14% per year, which, although it shows a growth trend, is significantly lower than the average global growth rate. We estimate the value of this indicator as something that distances Ukrainian enterprises from global trends, as it is a forward movement that is significantly slower than the movement of an average enterprise in the world. To include Ukrainian enterprises in e-commerce processes, it is necessary to master a new type of marketing - digital, which is very specific and involves intensive work with websites and increased activity in social networks. According to the Serpstat survey of marketing specialists, 48% of Ukrainian companies are changing their strategy and looking for new markets due to the war in Ukraine, but only 73% of Internet marketers have returned to work. Such trends indicate the presence of significant problems in the development of enterprises, but at the same time there is no mass trend of practical solutions to these problems. (4) **Conclusions**: Although today's global trend is the active development of e-commerce, Ukrainian enterprises are still poorly represented in the digital space, which may be due to the lack of specialists with appropriate qualifications at enterprises and the reluctance to purchase such services from professionals. The training of a large number of digital marketing specialists and the use of their work at Ukrainian enterprises is an urgent necessity of today's realities of the Ukrainian economy.

Keywords: digital economy, e-commerce, digital marketing, business development.

THE INFLUENCE OF PERFORMANCE INDICATORS OF POULTRY ENTERPRISES ON THE LEVEL OF PROFITABILITY

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Abstract: (1) **Background**: Constant dynamic fluctuations in the level of profitability among poultry enterprises due to the simultaneous work of both profitable and unprofitable economic entities indicates that today there are still certain reserves for the enterprise to improve the efficiency of operations and constantly increase profits. (2) **Methods**: It is proposed to use the grouping method to generalize the results of statistical studies by ranking areas by the level of profitability. (3) **Results**: The regions of Ukraine were grouped into four groups according to the level of profitability in percentages: 1 group from -70 to -36%; 2 group from -35 to 0%; 3rd group from 0.1 to 15%, 4th group from 16 and above percent. In order to rank regions depending on the level of profitability, the following indicators of the activity of poultry enterprises are distinguished: income from the sale of poultry on average per group, production cost of reared poultry, sale price of poultry meat, volumes of poultry sales, direct material costs for rearing poultry , estimated profit from sold poultry meat. Based on the results of the grouping of the dependence of the level of profitability of grown poultry meat on the activity indicators of poultry enterprises, it was determined that 4 regions of Ukraine are included in group 1, 9 regions are included in group 2, 6 regions are included in group 3, and 3 regions are included in group 4. Accordingly, in group 4 with the highest average level of profitability of poultry meat cultivation – 24.53%, the production cost is equal to UAH 786,801.5, which is 2.05 times less than for the group of regions where the average level profitability is -11.7%. (4) **Conclusions**: The presented studies show that the ratio of the price of poultry meat sales and the production cost of raised poultry has the greatest influence on the formation of the level of profitability of poultry enterprises.

Keywords: profitability of production, profit, poultry enterprises, cost price of poultry meat

SUPPORT OF THE BUSINESS IN UKRAINE DURING THE MILITARY STATE

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Abstract: (1) **Background**: Under circumstances plenty of destructions of civil objects and objects of infrastructure on all territory of our country, forced migration of population, through military aggression, inflationary processes, dissolution of the commercial acceding to Republic Byelorussia and blocking of Ukrainian ports domestic business found oneself on verge of existence. Taking into account importance of stabilizing of national economy for the sake of possibility of the subsequent financing the country of the military ability, liquidation of consequences and support of a victim, from Russian-Ukrainian war, extraordinary actuality is acquired by the question of sponsorship of enterprises and businessmen of Ukraine in the conditions of the military state, as exactly a business-sector is the basic source of the tax entering budget. The purpose of the work is opening and systematization of key financial aspects of support of domestic business in the conditions of the military consisting of Ukraine. Gaining end is provided the use of such methods, as an analysis and synthesis, generalization and scientific abstraction; (2) **Methods**: The methods used for this work are induction and deduction, scientific abstracting and statistical treatment of information; (3) **Results**: By the state on today the Ukrainian economy functions only half. Working part is mainly made by the enterprises of critical infrastructure, which give services a population in the field of medicine, water-supply, energy supply, gas-supplying, production and realization of food stuffs, and by other groups of commodities of everyday consumption. However possible work even of these enterprises is only on controlled by Ukraine territories and those territories, where military operations are not. At support of international partners and on the basis of reformation of tax legislation the substantial steps of sponsorship of domestic enterprises and businessmen are already done in Ukraine, however much these initiatives need deepening and expansion with the purpose of subsequent renewal of national economy, which must be arrived at by renewal and development of such spheres as agrarian business, food industry, pharmaceutics, light industry, trade and providing resources; (4) **Conclusions**: Development and strengthening of own economic feasibilities, complete liquidation of any economic connections, with countries-aggressors, development of the European collaboration due to the output of domestic producers on a new level will help not only to accelerate victories and complete war but also will lay the foundation of the economy growing and rapid renewal of our country.

Keywords: business, military state, financial support

INNOVATIVE APPROACHES TO THE MANAGEMENT OF VETERINARY MEDICINE ENTERPRISES

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Abstract: (1) **Background**: In modern terms the orientation of enterprises of veterinary medicine on the real requirements of market induces newly to estimate innovative approaches of management, which will promote effective activity of enterprises on the basis of the balanced upgrading services, its competitiveness, demand, and rational distributing of expenses. Urgency of decision of the outlined problems was stipulated choice of theme, defined a purpose, task, logic and maintenance of research. The purpose of work is development theoretical and methodological bases of innovative approaches of management of industry of veterinary medicine enterprises in modern terms. A research object is a process of forming of innovative approaches of management of veterinary medicine enterprises. The article of research are theoretical, methodological and practical government of veterinary medicine enterprises bases. (2) **Methods**: The aggregate of scientific and special methods of scientific cognition, which are based on modern theoretical and methodological approaches, is in-process used, that enabled to provide achievement of the put purpose and decision of the formulated tasks, in particular: dialectical – for the ground of theoretical bases of determination of innovative approaches of management; to the synthesis, induction and deduction, – for formulation of generalizations, theoretical conclusions, on the basis of the studied material; retrospective analysis – in the process of study of world experience of management of veterinary medicine enterprises; logic and -analytical – for the lineation of modern tendencies of management in industry of veterinary medicine; statistical treatment of information – for determination of quantitative parameters of results of the use of innovative approaches of management of veterinary medicine enterprises; scientific abstracting – for formulation and opening of maintenance of the defined notions and determinations; graphic visualization – for evident presentation of information and others like that. (3) **Results**: During the last years in the structure of management of enterprises of veterinary medicine of Ukraine subsections, related to introduction of innovative approaches of management, become firmly established actively. Drawing on marketing researches of market, that allows them to determine carefully thought out strategy of development of enterprises, perfect going near organization of production, in time to analyze the requirements of users, to improve the system of quality of products, analyze levels and tendencies of appeal of products at the market. Characteristic is also the use

of information technologies and software for work of personnel and service of customers. A policy and strategy is formed coming from necessities and prospect of development, taking into account interests and possibilities of partners and queries and estimations of users here. And that it is important, it them purposeful, system work on strengthening of the participation and position at the market of products for veterinary medicine, working off such pattern of production, which would combine the production of high-quality competitive product of maximal, competent participation of all subsections of production, every working. (4) **Conclusions**: Experience leading foreign and domestic enterprises of veterinary medicine confirms the priority role of application of innovative approaches of management, as to the mechanism of generalization and informative design of market of products for veterinary medicine.

Keywords: management, innovative approaches, veterinary medicine enterprises

INTENSIFICATION USE OF THE LAND-RESOURCE POTENTIAL OF AGRICULTURAL ENTERPRISES

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Abstract: The increase in the intensification of the use of the land resource potential of agricultural enterprises depends, first, on the return on invested costs and rational use of land. The problem of intensification is closely connected with the problem of efficiency. Intensification is the most important factor in increasing the efficiency of the use of agricultural land, reproductive processes in the agro-industrial sector. However, the specificity of the agricultural sector leads to the need to separate the problem of agricultural land intensification into an independent one. This is served by the objective prerequisites of intensification - the ever-increasing need for agricultural products and products of their processing, limited land, improvement of the means of production, and development of productive forces. (1) **Background:** The intensification of the use of agricultural land resources is expressed in the increase of material, labor and other resources per unit of agricultural land, that is, it comes down to increasing the intensity of the use of the main resource in agriculture - land. The main factors of intensification of land resource potential include additional investments, which consist in increasing resources per unit of agricultural land; organizing the use of resources, improving the combination of their individual types; improvement of the quality of resources based on the achievements of scientific and technological progress. (2) **Methods**: We use the method of economic investigation for analysis of the usage of the land-resource of agricultural enterprises. (3) **Results**: The economic efficiency of intensification reflects the ratio of the obtained result (effect) and the

costs or resources that determined this result. It is advisable to measure the economic efficiency of agricultural land intensification using a system of indicators, the main indicators of which will be the indicators of increasing the efficiency of the use of agricultural land: the amount of gross and marketable products, gross income, profit obtained additionally per 1 ha of agricultural land. Additional indicators are the increase in the economic efficiency of the use of labor resources: additional gross and commodity products, gross income, profit per 1 average annual employee, 1 man-hour of labor costs were obtained as a result of intensification. The main directions of increasing the economic efficiency of intensification of agricultural land should be the following: complex mechanization, based on the latest achievements of scientific and technical progress; rational chemical treatment (use of high-quality fertilizers and plant protection products); justified melioration and reclamation; improvement of agro technical works (application of advanced methods of cultivation of agricultural crops; reduction of losses during harvesting and storage); introduction of more productive crops and varieties; improvement of seed production. (4) **Conclusions.** The main areas of increasing the efficiency of agricultural land use within the framework of intensification should be determined: 1. Involvement in agricultural production of low-productivity areas, while reducing the size of agricultural lands, which for various reasons fall out of economic turnover. 2. Carrying out recreational and supporting agro-technological measures with the aim of increasing the productivity of existing agricultural lands. 3. Full use of the existing fertility of agricultural land.

Keywords: sustainable land tenure, agricultural enterprises

LEAN PRODUCTION TOOLS TO IMPROVE THE EFFICIENCY OF SALES OF CONSTRUCTION MATERIALS

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Abstract. (1) **Background:** In modern conditions, the concept of Lean has proven its effectiveness both in the production sphere and in the sphere of services, and public administration. In addition, this philosophy is becoming popular in everyday life. An important type of activity of any manufacturing enterprise is the sale of products. The problems of organizing the work of the sales department of an enterprise for the production of asphalt-concrete mixtures are investigated, and the possibilities of using lean technologies are considered. (2) **Methods**: With the help of the "cross-functional map" tool, the sales process is analyzed in terms of individual operations and responsible persons, indicating the execution time of each stage. (3) **Results:** All operations that make

up the process are divided into actions that create value for the product consumer; actions that do not provide added value, but cannot be abandoned, and actions that are unproductive losses, according to the Lean approach. Such operations were waiting for confirmation of payment and waiting for confirmation from the download. By eliminating unproductive waste through improved communication tools, actual manager involvement was reduced and overall process time was reduced by 30 minutes within one process. The implementation of the "qualification matrix" tool made it possible to determine the level of real skills and knowledge of the staff and identified weak points. The management organized training to improve the qualifications of employees. According to a preliminary assessment, this will ensure the interchangeability of personnel and free up 2 employees who will be involved in other processes. The implemented 5S system made it possible to reduce the time to search for the necessary information by 20 minutes. within 1 order. (4) **Conclusions**: The use of Lean (lean production) tools allows you to achieve: cost reduction, product quality assurance, management process transparency, increase consumer satisfaction with the company's products, increase the involvement of the company's personnel and strengthen their motivation, reducing the loss of resources.

Keywords: Lean production, construction materials, efficiency of sales, Lean production tools.

DEPOSIT INSURANCE DEVELOPMENT CLUSTER MODEL (ON THE EXAMPLE OF UKRAINE)

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Abstract: (1) **Background**: The deposit insurance market is an essential subsystem of the financial infrastructure of Ukraine, as it is supposed to ensure the smooth functioning of the financial and credit system, which plays a crucial role in ensuring the movement of cash flows in the economy and thus creates the essential prerequisites for social reproduction. Moreover, some authors researched deposit insurance as a factor of economic security of banking activity in Ukraine; (2) **Methods**: The article suggests investigating the development of deposit insurance in Ukraine, having carried out periodization in the following stages: selection of input-defining features, standardization of variables, application of the Ward procedure for the formation of

clusters-periods, and financial and analytical interpretation of the results and characteristics of the obtained periods. To determine the periods of deposit insurance in Ukraine, we suggest using the methodological toolkit of cluster analysis; (3) **Results**: This method will make it possible to define periods as grouped levels of a dynamic series, which are like each other in terms of the dynamics of the operation of deposit insurance and the most actively performed functions; (4) **Conclusions**: Approbation of the proposed scientific and systematic approach made it possible to reach conclusions regarding four stages of the development of deposit insurance in Ukraine from 2005-2020: completion of formation period (2005-2007), formation and activity period (2008-2013), the performance of functions in conditions of a mass withdrawal of banks from the market period (2014-2016), and stabilization and activation period (2017-2020).

Keywords: banks, banking system, deposits, deposit insurance, cluster modeling.

MODIFICATION OF THE AGRIBUSINESS DEVELOPMENT STRATEGY OF UKRAINE

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Abstract: (1) **Background**: Due to the full-scale invasion of the aggressor country on the territory of Ukraine, agribusiness suffered tens of billions of dollars in losses. If in the past years, the priority questions regarding its further development were questions about decentralization, land reform, the work of the agricultural sector in the conditions of a pandemic, now the questions of the survival of the agricultural sector and its further development in the conditions of war arise, which makes it necessary to change the existing Strategy for the Development of Agribusiness. (2) **Methods.** The fundamental basis for conducting the research was a strategic analysis. (3) **Results.** As evidenced by the analysis of long-term statistical data, in recent years, Ukraine has steadily increased the export of agricultural products, thus setting another record in 2021 in the amount of 27.7 billion dollars. About 90% of the commodity structure of exports will continue to be occupied by grains, oil crops, residues of the processing industry, oils and fats, meat and by-products. The geography of supplies of agricultural raw materials and value-added products from Ukraine is almost entirely focused on the Asian region (about 50%), European countries (30%), the African continent (13%) and the CIS countries (5%). The list of the largest buyer countries includes China, India, the Netherlands, Egypt, Turkey, Spain, Poland, Germany, Indonesia, and Italy. Therefore, Ukraine is currently one of the

key suppliers of agricultural products to the world market. Under these conditions, the prospects for domestic agri-food exports in 2022 looked favorable, but Russia's military invasion destroyed all gains in the export potential of agribusiness and put global food security at risk. Ukraine currently has a valid Strategy for the Development of Agricultural Exports until 2030. In view of the war, it is already necessary to ask questions about its review and the formation of a new Strategy, focused on the reasonable diversification of the production structure through the model of sustainable development and smart specialization and its orientation on climate-optimized agriculture. Undoubtedly, both scientists and practitioners agree with the need to adjust the Strategy. Instead, the visions of the future Strategy of agribusiness are quite different, as some scientists give preference to the Strategy of Survival, while others prove the necessity of choosing the Strategy of Accelerated Development. We fully support the latter and believe that according to the new strategy for the development of agribusiness, value-added products (70%) should prevail in the structure of agribusiness production, rather than raw materials (30%). The transformation of the existing model of the domestic agricultural market should also be foreseen: 20% - large agribusiness, 40% - medium, 40% - small. Today, there are many discussions on whether the country needs agricultural holdings or not. They are definitely needed, because they are the drivers of innovative changes and set the tone for progressive transformations in the market. (4) **Conclusions.** Implementation of the submitted proposals in practice will ensure the acceleration of the development of agribusiness, its creation as a center of food security of the world and an international hub-organization.

Keywords: agricultural sector, agribusiness. strategic management of agribusiness, agribusiness development strategy.

THE EFFECT OF THE APPLICATION OF ANTICIPATORY MANAGEMENT METHODS ON THE COMPETITIVENESS OF ENTERPRISES

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Abstract: The article carried out a detailed analysis of the impact of anticipatory management methods on the competitiveness of enterprises. (1) **Background:** Due to the onset of crises, most enterprises find themselves in difficult situations. Therefore, managers and employees of organizations should focus their attention on resolving crises that have arisen as a result of refusing to use anticipatory management methods.

The main goal of the study is to determine the main methods of anticipatory management and their impact on the competitiveness of enterprises. (2) **Methods**: The theoretical and methodological basis of the study was the work of domestic and foreign scientists, leading scientists, and practitioners in the field of anticipatory management development. Also, general scientific and special methods were used during the research. (3) **Results**: First, pay attention to the study of the problems encountered in the process of anticipatory management:

Lack of a unified, clear, and accessible sequence of weak signal research.

Complexity and time-consuming use of existing methods.

Complexity of processing weak signals of the functioning environment.

The difficulty of obtaining information about weak signals.

Insufficient qualification and low level of experience of employees.

From the collected data, which are presented, we can conclude that the biggest problem of enterprises in applying anticipatory measures is the lack of a clear plan for detecting "weak signals". After all, their timely detection is the first step to successfully overcoming or avoiding crises.

Therefore, to determine the impact of anticipatory management methods on the competitiveness of the enterprise, we will focus our attention on the analysis of possible types of anticipatory management:

passive;

reactive;

"weak signals";

active.

Experts believe that the most effective results can be obtained by managing "weak signals" when the enterprise registers changes in crisis factors in advance.

Summarizing the results of the study, we proposed a set of actions to detect weak signals:

Stage 1. Monitoring of environmental changes.

Stage 2. Calculation of the entropy level.

Stage 3. Determination of the trajectory of transformation of a weak signal.

Stage 5. Establishing all possible manifestations of destabilizing factors.

Stage 6. Development of scenarios for the development of events and the future state.

Stage 7. Assessment of the state of functioning and the level of economic security.

Stage 8. Control of the level of economic security from the perspective of the implementation of the management strategy.

Stage 9. Evaluation of the effectiveness of management decisions.

(4) **Conclusions**: The skilful application of anticipatory methods will enable the enterprise to maintain its competitive position in the market and adjust its activities before the onset of crises.

Keywords: anticipatory management; competitiveness; enterprises.

UNIFIED PANEL OF AGRO-ECOLOGICAL INDICATORS FOR MONITORING THE SUSTAINABILITY OF AGRIBUSINESS IN THE CONTEXT OF GLOBAL ESG-INTEGRATION

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Abstract: (1) **Background:** The investment attractiveness of sustainable agribusiness has been growing rapidly in recent years. Accordingly, environmental, social and governance (ESG) criteria are a set of company performance standards that socially conscious investors are now considering to identify potential investments. Most investors are convinced that carbon-neutral business processes and full alignment of business strategies with the goals of sustainable development are crucial for the successful further growth of companies and for increasing its sales worldwide. Therefore, business with a low carbon footprint is now a priority. (2) **Methods**. The cognitive method, abstract-logical method, method of generalization and formalization, as well as the tools of stakeholder analysis were used in the research. (3) **Results.** The approval by the Government of Ukraine of the Sustainable Development Strategy, according to which high economic performance of agribusiness should go hand in hand with the sustainable use of natural resources and waste, maintenance of biodiversity, conservation of ecosystems and avoidance of desertification, requires constant monitoring of its sustainability, and hence the development of a set of agro-ecological indicators to assess its ESG-attractiveness and the formation of ESG-reporting. We are convinced that the creation of a single dashboard of ESG-competitiveness of agribusiness cannot be carried out by fragmentary solution of individual issues, and therefore we consider it expedient to develop a roadmap for the creation of a single dashboard of ESG-competitiveness of agrarians, which will include: creation of a regulatory framework for the formation of information support for financial and non-financial reporting of agricultural enterprises; creation of an organizational field for collecting and verifying information support for ESG-competitiveness assessment of agribusinesses; creation of a set of agro-ecological indicators for the assessment of ESG-competitiveness of agribusinesses. To this end, the Ministry of Finance of Ukraine, in close cooperation with the Ministry of Environmental Protection and Natural Resources of Ukraine, as well as the Ministry of Digital Transformation of Ukraine, should determine the technical components of the ESG Reporting Collection Center, as well as its functional components designed to collect information support for ESG reporting in a single electronic format, based on the UA XBRL IFRS 2020 Taxonomy, approved on 09.04.2021. With the creation of the ESG Reporting Collection Center, the Ministry of Digital Transformation of Ukraine should develop, taking into account the specifics of the Sustainable Finance Platform by amending Delegated Acts, an ESG-Report software

service that will provide stakeholders with access to the information necessary for making management decisions on ESG investing, public dialogue and legal regulation of its implementation. In order to fully provide stakeholders with the necessary information on the economic and socio-economic activities of agribusiness, we consider it expedient to present information on the Unified Dashboard. (4) **Conclusions**. The practical implementation of the submitted proposals will contribute to ensuring the transparency of ESG reporting of agricultural enterprises, and, accordingly, will contribute to the formation of a favourable environment for attracting ESG investments in agribusiness.

Keywords: ESG-integration, ESG-investments, ESG-reporting, ESG-attractiveness of agribusiness, ESG-competitiveness of agrarians

AGROVOLTAICS IN AGRICULTURE

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Abstract: (1) **Background:** Agricultural businesses are forced to look for alternative and non-standard energy supply solutions due to the large-scale invasion of the aggressor country. One of these solutions, suitable for introduction after the war, is agrovoltaics - the use of land for both solar photovoltaic energy production and traditional agriculture. (2) **Methods**. We used methods of comparative analysis and analogies, monographic and abstract-logical for this research. (3) **Results**. One of the main issues facing agribusiness is energy independence and the efficient use of existing potential (in particular, agricultural land), since a significant part of the land of farms due to hostilities is either not suitable for use or remains in the occupied territory. The solution to these issues, based on world experience, is the introduction of agrovoltaics - land sharing, both for the production of solar photovoltaic energy and for traditional agriculture, thanks to which farms can receive not only environmentally friendly electricity, but also increase crop yields , solve issues of autonomous watering and irrigation, limit the level of solar radiation entering growing crops, create hotels for insects, etc. The secret of agrovoltaics lies in the microclimate that is formed under solar panels. The ground temperature is kept constant by shading during the day and retaining heat during the night. In addition, farmers have significant savings on irrigation, because moisture almost does not evaporate, since morning condensate from the soil surface (dew) accumulated under solar panels is enough to irrigate plants during the day. Therefore, watering is sufficient to carry out only in the evening. As of today, the agrovoltaics has been introduced in Germany, Asia, Italy and

other countries. In Ukraine, the agrovoltaics has not yet been introduced for the reason that the implementation of this idea into reality on the territory of Ukraine has a number of obstacles. In particular, the current legislation of Ukraine prohibits the placement of generating equipment on agricultural land. The reason for the government's decision was the need to withdraw large tracts of land from agricultural circulation. Additionally, the value of agrovoltaics lies precisely in the fact that it eliminates the main drawback of solar energy - the placement of land on large areas of solar farms. Nowadays, the experts are trying to allocate land unsuitable for agriculture for SES. However, scientists from the University of Hohenheim managed to prove that the combination of solar stations and agriculture on the same area is not only possible, but also beneficial. Today, when the advantages of agrovoltaics are confirmed all over the world, the priority measures to address the issue of ensuring the energy independence of Ukrainian agribusiness in the post-war years is the development by the government of an effective regulatory policy to stimulate the introduction of agrovoltaics in agribusiness and simplify the procedure for land allocation for energy facilities. (4) **Conclusions**. Ukraine must move in the right direction. The introduction of agrovoltaics will provide farmers with energy independence and provide additional income from the surplus of energy produced.

Keywords: agrovoltaic, agribusiness, energy independence, alternative energy, dual use of arable land.

FOREIGN TRADE POLICY OF UKRAINE: EUROPEAN DIMENSION

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Abstract: The formation of Ukraine as an independent democratic state with a market economy and a Euro-oriented vision of the prospects of economic and social transformations is inextricably linked to the spheres of foreign economic policy and international trade. (1) **Background:** At the same time, such a strategic focus of Ukraine was significantly adjusted by the consequences of the global pandemic, which led to a number of crisis and destabilizing changes in the foreign economic policy of the state. The implementation of non-protectionist measures by countries led to a change in the agri-food market not only in quantitative but also in qualitative parameters; intensifying competition and price fluctuations; changing supply and demand in the global food market. (2) **Methods:** Research methodology based on a number of general philosophical methods. Analysis and synthesis method gave the possibility to study the structure and to evaluate

agricultural sector export potential, to determine the dynamics of foreign trade of agro-food products. (3) **Results**: It has been established that, relatively at the initial stages of Ukraine's accession to the EU, Ukrainian business has already discovered a number of institutional advantages that contribute to the development of trade in agro-food products. It was determined that such opportunities are realized not only in entering one of the most powerful and protected markets in the world - the EU market, but also within the framework of regulation of foreign economic activity, elimination of non-tariff restrictions and avoidance of institutional "traps". The results of the study give grounds for asserting that trade relations between countries in the market of agro-food products are formed under the influence of the economic interests of business entities and the requests of food consumers. It was analytically confirmed that the main export items of Ukraine in 2020 were oil crops, horticultural products and meat. Other agricultural products formed imports from Poland. Perceptible changes in trade in agri-food products between countries are also proven, which occur as a result of the transformation of agricultural production, its technological modernization, changes in the institutional conditions of functioning, the formation of a new model of land use and land relations (in Ukraine). Thus, the traditional items of Polish agricultural export to Ukraine in modern conditions are becoming the fastest growing items of Ukrainian export. (4) **Conclusions**: It is substantiated that against the background of the noted positive trends and under the influence of the economic recession provoked by pandemic threats and restrictions, the real potential of bilateral trade remained underutilized. This is confirmed by a critical slowdown in the dynamics of bilateral trade relations. It has been proven that differences in the institutional regulation of foreign trade in Ukraine and the EU serve to benefit such a situation.

Keywords: trade, trade relations, export, import, institutional framework, international trade policy.

IMPACT OF WAR IN UKRAINE ON DEVELOPMENT OF THE CREATIVE ECONOMY

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Abstract: (1) **Background**: Before the start of the full-scale Russian invasion, the Ukrainian creative economy (CE) was rapidly developing. In 2013-2019 the added value created by CE increased 3.5 times: from 74.2 billion UAH up to 258.9 billion UAH. The major role in that development played IT sector. In 2019, almost a quarter of the CE added

value was created by the IT sector. Other significant components of the Ukrainian creative economy were architecture and engineering — 9.2% of added value, information services — 7.8%, film and television — 7.8%, advertising and marketing — 7.7%. In 2019, the creative economy provided jobs for almost 913 thousand Ukrainians. But, after the 24th of February the sustainable development of creative economy and whole economy in Ukraine was put under the risk. The abstract analyzes the state of Ukrainian CE during the full-scale invasion and the prospects of its future development. (2) **Methods**: To provide the research the qualitative analysis methods, such as literature review, context analysis, etc. were used. (3) **Results**: According to the Ministry of Education and Culture of Ukraine statistical review "Creative industries in the 1st quarter of 2022" in comparison with the 1st quarter of 2021, in January-March 2022, the amount of declared income in the field of creative industries decreased by 41%, and the total number of taxpayers decreased by 60 %. This means unemployment and the outflow of talent abroad. If we look at the structure of declared revenues in the 1st quarter of 2022by sectors, most of them, namely 84.5% (39.3 billion UAH) came from the IT sector. So this area was the least affected, as most of its companies work with foreign clients. The areas of architecture and cinema were the most affected, where declared income fell by 74%. Revenues from advertising decreased by 66%, from design - by 54%, and from IT - by 32%. Ukrainian resilience and creativity amaze the world. According to the experts, the future recovery of Ukrainian economy lies precisely in the creative economy. The development of the country around the creative economy brings with it many advantages for the whole economy. First, it will speed up the digital transformation, which is already taking place very actively in Ukraine, that in turn will add transparency to processes at all levels. Also, that is no less important, it will help to return home Ukrainians, who were forced to go abroad, and provide them with high-paying jobs. Talented people will be able to realize their potential in Ukraine and earn with their own intelligence and creativity, without looking for a better life elsewhere. Therefore, investing in the creative economy will significantly accelerate the social development of the country. (4) **Conclusions** During the wartime, the creative industries suffered a drain of talent, reduced funding, reduced demand for cultural products and services, and the negative effects of disrupted supply chains. At the same time, creative industries have a chance to become the engine of Ukraine's recovery after the war. Some entrepreneurs continue to work, exporting a creative product and supporting the state's economy. In order to build an effective interaction with cultural actors in these extremely difficult conditions, a deep understanding of their internal state and the peculiarities of responding to challenges is necessary.

Keywords: creativity**,** creative economy; creative industries; recovery of economy.

STATE AND PROBLEMS OF AGRICULTURAL EXPORTS OF UKRAINE IN THE CONDITIONS OF RUSSIAN AGGRESSION

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Abstract: (1) **Background:** In Ukraine, agricultural sector has traditionally been a budget-generating one. During the war, it is the agricultural sector that ensures food and economic security, remaining the main filler of the budget, in particular through the export of agricultural products, which occupies almost one third in the structure of Ukrainian export earnings. The purpose of the study is to assess the state and problems of agricultural exports of Ukraine in the conditions of Russian military aggression. (2) **Methods:** The scientific methods of analysis, synthesis and comparison were used in the research. (3) **Results:** For the period from March-October 2022, 26.3 million tons of agricultural products were exported from Ukraine. The largest share in the structure of export is corn grain – 39.1% and wheat – 20.6%. In the 2021 year, the export of corn grain from Ukraine to EU countries amounted to 7.1 million tons, which is 29.1% less compared to the previous 2020 year. The TOP-5 importers of Ukrainian corn include the Spain (34.4%), Netherlands (31.6%), Italy (12.4%), Portugal (9.1%) and Belgium (8.9%). Wheat exports increased by 146%, its main EU importers in 2021 were Spain (25.7%), Italy (11.9%), Greece (7.0%) and the Netherlands (25.7%). At the same time, the export of such a strategic crop as soybeans increased by 8.3%, in particular in 2021-2022 MY compared to the 2020-2021 one, while its production fell by 26.3%. A negative factor is a 7.7% decrease in soybean processing volumes in Ukraine. During the researched period, sunflower production reduced by 45.7%, its export – by 53.1%, sunflower seed processing – by 9.5%. A decrease in the volume of agricultural products processing has a negative effect on the commodity structure of Ukrainian exports. In the conditions of Russian military aggression, the agricultural products logistics system "supply → production → processing → sales" was destroyed. Ukrainian agricultural producers faced a number of new problems and challenges: contamination of agricultural lands with explosive objects (according to individual experts, their complete demining needs 5-10 years); a significant disruption in logistics and supply of material and technical resources for the agricultural sector and ways of selling agricultural products; increase in the cost and terms of transportation; growth of agricultural production costs (due to the fuel, mineral fertilizers, plant and animal protection products, energy carriers price rising); death of farm animals, destruction of farm infrastructure; decline in the quality of animal feeding due to the feeds deficit, forced changes in feed rations; decrease in agricultural products export cause by the sea routes blocking; destruction of logistics infrastructure, complication of transit through the EU countries, problems of export due to

administrative barriers, increase in the cost of transportation; destruction of grain storage facilities. According to some estimates, more than 15% of domestic crop storage facilities (elevators, storage warehouses, silos) have been lost, which causes significant problems in warehouse logistics. Relocation of businesses from the war zone; lack in labor force and qualified personnel; limited working capital, high inflation rate, decline in the domestic consumer market, etc. are also the problems caused by Russian aggression. (4) **Conclusions:** In the conditions of Russian military aggression, the global food crisis worsened. One of the factors of the national economy stabilization is agricultural sector development. It is necessary to restore agricultural exports to the pre-war level, and to expand it, first of all, through the value-added goods.

Keywords: agricultural export, agricultural export structure, export promotion.

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