



ICECAE 2020



TIQXMMI



KARABÜK
ÜNİVERSİTESİ



ICECAE 2020



PROGRAM OF THE CONFERENCE

1st International Conference on Energetics,
Civil and Agricultural Engineering 2020

October 14th - 16th 2020
Tashkent, Uzbekistan



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



KARABUK
UNIVERSITY
2007

 **ICECAE 2020**

PROGRAM

1st International Conference on Energetics, Civil and Agricultural Engineering 2020

DAY 1: OCTOBER 14, 2020

OPENING CEREMONY	
11.00am – 12.20pm (Tashkent-Uzbekistan time zone) (Chair/Moderator: Prof. Dr. Obid Tursunov)	
11.00am–11.10am	Prof. Dr. Uktam Umurzakov <i>Rector of the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers – Uzbekistan</i>
11.10am-11.20am	Prof. Dr. Dariusz Bogdal <i>Vice-rector of the Cracow University of Technology – Poland</i>
11.20am-11.30am	Prof. Dr. Mustafa Yaşar <i>Vice-rector of Karabuk Univeristy – Turkey</i>
11.30am-11.40am	Prof. Dr. Justyna Kobylarczyk <i>Cracow University of Technology – Poland</i>
11.40am-11.50am	Mr. Uzokboy Begimkulov <i>Vice-Minister, Ministry of Higher and Secondary Specialized Education of the Republic of Uzbekistan</i>
11.50am-12.00pm	Mr. Azimjon Nazarov <i>Vice-Minister, Ministry of Innovative Development of the Republic of Uzbekistan</i>
12.00pm-12.10pm	Representative of the Ministry of Water Resources of the Republic of Uzbekistan
12.10pm-12.20pm	Representative of the Ministry of Energy of the Republic of Uzbekistan
END OF OPENING CEREMONY	



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



 **ICECAE 2020**

PLENARY SESSION - KEYNOTE SPEAKERS

Chair/Moderator: Prof. Dr. Obid Tursunov

Keynote Speaker I: 12.20pm-12.40pm	
	Prof. Dr. Davidas Belsare <i>Professor Emeritus of Bhopal University, India</i>
Speech title	Elimination of Poverty in Melghat Tiger Reserve by Transfer of biotechnologies
Abstract	<p>Melghat region consists of two blocks, Dharni and Chikhaldara, situated at higher altitude of Amaravati district of India, where 87% population is of tribal people living in three hundred forest villages. Many of these villagers are so poor that they have no infrastructure like connectivity, transport, communication, electricity and basic amenities. Due to undulating topography, there is high rate of run-off rain water. Less than 10% families are farmers of small holders. They face food problems and stand below poverty line. We are training them with transfer of technologies like bee-keeping (designed by R.Tamazuski) , lac cultivation and aquaponic farming (Belsare's model) and ecohouses with solar power for electricity. These high-tech methods are expected to remove their poverty by income generation and healthcare.</p> <p>Biotechnology of bee-keeping (developed by Apipol Poland) with monoflower plants ,(Sun-Flower) and lac cultivation on plant, <i>Flemingia semialata</i> on one acre farm, irrigated with drip irrigation, was applied in ten villages of Melghat region (Maharashtra State India) for the present experimental study. They were trained in these techniques for seven days. At the end of experiment the income of these farmers (smallholder) was 4,00,000 rupees (US \$ 7000) per annum. In future these technologies will be applied to the remaining farmers to eradicate poverty of this region within five years.</p>
Keynote Speaker I: 12.40pm-1.00pm	
	Prof. Dr. Davidas Belsare <i>Professor Emeritus of Bhopal University, India</i>
Speech title	Bioeconomic Model For Sustainable Development of Farmers of Small Holding
Abstract	<p>Bio economy can contribute to sustainable development using bio based materials for additional income contributing to economy and linking rural areas to urban centers for bio based products etc.</p> <p>Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their needs as well. Today, technology plays a big role in sustainable development in all of its aspects: social, environmental, and economic.</p> <p>This bio-economic model is a modification of previous model proposed at the International Conference on Fisheries held at Barrackpore in 2017.</p> <p>In addition to food security and income generating technologies, this model is also based on biofuels and bioenergy technologies so that a farmer of small holding can get <i>additional</i> income to support his/her family and would never depend on government or traders' mercy. This model would help to alleviate poverty and prevent suicidal approach. The first such model is developed at Mahuli village of Amaravati district of Maharashtra, India.</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



 **ICECAE 2020**

Keynote Speaker II: 1.00pm – 1.20pm	
	Prof. Dr. Jan W Dobrowolski <i>Professor of the AGH University of Science and Technology, Poland</i> <i>Member of the World Academy of Arts and Science</i>
Speech title	Laser Biotechnology for Nutritional Health, Sustainable Environment and Development
Abstract	The key factor for sustainable development is the integration of sensitive methods <i>for early detection of environmental risk factors for nutritional health with efficient primary prevention</i> against contamination of the food chains as well as deficiency of biologically active trace elements in the human diet. Proper algorithms of laser photostimulation are recommended both for more efficient biological treatment of wastewater and also for a proper amount of essential elements in cultivated plants supplemented by other modern biotechnology for multiplication e.g. vegetables. Laser biotechnology is also recommended for better reclamation followed by enhancement of biomass and bioenergy production in different regions of the world as a contribution to sustainable development and the creation of many <i>green jobs</i> . This eco-innovation supplemented with the complementary biotechnologies e.g. <i>reclamation of semiarid areas, modern apiculture integrated with the cultivation of medical plants, cultivation of algae, aquaculture, energy plantations, reforestation and protection of biodiversity</i> could contribute to better adaptation to climate change and situation connected with COVID-19 pandemic and <i>risk of worsening human health, malnutrition, and hunger</i> .
Keynote Speaker III: 1.20pm – 1.40pm	
	Prof. Dr. Justyna Kobylarczyk <i>Professor of the Cracow University of Technology – Poland</i>
Speech title	Urban climatology
Abstract	Contemporary cities experience both positive and negative effects of their development. The most serious include environmental degradation, increasing security threats and uncontrolled growth of urban centres. All these phenomena make the pursuit of high-quality housing areas one of the most important priorities in the paradigm of sustainable development. It is influenced by many factors. One of them is the microclimate of urban interiors. There are close relationships between climatic conditions and the built environment with a specific typology of buildings and a characteristic spatial arrangement. Natural elements, including the natural topography, vegetation and water arrangements, are also of great importance for the climatic conditions. The relations between the existing conditions and the microclimate prove that it is possible to introduce climate changes when altering spatial conditions. Therefore, we can greatly influence the microclimate of the interior and thus the comfort of living conditions. The location of the facilities, their scale and greenery are also significant. These factors determine, among other things, the free flow of air and regulate temperature fluctuations. Rational planning of residential areas allows for the economical management of natural resources, the use of renewable energy sources and the maintenance of energy efficiency.
Keynote Speaker IV: 1.40pm-2.00pm	
	Prof. Dr. S.D. Belsare <i>Professor Emeritus of Biochemistry, Barkatullah University, Bhopal, India</i>
Speech title	Bactericidal Effect of Agnihotra Homatherapy
	Agnihotra Homatherapy" was discovered during ancient veda's time. At sunrise many fires, electricity, ethers and more subtle energies emanating from the sun extend all the way to the Earth and produce a flood effect at those coordinates where the sun is said to rise. It is



 **ICECAE 2020**

Abstract	<p>awesome. The flood enlivens and purifies everything in its path, destroying what is impure in its wake. This torrent of life-sustaining energies causes all life to rejoice. At sunrise that music can be heard. The morning Agnihotra Mantra is the essence of that music. It is quite essential sound of that flood. At sunset the flood recedes.</p> <p>The laboratory experiments demonstrated that culturing bacterial colony and performing this technology to control spread of the colonies of bacteria, <i>Klebsiella pneumoniae</i>, <i>Staphilococcus aureus</i> and <i>Pseudomonas aeruginosa</i> indicate its bacterocidal effects. It was tried to cure HIV affected patients, which means that it would cure viral effects also. It can be used to control environmental pollution, because bacteria and viruses are present in aerosol.</p>
Keynote Speaker V: 2.00pm-2.20pm	
	<p>Prof. Dr. Michał Krupa <i>Professor of the Cracow University of Technology – Poland</i></p>
Speech title	Design issues of theatrical function objects
Abstract	<p>The lecture will deal with the design process at the facility with a theatrical function and then its implementation. The functional and architectural conditions of the design of the selected theatre facility and its spatial context will be presented.</p>
Keynote Speaker VI: 2.20pm – 2.40pm	
	<p>Prof. Dr. Dominika Kuśnierz-Krupa <i>Professor of the Cracow University of Technology – Poland</i></p>
Speech title	Renovations of historic buildings – legal issues
Abstract	<p>The lecture will deal with renovations about historic buildings in the context of legal procedures in Poland. The Law on the Protection of Monuments and the requirements to be met when conducting the design process and subsequent construction at the historic site will be discussed.</p>
Keynote Speaker VII: 2.40pm – 3.00pm	
	<p>Prof. Dr. Tomasz Kozłowski <i>Professor of the Cracow University of Technology – Poland</i></p>
Speech title	The beauty of engineering facilities
Abstract	<p>Designers of engineering objects aren't usually architects. However, there are some buildings which, after many years and often after a change of purpose, are recognized as works of engineering art. The perfection of form or durability of the materials from which they were made allows them to be transformed into modern sculptures. Such a change is sometimes made by architects, as happened with the Viennese <i>Gazometer</i> buildings, or without them, as was the case with the German anti-aircraft towers – Flakturme, also in Vienna. Engineers and architects can stand on the same side of the barricade in the pursuit of uniqueness and beauty, and the previously unused objects, previously known as "technical", can enter the world of art with their new purpose. We do not know if it will be a world of fine arts, but certainly of applied arts.</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

Keynote Speaker VIII: 3.00pm – 3.20pm	
	Prof. Dr. Jose Osvaldo B. Carioca <i>Professor of the Federal University of Ceara – Brazil</i>
Speech title	Global and Regional Problems Analysis: Droughts and the Water Crises
Abstract	This paper presents a critical analysis of global and regional problems related with the droughts and the global water crisis, in the context of BRICS countries. It means Brazil, China, Russia, India and South Africa. So, initially, the areas suffering droughts were identified, with their related problems. An analysis was made inside the context of the United Nations program on arid lands. On the other side it was also analyzed the data related with the global water crisis, it means, the water deficit. As a case study, a deep analysis was made in relation to Brazilian Northeast Semiarid Region, looking for the main regional problems related with droughts, and the political policies to mitigate these problems. Models were proposed to use wastewater to produce reuse water for irrigation using microalgae, as well as, added value products to introduce new industrial network products to promote regional development. Complementary, it was analyzed the potential to produce active principles from regional plants aiming at to create new jobs and promote rural developments through new development policies.
Keynote Speaker IX: 3.20pm – 3.40pm	
	Prof. Dr. Alirza Mamedov <i>Professor of the Kyiv National University of Construction and Architecture – Ukraine</i>
Speech title	Digital tools in spatial planning
Abstract	Spatial planning supported by digital technology allows for the implementation of the design idea, analysis of spatial transformations and their constant monitoring. The problematic scope presented during the speech raises two issues. The first deals with spatial planning including digital tools, while the second is connected with the involvement of society in integrated urban design. Both issues are close; they often complement each other. The presentation aims to depict contemporary trends in spatial planning based on new technologies. Digital space design can be supported by the participation of social groups. One of the common activities is <i>crowdsourcing</i> . In response to the invitation, the Internet community undertakes activities in line with the pursuit of the implementation of the city's strategy, which is coherent with the idea of a smart city. So far, <i>crowdsourcing</i> has been equated with the development of the brand image. Today, it has expanded the scope of its activity to interventions in urban spaces. Integrated planning is also important, as it is favoured by digital technologies that enable communication between the entities involved in the process. The activities of the public sector are complemented by the actions of the residential and economic environment relying on network communication. <i>Mapping</i> is another common method, which allows the public to evaluate selected solutions. Of course, we may expect both positive and negative outcomes; however, omitting the role of society in spatial planning may fail to meet their expectations and cause a lack of approval. It should be emphasized that the preferences of modern man and the pursuit of their implementation are one of the priorities of spatial planning. The use of digital technologies is only intended to support and strengthen the effects of these activities.
Keynote Speaker X: 3.40pm – 4.00pm	
	Prof. Dr. G. Schneider-Skalska <i>Professor of the Cracow University of Technology – Poland</i>



 **ICECAE 2020**

Speech title	Housing Environment of The Xxi Century
Abstract	<p>Man still needs a place to live. The word “living” signifies a place, an object, a separate part of space, but also an activity, the state we are in, development and feelings. It means a life that lasts longer and longer and from which we expect more and more. In the 21st century, people experience revolutionary changes such as globalization and the development of information civilization. At the same time, we are reminded about our weakness in the face of natural disasters or global pandemics. All demographic, climatic, economic and social processes result in two trends - the movement of people from rural areas to cities and from downtown districts towards the outskirts. People are looking for the best possible living conditions supporting their mental and physical well-being. These processes affects also the quality of the environment on the scale of the entire city, region, and the globe. The development of urban structures, most of which comprise residential areas, is the subject of theoretical considerations within the framework of the principles of sustainable development. Applied models and systems include the concept of Ken Yeang's infrastructures, design based on Richard Rogers' models or model housing units according to the theory of Witold Cęckiewicz.</p> <p>When considering the principles of sustainable design of the housing environment in details, one can conclude that the desired 21st-century housing environment is a pro-social, Economic and beautiful environment. It is legitimate to argue that in the case of this particular environment, these three features include groups of elements, factors and processes allowing for the formation of a sustainable housing environment. They cover all areas relating to both the individual and the environment as a whole.</p> <p>The pro-social character is related to the availability of housing, the diversification of the social structure, the utility program for all age groups, the appropriate spatial structure and social participation.</p> <p>Savings resulting from the implementation of the principles of sustainable design are related to land and biologically active area savings, urban cohesion, water and energy savings.</p> <p>A beautiful housing environment is connected with the attractiveness and aesthetics that are essential to your well-being. The aesthetic quality is influenced by fixed elements of the urban structure and variable elements in architecture and space.</p> <p>These issues will be the subject of a wider discussion both at the level of theory and examples of implementation.</p>
Keynote Speaker XI: 4.00pm – 4.20pm	
	<p align="center">Prof. Dr. Krystyna Paprzyca <i>Professor of the Cracow University of Technology – Poland</i></p>
Speech title	Activating the development of small towns by offering an increase in recreational and cultural values
Abstract	<p>The city has always been perceived as a common good that must be constantly looked after, as well as the people living in it.</p> <p>The attention of local governments of many modern, small and medium-sized cities in Poland is focused on various types of projects that increase their attractiveness. These activities are focused in particular on improving the quality of the living environment and the quality of public spaces. However, other important measures are also taken to emphasize the advantages of towns in the cultural and recreational context.</p> <p>They concern, among others:</p> <ul style="list-style-type: none"> - increasing the recreational and tourist offer, - maintaining identity and culture, - using the potential of the location, - using the creative potential of the inhabitants. <p>All activities in small towns that have an impact on the growth of cultural and recreational values are aimed at improving its image, making it attractive for residents, tourists and</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

	<p>entrepreneurs. They also positively influence the processes of changes: spatial, economic, and social and economic.</p> <p>This can be confirmed by the following indicators: the changing number of inhabitants, the number of visitors and companies, the level of residents' income, the level of real estate value and capital invested in a given area.</p>
Keynote Speaker XII: 4.20pm – 4.40pm	
	<p>Assoc. Prof. Dr. Sakine Ugurlu Karaagach <i>Karabuk University – Turkey</i></p>
Speech Title	Soil Pollution Caused Crude Oil and Remediation Methods
Abstract	<p>Many petroleum products play an essential role in modern society. The volume of crude oil and petroleum products used today is vastly larger than other chemicals of ecological and health concern. Petroleum products including gasoline, diesel or lubricants can be released to the environment through accidents, managed spills, or as unintended by-products of industrial, commercial or private actions; causing local and diffuse pollution to the environment. Environmental contamination is widespread due to the different facilities and processes, affecting human health, water resources, ecosystems and other receptors. Petroleum mixtures can be affected by air, water and organisms, thereby changing the location and their composition in soil, water or air. A proper risk assessment is essential for the understanding and management of the soil polluted by hydrocarbons, enabling us to develop a suitable risk assessment framework. Oil spills result in negative impacts on the environment, economy and society. At present, most clean-up efforts for oil spill on soil and shoreline require mechanical and labour intensive methods as they may be a quick and simple solution to remove oil contaminants. However, there are many disadvantages associated to these methods. For instance, the usage of high pressure washing to displace oil may destroy the microbial populations, dispersants may be harsh to the environment.</p>
Keynote Speaker XIII: 4.40pm – 5.00pm	
	<p>Assoc. Prof. Dr. Ziyodulla Yusupov <i>Karabuk University – Turkey</i></p>
Speech Title	Fault control of microgrid system: A case study of Karabuk University - Turkey
Abstract	<p>In this paper Karabuk University microgrid system is introduced and fault control of microgrid is analyzed. The microgrid system of Karabuk University campus consists of diesel generator, solar PV panels, energy storage unit, critical and non-critical loads. Simulation of microgrid in both grid-connected and isolated operation modes are conducted on MATLAB/Simulink. The fault control has been implemented in the microgrid system to effectively manage of power in the system. The system is effectively disconnecting the microgrid from main grid within a microsecond after fault conditions. The distributed energy sources have been supplying the energy to load based load profile settings. From the simulation results, the developed control mechanisms provide stable operation in the microgrid system.</p>
Keynote Speaker XIII: 5.00pm – 5.20pm	
	<p>Asst. Prof. Dr. Songul Kaskun <i>Karabuk University – Turkey</i></p>
Speech Title	An overview of hydrogen production by supercritical water gasification of household wastes
Abstract	Studies on the production of hydrogen energy are at the forefront of reducing the dependence



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



KARABUK
UNIVERSITY

ICECAE 2020

	<p>on fossil fuel energy. This work is a brief summary of hydrogen production systems especially in a supercritical water environment. Hydrogen production by the gasification of organic wastes in a supercritical water environment has been preferred more than other methods in recent years. In this study, the common biomass resources used for the hydrogen production have been explored, evaluating their properties. Moreover, catalysts which are used for the gasification of household wastes have been presented in-details. Therefore, a review of hydrogen production system by supercritical water gasification is summarized with the remarkable features.</p>
<p>Keynote Speaker XVI: 5.20pm – 5.40pm</p>	
	<p style="text-align: center;">Dr. Ulrich Baker <i>President of the German Association of Homatherapy – Muchlingen, Germany</i></p>
Speech Title	<p style="text-align: center;">Agnihotra and organic farming</p>
Abstract	<p>Growing vegetables, fruits, grains, etc without chemical fertilizers, insecticides, pesticides and herbicides, by strengthening the subtle energy structure of plants and affecting hormones in the reproductive organs of pests, etc. Large quantities of food can be grown in a small area by introduction of mini-climate techniques that become self-operating based on the phases of sun and moon and Homa fire. Homa Organic Farming means the application of Homa Therapy in agriculture, which means healing the environment, the atmosphere and the all of life using the Vedic science. By practising Homa Therapy for farming one can grow maximum yield in minimum agricultural area and keep the soil fertile, the water pure and the atmosphere nutritious. No chemical fertilizers or chemical pesticides are used in the complete process. Only the Yajña (Agnihotra) atmosphere and ash is used as manure and for pest control or curing the diseases of plants. The main important stress of Homa Organic Farming lies upon the daily practice of Agnihotra. A copper pyramid of prescribed shape and size is used for this process. In the ancient sciences Bizberg, Jerak. Homa Farming. A practical guide to Homa Farming based on the ancient science of Agnihotra, bioenergy, biogenetics, medicine, agriculture, weather engineering and psychotherapy given through VEDAS to bring harmony into the ecosystem, the process of Agnihotra is the basic tool. In the ancient body of knowledge many things are described about pollution. The Agnihotra- Homa is performed at the centre of the field everyday at sunset and sunrise.</p>
<p>Closing Speech: Prof. Dr. Obid Tursunov</p>	
<p>END of 1st Day</p>	



ICECAE 2020

DAY 2: OCTOBER 15, 2020

SESSION 1: ENERGETICS

Time: 11⁰⁰ a.m. – 16³⁰ p.m.

Session chairs: Prof. Dr. Obid Tursunov, Assoc. Prof. Dr. Ziyodulla Yusupov, Dr. Dilshod Kodirov

Presenters

S Kaskun

*Department of Environmental Engineering, Engineering Faculty, Karabuk University,
78050 Karabuk, Turkey*

Title of presentation: An overview of hydrogen-rich gas production from biomass by using thermal technologies

Abstract: Studies on the production of hydrogen energy are at the forefront of reducing the dependence on fossil fuel energy. This work is a brief summary of hydrogen production systems especially in a supercritical water environment. Hydrogen production by the gasification of organic wastes in a supercritical water environment has been preferred more than other methods in recent years. In this study, the common biomass resources used for the hydrogen production have been explored, evaluating their properties. Moreover, catalysts which are used for the gasification of biomass have been presented in-details. Therefore, a review of hydrogen production system by supercritical water gasification is summarized with the remarkable features.

Paper 28
11⁰⁰ – 11¹⁵
(5 min discussion)

**Z Yusupov^{1,2*}, N Almagrahi¹, O Tursunov^{2,3,4}, D Kodirov², H A Almagarbj⁵,
and N Toshpulatov²**

¹*Electrical-Electronics Department of Engineering faculty, Karabuk University, 78100
Karabuk, Turkey*

²*Department of Power Supply and Renewable Energy Sources, Tashkent Institute of
Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan*

³*School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240
Shanghai, China*

⁴*Research Institute of Forestry, 111104 Tashkent, Uzbekistan*

⁵*High Institute of Science and Technology – Al-Khomes, Libya*

Title of presentation: Fault control of microgrid system: A case study of Karabuk University - Turkey

Abstract: In this paper Karabuk University microgrid system is introduced and fault control of microgrid is analyzed. The microgrid system of Karabuk University campus consists of diesel generator, solar PV panels, energy storage unit, critical and non-critical loads. Simulation of microgrid in both grid-connected and isolated operation modes are conducted on MATLAB/Simulink. The fault control has been implemented in the

Paper 80
11¹⁵ – 11³⁰
(5 min discussion)



 **ICECAE 2020**

	<p>microgrid system to effectively manage of power in the system. The system is effectively disconnecting the microgrid from main grid within a microsecond after fault conditions. The distributed energy sources have been supplying the energy to load based load profile settings. From the simulation results, the developed control mechanisms provide stable operation in the microgrid system.</p>
<p>Paper 43 11³⁰ – 11⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">A Khalilov¹, and A Mirzaev^{1,2}</p> <p>¹<i>Republic of Uzbekistan Joint Stock Company "National Electric Grids of Uzbekistan" 100000, Republic of Uzbekistan.</i></p> <p>²<i>Department of Power Stations, Networks and Systems, Tashkent State Technical University named after I.A.Karimov, 100095 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Validity of measurements for use in assessment of the state of the electric power system</p> <p>Abstract: This article analyzes the possibilities of using the method of nonlinear equations to detect gross errors in the effective values of measurements when assessing the state of the power system. On the example of the 18-node test circuit of the Eastern part of the power system of Uzbekistan, the simulation of the actual measurement values was carried out, on the basis of which nonlinear equations were formed, the valid measurements were verified, the analysis of the possibility of detecting gross errors by the obtained nonlinear equations was carried out.</p>
<p>Paper 4 11⁴⁵ – 12⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">A Turaev^{1*}, Kh Muratov¹, and O Tursunov^{2,3,4}</p> <p>¹<i>LLC «Scientific and technical center» of JSC “Uzbekenergo”, 100074, Tashkent, Uzbekistan</i></p> <p>²<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000, Tashkent, Uzbekistan</i></p> <p>³<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>⁴<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Comprehensive analysis of the change of pop solar power station output parameters in relation to ambient temperature</p> <p>Abstract: This article examines a 128kW solar photovoltaic plant (SPP) connected to a 0.4kV distribution network in Pop district, Namangan region. The research revealed the effect of ambient temperature on the quality indicators of electricity generated by SPP. Ambient temperature affects not only the SPP production capacity, but also the inverter performance, which is the most basic device for SPP. The results were obtained on July 21-22, 2019 year when the air temperature was 350-450 C.</p>
<p>Paper 2 12⁰⁰ – 12¹⁵ (5 min discussion)</p>	<p style="text-align: center;">S B Donaev^{1*}, B E Umirzakov¹, D U Sobirova¹, T D Azimov¹, and D K Alimova¹</p> <p>¹<i>Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Obtaining nanoscale CoSiO/Si/CoSi₂ systems for increasing the range of light ray absorption energy</p>



ICECAE 2020

	<p>Abstract: The morphology, composition and electronic properties of the CoSiO film obtained on the CoSi₂/Si (111) surface by implantation of O²⁺ ions in combination with annealing were studied. Parameters of energy zones are determined and information about the density of the state of electrons of the valence zone and conductivity zone is obtained. In particular, it is shown that the band gap width of this film is ~2.4 eV. It was ascertained that the CoSiO/Si/CoSi₂ heterosystem is very promising for creating efficient solar energy devices.</p>
<p>Paper 22 12¹⁵ – 12³⁰ (5 min discussion)</p>	<p style="text-align: center;">Sh Shoyusupov¹*, Sh Rakhmatullaev², and Sh Shoyusupov³</p> <p style="text-align: center;">¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori-Niyoziy, Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</i></p> <p style="text-align: center;">³<i>Namangan Engineering and Technological Institute, Kosonsoy str. 7, Namangan, Uzbekistan</i></p> <p>Title of presentation: Investigation of the transient characteristics of S-diodes based on silicon compensated by vanadium</p> <p>Abstract: . To obtain more photosensitive S-diodes, silicon should be compensated for by impurities, which increase the photosensitivity of the original crystals. Diffusion of vanadium in silicon was carried out in evacuated or open quartz ampoules at a temperature of 900-1250 °C for 2-20 hours. Silicon wafers 0.5-1.0 mm thick and an alloying element of vanadium were placed in the ampoule. Usually used n-Si with $\rho \sim 5 \div 200 \Omega \cdot \text{sm}$ and with a thickness of 0.2-0.5 mm. The concentration of deep levels introduced during diffusion was 10^{14} cm^{-3}. The resistivity of silicon after diffusion increased to $10^3\text{-}10^4 \Omega \cdot \text{sm}$ at 300 K, and the diffusion length L_d decreased to 10-30 μm. S-diodes were made in a vacuum by melting aluminum and Au + 0.1% Sb alloy at 700 °C for 1 min. The contact area (S) is approximately 0.2 mm², the base thickness $d = 0.2\text{-}1.0$ mm. Attitude $d/L_d \approx 10 \div 100$. $I_{\text{incline}} \sim 1/t_{\text{inclusion}}$ in a wide range of currents is linear, where $I_{\text{incline}} > I_{\text{bre}}$. Determined by the slope $I_{\text{incline}} \sim 1/t_{\text{inclusion}}$ the charge is $Q_{\text{cr}} = 3.52 \cdot 10^{-9} \text{ C}$. In this case, the average concentration of injected current carriers in the base is $n = 5.44 \cdot 10^{13} \text{ cm}^{-3}$, which is in good agreement with the concentration of electroactive atoms</p> $\frac{1}{V_t} - \frac{1}{V_\infty}$ <p>V in Si, determined by capacitive methods. The dependence $\frac{1}{V_t} - \frac{1}{V_\infty}$ for S-diodes from n-Si <V> has a complex form at each temperature and is approximated by two exponents. The obtained experimental results, their analysis and conclusions on S-diodes from Si <V> can be used as a temperature relay, photo relay, switches and photodetectors controlled by the sensitivity current.</p>
<p>Paper 148 12³⁰ – 12⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">YU M Kurbonov¹, E B Saitov^{1*} and B M Botirov¹</p> <p style="text-align: center;">¹<i>Faculty of Power Engineering, Tashkent State Technical University named after Islam Karimov, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Analysis of the influence of temperature on the operating mode of a photovoltaic solar station</p> <p>Abstract: In this paper, the influence of overheating on the performance of photovoltaic modules was evaluated. The experimental observation was carried out on</p>



 **ICECAE 2020**

	<p>the basis of a 20 kW photovoltaic station with 60 photovoltaic modules. It was found that an increase in the number of solar cells with overheating in the photovoltaic module leads to an increase in output power losses. The temperature of the Feb is one of the main factors that determine the electrical parameters of the Feb and its efficiency in General. An increase in the SE temperature leads to a decrease in the band gap, which gives a slight increase in the photocurrent due to the expansion of the photo-response spectrum into the long-wave region. However, this increase in photocurrent does not compensate for the decrease in Uoc and the filling factor of the load characteristic FF due to an exponential increase in the saturation current with increasing temperature, which leads to a significant decrease in efficiency with increasing temperature. The width of the band gap of semiconductors decreases with increasing temperature, and the absorption edge shifts to the region of lower energies. Continuous analysis of the presence of "hot spots" and replacement of defective modules during the initial period of operation can increase the output power and shelf life of the photovoltaic system.</p>
<p>Paper 26 12⁴⁵ – 13⁰⁰ (5 min discussion)</p>	<p>A Anarbaev¹, A Muxammadiev¹, S Umarov¹, O Tursunov^{1,2,3}, D Kodirov¹, S Khushiev¹, F Muhtarov⁴, Sh Muzafarov¹, and J Izzatillaev¹</p> <p>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000, 39 Kari Niyazov, Tashkent, Uzbekistan ²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China ³Research Institute of Forestry, 111104 Tashkent, Uzbekistan ⁴Tashkent State Technical University, Tashkent, Uzbekistan</p> <p>Title of presentation: Mobile installations for electro treatment of soils and plants with the use of photovoltaic systems as power supply Abstract: The technology of electro processing by UV- radiation for cultivation of cotton is considered. By results of experimental researches optimum parameters for treatment soils with ultraviolet radiation lamps for increasing the accumulation of the most mobile nitrate forms of nitrogen are defined. Prospects of transition of UV-lamps to light-emitting diodes (LED) as way of improving efficiency of processing, and creation of independent power supply by means of photo-electric batteries are shown.</p>
<p>Paper 3 13⁰⁰ – 13¹⁵ (5 min discussion)</p>	<p>S B Donaev^{1*}, V N Karimova¹, A T Azimov¹, K Boltaboyev¹, and M M Yakubova¹</p> <p><i>1Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Using of ion implantation for obtaining nanostructures with the wide band GaP based on GaP Abstract: GaAlP films and monocrystalline phases were obtained by method implantation of Al⁺ with E₀ = 1 keV ions at different doses on the surface of a GaP(111) single crystal, their electronic and crystal structure was researched. It was shown that the type and parameters of the three-component nanostructure lattice well coincide with those of the substrate. The relationship between the width of the band gap E_g and the size of nanocrystalline phases is researched. It was found that in the case of the surface dimensions of phases d less than 35-40 nm (thickness 3.5-4 nm), in the nanocrystalline phases Ga_{0.6}Al_{0.4}P quantum-sized effect are conducted.</p>



 **ICECAE 2020**

T Gayibov^{1*}, Sh Latipov¹, and D Abdurashidov¹

¹Department of Power Plants, Networks and Systems of Tashkent State Technical University, Tashkent, Uzbekistan

Title of presentation: Optimization of electrical networks modes by transformer ratios

Abstract: The problem of optimization the modes of electrical networks provides determination the optimal values of reactive power of sources, voltages of reference nodes and transformation ratios of controlled transformers. At present, methods and algorithms for optimization of reactive power and node voltages are sufficiently developed. However, the development of new efficient optimization algorithms of transformation ratios remains as a important topic. In this case, the issues of optimization of transformation ratios of transformers included in closed networks have a particular importance. This paper provides an effective algorithm for optimization the modes of electrical networks on transformation ratios of controlled transformers. The results of research of its efficiency in the presence of transformers with phase-rotary and longitudinal control in the circuit are presented. It is shown that minimization of losses in closed electrical networks when optimizing transformation ratios occurs due to the rational distribution of power flows in the branches.

Paper 122

13¹⁵ – 13³⁰

(5 min discussion)

N Abduganiev¹, O Tursunov^{1,2,3*}, D Kodirov¹, B Erkinov⁴, E Sabirov⁴, and O Kilichov¹

¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan

²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China

³Research Institute of Forestry, 111104 Tashkent, Uzbekistan

⁴Department of Electrical Engineering and Mechatronics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan

Title of presentation: The use of thermal technologies for the recovery of value-added products from household solid waste: A brief review

Abstract: The amount of household solid waste (HSW) has been significantly increasing due to a rapid population growth and economic development. HSW management is immensely sensitive and complicated problem not only in rapidly developing countries like Uzbekistan but also in developed countries with advanced economies. The accumulated waste has been causing a number of serious environmental problems such as release of the most dangerous greenhouse gases (CO₂, N₂O, CH₄) in the atmosphere which misbalance radiation in a planet's atmosphere causing a global warming. However, this waste can be friendly in terms of its potential to be used as energy source. HSW into energy conversion technologies has been playing a vital role in order to successfully address global challenges such as fossil fuel dependency, emission control and waste management issues. The most promising technology for conversions can be performed using thermochemical processes (e.g., pyrolysis or gasification). These

Paper 12

13³⁰ – 13⁴⁵

(5 min discussion)



ICECAE 2020

	<p>thermochemical technologies can be used to convert solid waste into liquid and gaseous fuels, and this has already been studied sufficiently by other researchers. This article recommends a novel concept for intensification of value-added solid and liquid products recovery from HSW using hydrothermal carbonization and plasma treatment.</p>
<p>Paper 86 13⁴⁵ – 14⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">Y T Adilov¹, and M M Khabibullaev¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Application of fiber-optic measuring current transformer in control and relay protection systems of belt conveyor drives</p> <p>Abstract: Until recently, control and protection systems used electromagnetic current transformers as information sensors. Due to the nonlinearity of the magnetization curve of the magnetic circuit, such current transformers cannot fundamentally provide satisfactory metrological characteristics in transient conditions, as well as after passing short-circuit currents when the magnetic circuit of the current transformer is deeply saturated with the aperiodic component of the short-circuit current. This is the main disadvantage of electromagnetic current transformers, which complicates and makes unreliable operation of control systems and protection of asynchronous conveyor motors. The article suggests the use of optoelectronic current transformers as information sensors for control and protection systems of Induction Motor.</p>
<p>Paper 6 14⁰⁰ – 14¹⁵ (5 min discussion)</p>	<p style="text-align: center;">A Anarbaev¹, O Tursunov^{1,2,3*}, R Zakhidov¹, D Kodirov¹, A Rakhmatov¹, N Toshpulatov¹, S Namozov¹, and E Sabirov⁴</p> <p style="text-align: center;"><i>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p style="text-align: center;"><i>³Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>⁴Department of Electrical Engineering and Mechatronics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Mathematical description of water flow quantity for microhydroelectric station</p> <p>Abstract: The main methods of regulating water flow and power of a microhydroelectric power plant are considered. New technical solutions are proposed for screw jet hydraulic turbines adapted to low heads and water flow rates. Preliminary calculations carried out by the authors show that the power of a micro-hydroelectric power plant depends on the individual factors of the area. As the speed of the water flow increases, the speed of the water wheel also increases, and in turn, the electric power of the micro-hydroelectric power plant is increased.</p>
<p>Paper 98 14¹⁵ – 14³⁰ (5 min discussion)</p>	<p style="text-align: center;">U A Vakhidova¹, Z I Ibragimova², and T U Apakhodjaeva²</p> <p style="text-align: center;"><i>¹Tashkent Institute of textile and light industry, Tashkent 100000, Uzbekistan</i></p> <p style="text-align: center;"><i>²Department Hydraulics and Hydro Informatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i></p>



 **ICECAE 2020**

	<p>Title of presentation: Estimation of the temperature and humidity kinetics during the passage of vaporous moisture through textile materials</p> <p>Abstract: The article presents the results of analyses of heat transfer during the passage of vaporous moisture through textile materials. The process of heat exchange in the system "human - clothes - environment" is considered. Considering that clothing is one of the main thermoregulators of the body, the research was conducted in terms of "thermal comfort", which relies on the feeling of satisfaction when using the garment. Psycho-emotional and physical comfort are closely related and make up a single unity. This is of particular importance when designing clothes for pregnant women. The results of the experiments showed that with an increase in the volume of droplet-liquid moisture (which occurs during wearing with an increase in the ambient temperature and physical activity on the human body), the strength of tissue adhesion to the skin surface increases. Analyses of experimental data using mathematical statistics allowed obtaining the dependence of the sticking force on the temperature difference.</p>
<p>Paper 118 14³⁰ – 14⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">A M Plakhtiev¹, R J Baratov¹, G A Gaziev², O Ch Doniyorov¹, and D Sh Norkholboyev¹</p> <p style="text-align: center;"><i>¹Tashkent institute of irrigation and agricultural mechanization engineers, 39, Qori Niyaziy Street, Tashkent 100000, Uzbekistan</i></p> <p style="text-align: center;"><i>²Scientific research institute for standardization, certification and technical regulation, 9B, Choponota Street, Tashkent 100059, Uzbekistan</i></p> <p>Title of presentation: Estimation of the error of a magnetic modulation non-contact wide-range device for non-destructive control of high amperage currents</p> <p>Abstract: The paper provides information on use of direct current (DC) energy in the electric power supply industry of agriculture and water management, hydraulic engineering construction, metallurgy, irrigation and melioration. The need for non-contact non-destructive control of high amperage DCs of high-capacity electrical installations in irrigation and melioration, hydraulic engineering has been identified. The basic requirements for non-contact transducers and sensors of high amperage DC measurements without circuit breaking are formulated. Identified priority directions in the development of above mentioned transducers. The general construction principles of non-contact ferromagnetic transducers of high amperage DCs and the results of the development of one of the modification of the developed wide-range magneto modulation contactless transducers of high amperage DCs and a device based on it are given. It is shown that the developed transducer and device, as distinct from the known ones, have increased accuracy and sensitivity, technological design and small weight and dimensions with low material consumption and cost. The error estimation of the developed magneto modulation non- contact wide-range device for non-destructive control of high amperage currents is carried out and it's RMS (root-mean-square) and entropy errors are estimated. It can be widely used in power systems in irrigation and melioration, in water supply system, industry, railway transport, science, technology and for testing power meters at their installation site for contactless control of DC and also ACs (alternative currents).</p>
<p>Paper 92 14⁴⁵ – 15⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">Zh E Yussupov¹, A A Yakovlev¹, E S Sarkynov¹, and B A Zulpykharov¹</p> <p style="text-align: center;"><i>¹Kazakh National Agrarian University, 050000 Almaty, Kazakhstan</i></p>



 **ICECAE 2020**

	<p>Title of presentation: Results of using the hydro-impact method of water lifting from watercourses</p> <p>Abstract: The developed new types of hydraulic RAM pumping units with a drive from an energy-saving and environmentally friendly water source of energy in watercourses, their design and technological schemes for water lifting from watercourses for irrigation of pastures and land plots, a brief device, operating principle, novelty, distinctive features and advantages in comparison with analogues are considered. The following research methods were used: patent method with a review of works, theoretical and experimental. The theoretical prerequisites of the hydro-impact method of water lifting to determine the dependencies: supply, pressure and efficiency ratio of the total water flow and experimental studies to confirm the reliability of the proposed formulas are given. Positive results of laboratory tests and economic verification of two developed variants of hydraulic RAM pumping units are given. Research results have shown that the proposed hydro-RAM pumping units have significant advantages over their analogues: increase in feed by 1.8-3.5 times and efficiency by 1.9 times.</p>
<p>BREAK 15 p.m. – 16 p.m.</p>	
<p>Paper 132 16⁰⁰ – 16¹⁵ (5 min discussion)</p>	<p style="text-align: center;">F Sh Khan^{1*}, M Sh Hossen¹, N Islam¹, Md Kosar¹, and M R Hasan¹ <i>¹Department of Electrical and Electronic Engineering, International Islamic University Chittagong, Chittagong, Bangladesh</i></p> <p>Title of presentation: Smart Fuel Station Controlling System</p> <p>Abstract: The prime outcome of the research is to design a smart fuel bunk system and fuel dispensing system by using RFID technology. It combined with secure payment and exit gate control. Here, in the Microcontroller, 4×4 matrix keypad, LCD, RFID reader and GSM module has included for secure payment system and transaction confirmation. After getting command from the microcontroller, the relay has controlled by the pump motor. Besides, this motor has operated for oil supply in a dispenser. Subsequently, Servo motor, photodiode, and IR sensor have used to control the exit gate. As a result, the exit gate control has provided secure bill payment. So, reducing the misuse of the fuel, time, and the employer is good merit of the system. Therefore, this fuel station becomes smarter.</p>
<p>Paper 181 16¹⁵ – 16³⁰ (5 min discussion)</p>	<p style="text-align: center;">P Dutta^{*1}, M A Sufian¹, Sh M Sheen², and S Chowdhury³ <i>¹Department of Wet Processing Engineering, Textile Engineering College, Zorargonj, Chattogram, Bangladesh.</i> <i>²Department of Fabric Engineering, Textile Engineering College, Zorargonj, Chattogram, Bangladesh.</i> <i>³Department of Apparel Engineering, Textile Engineering College, Zorargonj, Chattogram, Bangladesh</i></p> <p>Title of presentation: A Sustainable Environmentally Friendly Pre-Treatment Process towards Knit-Dyeing Technology Convenient for Environmental Perspective</p> <p>Abstract: The use of enzymes in textile processing has made a major contribution to the development of textiles, in particular, textile wet processing. With temperatures of 95°C, a method of conventional scouring on cotton knitted fabric is conducted in a higher base medium (pH 10.5-12) with sodium hydroxide. This process is gradually being replaced</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

by an eco-friendly and economical approach using enzymes that obviate the non-cellulosic impurities. In this work, cotton knit fabric samples were bio-scoured by BioPrep® Fusion (bio-scouring enzyme) and also, they were scoured by using the traditional method. Then, the physicochemical parameters of the effluents derived from the scouring process have been investigated in this study. The physical parameters include Electrical Conductivity (EC), Total Solids (TS), Total Suspended Solids (TSS), and Total Dissolved Solids (TDS). Moreover, the chemical parameters involve pH, Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), and Alkalinity. Furthermore, the impacts of traditional caustic soda scouring on environmental contamination have also been investigated using a number of different techniques and apparatus and compared to that of enzymatic scoured fabrics. The results of the physicochemical parameters of the effluents test reveal greater ecological developments in the use of the enzyme. Based on the findings of this analysis, it is often understood that the bio-scouring process performed far better as opposed to the traditional method, and also the method is environmentally friendly and sustainable. Hence, enzymatic scouring can be utilized as an eco-friendly in contrast to traditional caustic soda scouring in the knit-dyeing factory.

Closing Speech: Prof. Dr. Obid Tursunov, Assoc. Prof. Ziyodulla Yusupov

END of SESSION - ENERGETICS



 **ICECAE 2020**

DAY 2: OCTOBER 15, 2020

SESSION 2: CIVIL ENGINEERING

Time: 11⁰⁰ a.m. – 20⁰⁰ p.m

Session chairs: Prof. Dr. Justyna Kobylarczyk, Prof. Dr. Dominika Kusnierz-Krupa, Prof. Dr. Alirza Mamedov

Presenters

G A Bahadirov², T Z Sultanov¹, and A Abdukarimov^{2*}

¹*Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39, st. Kari-Niyazi, 100000, Tashkent, Uzbekistan*

²*Institute of Mechanics and Seismic Stability of Structures of the Academy of Sciences of the Republic of Uzbekistan, 31 Durmon yuli str., 100125, Tashkent, Uzbekistan*

Title of presentation: Kinematic analysis of tooth-lever differential transmission mechanisms

Abstract: This paper refers to a problem of application of tooth-lever differential transmission mechanisms in roller technological machines with variable inter-axial distance of working shafts, which are widely used in civil and agricultural engineering. Shortcomings of tooth-lever differential transmission mechanisms, used in roller machines, were shown; they are expressed in discrepancy of kinematic characteristics of these mechanisms to technological requirements of different types of roller machines. An arrangement and a principle of operation of new tooth-lever differential transmission mechanisms, developed by the authors, are briefly considered here. The possibilities of application of offered transmission mechanisms in six principal schemes of roller machines are described. Formulas are drawn to determine kinematic parameters of one of new transmission mechanisms depending on geometric and kinematic parameters of two-roller modulus, processed material and transmission mechanisms itself.

Paper 198

11⁰⁰ – 11¹⁵

(5 min discussion)

Z Mamatkulov^{1*}, J Rashidov², G Eshchanova³, M Berdiev², and Z Abdurakhmonov¹

¹*Department of Geodesy and Geoinformatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kory Niyoziy str., 100000 Tashkent, Uzbekistan*

²*Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kory Niyoziy str. 39, 100000 Tashkent, Uzbekistan*

³*English Language Department, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kory Niyoziy str. 39, 100000 Tashkent, Uzbekistan*

Title of presentation: Visualization and analysing the state of hydrotechnical construction via geospatial methods (on the example of Kharshi pumping stations cascade)

Abstract: In the given article the state of Kharshi pumping station, which is considered as one of the huge pumping stations cascade in Central Asia is described through analysing and visualising the geographic information systems (GIS) and remote sensing (RS) methods. As data there were used Shuttle Radar Topographic Mission - SRTM and high-resolution optical images of the area, provided by ESRI. For data processing and visualization, there was used the software of ArcGIS 10.5 by ESRI company and the results were obtained. At the same time the geographical location of pumping stations and water elevating points and the state of water flowing canals were

Paper 130

11¹⁵ – 11³⁰

(5 min discussion)



 **ICECAE 2020**

	<p>analysed remotely along with the results from the cross-sectional area of cascade were obtained. In assessing, the accuracy of results it was compared with the data based on field search work and the obtained results from the distance showed 86% accuracy.</p>
<p>Paper 73 11³⁰ – 11⁴⁵ (5 min discussion)</p>	<p>F T Khudoyberdiev¹, Y T Nurboboev¹, Sh F Maksudov¹, and Sh M Shomurodov¹</p> <p><i>¹Tashkent State Technical University named after I Karimov, Tashkent, Uzbekistan</i></p> <p>Title of presentation: The process of destruction of rock by an explosion with the use of blasthole stemming in roadheading mining operation</p> <p>Abstract: Blasting is one of the main methods of rock destruction and accounts for approximately 20% of the cost of mining operations. Given that the efficiency of the explosion for crushing does not exceed a few percent, it becomes obvious that further improvement of explosive destruction is necessary, taking into account the new achievements of science and technology. One of the main ways to improve the efficiency of underground mining is to improve the conduct of drilling and blasting operations with the use of the stemming plays a significant positive role in the operation of the explosion.</p>
<p>Paper 15 11⁴⁵ – 12⁰⁰ (5 min discussion)</p>	<p>Priyanka Singh</p> <p><i>Department of Civil Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India</i></p> <p>Title of presentation: Blockchain based Security Solutions with IoT Application in Construction Industry</p> <p>Abstract: Blockchain Technology is an evolving digital technology that has become widely applicable in different industry and business sectors in recent years, particularly in financial and banking areas due to the rapid rise in the value of cryptocurrencies in recent years. A blockchain technology is basically a decentralized database that records any transaction made within the network, which is known as a 'node,' which includes encrypted data from the entire background of the transaction. In any sector, the implementation of decentralized technology lead to strengthening, protection, implementation of accountability and a transition from current centralized systems to a decentralized system, which is required in construction industry. The construction industry will continue to be a crucial engine of economic development for all nations. Construction industry is one of the world's most important sectors. Application of Blockchain and IoT plays a very important role in construction industry. In construction industry, the decentralized ledger of data gathered from sources includes transactions and accounts via a linked network and relies on the agreement between the node points, which strengthens Blockchain's transparency, traceability, and collaborative existence. This paper presents an overview and motivation for the application of IoT & Blockchain Technology in the construction industry. The integration of Blockchain technology and IoT (Internet of Things) strengthens the whole system and makes real time more applicable. This paper therefore shows Blockchain's potential applications with IoT in the infrastructure and construction industry.</p>
<p>Paper 58 12⁰⁰ – 12¹⁵ (5 min discussion)</p>	<p>A Zaiter¹, and T L Lau^{1*}</p> <p><i>¹School of Civil Engineering, Universiti Sains Malaysia, 143000 Pulau Pinang, Malaysia</i></p> <p>Title of presentation: Review on Strengthening Reinforced Concrete Columns Using Reinforced Concrete Jackets</p> <p>Abstract: This paper highlights the review of the effects of concrete surface treatment and loading on the structural behavior of reinforced concrete (RC) columns retrofitted with RC jackets. The concrete surface treatment aspect is assessed based on the surface</p>



 **ICECAE 2020**

	<p>roughness, use of dowel bars, use of shear connectors, and applying bonding agent between the column core and the jacket. However, the loading aspect is evaluated based on preloading history and the applied loading pattern. The latest researches and recommendations for concrete jacketing are presented. It is found that sand-blasting with the use of dowel bars or shear connectors helps the retrofitted column to behave monolithically. Preloading does not have a significant effect on the retrofitted column. However, it is recommended to apply the load on the full retrofitted cross-section.</p>
<p>Paper 65 12¹⁵ – 12³⁰ (5 min discussion)</p>	<p style="text-align: center;">R E Y Ng¹ and T L Lau^{1*}</p> <p style="text-align: center;"><i>¹School of Civil Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Penang, Malaysia</i></p> <p>Title of presentation: Experimental study on a traditional house in Sabah, Malaysia using shake table</p> <p>Abstract: Due to destructive earthquake seldom happen in Malaysia, Malaysian have lack of awareness and knowledge towards earthquake disaster. Hence, most of the buildings constructed in Malaysia do not consider lateral loads in the building design. This includes traditional houses in Lahad Datu that located in Sabah state of East Malaysia where moderate earthquakes had occurred in past decades. These houses may be vulnerable towards earthquake due to lack of appropriate lateral resisting system in place. In this paper, the seismic hazard in Sabah is first reviewed. It is followed by an experimental study on a 1/4 scale model of a traditional house. The building is a hybrid structure with the combination of timber main frame and small portion of concrete beam and slab which is a common construction in local community. The model was constructed and tested on uni-directional shake table using the ground motion recorded at KKM seismic station and scaled to 80gal. Seven Linear Variable Differential Transducers (LVDTs) and nine accelerometers were installed to record displacements and accelerations of the model, respectively. The displacements and accelerations at various parts of the model were analyzed and discussed.</p>
<p>Paper 67 12³⁰ – 12⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">J Y Lee¹ and T L Lau^{1*}</p> <p style="text-align: center;"><i>¹School of Civil Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Penang, Malaysia</i></p> <p>Title of presentation: Estimation of the subsurface structure in Georgetown, Penang Island using single point microtremor observation technique</p> <p>Abstract: In this paper, the subsurface structure was estimated using single point microtremor observation technique in Penang Island, Malaysia. Malaysia is located out of Pacific Ring of Fire hence no active tectonic activity happens. However, numerous earthquakes that happened at neighbouring countries act contrary to the myth that Malaysia is seismic free. Tremors from far field earthquake events in Sumatra can be felt at Penang Island. The local site condition is investigated in this study in order to predict the damages on buildings when the earthquake strikes. The study area focused on Georgetown as it is the heart of Penang Island where the economy and population concentrated on. The objective of this study is to determine Vs,30 substructure of Georgetown area. Microtremor single point measurements were conducted to estimate the Vs profile at Georgetown area. For estimating the ground structure, Rayleigh wave ellipticity method was adopted to single point measurements. From the results, it is found that Georgetown area has Vs,30 of 216.4 m/s to 286.6 m/s and the predominant frequency ranging from 1.7 Hz to 2.43 Hz. Hence, the ground type of Georgetown area is classified as Class C in accordance to Eurocode 8.</p>
<p>Paper 87 12⁴⁵ – 13⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">P Singh¹, and K S Sreerag¹</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India</i></p> <p>Title of presentation: Additive Manufacturing through Digital Concrete by Extrusion</p>



 **ICECAE 2020**

	<p>and Non-extrusion method</p> <p>Abstract: The phase of construction industries is very weak to adapt new technologies. We faced plenty of problems related to our construction industries because of old conventional method. Digital Concreting (DC) is the techniques from Additive Manufacturing (AM), the concrete is laying like layers to build a whole structure. DC could to overcome the problems faced by conventional construction. Furthermore, the DC will open the windows that allow the new innovative technologies enter in to construction industries. Generally, the usage of concrete is more than enough so it leads to increase the waste in site and harmful to environment. In DC technique uses of the concrete is only for need and no excess use. The properties of concrete are different for printing compared to conventional method. In this paper, we discussed about the general view on DC, properties of concrete and the methods used to print.</p>
<p>Paper 93 13⁰⁰ – 13¹⁵ (5 min discussion)</p>	<p style="text-align: center;">M Z Aryan¹, P Singh¹, and Zabihullah¹</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Amity School of Engineering & Technology, Amity University Noida, Uttar Pradesh, India.</i></p> <p>Title of presentation: Selection of Optimum Structural System in the Design of Reinforced Concrete High-Rise Building under the Effect of Seismic Load</p> <p>Abstract: Due to the infrequency of spaces in megacities, it is highly required to construct high rise buildings. In high rise buildings, the effect of seismic lateral forces is significant to be studied. The stiffness of lateral force-resisting elements of the building should be enough to stay safe during an earthquake. Providing the required stiffness by only enlarging the size of columns will cause congestion in space. Shear wall and/or bracing positioned at a lucrative location in frame, contribute to the structure and serve as lateral load resisting systems. Hence, Optimization for the selection of proper structural systems is vital in the structural engineering profession. This study deals to investigate the consequences of the shear wall and RC bracing on the reduction of earthquake lateral forces in the building. Including a moment-resisting frame, nine models of G+14 Storeys RC building with various structural systems and configurations are analysed and compared using Response Spectrum Method, as per IS 1893 (part 1); 2016. The comparison among all the models is carried out based on the storey displacement, base shear, storey drift, fundamental period, storey stiffness, force demand, and modal period. Based on the comparison of all building models with various configuration, it was found that out of all models, the model M-1 (moment-resisting frame) is not desirable, while the model M-5 (shear wall at the corners of the periphery) will have an upmost seismic performance and the model M-8 (bracing at the middle of the periphery) has indicated better execution during an earthquake.</p>
<p>Paper 95 13¹⁵ – 13³⁰ (5 min discussion)</p>	<p style="text-align: center;">J Abdullahi^{1,*}, G Elkiran², and F Aslanova²</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Kano State Ministry of Works, Housing and Transport, Kano, Nigeria ²Department of Civil Engineering, Faculty of Civil and Environmental Engineering, Near East University, North Cyprus Near East Boulevard, 99138</i></p> <p>Title of presentation: Virtual water trade in the semi-arid regions of Nigeria</p> <p>Abstract: With continuous growth in the world population, the demand for water increases and hence water scarcity rises. Adequate measures have to be put in place in order to make proper utilization of the available water. Virtual water trade is defined as the water volume conveyed within the imported or exported food. Hence, the aim of this study was to determine the virtual water volume required for crops production of 25 different crops in the semi-arid regions of Nigeria for the year 2013. In addition, the water footprint, imports and exports of virtual water, the production volume of virtual water, green, blue, and grey water contributions to crops production, water balance, exports income, imports costs and value of the selected crops produced were distinguished. The study was conducted using CROPWAT 8.0 software. The result</p>



 **ICECAE 2020**

	<p>revealed that in the 7 regions of the semi-arid zone, the crops selected had total volume of virtual water produced of approximately 35.9 Gm³/yr, exports volume of virtual water was 27.5 Mm³/yr, imports volume of virtual water was 8.6 Gm³/yr, water footprint was 44.5 Gm³/yr and water balance was 8.6 Gm³/y. Total value of the produced crops was \$2.6 billion, export income \$1.1 million and import cost \$794.6 million. Gusau with higher percentage of green water used is preferable region to grow crops in the semi-arid regions of Nigeria, which can consequently lead to reduced cost of production and scarcity of water.</p>
<p>Paper 101 13³⁰ – 13⁴⁵ (5 min discussion)</p>	<p>I N Kravchenko^{1,2}, A O Fyodorov³, Yu A Kuznetsov⁴, V V Goncharenko⁴, D T Abdumuminova^{5*}, and Sh U Yuldashev⁵</p> <p>¹<i>Russian State Agrarian University-Moscow Agricultural Academy named after K.A. Timiryazev, 127550 Moscow, Russia</i></p> <p>²<i>Blagonravov Institute of Machine Science, 101990 Moscow, Russia</i></p> <p>³<i>Military Institute (engineering), Military Academy of Logistics named after Army General A.V. Khrulev, 199034 St. Petersburg, Russia</i></p> <p>⁴<i>Orel State Agrarian University named after N.V. Parakhin, 302019 Orel, Russia</i></p> <p>⁵<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Theoretical study of shock-aerating activator for dry enrichment of constructional materials</p> <p>Abstract: For construction in areas remote from the main raw material industrial bases, reconstruction of destroyed objects and infrastructure, roads, especially in mountainous earthquake-prone areas as part of concretes it is advisable to use enriched local natural materials and recycled materials. The most effective method of enrichment is activation of materials by fine grinding. To implement the technology, a new development of small-sized compact activation equipment is proposed, which allows achieving guaranteed strength of concrete while reducing construction time and saving costs for imported materials.</p>
<p>Paper 105 13⁴⁵ – 14⁰⁰ (5 min discussion)</p>	<p>J P L Ngenge^{1*}, and P Akpinar¹</p> <p>¹<i>Civil Engineering Department, Near East University, Nicosia, Via Mersin 10, Turkey</i></p> <p>Title of presentation: An overview on the experimental methods for the evaluation of properties and durability performance of RCA-containing concrete</p> <p>Abstract: The usage of recycled concrete aggregates (RCA) originates from buildings' demolishing and increased demand in construction. Demolishing could be due to completion of building's service life or its pre-mature failure as well as due to other reasons such as wars or earthquakes. In such cases, wastes of demolished buildings pose a threat to nature. RCA usage avoids the environmental degradation resulting from excessive extraction of raw materials to produce natural aggregates (NA) and storage of waste materials from devastated structures. Since RCA originates from construction waste, it becomes important to ensure the quality of new structure to be erected using RCA. From this perspective, the examination of general properties and long-term durability of RCA is vital. Hence, an understanding on the critical parameters to be inspected and experimental procedures are essential. This paper aims to provide a compact overview on the crucial parameters defining the quality, properties and the durability of RCA-containing concrete for the civil engineers and researchers aiming to work in this field. The adopted approach for this study implies a systematic literature review that copes with collecting essential information on this topic from existing respected studies from all around the world and the standard codes covering practices for related issues. The found results asserts that, performing tests on each type of waste materials irrespective of theirs sources is vital. For structural usage, the replacement of RCA with respect to the NA shall not be more than 30%. Finally, the usage of finer RCA shall be minimum for the better performance of RCA-concrete</p>



 **ICECAE 2020**

<p>Paper 50 14⁰⁰ – 14¹⁵ (5 min discussion)</p>	<p>containing.</p> <p>M Turgunov^{1,2}, D Mamatova³, and Kh Tukmenov⁴</p> <p>¹<i>Department of Mechanical and Aerospace Engineering, Turin Polytechnic University, Tashkent 100095, Uzbekistan</i></p> <p>²<i>Department of General Engineering Discipline, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100100, Tashkent, Uzbekistan</i></p> <p>³<i>Department of Machine Science and Service, Tashkent Institute of Textile and Light Industry, Tashkent 100100, Uzbekistan</i></p> <p>⁴<i>Department of General Engineering Discipline, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, 100100 Tashkent, Uzbekistan</i></p> <p>Title of presentation: The influence of widescale factors on the cyclic strength of nanocoated metals with a heterogeneous structure</p> <p>Abstract: A brief overview of research work in the field of studying the wear resistance and surface strength of die tooling under cyclic loading is given. The peculiarities of deformation and the presence of a limit of physical endurance, which is associated with the course of dynamic deformation aging in metals (Cr,V) are considered. Relatively slow aging is observed under cyclic deformation conditions. The influence of saturation processes with pairs of elemental structure formed in metals with multilayer nanocoating is also considered. The work dedicated to the definition of wear resistance and improvement of die tooling is of great interest and requires a more in-depth study of this problem, thereby developing a new technique as a promising new direction in the automotive industry and mechanical engineering.</p>
<p>Paper 175 14¹⁵ – 14³⁰ (5 min discussion)</p>	<p>Sh R Khurramov</p> <p><i>Laboratory of Theory of Mechanisms and Machines, Institute of Mechanics and Seismic Resistance of Structures named after M.T. Urazbayev, Academy of Sciences of the Republic of Uzbekistan, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Simulation of the form of contact curves rolls in two-roll modules</p> <p>Abstract: This article presents the results of the study of roll contact curves in two-roll modules. The shapes of the contact curves of the rolls in the generalized two-roll module are modeled in the case when the nature of the deformation of the contacting bodies is described by empirical formulas. It was revealed that the previously obtained mathematical models, considering the ratio of deformation of contacting bodies to be equal to the ratio of their deformation rates, describe a particular case of interaction in a two-roll module. Expressions are found that determine the ratio of the deformation rates in a two-roll module, which make it possible to determine the shape of the roll contact curves.</p>
<p>Paper 52 14³⁰ – 14⁴⁵ (5 min discussion)</p>	<p>M. Tuychieva</p> <p><i>Department of Electric Transport and High-Speed Electric Rolling Stock, Tashkent State Transport University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Control of electric locomotives with asynchronous electric motors under asymmetric operating conditions in Uzbekistan</p> <p>Abstract: The control of energy conversion processes in an alternating current electric traction drive with asynchronous (induction) motors under asymmetric operating conditions are considered in the paper and the ways to improve their efficiency are proposed. It was stated that asymmetric modes create asymmetry of currents in the AM phases, which negatively affects both the electrical and mechanical parts of electric traction drives. The analysis of electromagnetic processes in the complex asymmetry of currents and voltage in the circuits of electric traction drives allows creating an adaptive algorithm for electric locomotives control which allows increasing electric power indices and the system reliability.</p>



 **ICECAE 2020**

<p>Paper 55 14⁴⁵ – 15⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">Kh Khudoynazarov^{1*}, and Z B Khudoyberdiyev¹</p> <p style="text-align: center;"><i>¹Department of Theoretical and Applied Mechanics, Samarkand State University, 15 University Boulevard, 100104 Samarkand, Uzbekistan</i></p> <p>Title of presentation: Unsteady vibrations of a three-layer plate with an asymmetric structure</p> <p>Abstract: This article discusses the problem of symmetric vibrations of a three-layer plate pivotally supported along the edges in the longitudinal direction is solved. The materials of the plate layers are assumed to be elastic and isotropic. It is believed that the plate is not symmetrical in thickness, i.e. different thicknesses of layers. A brief review of scientific papers on theories of calculation of three-layer and multilayer plates is given. The equations of vibration of a three-layer plate, previously developed by the authors, are accepted as resolving equations. The stress and displacement components are expressed, as well as the oscillation equations, through the main parts of the longitudinal and transverse displacements of the points of the “intermediate” plane of the middle layer, which is at some distance from the middle plane of the plate. The conditions of the articulated plumage are formulated with respect to the displacements of the points of the middle layer. The initial conditions are assumed to be zero. The formulated problem is solved by an analytical-numerical method using a software package. The obtained numerical results are presented in the form of graphs of the dependences on time and the longitudinal coordinate of the displacements and voltages of the points, both the middle and the bearing layers of the plate. The calculations were performed for steel materials of the bearing layers, and for the middle layer the physic-mechanical parameters of the polymer material were adopted. The corresponding conclusions are made according to the results of numerical calculations. It was established that slight transverse displacements of the plate points appear due to the action of longitudinal external loads. Moreover, due to the insignificance of these displacements with symmetric vibrations of a three-layer plate, transverse displacements can be neglected. With symmetrical vibrations of the plate, longitudinal normal voltages are also excited despite the fact that the edges of the plate are free of external loads. These voltages are generated by the action of external tangential and normal voltages on the boundary surfaces.</p>
BREAK 15 p.m. – 16 p.m.	
<p>Paper 56 16⁰⁰ – 16¹⁵ (5 min discussion)</p>	<p style="text-align: center;">Kh Khudoynazarov^{1*}, and Sh R Yaxshiboyev¹</p> <p style="text-align: center;"><i>¹Department of Theoretical and Applied Mechanics, Samarkand State University, 15 University Boulevard, 100104 Samarkand, Uzbekistan</i></p> <p>Title of presentation: The Mathematical Model of Transverse Vibrations of the Three-Layer Plate</p> <p>Abstract: The article in a flat setting investigated the antisymmetric oscillations of a three-layer plate, which is infinite in plan. It is believed that the plate is not symmetrical in thickness. Based on the exact solutions of the equations of the linear theory of elasticity in transformations, a theory of unsteady transverse vibrations of a three-layer plate is developed. The oscillation equations are derived with respect to two auxiliary functions, which are the main parts of the longitudinal and transverse displacements of the points of some “intermediate” surface of the middle layer. The distance of this surface to the coordinate plane of the plate is arbitrary. All components of the stress tensors and displacement vectors at the points of the layers are expressed, like the vibration equations, through the introduced auxiliary functions. The problem of harmonic antisymmetric vibrations of an elastic three-layer plate is solved.</p>
<p>Paper 81 16¹⁵ – 16³⁰ (5 min discussion)</p>	<p style="text-align: center;">N Y Makhkamov^{1*}, G U Yusupov², T Tursunov³, and Kh Djalilov³</p> <p style="text-align: center;"><i>¹Department of Natural Sciences, Military Technical Institute of the National Guard of the Republic of Uzbekistan, Tashkent region, Uzbekistan</i></p> <p style="text-align: center;"><i>²Department of Hydrology and Hydrogeology, Tashkent Institute of Irrigation and</i></p>



 **ICECAE 2020**

	<p><i>Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>³Tashkent State Transport University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Properties of metal-based and nonmetal-based composite materials: A brief review</p> <p>Abstract: At present, the prospects for the progress of structural materials are mainly associated with the development and widespread use of composite materials. The aim to improve the existing designs, to create new materials opens up the opportunities for the implementation of new design solutions and technologies. The article outlines one of the pressing problems - the need to develop new structural materials such as composite ones. Two types of structural materials are considered in the article: composite materials on a metal basis and composites on a non-metal basis. Technical-technological, physical, technological, mechanical and chemical characteristics and properties of composites are given. Based on the analysis, the properties of unidirectional composite materials on a metal and non-metal basis are revealed. As a result of this review, the fields of application of composite materials on a metal and non-metal basis were determined.</p>
<p>Paper 88 16³⁰ – 16⁴⁵ (5 min discussion)</p>	<p>A Abduvaliev¹, and A Abdulkhayzoda^{2*}</p> <p><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>²Tashkent Transport University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Damping vibrations of an underground structure using a three-mass damper</p> <p>Abstract: The state of a rigid disk at elastic waves diffraction on it and the possibility of its oscillation suppression using a multi-mass damper was studied in the paper. The operation of a three-mass dynamic oscillation suppression was considered and its application was compared with the operation of a two-mass damper. The effectiveness of the use of multi-mass dampers was estimated by the relative amplitude of disk oscillations and by the width of the frequency zone. It was stated that to suppress disk oscillations in a state of low instability of external impact frequency, the use of single- or two-mass dampers was sufficient. To reduce the disk displacements at unstable frequency of external impact (to cover a wider frequency zone), it is necessary to use a three-mass damper; the width of the damper effective operation significantly increases (about 4-5 times) compared to the operation of a two-mass damper.</p>
<p>Paper 109 16⁴⁵ – 17⁰⁰ (5 min discussion)</p>	<p>D T Abdumuminova^{1*}, E A Lesyuk², M N Erofeev³, I N Kravchenko^{3,4}, A I Deryabin³, and Sh U Yuldashev¹</p> <p><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>²Strategic Missile Forces Military Academy Peter the Great, 143900 Moscow, Russia</i> <i>³Institute of Mechanical Engineering, A.A. Blagonravov Russian Academy of Sciences, 101990 Moscow, Russia</i> <i>⁴Russian State Agrarian University - Moscow Agricultural Academy K.A. Timiryazev, 127550 Moscow, Russia</i></p> <p>Title of presentation: The Influence of ultrasonic strengthening treatment on microhardness of the construction materials surface with different initial structure</p> <p>Abstract: The description of the method of ultrasonic surface hardening treatment (UST), which makes it possible to form gradient structures in structural materials, is given. This paper presents the results of the effect of UST on the surface microhardness of coarse-grained, ultrafine-grained and nanostructured^{3,4} titanium nickelide. The work is devoted to the study of the effect of ultrasonic hardening surface treatment on the surface microhardness of structural materials with different initial structures (coarse-grained, ultrafine-grained, nanostructured).</p>



ICECAE 2020

<p>Paper 23 17⁰⁰ – 17¹⁵ (5 min discussion)</p>	<p style="text-align: center;">P Singh</p> <p style="text-align: center;"><i>Department of Civil Engineering, Amity School of Engineering & Technology, Amity University Uttar Pradesh, Noida, India</i></p> <p>Title of presentation: Role of Blockchain Technology in Digitization of Land Records in Indian Scenario</p> <p>Abstract: Blockchain is a way of passing data (such as records, events, or transactions) from one party to another in a very secure way. It is an electronic record of information that requires digital security. All data stored in the blockchain is immutable; once a piece of data enters into a blockchain, it is practically impossible to alter its value. The Blockchain has changed the model from a centralized way of traditional business to the decentralized model of the blockchain, that means there it can run without any central authority. It works on Peer to Peer Model rather than Peer-Mediator-Peer. The Blockchains makes the process easier, fastest, and trustworthy to deal with businesses as it follows Peer to Peer nature Blockchain. It has become the most used business model in different industries, such as construction industries, as it is the safest, fastest, transparent, and it also is more comfortable to implement. The critical feature of the blockchain that makes it today's most potential technologies are: decentralized, self-control, peer- to- peer relationship, fixed record and time stamping. Thus, this chapter focuses on the pivotal role and application of BlockChain technology on the digitization of land records of the Indian Scenario.</p>
<p>Paper 119 17¹⁵ – 17³⁰ (5 min discussion)</p>	<p style="text-align: center;">A Iravanian¹, and Sh Ali^{1*}</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Civil and Environmental Engineering Faculty, Near East University, 99138 Nicosia, (via Mersin 10, Turkey), Cyprus</i></p> <p>Title of presentation: Soil Improvement Using Waste Plastic Bags: A Review Paper</p> <p>Abstract: Plastic waste is increasing by time that caused huge challenges all over the world. Therefore, there is a need for good ways to solve the environmental challenges. Also, there is another problem which is that many times weak soil faces the projects, the soil needs to be improved. The idea of this paper is to have a thorough review on literature to collect the data on reinforcing soil with waste plastic bags, where the plastic bags strips are reused as a soil stabilizing technique. This solution will be cost effective and eco-friendly and will solve soil weakness problem. This article reviews the works that has been carried out in this issue to find out the functionality of these waste strips as reinforcing material. From this paper the findings were that plastic bags can be used as an effective solution to improve soil strength while being eco-friendly and cost effective. It is noticed that addition of 0-2.5% plastic bags results in getting better property improvements. Regarding the dimensions of the additives it was found that the plastic strips with higher the aspect ratio lead to better test results. Finally, CBR, shear strength parameter and compaction characteristics of stabilized samples were visibly improved comparing to non-stabilized samples.</p>
<p>Paper 64 17³⁰ – 17⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">H Z Rasulov¹, R H Rasulov¹, A U Tashxodjayev¹, and M B Babajanov^{1*}</p> <p style="text-align: center;"><i>¹Tashkent Institute of Architecture and Construction, 13 str. Navoi, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Vibration creep of loess soils</p> <p>Abstract: Taking into account the rheological properties (creep) of clay soils when solving problems of soil mechanics is important, because many inaccuracies in forecasts related to soils arise from an under-accounting of these properties, which are characteristic of clay soils. The report deals with the issues of vibration creep of moisten loess soils, related to the precipitation of structures and the permissible load on the soil. The method of experimental research and the results of experiments on the dependence of the coefficient of soil vibration creep on the acceleration of vibrations are presented. The factors influencing the vibration creeping deformations of the forest,</p>



 **ICECAE 2020**

	<p>including the role of soil adhesion and the duration of shaking, are established. Research results are of great importance in the practice of constructing unique engineering structures in seismic areas.</p>
<p>Paper 123 17⁴⁵ – 18⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">A Iravanian¹, and Sh O Ravari^{1*}</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Civil and Environmental Engineering Faculty, Near East University, 99138 Nicosia (via Mersin 10), Turkey</i></p> <p>Title of presentation: Types of Contamination in Landfills and Effects on The Environment: A Review Study</p> <p>Abstract: Waste disposal is one of the important problems in the world. In general, wastes are categorized into different groups, and there are some special landfills and methods for disposing of each of these waste materials. However, it should be noted that although there are some rules and regulations that try to reduce the impact of waste disposal, landfills have negative effects on soil, air, water, and natural life. One of the most important sources of pollution in landfills is the leachate that is generated by the decomposition of waste. Leachate can penetrate into the soil and water resources, contaminate them, and can affect human life. Leachate generation has five different phases and each of these phases contains some reactions that have a direct impact on the quality and quantity of leachate. Leachate has four main types of pollution and each of these pollutants can contaminate soil and water resources and be hazardous for aquatic and animals in the soil. In addition, some of these contaminations can enter the food chain and affect the ecosystem and human life. The negative impacts of landfills remain even years after the landfill is closed. Therefore, it is important to consider the short-term and long-term effects of landfills on their surroundings to protect the environment and human health.</p>
<p>Paper 125 18⁰⁰ – 18¹⁵ (5 min discussion)</p>	<p style="text-align: center;">A Paktiawal^{1*}, and M Alam²</p> <p style="text-align: center;"><i>¹Department of Civil Engineering, Faculty of Engineering and Technology, Jamia Millia Islamia, Jamia Nagar, New Delhi 110025, India.</i></p> <p style="text-align: center;"><i>²Department of Civil Engineering, Faculty of Engineering and Technology, Jamia Millia Islamia, Jamia Nagar, New Delhi 110025, India</i></p> <p>Title of presentation: Nano-Silica and its Role on Performance of Cement Concrete-A Review of Experimental Investigation</p> <p>Abstract: The researchers are generally focusing on the basic technology of cementitious materials at the nano level. In addition, the researchers are mainly aimed at enhancing the durability and strength of concrete and have found rapidly developing the mechanical and microstructural properties of cementitious materials with the introduction of nano-silica. The present paper reviewed and summarized the experimental research works carried out on the use of nano-silica in cement concrete mix as an additive or replacement of cement and its effects on rheology of the fresh concrete, and properties of hardened concrete such as strength, and durability. Thus, nano-silica is a promising material which can be used to improve the properties of the cement concrete.</p>
<p>Paper 164 18¹⁵ – 18³⁰ (5 min discussion)</p>	<p style="text-align: center;">S M Anas^{1*}, Mehtab Alam², and Mohammad Umair³</p> <p style="text-align: center;"><i>¹Ph.D. Scholar, Department of Civil Engineering, Faculty of Engineering and Technology, Jamia Millia Islamia, New Delhi, Delhi, India 110025</i></p> <p style="text-align: center;"><i>²Professor, Department of Civil Engineering, Faculty of Engineering and Technology, Jamia Millia Islamia, New Delhi, Delhi, India 110025</i></p> <p style="text-align: center;"><i>³Assistant Professor, Department of Civil Engineering, Faculty of Engineering and Technology, Jamia Millia Islamia, New Delhi, Delhi, India 110025</i></p> <p>Title of presentation: Performance of One-way Composite Reinforced Concrete Slabs under Explosive-induced Blast Loading</p> <p>Abstract: A finite element model is developed in ABAQUS/CAE to simulate the</p>



 **ICECAE 2020**

	<p>behavior of one-way reinforced concrete slabs under air-blast loading. Several published empirical equations have been utilized to model air-blast pressure, $P(t)$, for different combinations of the explosive charges and standoff distances. The values of the peak overpressure have been taken from the field explosion tests conducted on four normal reinforced concrete (NRC) slabs of size 2000 mm x 1000 mm x 100 mm in the School of Civil, Environmental, and Mining Engineering, The University of Adelaide, Australia (2009). The slabs were doubly reinforced with HYSD steel re-bars of diameter 12 mm spaced at 100 mm c/c in the major bending plane ($\square\square = 1.34\%$) and 200 mm c/c in the other plane ($\square\square = 0.74\%$), where “c/c” is the center-to-center distance between two adjacent re-bars. A plasticity-based damage model for concrete and an explicit solver in ABAQUS/CAE are adopted in the finite element (FE) simulation. The available test results and finite element analysis predictions, including maximum mid-span displacement and damage to the RC slabs, are presented and weighed. The computed results are found in good agreement with the experimental ones. The validated model is used to examine the performance of RC slabs with 25% replacement of the conventional steel re-bars by the FRP re-bars of equivalent strength on the compression face only, remote face only, and both faces of the slab. The replacement has been done for higher strength and ductility. Substituted FRP re-bars are of (1) Aramid fiber-reinforced polymer (AFRP), (2) Basalt fiber-reinforced polymer (BFRP), (3) Carbon fiber-reinforced polymer (CFRP), and (4) Glass fiber-reinforced polymer (GFRP). The results are also compared with those obtained with a 50% replacement of the steel re-bars by the FRP re-bars.</p>
<p>Paper 178 18³⁰ – 18⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">Faisal Ratherl^{1*} and Mehtab Alam²</p> <p style="text-align: center;">¹<i>Jamia Millia Islamia, Jamia Nagar, New Delhi-110025, India</i> ²<i>Jamia Millia Islamia, Jamia Nagar, New Delhi-110025, India</i></p> <p>Title of presentation: Relative Performance of Linear Quadratic Regulator and Pole Placement Technique for Active Seismic Control of Structures</p> <p>Abstract: This paper presents the study conducted on the comparison of the performance of the two popular active control algorithms viz. Linear Quadratic Regulator (LQR) and Pole Placement technique in terms of their capability to alleviate the response of a structure to an earthquake. To compare the performance of the two control algorithms, a ten story regular shear building frame with three active tendons located in 1st, 4th and 5th Storys and subjected to an El Centro earthquake has been considered. A comparison of the numerical results shows that the reductions of maximum top floor displacement, maximum story drift and base shear obtained using LQR control algorithm are 71.48%, 59.70% and 62.7% while the reductions obtained using Pole Placement technique are 73.77%, 73.14% and 77% respectively. The percentage reduction of the three performance parameters per unit control force obtained using the two methods have also been estimated and compared. Pole placement technique gives higher reduction while the LQR algorithm gives more reduction per unit control force.</p>
<p>Paper 177 18⁴⁵ – 19⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">Sh.R. Khurramov, F.Z. Kurbanova</p> <p style="text-align: center;"><i>Laboratory "Theory of mechanisms and machines" of the Institute of Mechanics and Seismic Resistance of Structures named after M.T. Urazbayev of the Academy of Sciences of the Republic of Uzbekistan, Tashkent, Republic of Uzbekistan</i></p> <p>Title of presentation: DISTRIBUTION OF CONTACT VOLTAGES IN ASYMMETRIC TWO-ROLL MODULE</p> <p>Abstract: Mathematical models of the regularities of the distribution of contact stresses in the generalized two-roll module in the case when the nature of the deformation of the material layer is specified by rheological models are obtained. New data on the regularities of the distribution of contact stresses are revealed: normal contact stresses change from zero at the beginning and at the end of the contact zone</p>



 **ICECAE 2020**

	<p>of the rolls to a maximum at a point lying to the left of the center line (towards the beginning of the contact of the rolls); the tangential contact stresses change their signs at the neutral point, which in the driven roll is located towards the entrance of the material layer into the contact zone of the rolls, and in the free one - towards the exit; during static interaction of the rolls with the material being processed, the point of maximum normal stresses and the neutral point are located on the center line.</p>
<p>Paper 180 19⁰⁰ – 19¹⁵ (5 min discussion)</p>	<p>M Ikramova^{1*}, I Akhmedkhodjaeva² and A Khodjiev²</p> <p>¹<i>Scientific Research Institute of Irrigation and Water Problems of the Ministry of Water Resources, Karasu-4/10, 100187 Tashkent, Uzbekistan</i></p> <p>²<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari-Niyazi Str., 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: The reservoirs capacity assessment: the Tuyamuyun hydro complex in Khorezm region of Uzbekistan</p> <p>Abstract: The dynamic processes in water reservoirs depend on its morphological characteristics, i.e. bottom geology and relief, flow depth, intensity of water exchange, water and sediment features etc. The paper presents a capacity assessment of the Channel Reservoir of the Tyuyamuyun Hydro Complex located in Khorezm region of the Republic of Uzbekistan based on GIS tools. The study was aimed at determining of sedimentation dynamics of the Channel Reservoir during over 35 years dam operation and changes in the water storage capacity. The ongoing channel processes lead to regular reformation of the reservoir morphology. The data obtained allow determining the morphology of the reservoir, useful water volume, the capacity loss etc. and solving other issues related to management of water resources. The GIS technologies allows regular monitoring of the changes in capacity, make a prediction of future sedimentation processes, as well identify the stagnant water areas and volumes to be released to downstream for using in agriculture.</p>
<p>Paper 120 19¹⁵ – 19³⁰ (5 min discussion)</p>	<p>A Iravanian¹, and S A Saber^{1*}</p> <p>¹<i>Department of Civil Engineering, Civil and Environmental Engineering Faculty, Near East University, 99138 Nicosia (via Mersin 10, Turkey), Cyprus</i></p> <p>Title of presentation: Using Ceramic Wastes in Stabilization and Improving Soil Structures: A Review Study</p> <p>Abstract: The goal of this review study is to define the use of ceramic wastes as a raw material in soil structures and the construction of road pavement subgrades. The global output of ceramic waste powder (CWP) produced during the final polishing phase of ceramic tiles exceeds 22 billion tones. The application of (CWP) in landfill sites could create major environmental issues for soil, water and climate. It has been calculated that about 30% of the daily growth in the ceramic industry goes to waste. By trying to reduce this material, we can provide a big benefit of minimizing the use of natural products, decreasing the amount of money used and enhancing land conditions, based on the quantities we can use. Such wastes cannot be processed in any manner and thus create issues with the disposal and loss to the industry. Ceramic waste is strong, durable and resistant to all kind of declining powers, and these properties allow it to be substitute for replacements. Using various quantities of ceramic waste, we will obtain different results and characteristics of soil structures in different California bearing ratios, dry unit weight, unconfined soil density and optimum water content.</p>
<p>Paper 121 19³⁰ – 19⁴⁵ (5 min discussion)</p>	<p>A Iravanian¹, and A B Haider^{1*}</p> <p>¹<i>Department of Civil Engineering, Civil and Environmental Engineering Faculty, Near East University, 99138 Nicosia, via Mersin 10, Turkey</i></p> <p>Title of presentation: Soil Stabilization Using Waste Plastic Bottles Fibers: A Review Paper</p> <p>Abstract: Nowadays plastic has a major role in our life use, but the increased usage of</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

it led to a serious challenge which is plastic waste. Plastic waste is increasing day by day and which led to many bad disposal methods like burning and due to that there are many environmental and pollution problems. Therefore, there is a need to seek for safe and effective disposal methods to protect our plant and next generations' future. One of the effective and safe solutions is using plastic waste in civil engineering construction as this solution is eco-friendly where it will provide a safe disposal as well as in engineering there is always a seek for economical materials and as plastic waste is almost for free. In addition, adding these materials may improve the properties of the construction materials. This article reviews all the published trials of using waste plastic bottles fibers as soil improvement material to examine the effectiveness of using this material as a reinforcing material in improving soil properties. As well as to provide a data base of information regarding the best dimensions and percentages. After reviewing the literature, it was found that waste plastic bottles can effectively be used as a reinforcing material and it is an eco-friendly solution. But the best benefit is it really economical as this solution has showed good improvement in soil properties this can reduce the thickness of the pavement in highways construction as well as it provided a good stabilization method rather than the other expensive methods. This material also can solve the problem of time as the other stabilization take much time which delay the construction process. Also, it was found that the addition of (0-5) % with higher aspect ratios give the optimum results.

Closing Speech: Prof. Dr. Justyna Kobylarczyk, Prof. Dr. Dominika Kusnierz-Krupa, Prof. Dr. Alirza Mamedov

END of SESSION –CIVIL ENGINEERING



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



 **ICECAE 2020**

DAY 2: OCTOBER 15, 2020

SESSION 3: AGRICULTURAL ENGINEERING

Time: 11⁰⁰ a.m. – 19⁰⁰ p.m.

Session chair: Prof. Jan W Dobrowolski, Assoc. Prof. Sakine Ugurlu Karaagac, and Dr. Emmanuel Ugwu,

Presenters

J W Dobrowolski

Interuniversity Team of Sustainable Development and Ecoinnovation, Team of Environmental Biotechnology and Ecology, AGH University of Science and Technology, WAAS, Mickiewicza 30, 30-059 Krakow, Paw.C-4, Poland

Title of presentation: Life-long education for better quality of life, sustainable society and green economy adopted to climate change and Covid-19 pandemic

Abstract: European tradition of Human Rights has to be focused on optimization of progress in different fields of science and technology for *efficient prevention against common environmental health hazard* (focused on primary prevention of incurable diseases of civilization e.g. congenital malformations, mutations including *viruses and bacteria mutations* and *risk of pandemics*, cancer etc.) as well as *promotion sustainable management of the natural resources* by dissemination of low energy and waste-free biotechnology based on renewable energy sources (e. g. bioenergy from wastes and biomass from hydrobotanic wastewater treatment plants). We have to follow good *experiences of all generations contributing to the trans-disciplinary concept of sustainable development introduced by Prof. W. Goetel from AGH-UST and adopted by GA of IUCN already in 1956*. Prof. Goetel introduced also basic ideas of *new science sozology* and gave key note lecture together with eminent expert in *environmental health and pandemics* director of WHO Prof. Kostrzewski - already in 1968 [at initiated and led by me 1st National Summer School on the Human Environment in model area of the oldest in Europe border park in the Pieniny Mts.].

11⁰⁰ – 11¹⁵
(5 min discussion)

J S Bayzakova^{1*}, N K Abdildin¹, Zh S Shynybay¹, Zh S Chingenzhinova¹, A S Berdyshev², N M Eshpulatov², O Q Matchonov², and Sh B Yusupov²

¹Kazakh National Agrarian University, Abay Avenue 8-a, 050010, Almaty, Kazakhstan

²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy str., Tashkent 100000, Uzbekistan

Title of presentation: Methodology for conducting an optimization experiment for harvesting dry short-stalked grain crops

Abstract: The article raises the issue of climate warming without loss of harvesting dry short-stalked crops will increase, and requires an urgent technological and technical solution. Research aimed at the development of a device installed in an inclined chamber, providing a reduction in grain losses during harvesting of dry short-stalked grain mass, is relevant and of great economic importance. The aim of the study was to increase the efficiency of harvesting dry short-stalked crops due to the uniform distribution of threshed grain mass supplied to the combine harvester. And the scientific hypothesis of the study was to increase the efficiency of a single-drum combine harvester by threshing dry short-stalked breads, by ensuring a uniform layer of grain

Paper 51
11¹⁵ – 11³⁰
(5 min discussion)



 **ICECAE 2020**

	<p>mass entering the local government. The results showed that the threshing of grain increases due to the uniform distribution of mass depending on the length of the discrete part of the corrugation. The results of the experiment are obtained.</p>
<p>Paper 63 11³⁰ – 11⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">D Abduraimova^{1*}, and M Ismoilova²</p> <p style="text-align: center;">¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Hydraulic Department, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Siphon for measuring water at the intake from the tray engineering structures</p> <p>Abstract: Currently, in the context of an increasing shortage of water resources, metering and measurement of water in engineering channel communications is of particular relevance. Especially with water distribution between consumers, there always arises the need for accurate metering of water. This article discusses the issues of water distribution by siphon pipe and determining the actual amount of flow rate. Using the basic equations of hydraulic engineering, a mobile siphon water meter has been developed. The proposed design of the siphon performs two functions: water intake from the trays and water measurement. The paper presents the results of a field study on the use of a siphon water meter for the condition of the tray networks of Uzbekistan. Based on the hydraulic calculation, siphon parameters for abstraction and water measurement are proposed. For each specific case, the siphon throughput is calculated. Water discharge calculation with Siphon determined by vacuum meter a set at the rotating part of it is, depending on the display of the vacuum meter, the water flow rate is determined using the connection diagram of. For this, the graph is built or aggregated graph of. Based on laboratory research, the amount of discharge determined which takes siphon. Based on the research, was obtained a patent from the Intellectual Property Agency for a mobile siphon water meter. By installing this irrigation trays device to the farms through the existing irrigation systems, gotten opportunity to accurately assess the actual water intake and the actual amount of water it receives. According to the results of the work, a graph of the dependence of water flow on pressure is proposed for practical use.</p>
<p>Paper 96 11⁴⁵ – 12⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">K D Astanakulov¹, G G Fozilov², N M Kurbanov³, B Sh Adashev³, and S A Boyturayev³</p> <p style="text-align: center;">¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Scientific-Research Institute of Agricultural Mechanization, Samarkand str. 41, Tashkent Region, Uzbekistan</i></p> <p style="text-align: center;">³<i>Namangan Engineering-Technological Institute, Kasansay str.7, Namangan, Uzbekistan</i></p> <p>Title of presentation: Grinding of the grains according to parameters of hummers in double-staged grinder-crusher</p> <p>Abstract: Parameters of hummers in double staged grinder-crusher were studied for qualitative grinding of the grains. In order to determine performance indicators, an experimental sample of a grinder-crusher for stepwise grinding of grain was developed. In double stage grinder-crusher when hummers 3-4 mm thick were installed around rotor in 4 rows with 20 mm rotor height the best grinding of the grain was achieved.</p>
<p>Paper 179 12⁰⁰ – 12¹⁵ (5 min discussion)</p>	<p style="text-align: center;">B K Karimov^{1*}, S S Shoergashova¹, V N Talskikh², and A T Salokhiddinov¹</p> <p style="text-align: center;">¹<i>Department of Ecology and Water Resources Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kori-Niyazov street 39, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Center of Hydrometeorological Service of the Republic of Uzbekistan (Uzhydromet).</i></p>



 **ICECAE 2020**

72, 1st Bodomzor Yuli street, 100052 Tashkent, Uzbekistan

Title of presentation: Relationship between the concentrations of nitrogen compounds and the water discharge in the Chirchiq River, Uzbekistan

Abstract: The Chirchiq River is one of the most human affected important drinking and municipal water source in the Republic of Uzbekistan. This work aimed to study the level of water pollution in the Chirchiq River by nitrogen compounds (ammonium, nitrite, and nitrate) over the last decade (2008-2018) with the identification of possible correlations between the level of water pollution and discharge. Most common pollutants: ammonium, nitrite, and nitrate concentrations in water were determined using generally accepted photometric methods. Correlation analysis of relationships between the river discharge and the concentrations of these compounds was carried out for each of 9 hydropost for each year and multiyear average values of the ten years (2008-2017). The water quality in the upstream part of the river is evaluated as a very good, however, in mid- and down streams due to diversion of nitrogen-containing organic and inorganic wastewater into the river worsening the water quality abruptly and concentrations exceeding MPC for fishery water bodies up to 5-8 times. Fortunately, according to the $[\text{NO}_3^-]: [\text{NO}_2^-]: [\text{NH}_4^+]$ ratio, the river has still enough assimilation capacity to transform hazardous ammonium and nitrite forms into nitrate nitrogen. Obtained results did not confirm the existence of significant interdependencies between the nitrogen compounds and water discharge. The results of the study will provide a theoretical and practical basis in terms of elucidating the mechanism of hydrochemical transformation of nitrogenous compounds along with the river ecosystem and predicting the dynamics of their concentrations in river water.

P Singh¹, Ch Garg², and A Namdeo¹

¹Department of Civil Engineering, Amity University Uttar Pradesh, Noida, India

²Department of Computer Science and Engineering, Amity University Uttar Pradesh, Noida, India

Title of presentation: Applying Machine Learning Techniques to Extract dosages of Fertilizers for Precision Agriculture

Abstract: Increasing cost of fertilizers and subsidies are proving to be a burden on agriculturists as well as the government. Now it's high time to involve technology so that precise amount of fertilizers could be added in order to obtain maximum yield. Machine learning is an important tool that can be used to predict precise nitrogen, phosphorous and potassium for fertigation. But due to different soil types and different needs of different crops and varieties, it has become difficult to predict the exact amount of fertilizer needed. In this research paper a solution has been drawn to obtain precision in agriculture. Data has been collected from soil reports, soil science institutes and agriculture institutes of India. It has been rearranged into tables and pre-processed for applying machine learning models. Once the models were applied their accuracies have been evaluated using various parameters. Also, the predictions given by our model were compared by already existing recommendations. This work has been done for irrigated wheat growing areas of India and it could be extended to other crops and other areas all over the world.

Paper 114
12¹⁵ – 12³⁰
(5 min discussion)

S A Tashpulatova

Department of Ecology and Environmental Protection, Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan

Paper 108
12³⁰ – 12⁴⁵
(5 min discussion)

Title of presentation: Search and study of treatment spring water: A case study of Jizzakh region in Uzbekistan

Abstract: Determining the amount of groundwater sources (springs) and analyzing their quality has always been an important issue, because the health of the population largely depends on the quality of the water. This article presents the analytical results of a study



ICECAE 2020

	<p>of 242 springs in the Jizzakh region for 2018-2020. During these years, 242 sources (springs) in Farish, Bakhmal, Zaamin and other districts located in the mountain side of the Jizzakh region and 164 (68%) of 242 in the Farish district, 33 (14%) in the Bakhmal district, 27 (11%) in the Zaamin district and 18 (7%) located in the Gallaorol. Analysis of chemical and physical properties (total mineralization of the sampled water, iron, silicon compounds, bromine, iodine, carbon dioxide content, organic matter, pH, hardness, etc.) showed that 107 out of 242 springs are natural sources for human health and diseases prevention. The largest number of these springs is 68 (64%) in Farish district, 29 (27%) in Bakhmal district, 9 (8%) in Zaamin district and 1 (1%) in Gallaaral, respectively. These results will play an important role to research with large-scale quantitative and qualitative on healing springs in the future.</p>
<p>Paper 102 12⁴⁵ – 13⁰⁰ (5 min discussion)</p>	<p style="text-align: center;">S U Karaağaç</p> <p style="text-align: center;"><i>Karabuk University Engineering Faculty Environmental Engineering Department, 78050 - Karabuk, TURKIYE</i></p> <p>Title of presentation: Soil Pollution Caused Crude Oil and Remediation Methods Abstract: Many petroleum products play an essential role in modern society. The volume of crude oil and petroleum products used today is vastly larger than other chemicals of ecological and health concern. Petroleum products including gasoline, diesel or lubricants can be released to the environment through accidents, managed spills, or as unintended by-products of industrial, commercial or private actions; causing local and diffuse pollution to the environment. Environmental contamination is widespread due to the different facilities and processes, affecting human health, water resources, ecosystems and other receptors. Petroleum mixtures can be affected by air, water and organisms, thereby changing the location and their composition in soil, water or air. A proper risk assessment is essential for the understanding and management of the soil polluted by hydrocarbons, enabling us to develop a suitable risk assessment framework. Oil spills result in negative impacts on the environment, economy and society. At present, most clean-up efforts for oil spill on soil and shoreline require mechanical and labour intensive methods as they may be a quick and simple solution to remove oil contaminants. However, there are many disadvantages associated to these methods. For instance, the usage of high pressure washing to displace oil may destroy the microbial populations, dispersants may be harsh to the environment.</p>
<p>Paper 128 13⁰⁰ – 13¹⁵ (5 min discussion)</p>	<p style="text-align: center;">K Dokic^{1*}, L Blaskovic², and D Mandusic²</p> <p style="text-align: center;">¹<i>Polytechnic in Pozega, Vukovarska 17, 34000 Pozega, Croatia, European Union</i> ²<i>Faculty of Agriculture, University of Zagreb, Svetosimunska cesta 25, 10000 Zagreb, Croatia, European Union</i></p> <p>Title of presentation: From machine learning to deep learning in agriculture – the quantitative review of trends Abstract: In the last two decades, we have witnessed the intensive development of artificial intelligence in the field of agriculture. In this period, the transition from the application of simpler machine learning algorithms to the application of deep learning algorithms can be observed. This paper provides a quantitative overview of papers published in the past two decades, thematically related to machine learning, neural networks, and deep learning. Also, a review of the contribution of individual countries was given. The second part of the paper analyses trends in the first half of the current year, with an emphasis on areas of application, selected deep learning methods, input data, crop mentioned in the paper and applied frameworks. Scopus and Web of Science citation databases were used.</p>
<p>Paper 7 13¹⁵ – 13³⁰ (5 min discussion)</p>	<p style="text-align: center;">O J Nazarova¹, and O T Khujaev¹</p> <p style="text-align: center;">¹<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Fungal diseases in pistachio trees caused by cylindrosporium</p>



ICECAE 2020

	<p>concentricum pathogen: A case study of Uzbekistan Abstract: This article discusses the fungal infections of pistachios and the results of the fight against them. On a yearly basis, pistachio diseases have a significant impact on yields. Three drugs were utilized in the research. All of them are drugs recommended for use in agriculture. The drugs were used in the recommended doses and the results were shown. As a result of this research, a large part of the pistachio crop can be preserved. It is also recommended to produce a drug that has shown good results against the disease.</p>
<p>Paper 35 13³⁰ – 13⁴⁵ (5 min discussion)</p>	<p>S Tukhtamishev¹, R Gulmurodov^{2*}, Sh Gulmurodova², and G Sulaymonova² <i>¹Department of Soil science, Gulistan State University, 4th Micro-district, 120100 Gulistan, Uzbekistan</i> <i>²Department of Agricultural Phytopathology, Tashkent State Agrarian University, University str. 2, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Propagation and development of some aerogen diseases that cause damage to the crop in the wheat plant Abstract: Wheat crop losses due to aeronautical diseases have been observed in all countries, especially in the observations carried out in several districts of the Syrdarya region, this situation has also found its proof. In studies conducted on yellow and brown rust and powdery mildew diseases from aerogen diseases, they were studied at what time of season they appeared, spread, development and damage to the crop. Of these diseases, it was found that yellow rust disease spreads rapidly and develops, and also causes great damage to the fruit. Yellow rust disease wheatda spread and the damage is noted to be a lot on the farms of Bayaut district. The arrival of the spring season seryog in 2018 year caused a strong spread and development of wheat diseases, especially yellow rust disease, and there was a significant damage to the grain crop in chemically untreated areas with some fungicides. For this reason, constant control over the phytosanitary condition of grain fields during the growth period requires the use of rapid measures to protect the crop when there is a risk of a strong spread and development of any diseases.</p>
<p>Paper 44 13⁴⁵ – 14⁰⁰ (5 min discussion)</p>	<p>M S Mamiev¹, A A Khakimov^{1*}, M A Zuparov¹, and U N Rakhmonov² <i>¹Department Agrobiotechnology, Tashkent State Agrarian University, 100140 Tashkent, Uzbekistan</i> <i>²Department Plant Pathology, Tashkent State Agrarian University, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Effectiveness of different fungicides in controlling botrytis grey mould of tomato Abstract: Tomato is the most common and widespread vegetable among other vegetable crops in Uzbekistan. It ranks the first place by its planting area and gross yield. Tomato, like other farming crops, is affected by a number of infectious diseases. Among them, grey mould causes considerable damage to the crops. This article contains the data on testing fungicides with active ingredients Difenconazole and Cyprodinil against grey mould disease of tomato in greenhouse condition. In fungicides sprayed variants, the inhibitory effect of fungicides on the development of diseases was considerable, that is, disease development index constituted 3.4-6.4%. When 0.08% concentration of fungicide Difen Super, 55% WP was applied, then development of disease was 3.9% at the first spray; and 4.5% at the second spray; 5% at the third and 5.8% at the forth spray. Among the fungicides, 0.05% concentration of Skor, 250 g/l EC fungicide applied variant performed much less development of grey mould disease compared to other variants, disease development index indicated 3.4-4.7%. According to experiment results, it has been recommended to conduct treatment with Difen Super, 55% WP (0.08%) and Skor, 250 g/l EC (0.05%) fungicides against tomato's grey mould disease three times with 10 days interval.</p>
<p>Paper 45 14⁰⁰ – 14¹⁵</p>	<p>R Gaziyeva¹, E Ozodov^{1*}, E Bozorov¹, and A Nigmatov¹ <i>¹Department of Automation and Control of Technology Process, Tashkent Institute of</i></p>



 **ICECAE 2020**

<p>(5 min discussion)</p>	<p><i>Irrigation and Agricultural Mechanization Engineers, 39 Koriy-Niyoziy, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Effectiveness of different fungicides in controlling botrytis grey mould of tomato</p> <p>Abstract: Tomato is the most common and widespread vegetable among other vegetable crops in Uzbekistan. It ranks the first place by its planting area and gross yield. Tomato, like other farming crops, is affected by a number of infectious diseases. Among them, grey mould causes considerable</p>
<p>Paper 66 14¹⁵ – 14³⁰ (5 min discussion)</p>	<p>F O Egamberdiev¹, K J Jumaniyazov¹, and I Z Abbazov^{1*}</p> <p><i>¹Department of Light Industry Technology, Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan</i></p> <p>Title of presentation: Study of the influence of the guiding device on increasing the efficiency of fiber cleaning</p> <p>Abstract: In this article, the techniques and technologies established in the process of cleaning cotton and fiber are based on the fact that in the republic the cotton harvest is carried out mainly by hand. In order to preserve the natural quality of the cotton harvested in cotton pickers, it is necessary to improve the equipment for cleaning the fibers. The fiber refining process is one of the most important final processes in the cotton processing process, given that the quality of the fiber largely depends on the efficiency of this process. The article analyzes the scientific work on the mechanization of the type of collection and increasing the efficiency of its cleaning. In order to increase the efficiency of machine cotton picking, information is given on the need to improve the equipment for cleaning fibers used in cotton ginning enterprises. The research is based on the need to replace a specially designed device that guides the fiber to the desired tooth of the first saw cylinder located in a dual drum fiber cleaning equipment. It turned out that the new structural device can be installed on the existing equipment for cleaning fibers of JSC "Zarbdor pakhta tozalash" in the Jizzakh region and can produce from 18.2 to 127.4 kg of fiber from cotton of the first and fourth grades. Based on the results of the study, recommendations were given for widespread introduction of cotton into the production of cotton by installing a special guiding device on the equipment for cleaning fibers installed at primary processing enterprises.</p>
<p>Paper 75 14³⁰ – 14⁴⁵ (5 min discussion)</p>	<p>S S Murodova^{1*}, and M K Khujanazarova¹</p> <p><i>¹Department Agrobiotechnology, Tashkent State Agrarian University, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study of enzymatic activity of microbiological biopreparation in the cultivation of cotton plant (<i>Gossypium hirsutum</i> L.) under saline stress conditions</p> <p>Abstract: The changes in enzymic activity of the soils have been studied in the result of inoculation of cotton plants with microbiological preparation "Zamin-M" which was obtained on the base of association of strains <i>Pseudomonas stutzeri</i> SKB-308, <i>Bacillus subtilis</i> SKB- 309 and <i>Bacillus megaterium</i> SKB-310 isolated from the rhizosphere of cotton plant grown in different saline soils. The results of the study showed that when the biopreparation "Zamin-M" was used, the enzymic activity of peroxidase was 1.76 ± 0.32 and in the control 1.5 ± 0.31 (mg purpurgalin/ g soil, 24 hours), as well as the enzymic activity of polyphenol oxidase was 2.1 ± 0.53 and in the control 1.64 ± 0.51 (mg purpurgalin / g soil, 24 h). In the control variants, the activity of the enzyme of catalase relative to 1 g of absolutely dry soil was $1,0 \pm 0,55$ according to the amount of oxygen released in 5 minutes, while using the preparation its increase was observed and made 1.8 ± 0.27 ml O₂. Similar indicators were found in the study of invertase enzymic activity, when the preparation "Zamin-M" was applied, its amount constituted 271 ± 0.55 (mkg / absolutely dry soil), while in the control variant it made 111 ± 0.41 (mkg / absolutely dry soil). Urease enzymic activity was active under 24 ± 0.3 units when the preparation was used and in the control it was noted to be $14 \pm 0,64$ (mkg N/NH₄ / 1 g</p>



 **ICECAE 2020**

	soil) and phosphatase enzymic activity made 74 ± 0.21 and in the control 53 ± 0.32 (mkg P_2O_5/g soil, 24 hr) which led to the activation of biochemical processes in the soil.
Paper 76 $14^{45} - 15^{00}$ (5 min discussion)	<p>N A Ravshanova¹, I Usmonov¹, A Chulliyev¹, B Isroilov¹, D Rahimova¹, Z Usmanova¹, and A Abdumajitov¹</p> <p><i>¹Department of Crop Production, Tashkent State Agrarian University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Growth and development of Mung bean (<i>Vigna radiata</i>(L.)) depending on sowing methods</p> <p>Abstract: The article presents the value of the legume crop - mung bean, as a high-protein, nitrogen-fixing, and also gives the results of research work on the study of the influence of the seeding scheme and rate on the growth, development and yield of mung bean (<i>Vigna radiata</i>(L.)). Research results have shown that sowing methods affect the length of the developmental phases, the formation of leaf area, the net productivity of photosynthesis and the yield of mung bean. As a result of an increase or decrease in the seeding rate and changes in the seeding methods, the productivity of plants decreases, and subsequently the yield.</p>
BREAK 15 p.m. – 16 p.m.	
Paper 83 $16^{00} - 16^{15}$ (5 min discussion)	<p>H Yu Ulugmuradov^{1*}, I Z Abbazov², and R M Muradov³</p> <p><i>¹Department of Natural Fibers and Fabric Processing, Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan</i></p> <p>Title of presentation: Study on improving the efficiency of cleaning the pile drum</p> <p>Abstract: This article provides an analysis of current news about the development of the cotton industry in the country. It is also based on theoretical research and analysis of cleaning processes used in foreign countries, as well as ways to improve the efficiency of cleaning the pile drum, which is the main working body of equipment for cleaning cotton from small impurities. It is based on the need for theoretical calculations of its cleaning surface to increase the cleaning efficiency of fine-grained cleaning equipment. The results of theoretical research on the calculation of useful surfaces of mesh surfaces based on the calculation of the surface of the pile and the mesh located at the bottom, which are currently used in the republic and abroad. The need to develop new structures and their calculations were made to increase the use of mesh surfaces up to 100%.</p>
Paper 84 $16^{15} - 16^{30}$ (5 min discussion)	<p>E T Mukhametshina¹, A Jamolov², and R M Muradov³</p> <p><i>¹Department of Natural Fibers and Fabric Processing, Jizzakh Polytechnic Institute, Jizzakh, Uzbekistan</i></p> <p><i>²Department of Technology of Cultivation and Processing of Agricultural Products, Namangan Institute of Engineering and Technology, Namangan, Uzbekistan</i></p> <p><i>³Department of Technology of Primary Processing of Natural Fibers, Namangan Institute of Engineering and Technology, Namangan, Uzbekistan</i></p> <p>Title of presentation: Study on possibilities of scarring ways to reduce in the cotton cleaning process</p> <p>Abstract: This article provides a diagram of the technological process of cotton primary processing plants. It also shows which of the machines installed in the technological process can damage the seed, as well as the operation of the machine and the main working bodies, which separate the fine contaminants in the cotton. It is theoretically based on the fact that cotton ginning machines can reduce the impact force by improving the design of the working bodies. A device that has been proposed allows cotton to be cleaned from fine contaminants using a vibrating mesh surface without affecting its natural properties. In order to improve the technology of cleaning cotton from fine contaminants, an effective scheme of pile drum and mesh surface construction has been developed. With the help of a sloping mesh surface device, the existing impurities in the cotton were reduced by 0.2%. The graph of the formation of various defects in the fiber</p>



ICECAE 2020

<p>Paper 201 16³⁰ – 16⁴⁵ (5 min discussion)</p>	<p>content as a result of seed damage during cotton cleaning is given, pile drum, which</p> <p>D C Pari-Huaquisto¹, R Alfaro-Alejo^{1*}, I Pilaes-Hualpa^{1,2} and G Belizario¹</p> <p>¹<i>Faculty of Agricultural Engineering, National University of Altiplano, Av. Floral N° 1153. C.P. 21001. Puno, Peru.</i></p> <p>²<i>Professional School of Civil Engineering, Andean University Nestor Caceres Velasquez, Ciudad Universitaria Km 4.5. C.P. 21100. Juliaca, Peru</i></p> <p>Title of presentation: Seasonal variation of heavy metals in surface water of the Ananea river contaminated by artisanal mining, Peru</p> <p>Abstract: The objective of this research work is to evaluate the effects of mining tailings leak on the water quality of the Ananea river, which contain heavy metals. For which techniques such as taking surface water samples were applied at five strategic points, programming two sampling campaigns; one in the rainy season (March) and the other in the dry season (June). Heavy metal concentrations were determined by the EPA METHOD 200.7 Atomic Emission Spectrometry method; The results show that the highest concentrations were recorded at the M-1 sampling point for both the dry season and the rainy season. These concentrations are well above the peruvian Environmental Quality Standards (WQS) for water. In the same way, point M-1 was identified as the most critical and vulnerable to contamination in the study area by heavy metals that are above WQS. Likewise, the survey technique was applied, for which a question sheet was prepared for the surrounding population according to the activities carried out in this part of the basin, obtaining data to determine the effects caused by mining pollution on the surrounding life. In conclusion, the quality of the waters of the Ananea River are contaminated by the presence of heavy metals and these have been causing negative effects to all the surrounding life found in the study area.</p>
<p>Paper 197 16⁴⁵ – 17⁰⁰ (5 min discussion)</p>	<p>E I Ugwu^{1*}, O Tursunov^{2,3,4}, D Kodirov², L M Shaker⁵, A A Al-Amiery⁵, I Yangibaeva⁴ and F Shavkarov⁶</p> <p>¹<i>Department of Civil Engineering, College of Engineering and Engineering Technology, Michael Okpara University of Agriculture Umudike, P.M.B.7267 Umuahia Abia state, Nigeria</i></p> <p>²<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>³<i>School of Mechanical Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>⁴<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁵<i>Department of Applied Science, University of Technology, 10001 Baghdad, Iraq</i></p> <p>⁶<i>Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Adsorption mechanisms for heavy metal removal using low cost adsorbents: A review</p> <p>Abstract: A review of adsorption mechanisms for heavy metal removal using low cost adsorbents has been carried out in this article. Some metal ion sequestration techniques used over the years have some demerits, ranging from generation of sludge to high operational cost. Adsorption process using low cost adsorbents has been found cost effective and environmentally nuisance-free. In this review, various low cost adsorbents for heavy metal sequestration have been studied. The application of some adsorption models such as single and multi-component isotherms, adsorption thermodynamics, and kinetics as well as the effect of process parameters on heavy metal sequestration using low cost adsorbents has also been reviewed so as to better understand the adsorption process. From the literature reviewed, the percentage removal of chromium, copper and zinc was favoured by an increase in contact time, temperature, initial concentration, adsorbent dosage as well as a decrease in pH.</p>
<p>Paper 208</p>	<p>H A Shouket^{1*}, I Ameen¹, O Tursunov^{2,3,4}, Kh Kholikova⁵, O Pirimov⁶, N</p>



ICECAE 2020

<p>17⁰⁰ – 17¹⁵ (5 min discussion)</p>	<p style="text-align: center;">Kurbonov⁵ and I Ibragimov⁵</p> <p>¹<i>Department of pathology, Amin Welfare and Teaching Hospital Sialkot, Sialkot, Pakistan</i></p> <p>²<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000, 39 Kari Niyazov, Tashkent, Uzbekistan</i></p> <p>³<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>⁴<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁵<i>Karshi Engineering Economic Institute, 180100 Karshi, Uzbekistan</i></p> <p>⁶<i>Karshi branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 180100 Karshi, Uzbekistan</i></p> <p>Title of presentation: Study on industrial applications of papain: A succinct review Abstract: Papain is an enzyme having proteolytic function with cysteine protease activity obtain from papaya having green color and is acquired from latex. It is classified in superfamily. Papain has function essential of proteolysis widely for peptides of amino acid in all living beings. Present review shed light on general properties, structuring features and biological importance of papain, especially its industrial applications for different purposes, which includes food, Pharmaceuticals, Breweries, leather, meat, detergent and other fields, with the help of technological advancement; it is now used to treat lethal diseases and additionally scientist's are taking benefit of it for drug designing so there are high demands for its export. Papain uncommon properties have been making it more appreciable commercially. Papaya is present or grows in all tropical areas as there are no seasonal limitations for its growth and papain is resistant over wide range of Ph and temperature, so it has high demand for export and there is good prospect of papain marketing. Farmers at lower levels could use this enzyme as high source of income. Through recombinant DNA technology, engineering of proteins and procedures of immobilization papain could be ideal for biotechnological and industrial applications. Researchers could explore more potent applications by understanding detail mechanism and functions of papain. Then there will be novel papain function that would fulfill the massive need for betterment of life.</p>
<p>Paper 143 17¹⁵ – 17³⁰ (5 min discussion)</p>	<p style="text-align: center;">A J Bairov^{1*}, Kh T Nuriddinova¹ and Sh A Juraev¹</p> <p>¹<i>Research Institute of Soil Science and Agrochemistry, 100179 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Nitrogen fund of the Chyrchik river basin's dark serozems and its fractive structure Abstract: In this article, the information on the high-grade exposition of the amounts of mineral, easily goulizable, difficult goulizable and non-goulizable compounds of the dark serozems of the Chirchik River Basin of the Tashkent region, as well as changes in the effect of their use in viticulture is presented. These data serve to develop ways of effective and rational management of the Nitrogen Fund of the soils studied.</p>
<p>Paper 141 17³⁰ – 17⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">N Martinova¹, K Shavazov², N Telovov¹, S Toigambayev¹, and Sh Yusupov²</p> <p>¹<i>Russian State Agricultural University - MSHA named after K.A. Timiryazev, 127550, Russian Federation, Moscow</i></p> <p>²<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Machine for carrying works on deep loosening of soil with the simultaneous application of liquid organic fertilizers. Abstract: The situation in the country is analyzed, the amount of fallow lands withdrawn from agricultural use during the period of reforms is estimated. The necessity of carrying out work on deep loosening of mineral soils of III-IV groups of heavy mechanical action to increase water permeability, in order to drain excess surface water into the underlying soil layers, has been substantiated. The ways of achieving a high-</p>



 **ICECAE 2020**

	<p>quality fine crumbly soil structure to achieve an optimal water-air balance for the subsequent development of plants have been investigated. The efforts of reclamation rippers are considered and a two-row deep-ripping type with front shanks of a volumetric structure and rear curved shanks with additional plowshares is selected. The possibility of simultaneous operations on deep loosening of the soil with the introduction of liquid fertilizers has been substantiated. This will increase the fertility of the soil and qualitatively change its composition. The rates of application of liquid fertilizers to the soil have been investigated and a modified design of the machine for the delivery of organo-containing liquid to an enlarged pore space has been proposed. The resistance of soil development was estimated, the traction and grip qualities of the machine were checked and the possibility of installing additional equipment for applying fertilizers to the root-inhabited vegetation layer was revealed. The movement of an organic fluid in the pore representation is considered, the possibility of creating a homogeneous soil structure and uniform distribution of fluid, organic matter, in the root zone of plants is analyzed. The influence of the ongoing reclamation measures on increasing soil fertility, creating an optimal water and air balance for the growth and development of cultural and expected increase in yield is analyzed.</p>
<p>Paper 193 17⁴⁵ – 18⁰⁰ (5 min discussion)</p>	<p>Sh Ubaydullayev¹, N Shamsutdinov², L Yoziyev³, A Kurbanov³, Sh.Yuldashev⁴ and M Hakimova⁵</p> <p>¹<i>Karshi branch of the Tashkent Institute of Irrigation and Agriculture Mechanization Engineers, 19 Khanabadskoye shosse, 180119 Karshi, Uzbekistan</i></p> <p>²<i>All-Russia Research Institute of Hydraulic Engineering and Land Reclamation of A. N. Kostyakov, 44 Bolshaya Acakademicheskaya, 127550 Moskow, Russia</i></p> <p>³<i>Karshi State University, 17 Kuchabag, 180100 Karshi, Uzbekistan</i></p> <p>⁴<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁵<i>Karshi Engineering-Economics Institute, 225 Mustakillik, 180100 Karshi, Uzbekistan</i></p> <p>Title of presentation: The influence of different aged Black Saxaul plants on distribution, growth and accumulation of aboveground phytomass of Poa Bulboza L.</p> <p>Abstract: The purpose of this study was to determine the nature and degree of influence of different-aged plants of Black Saxaul on Bulbous Bluegrass - one of the dominant species of sagebrush-ephemeral pastures. The study was conducted using phytometer method in the conditions of the desert zone of Uzbekistan on the ephemeroïd-wormwood-black saxaul phytocenosis, formed as a result of self-seeding on inter-band spaces of pasture-protective Black Saxaul plantations. It is established that the character of the phytogenic influence of Saxaul on Bluegrass can be characterized as ambiguous conjugacy: in the minimal phytogenic field, the character of this influence is negative and therefore is gradually replaced, as a result of which the number of this species-phytometer significantly decreases, there are zones where bluegrass is absent. Growing specimens are stunted and poorly developed, so they accumulate insignificant aboveground phytomass. The character of the influence of Saxaul in the outer part of the phytogenic field on bluegrass was positive. Therefore, it is numerous here, grows better and accumulates 1,5-3 times more aboveground phytomass than outside the phytogenic field (control). Within the phytogenic field of Black Saxaul for Bluegrass Bulbous most “environmentally comfortable place” is the border of the internal and external parts of this field. In this part of the phytogenic field, due to its ecological and biological properties, the number of phytometer species reaches the highest value; they grow rapidly and accumulate the largest aboveground phytomass. The degree of influence depends on the age status of the Black Saxaul. The highest degree of influence on the abundance, growth and formation of over ground phytomass of Bluegrass Bulbous is observed in the phytogenic field of middle-aged species-edificators: the minimum field increases and reaches its maximum in the area where Bluegrass Bulbous is completely displaced, and on the border of internal and external parts and in the outer part opposed</p>



 **ICECAE 2020**

	<p>to a phytogenic one field due to the positive influence of species-edificators of the number of phytometra increases sharply, the values of the linear growth of shoots and accumulation of aboveground biomass reach the highest values. The smallest phytogenic effect of the edifier species on the phytometer species is observed in the phytogenic field of virginal plants of the black saxaul. The phytogenic effect on bluegrass is distributed in virginal individuals of the active species outside the crown at a distance of 90 cm, in young generative - by 120 cm and in middle-aged generative - by 150 cm and even 180 cm. When further removed, the distribution, growth and formation of aboveground phytomass of the phytometer species does not depend on the edifier species.</p>
<p>Paper 194 18⁰⁰ – 18¹⁵ (5 min discussion)</p>	<p>Z Shamsutdinov¹, Sh Ubaydullaev², N Shamsutdinov³, B Mirzaev⁴, F Mamatov^{4,5} and N Chorshabiyev⁵</p> <p>¹All-Russian Research Institute of Feed named after V.R. Williams, 141055 Lobnya, Russia</p> <p>²Karshi branch of the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 19 Khanabad highway, 100119 Karshi, Uzbekistan</p> <p>³All-Russian Scientific Research Institute of Hydraulic Engineering and Land Reclamation named after A. N. Kostyakov, 44 B. Akademicheskaya st., 127550 Moscow, Russia</p> <p>⁴Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</p> <p>⁵Karshi Engineering and Economic Institute, 225 Mustaqillik, 180100 Karshi, Uzbekistan</p> <p>Title of presentation: The concept of the phytogenic field: theory, research experience and practical significance</p> <p>Abstract: The aim of this study was to analyze the theoretical foundations of the concept of the phytogenic field, to show the fruitfulness and practical feasibility of studying the phytogenic field of plants, especially edificatory species, using the example of studies carried out in various ecological and phytocenotic conditions and to determine the effect of uneven-aged black saxaul plants on wormwood-ephemeral vegetation by studying phytogenic field of this edificator species. The phytogenic field of black saxaul was studied by the phytometer method in the Karnabchul desert. It was found that the phytogenic effect of the edificator on the wormwood-ephemeral vegetation is observed at a distance of 90-150 cm outside the crown, depending on the age state of black saxaul. The average crown radius of black saxaul in the studied phytocenosis is 115 cm, and the average radius of its phytogenic field is 235 cm. To create a continuous integral phytogenic field in the entire phytocenosis, 434 black saxaul individuals per 1 ha are required evenly.</p>
<p>Paper 188 18¹⁵ – 18³⁰ (5 min discussion)</p>	<p>KD Astanakulov¹, Sh Gapparov^{1*}, F Karshiev¹, A Maksumxonova¹, and D Khudaynazarov²</p> <p>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, K.Niyazi str. 39, Tashkent, Uzbekistan</p> <p>²Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</p> <p>Title of presentation: Study on preparation and distribution of forage by chopping coarse fodder</p> <p>Abstract: Livestock farming is one of the very important agricultural branches in Uzbekistan. In present days there are a lot of small livestock farms. In cattle farming for increasing productivity it depends on feeding well with different types of fodder of the livestock animals. For this reason, it is necessary for these farms to develop a small chopping machine and distributor device for individual use. According to construction of available fodder-choppers and physical-mechanical properties of the rough fodder, technological schemes of the small scaled chopper-mixer and distributor device were developed. During the experiments the chopping apparatus of the fodder chopper device</p>



ICECAE 2020

	<p>was researched. When rotation frequency of the rotor was 1000 rpm qualitative chopping of the coarse fodder was determined when diameter of the rotor was 450-500 mm and the number of the knives on the rotor was 24-30 pieces. Next task is making experimental variant of the small scaled fodder distributing device as well testing of performing capability its defined technological process and determination its optimal parameters.</p>
<p>Paper 168 18³⁰ – 18⁴⁵ (5 min discussion)</p>	<p>A Rau¹, I Begmatov^{2*}, Zh Kadasheva³ and G Rau³</p> <p>¹<i>Department of Hydraulic Engineering and Melioration, Kazakh National Agrarian University, Almaty 050000, Republic of Kazakhstan</i></p> <p>²<i>Department of Irrigation and Melioration, Tashkent Institute of Engineers of Irrigation and Agricultural Mechanization, 100000 Tshkent, Uzbekistan</i></p> <p>³<i>Kazakh National Agrarian University, Almaty 050000, Republic of Kazakhstan</i></p> <p>Title of presentation: Water resources management in rice irrigation systems and improvement of ecological situation in rice growing river basins</p> <p>Abstract: Water resources management in the rice irrigation systems in Kazakhstan as well as water conservation and its efficient use are associated with technological processes control factors such as irrigation efficiency, layout of rice bays and their terracing. Managing technological processes in rice systems is complex, since there are significant deviations in the technological parameters of rice systems from the optimal. Therefore, in order to properly manage these processes, it is necessary to know the impact, its direction, assess the results of these impacts and develop an appropriate scientific and information base. The paper considers the impact of rice bays layout quality and terrace on the water-salt regime of soils, rice productivity and irrigation rate. Also, it proposes improvements to parameters of rice systems, water conservation, environmental situation in areas of rice cultivation and water resources management in rice systems.</p>
<p>Paper 129 18⁴⁵ – 19⁰⁰ (5 min discussion)</p>	<p>E Uljayev^{1*}, Sh T Ravutov², and U M Ubaydullayev¹</p> <p>¹<i>Department of Information Processing and Management Systems, Faculty of Electronics and Automation, Tashkent State Technical University named after Islam Karimov, University str. - 2, Almazar district, 100095Tashkent, Uzbekistan</i></p> <p>²<i>Department of Overhead transport systems, Faculty of Machine Construction, Tashkent State Technical University named after Islam Karimov, 2 str. University, Almazar district, 100095 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Remote control device to control the contact uniformity of the brush strippers on the spindle's surface of the cotton picking apparatus</p> <p>Abstract: In this paper, the question of implementation remote control of contact uniformity of brush strippers on a spindles surface of the harvest device of the mechanical cotton picker is considered. A brief analysis of known works is carried out and the urgency of the development of a specialized remote control system for the rotation speed of brush strippers and the uniformity of touching the brush strips on the surface of the spindles is substantiated. As a sensing element, it is proposed to use a strain gauge that changes its ohmic resistance when the stripper brush touches the spindle surface. A wireless GSM communication unit is used for remote transmission and reception of information.</p>
<p>Paper 158 19⁰⁰ – 19¹⁵ (5 min discussion)</p>	<p>R A Kulmatov^{1*}, S A Adilov¹, and S Khasanov^{2,3}</p> <p>¹<i>Department of Applied Ecology, National University of Uzbekistan, University str. 4, Tashkent, Uzbekistan, 100174</i></p> <p>²<i>EcoGIS Center, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kary Niyazi str. 39, Tashkent, Uzbekistan, 100000</i></p> <p>³<i>Department of Education Quality Control, Tashkent State Agrarian University, University str. 2, Tashkent province, Uzbekistan, 100140</i></p>



ICECAE 2020

	<p>Title of presentation: Evaluation of the spatial and temporal changes in groundwater level and mineralization in agricultural lands under climate change in the Syrdarya province, Uzbekistan</p> <p>Abstract: Salinization processes are taking place as a result of rising groundwater level and its mineralization rate due to inefficient and unsustainable use of water and land resources in Uzbekistan. This leads to a reduction of arable land productivity and a decrease in nationwide yield production. Especially, salinization is the case in the plain irrigated areas of Uzbekistan where the groundwater is closer to the surface. Salinization processes occur as a result of an increase in the level of groundwater and the degree of their mineralization due to inefficient and irrational use of water and land resources in Uzbekistan. This leads to a decrease in the productivity of irrigated land and a decrease in yields throughout the country. Principally, salinization takes place in irrigated plain areas like the Syrdarya province, where mineralized groundwater is closer to the surface. Considering the geo-location of Uzbekistan as an aridic zone, there is a massive stress on groundwater because of surface water shortage. Since the estimation of the salinization consequences on groundwater is critical, this research, therefore, was aimed to understand and evaluate the long-term changing behavior of groundwater level and its mineralization in the irrigated areas of the Syrdarya province of Uzbekistan from 2000 to 2015 by using traditional methods, and GIS-based methods for from 2016 to 2019. The level and mineralization of groundwater in each administrative district of the province were for the first time studied and assessed. Consequently, the dependence of the groundwater level and its mineralization on soil conditions and climatic factors were determined. Based on the results of the study, agricultural specialists and farmers of the province were highly advocated to take the following measures considering the actual condition of groundwater mineralization in the irrigated areas of the Syrdarya province: (1) targeted and economical use of irrigation water; (2) ensuring that existing drainage networks are in an adequate working condition and can operate with full-efficiency; and (3) to conduct annual monitoring of groundwater table and its mineralization of irrigated lands using traditional and GIS technologies.</p>
<p>Paper 184 19¹⁵ – 19³⁰ (5 min discussion)</p>	<p style="text-align: center;">A Tukhtakuziev¹, A R Rasuljonov^{1*} and AR Rasuljonov²</p> <p style="text-align: center;">¹<i>Scientific-Research Institute of Agricultural Mechanization, Samarkand str. 41, Yangiyul dis., Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, K.Niyazi str. 39, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Ensuring the stability of the processing depth of suspended soil mounted machines</p> <p>Abstract: The article presents the results of research conducted to ensure the stability of the depth of processing of suspended soil processing machines with a base wheel on the example of a mounted plow and a chisel-cultivator. It is noted that for the operation of the suspended soil processing machines with a base wheel to sink to the specified depth, and for a stable (uniform) walk at this depth, their base wheels must be continuously pressed against the field surface. This should be provided for the calculation of changing the steep distances from the base plane to the increase in the steep distances from the base planes of the mounted plow and chisel-cultivator to the bottom hanging points in the experimental studies conducted on the vacant areas of the experimental farm of the institute. This has led to an increase in the processing depth and a decrease in its average square deviation. According to the results obtained from the where, the base wheels of the mounted plow and chisel-cultivator should be pressed against the field surface. Hence, the steep distance from the base plane to the bottom hanging points should be between 78-83 and 63-68 cm respectively to work at the specified depth and to move.</p>
<p>Paper 205 19³⁰ – 19⁴⁵ (5 min discussion)</p>	<p style="text-align: center;">F Mamatov^{1,3}, B Mirzaev^{2*}, O Tursunov², S Ochilov³ and D Chorieva³</p> <p style="text-align: center;">¹<i>Karshi Engineering Economic Institute, 180100 Karshi, Uzbekistan</i></p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

	<p>²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</p> <p>³Karshi branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 180100 Karshi, Uzbekistan</p> <p>Title of presentation: Relief, physico-mechanical and technological properties of soil in the cotton milling area</p> <p>Abstract: The aim of the study is to study and analyze the physical, mechanical and technological properties of the soil of the cotton growing zone. The results of determining the relief of cotton fields, physical, mechanical and technological properties of takyr soils and gray soils, and the most common in areas of cotton cultivation are presented. It was found that before plowing, cotton fields have a pronounced uneven relief, characterized by the presence of ridges and irrigation furrows. The average height of the ridges in fields with row spacing of 90 and 60 cm is 17.1 and 12.8 cm, respectively. The physical-mechanical and technological properties of the soil of the arable and sub-arable layer of a cotton field along the track of wheels differ significantly from the soil between rows without a track of wheels and a ridge: the density of the soil along the track of the wheels of light gray soils reaches 1.78 g/cm³, and of takyr soils - 1.51 g/cm³, which is respectively more than the density of the ridge soil by 0.24 and 0.16 g/cm³; the resistance of light gray soils to shear is 1.4 and 1.2 times greater than to rupture and torsion, and takyr soils - 1.33 and 1.15 times, respectively; density, hardness and resistance of the soil to various deformations has a maximum value in layers of 15-25 cm along the track of the tractor wheels.</p>
<p>Paper 206 19⁴⁵ – 20⁰⁰ (5 min discussion)</p>	<p>M I Annaeva¹, F N Toreev^{1*}, M M Yakubov¹, B D Allashov², N Mavlonova¹ and S Tursoatov¹</p> <p>¹Tashkent State Agrarian University, Tashkent, Uzbekistan</p> <p>²Research Institute of Cattle Breeding and Poultry, Kibray district, Tashkent, Uzbekistan</p> <p>Title of presentation: Agrotechnology of Melilotus albus cultivation in saline area</p> <p>Abstract: In order to organize a profitable agrotechnology for the cultivation of Melilotus albus in saline area, Melilotus albus's Kibray variety and Tashkent-1 variety of common alfalfa seeds for comparative study in different versions were studied by sowing in 4 versions, different sowing norms. For each version, valuable farm traits during the vegetation, especially blue mass yield and hay yield were analyzed. Just like that, to each version economical effective ness was studied. In saline areas has been identified an effective version of the sowing norm Melilotus albus.</p>
<p>Closing Speech: Prof. Jan W Dobrowolski, Assoc. Prof. Sakine Ugurlu Karaagac, and Dr. Emmanuel Ugwu</p> <p>END of SESSION –CIVIL ENGINEERING</p>	

CLOSING CEREMONY:

Announcement of Best Presentations and Best Papers

Closing Speeches: Rector of TIAME - Prof. Dr. Uktam Umurzakov, and Professor of TIAME – Prof. Dr. Obid Tursunov

END OF CONFERENCE ICECAE 2020



 **ICECAE 2020**

ICECAE 2020 POSTER PRESENTATIONS

All posters are displayed on the ICECAE 2020 website

ENERGETICS	
Paper ID 19	<p style="text-align: center;">A Isakov¹, B Tukhtamishev¹, and R Choriev¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Method for calculating and evaluating the total energy capacity of cotton fiber</p> <p>Abstract: This paper discusses the need to save material and fuel and energy resources, requires a new approach to their accounting, qualitative and quantitative assessment, and, in particular, to their use. The correctness of planning and forecasting the levels of mining, production and distribution of resources, and, as a consequence, the clear functioning of industrial and household consumers, depends on this. As the first stage of the calculation, an analysis of energy consumption was performed for the following groups of their consumption: field work; production of mineral fertilizers used in cotton growing; water supply for cotton fields (pumping stations, vertical drains); preparation points and cotton processing enterprises. According to consumption groups, energy capacity is: field work 41%, mineral fertilizers 14% and irrigation 45%. The analysis of the obtained results shows that cotton production occupies a rather large place in the total energy consumption in the republic and its savings at each stage of agricultural work and in industrial processing can give significant results in increasing the efficiency of saving the country's fuel and energy resources.</p>
Paper ID 22	<p style="text-align: center;">D Kodirov^{1*}, Kh Muratov^{1,2}, O Tursunov^{1,3,4}, E I Ugwu⁵, and A Durmanov¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>²“Uzbekenergo” JSC Scientific and Technical Center LLC, 100076 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>³Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>⁴School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p style="text-align: center;"><i>⁵Department of Civil Engineering, College of Engineering and Engineering, Technology, Michael Okpara University of Agriculture, Umudike, Nigeria</i></p> <p>Title of presentation: The use of renewable energy sources in integrated energy supply systems for agriculture</p> <p>Abstract: In many sectors of the industry, for example in agriculture, many countries find alternative sources of energy as an acceptable and feasible choice, given the high energy requirements on the one hand and the negative environmental effect of fossil fuels, on the other. Sustainable agriculture is a delicate equilibrium to increase crop production and preserve economic stability while reducing the use of scarce natural resources and the negative effects of the environment. The use of renewable energy systems for sustainable agriculture, therefore, needs to be promoted. This paper is a state of art on the numerous update and feasible technologies of renewable energy applications in the agricultural sectors. It also discusses the significance of renewable energy as environmentally clean technologies and the most reliable energy source. This study covers different types of renewable energy sources like solar systems, biomass energy, and hydropower. Such forms of renewables have been proven to be suitable options in agriculture, and in particular for remote rural areas.</p>



 **ICECAE 2020**

<p>Paper ID 26</p>	<p>Sh M Muzafarov¹, V E Balitskiy¹, B K Toqae¹, L A Batirova¹, and A Isakov² <i>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>²Faculty of Energy Supply of Agriculture and Water Resources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: The research results of cleaning air stream process from aerosol particles in electric fields of corona discharge stream form</p> <p>Abstract: In article the method and results of experimental researches of electrode scheme parameters is given “Potential plane with corona’s needles – landed plane (earthed)”. The parameters of electrode scheme is determined for distance between electrodes which equal for 0,05 m, 0,1m and 0,15v determined on the basis of these researches the electrode scheme parameters is checked on the basis of experimental researches, process of catching dust particles from air stream. Method and the results of these researches the best correlation of electrode scheme parameters in the best degree of cleaning air is determined. Difference of distance between needles in line, which situated perpendicularly to stream of cleaning air, and between needle’s lines is defined.</p>
<p>Paper ID 27</p>	<p>N Toshpulatov¹ <i>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Theoretical basis for the movement of a pulsed current discharge through a plant organism</p> <p>Abstract: The article presents the current state of the problem of contamination of cultivated areas with weeds. A tribute to the analysis of scientific and technical information on weed control, their advantages and disadvantages are described. Theoretically substantiated processes are the destructive effects of electric discharges of current on plant tissue.</p>
<p>Paper ID 38</p>	<p>A Isakov¹, A Rakhmatov¹, and Z Ismailova¹ <i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study the effect of the design of discharge electrodes on the characteristics of the corona discharge</p> <p>Abstract: The article discusses the development of electric ionizers for fruit storage. Based on the technological requirements, the design parameters of the electric ionizer were determined, the current source and operating modes were analyzed and appropriate conclusions and solutions were developed. Optimal quantities of basic geometric sizes specific to needle electrodes are recommended.</p>
<p>Paper ID 57</p>	<p>A Muhammadiev¹, R Yunusov^{1*}, T Bayzakov¹, N Sattarov¹, Sh Yusupov¹, U Xaliqnazarov¹, and M Sattarov¹ <i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Liner motor drive of cattle farm feeders</p> <p>Abstract: This article discusses feed distribution control using a linear electric drive for small cattle farms. Electrification feeders are difficult complex units which in addition to the dispenser, they are equipped with working bodies that perform various technological functions. Given the above, we can conclude that this type of farm use a lot electro energy to low this effect we need use automation systems to electro mechanic units. In this article given results of experimental work in using of liner motor drives in cattle farms and mathematic explanation of electro safety according to proposed technology.</p>
<p>Paper ID 60</p>	<p>A Isakov¹, A Mirzabaev^{1,2}, O Sitdikov³, M Makhkamova³, and D Kodirov¹ <i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan</i></p>



 **ICECAE 2020**

	<p>²<i>International Solar Energy Institute ISEI, Tashkent, Uzbekistan</i> ³<i>“Mirsolar” LLC, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Innovative methods of developing solar power systems for remote and agricultural facilities in Uzbekistan Abstract: This paper presents innovative methods and techniques for the development of small solar power systems in Uzbekistan, based on the properties of patterning and prosumerism, adoption of which would increase the efficiency of power supply. It also provides examples and results of their application in solar systems for remote and agricultural power supply developed by MIR SOLAR LLC, as well as the experience of teaching these innovations to students of Uzbek universities (Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent State Technical University, and others).</p>
<p>Paper ID 62</p>	<p>A Anarbaev^{1*}, R Zakhidov¹, O Tursunov^{1,2,3}, D Kodirov¹, U Vakhidov¹, U Khaliknazarov¹, Z Yusupov⁴, and A Kushev⁵</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000, 39 Kari Niyazov, Tashkent, Uzbekistan</i> ²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i> ³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i> ⁴<i>Department of Electrical-Electronics Engineering, Faculty of Engineering, Karabuk University, 78050 Karabuk, Turkey</i> ⁵<i>JSC Uzbekenergo, Scientific Technical Center, Tashkent, 100143, Uzbekistan Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Using of evaporative cooling systems in poultry farms Abstract: This article is devoted to the development of promising low-power evaporative cooling systems in poultry farms. At the same time, the placement of elements of the system in determining the temperature, humidity and gas composition of the air in such indoor areas is determined by the parameters at which the most favorable conditions for the life of their bodies and their high productivity are created. The promising method of intensifying the process of heat and mass transfer between gaseous and liquid is considered. The article presents the structural and thermodynamic parameters of the developed evaporative cooler air. Create a layout of the plant shown efficiency and effectiveness of the cooling air. Preliminary methods of calculation thermodynamic parameters of this installation are presented for the conditions of the Republic of Uzbekistan and are more effective with comparison in widely used at present time I-d diagram.</p>
<p>Paper ID 68</p>	<p>A Mirzabaev^{1,2}, A J Isakov^{1*}, Sh Mirzabekov³, T Makhkamov⁴, and D Kodirov¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan</i> ²<i>International Solar Energy Institute ISEI, Tashkent, Uzbekistan</i> ³<i>Tashkent State Technical University, Tashkent, Uzbekistan</i> ⁴<i>“Mirsolar” LLC, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Problems of integration of the photovoltaic power stations with the grid systems Abstract: The analysis of the factors of renewable energy sources (mainly solar ones) integration with the central grid was conducted in the paper. Various problems arising during integration, solved in Uzbekistan through the development and adoption of a modern legislative and regulatory framework were described. Various aspects of solving the problem were considered, including research work intensification in this direction.</p>
<p>Paper ID 69</p>	<p>R F Yunusov^{1*}, T M Bayzakov¹, N E Sattarov¹, U A Xaliqnazarov¹, O A Nazarov¹, and D U Diniqulov¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p>



 **ICECAE 2020**

	<p>Title of presentation: Linear electric actuator of a sectional plane shut-off of hydrotechnical structures</p> <p>Abstract: The sectional design of a flat shutter with an electric drive has lower energy characteristics and improved operational and technological indicators compared to the existing ones for hydraulic structures and channels. The use of linear asynchronous electric motors in linear electric drives allows to simplify the design and reduce material consumption. Modeling of linear induction motors with various designs of the secondary element is carried out on the basis of detailed equivalent circuits for electric and magnetic circuits. Coating a massive or serrated secondary element with a layer of non-magnetic material can increase the traction performance of a linear motor. Comparison of the results of numerical modeling and physical experiments of linear induction motors with various secondary element designs for a sectional flat shutter is the most effective shielded ferromagnetic secondary element.</p>
<p>Paper ID 71</p>	<p align="center">M Ibragimov¹, N Eshpulatov¹, and O Matchanov¹</p> <p align="center"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy str., Tashkent 100000, Uzbekistan</i></p> <p>Title of presentation: Substantiation of the optimal parameters by processing with electric contact methods to decrease the moisture content of technical seeds</p> <p>Abstract: To reduce moisture content of technical seeds in compliance with standard requirements, electric contact heating method is applied. The technical seed moisture content reduction process has been studied experimentally through electric contact processing. The mathematic model of the process has been defined. The optimal parameters of the process have been identified based on the mathematic model. To identify the optimal parameters of the technical seed moisture content reduction process the computer program, calculation algorithm has been developed by using computer program PascalABC.</p>
<p>Paper ID 82</p>	<p align="center">M Ibragimov¹, A Rakhmatov¹, and I Tadjibekova²</p> <p align="center"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kari Niyazov, 100000 Tashkent, Uzbekistan</i></p> <p align="center"><i>²Tashkent State Agrarian University, Universitetskaya 2, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Electrotechnological approach for effective storage of fruits and vegetables in farms</p> <p>Abstract: It is proposed to use the ozonation method in vegetable and fruit storage facilities of farms that are not equipped with refrigerators. Ozone is a strong disinfecting agent against putrefactive microorganisms. The results of the treatment of apples and carrots with various doses of ozone are given. The effectiveness of this processing method has been verified.</p>
<p>Paper ID 85</p>	<p align="center">Sh M Muzafarov¹, L A Batirova¹, A G Babaev¹, O G Kilichov¹, and V E Balitskiy¹</p> <p align="center"><i>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Analysis of processes in the supply chain of ozone generator by sinusoidal and pulse voltage</p> <p>Abstract: Based on an analysis of the processes in the supply circuit of ozone generators with periodic sinusoidal and pulsed voltages of high duty cycle, it is revealed that when powered by a sinusoidal voltage, a significant part of the energy consumed is spent on heat loss. Only in a small part of the sinusoidal voltage, namely in the zone of reaching the amplitude value, a barrier discharge occurs with the generation of ozone. Therefore, the efficiency ozone generators at sinusoidal voltage do not exceed 2%. When powered by a pulsed voltage, ozone generation occurs almost during the application of the entire voltage pulse; in addition, ozone generation also occurs in the pause between pulses, due to oscillatory processes in the pause between pulses. In addition to a significant increase in ozone yield, there is practically no process of heating the dielectric barrier.</p>



ICECAE 2020

<p>Paper ID 100</p>	<p>N Toshpulatov¹, O Tursunov^{1,2,3}, D Kodirov¹, A Maksumkhanova⁴, and Z Yusupov⁵</p> <p>¹<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁴<i>Department of Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁵<i>Department of Electrical-Electronics Engineering, Faculty of Engineering, Karabuk University, 78050 Karabuk, Turkey</i></p> <p>Title of presentation: Study on issues of uninterrupted power supply, energy-saving and improving the quality of electrical energy of water facilities</p> <p>Abstract: This paper analyses the results of studies of uninterrupted power supply, energy saving issues, problems of improving the quality of electrical energy of irrigation pumping stations and electrical consumers of water facilities. The current state of the power supply system is described, and the analysis of the existing situation is carried out. On the basis of comparison of theoretical calculations and practical measurements of the consumption of electrical energy, discrepancies in the results were determined. A solution was found to the problem of reducing the actual consumption in relation to the calculated ones. Recommendations are given for ensuring uninterrupted power supply, solving the issues of increasing the energy efficiency of the equipment in operation for energy conservation and saving electrical energy by improving quality indicators.</p>
<p>Paper ID 103</p>	<p>A Anarbaev¹, O Tursunov^{1,2,3*}, R Zakhidov¹, D Kodirov¹, U Vakhidov¹, E Bozorov⁴, G Tuhtaeva⁵, and A Babaev¹</p> <p>¹<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁴<i>Department of Automation and Control of Technology Process, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁵<i>Department of Hydrology and Ecology, Bukhara branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Bukhara, Uzbekistan</i></p> <p>Title of presentation: Determination the installation efficiency of the evaporative air cooling in the greenhouse by temperature-moisture regime</p> <p>Abstract: The results of theoretical studies and experiments of the developed exhaust ventilation system with direct evaporative air- cooling with using “wet mats” are given. It has shown sufficient efficiency with increasing quality of flower cutting in the summer months. The effect of moisture on the operation of this system was studied. It is established that the heat absorption capacity of air directly depends on its temperature and relative humidity. It is also determined that the temperature of leaves and flowers in summer is usually 2 ÷ 7 °C greater than the air temperature in the greenhouses. In an experimental greenhouse, according to the results of experiments, the effectiveness of the developed installation for evaporative cooling of its operation was determined.</p>
<p>Paper ID 116</p>	<p>B Kuchkarov^{1*}, O Mamatkarimov², and A Abdulkhayev¹</p> <p>¹<i>Namangan State University, Namangan, Uzbekistan</i></p> <p>²<i>Namangan Engineering-Technological Institute, Namangan, Uzbekistan</i></p> <p>Title of presentation: Influence of the ultrasonic irradiation on characteristic of the structures metal-glass-semiconductor</p> <p>Abstract: The studied influence ultrasonic irradiation on change the rolling charge built-in in structure lead borosilicate glasses PbO - SiO₂ - B₂O₃ - Al₂O₃ - Ta₂O₅. It is shown that</p>



 **ICECAE 2020**

	<p>influenc ultrasonic irradiation brings about reduction of the rolling charge and improvement insulation parameter glass.</p>
<p>Paper ID 133</p>	<p>D Kodirov^{1*}, O Tursunov^{1,2,3}, A Ahmedov⁴, R Khakimov⁵, and M Rakhmataliev⁴</p> <p>¹<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁴<i>Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁵<i>Faculty of Organization and Management of Water Resources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Economic efficiency in the use of solar energy: A case study of Agriculture in Uzbekistan</p> <p>Abstract: This article explores the cost-effectiveness of using a solar panel in a household. It also analyzes households' demand for electricity and their use. Daily household consumption of electricity was calculated based on monograph observations and its average daily consumption was 1513 kW/day. The solar panels' technical characteristics (current, voltage, battery capacity, inverter, and other) are based on the solar panels to fully meet their electricity demand. It was found that the lowest electricity generation potential could be accumulated in December, the highest in June and July, and the law was based on the opposite. Proposals and recommendations on efficient use of solar energy have been scientifically justified.</p>
<p>Paper ID 134</p>	<p>D Kodirov^{1*}, O Tursunov^{1,2,3}, S Khushiev¹, O Bozarov⁴, G Tashkhodjaeva⁵, and S Mirzaev⁶</p> <p>¹<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁴<i>Andijan branch of Tashkent State Agrarian University, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 170600 Andijan, Uzbekistan</i></p> <p>⁵<i>Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁶<i>Department of Information Technologies, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Mathematical description of water flow quantity for microhydroelectric station</p> <p>Abstract: The main methods of regulating water flow and power of a microhydroelectric power plant are considered. New technical solutions are proposed for screw jet hydraulic turbines adapted to low heads and water flow rates. Preliminary calculations carried out by the authors show that the power of a micro-hydroelectric power plant depends on the individual factors of the area. As the speed of the water flow increases, the speed of the water wheel also increases, and in turn, the electric power of the micro-hydroelectric power plant is increased.</p>
<p>Paper ID 135</p>	<p>A Rakhmatov^{1*}, M Ibragimov¹, and D Ximmataliev¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study on Ion generators for fruit and vegetable storehouses</p> <p>Abstract: The development of food industry and fruit and vegetable production is currently determined not by the amount of production, but by how much of it is preserved. Therefore,</p>



 **ICECAE 2020**

	<p>the introduction into fruit and vegetable production plan the task of loss reduction of food raw materials at all stages of its transportation, storage and processing was a timely and important step. This paper presents the results from the influence of ionizer structural and operating parameters on the energy performance of the ionized air. The data on optimal modes, that ensure the minimum product losses during long-term storage, are given.</p>
<p>Paper ID 161</p>	<p>L A Sharipov^{1*}, Sh J Imomov¹, J A Majitov², O S Komilov², M Z Sharipov², F Pulatova¹, and O S Abdisamatov¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy str., Tashkent 100000, Uzbekistan</i></p> <p>²<i>Bukhara Engineering Technological Institute, Bukhara, Uzbekistan</i></p> <p>Title of presentation: Modeling of heat exchange processes in the Metanetka bioenergy plant for individual use</p> <p>Abstract: A bioenergy plant with a solar heating system for individual use has been developed and built, intended for the processing and disposal of agricultural waste of organic origin to obtain biogas and liquid high-quality organic fertilizers under conditions of anaerobic fermentation. The main features of heat transfer processes in bioreactors are considered. A mathematical model is proposed that describes these processes. The use of the resulting model will improve the control processes of reactors and comply with technological regimes</p>
<p>Paper ID 163</p>	<p>N N Sadullaev¹, A B Safarov¹, R A Mamedov^{2*}, and D Kodirov³</p> <p>¹<i>Department of Energy audit, Bukhara Engineering Technological Institute, 200100 Bukhara, Uzbekistan</i></p> <p>²<i>Department of Energy, Bukhara Engineering Technological Institute, 200100 Bukhara, Uzbekistan</i></p> <p>³<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Assessment of wind and hydropower potential of Bukhara region</p> <p>Abstract: This article presents a methodology for assessing the gross, technical and economic potential in the territory of the Bukhara region. Locations with high wind and hydropower potential were identified in the region, and the introduction of wind and micro-hydroelectric power plants was analyzed. According to the results of the study, the importance of wind and hydropower in the development of the socio-economic sphere of remote areas of the Bukhara region was studied.</p>
<p>Paper ID 165</p>	<p>D Kodirov^{1*}, O Tursunov^{1,2,3}, Kh Karimova⁴, N Akramova⁵, S Parpieva¹, and B Shafkarov⁶</p> <p>¹<i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>⁴<i>Department of Information Technologies, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁵<i>Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>⁶<i>Department of Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Application of hydro energy in small power supply systems</p> <p>Abstract: This paper provides an opportunity to increase the efficiency of use in low-pressure watercourse systems by determining the dimensions and design of the micro-hydroelectric power plant operating on low-pressure watercourses. It was found that the size of a micro-hydro water turbine depends on the flow rate of the water, the volume of water</p>



 **ICECAE 2020**

	<p>hitting the blade at a fixed time, and the depth of the water surface. As a result, a technological scheme of a micro-hydroelectric power plant operating on low-pressure water streams was developed.</p>
<p>Paper ID 166</p>	<p>D Kodirov^{1*}, O Tursunov^{1,2,3}, D Talipova⁴, G Shadmanova⁵, S Parpieva¹, and B Shafkarov⁶</p> <p>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China ³Research Institute of Forestry, 111104 Tashkent, Uzbekistan ⁴Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ⁵Department of Information Technologies, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ⁶Department of Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</p> <p>Title of presentation: System approach to renewable energy use in power supply Abstract: Based on the analysis of current developments in small hydropower plants, the structural scheme and installation scheme of a dam without hydropower were developed. According to the developed scheme, a small hydroelectric power plant was installed and prepared for testing. During the study, an analysis of 3 magnitudes (V), voltage frequency (Hz) and sinusoidal coefficient (%) that determine the quality indicators of electricity was presented. The obtained results are compared with the value limits given in the international standard normative document.</p>
<p>Paper ID 167</p>	<p>A Davirov^{1*}, O Tursunov^{1,2,3}, D Kodirov¹, B Rakhmankulova⁴, Sh Khodjimukhamedova⁵, R Choriev⁶, D Baratov⁷, and A Tursunov⁷</p> <p>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China ³Research Institute of Forestry, 111104 Tashkent, Uzbekistan ⁴Department of Information Technologies, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ⁵Department of Accounting and Audit, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan ⁶Department of Pedagogy, Psychology and Mechanics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers ⁷Karshi branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 180100 Karshi, Uzbekistan</p> <p>Title of presentation: Criteria for the existence of established modes of power systems Abstract: This article considers the criteria for the existence of established modes of power systems. Nonlinear nodal equations of steady-state modes are presented, which have many solutions or do not have any physically realizable solutions. Criteria for the existence of solutions are given based on derivatives of power losses depending on the parameters of the power system modes. Equivalent circuit of the electrical system was performed using the South-Western MEN (MAIN ELECTRIC NETWORKS). The paper highlights the results of calculations of steady-state modes of the electrical system at weighted values of node 12. The maximum normal modes of electrical systems for the power of nodes was determined by the criteria are set $\frac{\partial \Delta P_c}{\partial \Pi_i} = \infty$.</p>
<p>Paper ID 195</p>	<p>E Bozorov</p>



 **ICECAE 2020**

	<p><i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Electric pulse treatment of trees as an environmentally friendly mechanism for protection of orchards</p> <p>Abstract: This article explains the main diseases of horticultural trees and almonds, which are grown in mountainous and hilly areas. At present, the protection of the environment, especially land and water resources from the effects of various chemical toxins are one of the main problems of world civilization. During the global financial and economic crisis, our country is currently using high-quality land resources, introducing advanced scientific and technical agricultural technologies and growing low-quality crops. Some of the important problems are management and control of land use, improvement of land relations and efficient use of public lands in general. For the cultivation of almond fruit products should use the method of electric pulse processing. Diseases of nematodes attach and settle on the root system of almonds. In the roots of the almond tree, nematodes form swells and bumps, feeding the young seedlings with mineral nutrients and eventually destroying the seedlings. We propose an electric pulse treatment method against nematode diseases of almond roots and obtain the results of electrotechnical experiments. To get the results of this experiment faster, we can clearly see the results of the experiment in the scientific laboratory of the Institute of Plant Protection in the data obtained using an electron microscope when processing the root stems of almond trees infested with nematodes. The use of an electrical impulse device in the cultivation of almond trees and in the fight against nematode diseases arising from its roots has been considered and the results of preliminary studies have been presented.</p>
<p>Paper ID 200</p>	<p>A Djalilov^{1*}, N Juraeva², O Nazarov¹, Ya Chulliyev¹, E Sobirov¹, M Begmatov¹, and S Urolov³</p> <p>¹<i>Department of Electrical Engineering and Mechatronics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> ²<i>Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</i> ³<i>Tashkent Chemical-Technological Institute, 32 Navoiy str., 100011 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Intellectual system for water flow and water level control in water management</p> <p>Abstract: Currently, the shortage of water in our country is growing. This means that we must support every drop of water. At the same time, water management systems in advanced economies are used to measure and monitor water flow and water meters with different designs. Existing measurement and control systems have some drawbacks in energy saving. Therefore, the issue of improving water and energy saving water flow devices and rights management levels was considered.</p>
<p>Paper ID 202</p>	<p>S B Donaev^{1*}, J A Normuminov¹, A M Rakhimov¹, D Muminova¹, and L H Nishonova¹</p> <p>¹<i>Tashkent State Technical University, University str. 2, Tashkent, Uzbekistan</i></p> <p>Title of presentation: The effect of implantation barium ions on the surface of Pd and Pd-Ba under ion bombardment</p> <p>Abstract: The influence of ion implantation Ba⁺ on the composition, structure and secondary emission properties of polycrystalline samples of Pd and Pd-Ba. It is shown that at low doses ($D < 10^{15} \text{ cm}^{-2}$) formed separate nanocluster phase, and at high doses ($D \geq 10^{16} \text{ cm}^{-2}$) - coarse sites Pd₂Ba, Pd-Ba with sharp edges, the dimensions of which lie in the range 2 -10 microns. It has been established that ion-implanted samples exhibit relatively high emission efficiency than activated alloys.</p>
<p>Paper ID 187</p>	<p>A Muratov^{1*}, O Muratov¹, and S Melikuziyev¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Operational control of energy consumptions of reclamation machines</p>



 **ICECAE 2020**

	<p>Abstract: The article presents the results of theoretical and experimental studies of the effectiveness of the application of a new method of operational control over the consumption of fuel and lubricants (POL) of construction and reclamation machines using GIS technologies. Operational control over the consumption of fuels and lubricants is necessary to place orders for their purchase on stock exchanges, to manage the route of refueling vehicles between construction sites and to assess the continuity of the machines at the construction site. Remote sensing of the work of the organization's construction machines will allow you to quickly manage the processes of their transfer from facility to facility, as well as to monitor the timing of specific work (production assignment) by these machines, units and teams.</p>
<p>Paper ID 207</p>	<p style="text-align: center;">A J Isakov^{1*}, and Z S Abdullaev¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000, 39 Kari Niyazov, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study on increase of operation efficiency of electrical energy and electrical equipment</p> <p>Abstract: This article discusses and reveals the problems of the need for proper use of electricity and electrical installations to improve efficiency. Information on the structure of installed capacity at power plants, the structure of fuel consumption and the consumption of electricity by consumers are reviewed and given; as well as information about the increase in efficiency and causes of failure in operation. Agro-industrial complex consumes about 30 percent of all electricity produced in the country (including the rural population), including pumping stations. This figure is expected to reach 45-50% over the next few years. Thus, the choice, design, installation, maintenance and repair of electrical equipment, which have different forms of ownership and management, but are interconnected by consumers in strict accordance with the rules of electricity consumption, Joint modernization, that is an operating efficiency, remains relevant.</p>
<p>Paper ID 210</p>	<p style="text-align: center;">A U Gapparov¹, G A Govor², U T Berdiyev^{3*}, F F Hasanov³, and A M Kurbanov³</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>²“NPC NAN of Belarus on Materials Science, Minsk, Belarus</i></p> <p style="text-align: center;"><i>³Tashkent Institute of Railway Engineers, 100167 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Magnetic-soft materials based on iron for electromechanical engineering</p> <p>Abstract: This article describes the methods of using composite magnetic soft materials in the railway transport and mechanical engineering. Soil state in two modifications of Fey and Fey are formed in the iron. Also in the text, the main temperature magnetic and non-magnetic properties of materials, and magnetic properties of materials at various different temperatures are highlighted. It has been noted that other material properties change at normal temperature also. In this regard, the study of new magnetic materials based on isolated iron particles is of interest to the theory of magnetism - the study of the mechanism of magnetic exchange through thin insulating layers with the formation of single-phase ferromagnetic ordering in a multiphase crystalline system.</p>
<p>Paper ID 212</p>	<p style="text-align: center;">Sh M Muzafarov^{1*}, O Tursunov^{1,2,3}, D Kodirov¹, V E Balitskiy¹, A G Babaev¹, O G Kilichov¹, M N Abdukadirova¹, and U T Tasheva¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;"><i>²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p style="text-align: center;"><i>³Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Substantiation of a method for increasing the efficiency of the electrosynthesis of ozone by using periodic voltage pulses</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

	<p>Abstract: The article analyzes the main directions research to improve process efficiency ozone electro synthesis: research to improve structures and materials of ozone generators; research influence of form, frequency, type of voltage. The article analyzed the process of ozone electro synthesis during nutrition sinusoidal voltage and identified significant disadvantages of this method. Process analyzed electrosynthesis of ozone when fed by periodic pulse stress with a drainage capacity of more than 5 and a significant increase in efficiency this method.</p>
<p>Paper ID 213</p>	<p>Sh M Muzafarov^{1*}, O Tursunov^{1,2,3}, D Kodirov¹, B K Togaev¹, V E Balitskiy¹, A G Babayev¹, O G Kilichov¹, B R Nasibov¹, and I V Allenova¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i></p> <p>³<i>Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Features of streamer form of corona discharge in respect to electric gas purification</p> <p>Abstract: An article briefly describes advantages of streamer form of corona discharge over corona discharge of direct voltage. With the purpose of confirmation of hypotheses about possibility of stabilization of discharge processes in electric fields of streamer form of corona discharge oscillography voltage and current were done, and volt amperage features at various frequencies of pulse voltage were taken. Impact of parameters of electrodes system «Potential plane with corona needles – grounded plane» to value of discharge current was studied. Outcomes of study of power features and character of change in strength of electric fields of streamer form of corona discharge are presented.</p>



ICECAE 2020

CIVIL ENGINEERING

<p>Paper ID 1</p>	<p>A A Tukhtaboev^{1*}, F Turaev², B A Khudayarov², E Esanov³, and K Ruzmetov⁴ <i>¹Namangan Civil Engineering Institute, Namangan, Uzbekistan</i> <i>²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>³Tashkent State Technical University named after I.Karimov, 100095 Tashkent, Uzbekistan</i> <i>⁴Tashkent State Agrarian University, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Vibrations of a viscoelastic dam–plate of a hydro-technical structure under seismic load</p> <p>Abstract: One of the characteristic features of the development of the hereditary theory is the wide possibilities for describing the dynamic processes of deformation of various materials. However, due to the lack of an adequate mathematical apparatus, the implementation of these possibilities is in many cases difficult, especially when studying nonlinear dynamic processes. In recent years, the power of computing has increased interest in nonlinear problems. Under these conditions, it is important to create and develop such effective methods of solution that could be applied to the widest possible class of problems. In this work, a mathematical model of the problem of the dynamics of thin-walled structures is constructed taking into account the hereditary properties of the material. Using the Bubnov-Galerkin method under various boundary conditions, the problem under consideration is reduced to solving systems of integro-differential equations. The analysis of the influence of various properties of the construction material on the amplitude-frequency characteristics is carried out.</p>
<p>Paper ID 17</p>	<p>A Khalimbetov¹, M Bakiev^{1*}, S Shukurova¹, J Choriev¹, and Kh Khayitov¹ <i>¹Department of Hydraulic Construction and Engineering Structures, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers 100000Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study of submountain river flow patterns constrained by a combined dam</p> <p>Abstract: Great attention around the world is paid to the design and construction of riverbank protection and channel control structures on submountain section of rivers. High slopes ($i=0,001\div 0,004$ and higher), flow kinetics and ability to transport large amount of sediments are the features of submountain section of rivers. Most of the research in this sphere has been conducted on the study of patterns of flow constrained by transverse structures in valley parts of rivers. The main goal of this work is to establish the physical picture of flow around a combined dam in submountian river, the through-flow part of which is made of tetrahedrons, as well as to develop a design method for flow velocity field. Formations of two regimes have been established experimentally, i.e. “calm” at $ia < icr$ and “critical” at $ia \geq icr$. These regimes are mainly affected by flow contraction degree na, and Froude number Fr. The presence of the following zones was established: core, intensive turbulent mixing and backflow zones, as well as the affinity of velocity fields in the zone of mixing by Shlihting-Abramovich. Prandtl has realized the task for “calm” regime with the use of integral relationship expressing law of conservation of momentum in the flow, equation for conservation of discharge and differential equation for nonuniform motion of transit flow with the account of tangential turbulent stresses on lateral surfaces. As opposed to the existing solutions, we accounted for the presence of two regions of spreading with different slopes of water surface, horizontal component of fluid weight, nonuniform distribution of velocities in head section, high roughness and the case when sections of target and vertical contraction do not match. Satisfactory results were obtained by comparing theoretical solution and experimental data.</p>
<p>Paper ID 20</p>	<p>A Fatxulloev¹, D Allayorov^{1*}, and M Otakhonov¹</p>



 **ICECAE 2020**

	<p>¹<i>Department of Hydraulics and Hydroinformatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Uzbekistan</i></p> <p>Title of presentation: Study of hydraulic parameters for concreting channels Abstract: Irrigation channels plays particular importance role to provide water for irrigated areas. In recent years, the irrigation channels of Central Asia have been negatively affected by deformation phenomena. As a result, their hydraulic parameters changed and their throughput decreased. The results of recent studies in the field of the phenomena of deformations in open and in the planning of irrigation channels show that a lot of work has been completed. Ensuring the static and dynamic stability of the channels, increasing the efficiency of the channels currently require to cover the channels with concrete cladding. A high cost of covering the channels with concrete cladding brings reveals the problems in these works. The best solution is to reduce concrete consumption. The article proposes a method for projecting a concrete channel from the condition of a hydraulically most advantageous section. According to the proposed method, the consumption of concrete mixture is reduced by 36% and increased the dynamic stability of the channel (when assessing the nanotransport ability of the channel) is increased by 26%. The rehabilitee of research results are confirmed by the formulas used in practice.</p>
<p>Paper ID 29</p>	<p>T Berdiyrov <i>Department of Management, Jizzakh Polytechnic Institute, 130100 Jizzakh, Uzbekistan</i></p> <p>Title of presentation: Metrobus in separated corridors as an optimal public transport system Abstract: One of the factors in the worsening of the quality of transport services is traffic delays which caused by constant and numerous congestion. In this article analyzed need of BRT-Bus Rapid Transit system which is serving in separated corridors for optimizing passenger turnover. Metrobus is a modern type of optimal public transport system, which is developed such cities Berlin, Curitiba, Ahmadabad, Istanbul, Seoul and etc. According to the above researches, the construction of a reliable transport system will allow increasing the level of transport accessibility, reducing the level of transport discrimination of the population, increasing the transport mobility of the population and improving other indicators characterizing the effective work of public transport in the city as a whole.</p>
<p>Paper ID 31</p>	<p>Sh M Salimov^{1,2*}, and T Mavlanov² ¹<i>Department of Natural sciences, Military technical institute of the National Guard of the Republic of Uzbekistan, Tashkent region, Uzbekistan</i> ²<i>Department of Theoretical and Civil Mechanics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Dynamic behavior of structurally inhomogeneous multiply connected shell structures considering their viscoelastic properties Abstract: The paper presents the statement and methods for solving dynamic problems of multiply connected structurally inhomogeneous shell structures, which make it possible to reduce the problem of calculating a wide class of engineering structures to computer-aided design tasks. On the basis of numerical experiments and multi-parameter analysis of the system as a whole, a number of fundamentally important applied problems have been solved for calculating the dynamic characteristics of oscillations (frequencies, modes, determinant resonant amplitudes and damping coefficients) of special structures depending on the parameters of structural inhomogeneity. The results obtained made it possible to identify some mechanical effects of theoretical and practical importance. The developed methods and algorithms allow, at the stage of inhomogeneous systems design, combining inhomogeneous materials and connections with various rheological properties, to establish the ranges of parameter values for numerical-experimental search of the most rational (in terms of efficiency) dissipative properties and material consumption of engineering structures. It was established that an account for nonlinear strain in the material does not strongly distort the picture of linearly viscoelastic calculation.</p>



 **ICECAE 2020**

<p>Paper ID 34</p>	<p>A K Mahmadioliev^{1*}, D R Makhmudov¹, Y T Nurboboev¹, and F Sh Pardaev¹ <i>¹Tashkent State Technical University named after I Karimov, Tashkent. Uzbekistan</i></p> <p>Title of presentation: Reducing the cost of backfill in the Kauldi gold mine Abstract: The Kauldi gold mine uses the backfill to control the mining pressure. Backfill should be able to effectively manage the pressure of the deposit, ensuring safe working conditions, easier preparation process as well as little funds. The cost of backfill directly affects the cost of ore and is important for the indicators of economic development of the mining enterprise. In this article, the method of reducing the costs spared by making changes to the composition of the backfill used in the Kauldi gold mine has been studied. Ore extraction is carried out in the stopes. After the primary stope is extracted and filled with backfill, the secondary backfill is extracted and filled. In the proposed method, 1/3 of the primary stope and 2/3 of the secondary stope are filled with burden. The remaining parts are left unchanged. The reason for such a distribution of the burden in the stopes is that if the backfill in the primary stope is not sufficiently solid, the ore can also be diluted and the backfill is broke-down when extracting the secondary stope. If this happens, the ore will degrade and cause excessive backfill costs for the secondary stope. Filling the stopes with burden is considered cost-effective, and in general, the amount of cement, sand, as well as marble waste purchased for the mining enterprise is reduced twice. As a result, the costs spent on them will also be reduced twice.</p>
<p>Paper ID 90</p>	<p>R I Khalmuradov¹, and E A Ismoilov^{2*} <i>¹Samarkand State University, University Boulevard 15, 100140 Samarkand, Uzbekistan</i> <i>²Department of Theoretical and Applied Mechanics, Samarkand State University, University Boulevard 15, 100140 Samarkand, Uzbekistan</i></p> <p>Title of presentation: Nonlinear vibrations of a circular plate reinforced by ribs Abstract: The behavior of a circular elastoplastic plate, consisting of a shell and reinforced ribs of a quadrangular cross-section and under the action of dynamic loads, has been investigated. The rib sections are considered to be constant. The relationship between deformations and displacements is taken geometrically nonlinear, and between stresses and deformations in the form of Hooke's law. Refined equations of the Timoshenko type are taken as resolving ones. It is believed that the vibrations of the plate are excited by a dynamic load acting on the surface of the plate. The solution of the differential equations for the vibrations of the plate, taking into account the elastoplastic properties of the shell materials and the reinforced ribs, is carried out by the finite difference method. The elastic and elastoplastic models are used to calculate the deflections of the central point and forces depending on the location of the ribs. In particular, it has been established that: when the plate is reinforced with one rib, the smallest deflection of the center point can be achieved when the rib is located in the middle of the radius; the proposed model and calculation method allow achieving the desired deflection value by varying the number of ribs.</p>
<p>Paper ID 94</p>	<p>Kh Fayziev¹, T Sultanov^{2*}, R Sharipov¹, and K D Salyamova³ <i>¹Tashkent Institute of Architecture and Civil Engineering, Tashkent, Uzbekistan</i> <i>²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan</i> <i>³Institute of Mechanics and Seismic Stability of Structures of the Academy of Sciences of the Republic of Uzbekistan, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Seismic resistance of sludge collector enclosing dams erected from the waste product – phosphogypsum Abstract: The results of experimental studies of the model behavior under seismic effect in a centrifugal testing installation are given in the paper. The goal was to study the deformability and stability of slopes of a given configuration made of phosphogypsum and to substantiate the possibility of using phosphogypsum in erecting enclosing dams of sludge collectors located in seismic regions. The experiments on models are based on the centrifugal modeling method,</p>



 **ICECAE 2020**

	<p>which involves the change in gravity field of the model. The models were tested at a stabilized and unstabilized state of phosphogypsum. Models stabilization was achieved by centrifugation for 8-25 min. The model was considered stabilized when its deformation did not exceed 0.01 mm. In a stabilized state, a fragment of the dam slope made of phosphogypsum in a water-saturated state at a slope steepness $m=2$, $m=3$ and in a dry state at $m=2$ was investigated. In an unstabilized state, the models of dams made of phosphogypsum were studied in a water-saturated state with a slope steepness $m=3$, and a dam fragment at $m=3$ in a water-saturated state with horizontal and vertical sand drainage layers. As a result of studies of seismic stability of dam fragments made of phosphogypsum, the following was established: the overall stability of dams made of phosphogypsum (in a stable state) under seismic effect of up to 9-10 points is fully ensured both in a dry and water-saturated state. Horizontal and vertical interlayers increase the slope stability of the dam model made of phosphogypsum in a water-saturated state; the slopes were stable after a dynamic impact of 9 point even in unstabilized states. Drainage layers accelerate the consolidation of phosphogypsum, and this naturally increases the seismic resistance of dams.</p>
<p>Paper ID 111</p>	<p style="text-align: center;">S A Abdukadirov</p> <p style="text-align: center;"><i>Tashkent Institute of Architecture and Civil Engineering, Tashkent 100084, Uzbekistan</i></p> <p>Title of presentation: Advanced computer algorithms to simulation of transient dynamics in solids and structures</p> <p>Abstract: The new approach of designing computation algorithms for simulation of transient dynamics in solids and structures is proposed. The algorithms are based on explicit finite-difference scheme built under special conditions imposed on the values of difference mesh parameters. The designed calculation devices possess a minimal influence of spurious effects of numerical dispersion that allows discontinuities and high-gradient components caused by wave fronts and fracture events to be accurately computed. A set of advanced computer algorithms and calculation examples of 1D/2D model and engineering problems are presented: (a) longitudinal impact onto a rod embedded into an elastic medium, (b) propagation of cylindrical and spherical waves with front discontinuities, (c) stress concentrations near a head surface of hard projectile indented into elastic solids and (d) transient wave dynamics and delamination in fiber reinforced composites.</p>
<p>Paper ID 113</p>	<p style="text-align: center;">A Arifjanov¹, F Gapparov^{2*}, T Apakxujaeva¹, and S Xoshimov¹</p> <p style="text-align: center;">¹<i>Department of Hydraulics and Hydroinformatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Department of Geology and Hydrogeologys, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Determination of reduction of useful volume in water reservoirs due to sedimentation</p> <p>Abstract: To develop a work plan for reliable and efficient use of water reservoirs, an accurate information about the volume of water stored in the reservoir for the safe operation of the reservoir facilities is necessary. The useful water storage capacity of reservoirs has been steadily declining over the years due to the sedimentation coming with the stream. The article presents a method for determining the continuous change of the reservoir volume during operation due to sedimentation. A calculation method estimating the dynamics of the sediment distribution in the reservoir has been scientifically developed. The proposed calculation method was tested and compared in the field conditions. The analysis of the data collected in the Chimkurgan, Tashkent and South Surkhan water reservoirs under field conditions based on mathematical statistical methods showed a relationship between the relative turbidity and the reservoir depth. A new method of determining the decrease in useful water volume due to sedimentation in reservoirs has been proposed.</p>
<p>Paper ID 124</p>	<p style="text-align: center;">K Kutlimuratov^{1*}, and A Mukhitdinov²</p> <p style="text-align: center;">¹<i>Tashkent Institute of Design, Construction and Maintenance of Automobile Roads, 20 Amir Temur, Tashkent, Uzbekistan</i></p>



 **ICECAE 2020**

	<p>²<i>Department of Ground Vehicles, Tashkent Institute of Design, Construction and Maintenance of Automobile Roads, 20 Amir Temur, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Impact of stops for bus delays on routes</p> <p>Abstract: In this paper bus travel time and delay is significant measures in public transportation. This research aims to explore impact of stops for the selected bus route and to find some simple suitable solutions to reduce the travel time and minimize delays for scheduling preferences of travellers. Delays data were collected using automatic vehicle location system (GPS technology) for the bus route #51 in Tashkent. Based on the collected GPS data were proposed the developed a linear and a logistic multivariate regression model. Travel time reliability were estimated regarding to a multivariate regression models and performed. The result shows that very good statistical suitable as expected and thus can be used in the public transportation to determine any travel time using real-time and available offline data. These outcomes, in the future it is expected that will be applicable and more efficient bus public transportation system in Tashkent.</p>
<p>Paper ID 144</p>	<p>R I Khalmuradov¹, and B F Yalgashev^{2*}</p> <p>¹<i>Samarkand State University, 140104 University Boulevard 15, Samarkand, Uzbekistan</i></p> <p>²<i>Department of Theoretical and Applied Mechanics, Samarkand State University, 140104 University Boulevard 15, Samarkand, Uzbekistan</i></p> <p>Title of presentation: Frequency analysis of longitudinal-radial vibrations of a cylindrical shell</p> <p>Abstract: The article solves the problem of harmonic longitudinal-radial vibrations of a circular cylindrical shell with freely supported ends. To solve the problem, we used the refined equations of oscillation of such a shell, derived earlier from the exact three-dimensional formulation of the problem and its solution in transformations. An extensive review of works devoted to the study of harmonic and nonstationary processes in elastic bodies on the basis of classical (Kirchhoff-Love, Flyugge) and refined Timoshenko type (Hermann-Mirsky, Filippov-Khudoinazarov) theories is given. Four frequency equations are obtained for the main parts of the longitudinal and radial displacements of the cylindrical shell. These frequency equations admit, as special cases, frequency equations and a thin-walled shell. Based on the solution of the obtained frequency equations, the frequencies of natural vibrations of the shell, including the thin-walled one, are determined. A comparative frequency analysis of longitudinal vibrations of a circular cylindrical elastic shell is carried out on the basis of the classical Kirchhoff-Love theory, refined theories of Hermann-Mirsky and Filippov-Khudoinazarov. On the basis of the results obtained, conclusions were drawn regarding the applicability of the studied oscillation equations, depending on the waveform and shell length. In particular, it was found that all the considered equations are unsuitable for describing wave processes in short shells, the lengths of which are commensurate with the transverse dimensions of the shells.</p>
<p>Paper ID 151</p>	<p>M Mukhammadiev¹, O Glovatskiy², N Nasyrova², N Karimova¹, A Abduaziz uulu¹, and A Boliev³</p> <p>¹<i>Tashkent State Technical University, Tashkent, Uzbekistan</i></p> <p>²<i>Scientific Research Institute of Irrigation and Water Problems, Tashkent, Uzbekistan</i></p> <p>³<i>Jizzakh Politechnic Institute, Jizzakh, Uzbekistan</i></p> <p>Title of presentation: Assessment of investment technologies for use of hydro-accumulating stations on intermediate channels of irrigation systems and water reservoirs</p> <p>Abstract: The article presents data on the cost of construction and economic efficiency of similar objects of pumped storage hydroelectric power plants (PSHPP) in world practice and in Uzbekistan. Development of measures to reduce head losses in intermediate channels of hydraulic systems and increase their efficiency is urgent issues. The authors assess the importance of the data obtained on the example of new design schemes for small hydroelectric power plants and pumped storage power plants of the Tuyamuyun hydroelectric complex, selected as an object of research.</p>



 **ICECAE 2020**

<p>Paper ID 152</p>	<p style="text-align: center;">M Mirsaidov^{1*}, and Q Mamasoliev²</p> <p><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy str., 100000 Tashkent, Uzbekistan</i></p> <p><i>²Samarkand State Architectural and Civil Engineering Institute, 70 Lolazor str., 140147 Samarkand, Uzbekistan</i></p> <p>Title of presentation: Contact problems of multilayer slabs interaction on an elastic foundation</p> <p>Abstract: A mathematical model and a method to assess the internal force factors in multilayer strip – slab on elastic foundation under various static loads were developed in the paper. A detailed review of well-known publications on assessing the stress-strain state and dynamic behavior of various structures interacting with the base is given. A closed system of integro-differential equations describing the strain process in multilayer slabs on an elastic foundation was derived. The problem under consideration was reduced (using the Chebyshev polynomial) to the solution of infinite systems of algebraic equations. The regularities of infinite systems of algebraic equations were proved and the corresponding estimates were obtained. A number of terms of the Chebyshev polynomial for obtaining a solution to the problem with the required accuracy was determined. The efficiency of the method was shown on the example of test problems.</p>
<p>Paper ID 153</p>	<p style="text-align: center;">M Mirsaidov^{1*}, and M Usarov²</p> <p><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy str., 100000 Tashkent, Uzbekistan</i></p> <p><i>²Institute of Mechanics and Seismic Stability of Structures of the Academy of Sciences of the Republic of Uzbekistan, 33 Dormon yoli, 100125 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Bimoment theory construction to assess the stress state of thick orthotropic plates</p> <p>Abstract: The paper is devoted to the development of a theory and method for calculating thick plates. A detailed analysis of well-known publications devoted to this problem is given. A theory and a method were developed to assess the stress-strain state of thick plates without simplifying hypotheses within the framework of three-dimensional theory of elasticity. When constructing a theory, all components of strains and stresses arising from the nonlinearity of the law of displacement distribution along the plate thickness were taken into account. The equations of motion of the plate were constructed with respect to forces, moments and bimoments. The solution method was based on exact expressions in trigonometric functions. The bending of isotropic and orthotropic plates was considered as a calculation example. The solution obtained showed the effectiveness and accuracy of the proposed bimoment theory in assessing the stress-strain state of thick plates.</p>
<p>Paper ID 154</p>	<p style="text-align: center;">M Atajanov^{1*}, and S S Solayev²</p> <p><i>¹Tashkent State Transport University, 1 Adilkhodjaev, 100167 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Increasing the efficiency of urban public transport (UPT) services through the use of multimodal transport technologies</p> <p>Abstract: The present paper investigates the problem of providing integrated transport services to passengers traveling from suburbs to the city center. Options for the organization of the route "From the resort of healing waters - Tashkent railway station" will be studied. By using the multimodal transportation technology, and by taking an account the following demands like the timetable, comfort, the price of transportation of passengers, the possibility of independent mobility to the different destinations will be organized. The article proposes a set of measures of improving public transport services on the routes in suburbs or from suburbs to the city center.</p>
<p>Paper ID 159</p>	<p style="text-align: center;">A Arifjanov¹, U Jonqobilov², S Jonqobilov^{1*}, Sh Khushiev³, and J Xusanova⁴</p> <p><i>¹Department of Hydraulics and Hydroinformatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p>



ICECAE 2020

	<p>²<i>Department of Operation of Hydraulic Structures and Pumping Stations, Karshi Engineering Economics Institute, Karshi, Uzbekistan</i></p> <p>³<i>Karshi branch of the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Karshi, Uzbekistan</i></p> <p>⁴<i>General Technical Sciences Chirchik Higher Military Tank Command Engineering School, Chirchik, Uzbekistan</i></p> <p>Title of presentation: The influence of hydraulic friction on the maximum pressure of water hammer</p> <p>Abstract: The article presents the results of theoretical and experimental studies of the effect of hydraulic friction on the maximum increase in pressure during water hammer. To solve the problem of determining hydraulic friction along a pressure pipe, the telegraph equation was adopted as a mathematical model. As a result of solving the adopted equation, dependence is obtained for calculating the energy loss in a non-stationary process. The calculations of the proposed formula are in good agreement with the experimental data of the author. This proves the legitimacy of the obtained dependence of the author and provides an accurate calculation of pipes for strength during impact and resource saving of pipe material.</p>
<p>Paper ID 162</p>	<p>R Vafoev^{1*}, S Vafoev¹, S Akhmedov¹, and Sh Imomov¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Method for sealing ground in trench closed drain</p> <p>Abstract: To improve the reclamation state of the land, a big role is played by a horizontal horizontal drain, which does not give for raising the level of groundwater and collect salt water during irrigation. For the protection of drainage from destruction and flushing, an important role is played by the compaction of the ground, which inside trench. The article addresses the issue of ground compaction in trenches of closed drains. The article gives the advantages and disadvantages of the existing methods of compaction of ground in trenches of closed drains, the results of a study of methods of compaction of ground in trenches of closed drains showed that backfilling and compaction of the ground is done separately, these operations must be performed simultaneously, this article gives the design of a compaction device that must be performed simultaneously, the basis theory of ground compaction, the results of laboratory research, the results of the study determined: acting ground force on the surface of the sealing blade ($F = 12 \text{ kN/m}^2$), the outer diameter of the sealing blade ($D_{ou} = 300 \text{ mm}$), the inner diameter of the sealing blade ($D_{in} = 60 \text{ mm}$), the coal between the blades ($\varphi = 15 \dots 30^\circ$), the rotational speed of the blade shaft ($n = 360 \text{ tu/min}$), degree coefficient ($K_s = 1,22$) of ground compaction, ground density ($\rho_g = 1375 \text{ kg/m}^3$).</p>
<p>Paper ID 171</p>	<p>K Rakhimov^{1*}, I Ahmedkhodjaeva¹, and S Xoshimov¹</p> <p>¹<i>Department Hydraulics and Hydroinformatics, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIAME), Tashkent, Uzbekistan</i></p> <p>Title of presentation: Theoretical bases of hydraulic mixture in round cylindrical pipelines</p> <p>Abstract: Hydro transport is characterized by the combined movement of liquid and solid particles, which in a mixture form two-phase or multiphase flows with different physical and me-mechanical properties. One of the main tasks of hydraulic transport is to study the throughput of pipelines, where taking into account the distribution of sediment concentration over the cross section of the pipeline formed under the influence of gravitational force is of great importance in describing the nature of the two-phase flow. Pressure-bearing suspended flows in hydro transport systems are usually characterized by high volumetric concentrations and a wide range of sizes and densities of solid particles that are part of hydraulic mixtures. The flows under consideration are more complex in their structure than turbulent flows of homogeneous liquids in pipes. Therefore, the methods for calculating these flows are much more complicated than the usual methods of hydraulics of pressure flows of homogeneous liquids. To develop scientifically based methods for calculating the parameters of the</p>



 **ICECAE 2020**

	<p>movement of hydraulic mixtures in pipes, widely used the averaged equations of the weighted flow and experimental data. When moving slurries through pipes, gravity plays a significant role. The article discusses the influence of gravity on the throughput of pressure systems with different slopes and obtains new dependences of the flow rate of turbid flow on the slope of the pressure pipe.</p>
<p>Paper ID 176</p>	<p style="text-align: center;">Sh R Khurramov¹, and F S Khalturaev¹</p> <p style="text-align: center;">¹Laboratory "Theory of mechanisms and machines" of the Institute of Mechanics and Seismic Resistance of Structures named after M.T. Urazbayev of the Academy of Sciences of the Republic of Uzbekistan, Tashkent, Uzbekistan</p> <p>Title of presentation: Simulation of contact voltages in two-roll modules Abstract: Mathematical models of the regularities of the distribution of contact stresses in the generalized two-roll module are obtained. These models take into account all the main parameters of two-roll modules and describe the distribution diagrams of contact stresses for all special cases of interaction of the processed material with pairs of rolls in two-roll modules. New data on the regularities of the distribution of contact stresses are revealed: normal contact stresses change from zero at the beginning and at the end of the contact zone of the rolls to a maximum at a point lying to the left of the center line (towards the beginning of the contact of the rolls); the tangential contact stresses change their signs at the neutral point, which in the driven roll is located towards the entrance of the material layer into the contact zone of the rolls, and in the free one - towards the exit.</p>
<p>Paper ID 199</p>	<p style="text-align: center;">G A Bahadirov², T Z Sultanov¹, and A Abdugarimov^{2*}</p> <p style="text-align: center;">¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 st. Kari-Niyazi, 100000 Tashkent, Uzbekistan ²Institute of Mechanics and Seismic Stability of Structures of the Academy of Sciences of the Republic of Uzbekistan, 31 Durmon yuli str., 100125 Tashkent, Uzbekistan</p> <p>Title of presentation: Comparative analysis of two gear-lever differential inter-roller transmission mechanisms Abstract: A comparative analysis of the kinematics of two gear-lever differential transmission mechanisms is given in this paper. These mechanisms can be used in engineering and agricultural technological roller machines and can solve important technological and agrotechnical problems. The purpose of comparative analysis of gear-lever differential transmission mechanisms is to determine the values and the patterns of gear ratios of the mechanisms with similar geometrical and kinematic parameters; to estimate the additional angular velocities of the driven gear rings of the considered mechanisms depending on geometrical parameters of the mechanisms and kinematic parameters of the driven gear ring, since this additional angular velocity can lead to geometrical slip between the material being processed and the working rolls. The devices and the operation principle of the considered mechanisms were described in the paper. First, the lever circuits of the mechanisms were considered. In the lever circuits of the mechanisms, the geometrical parameters of the levers, the position of the lever circuits, as well as the rate and direction of the driving links velocity are known. The kinematic parameters of the lever circuits of the mechanisms were determined analytically. Further, using the results of the lever circuits of these mechanisms, the gear circuits of the mechanisms were also investigated analytically. The centroid method was used in analytical study of the mechanism. The graphs of changes in gear ratios of the mechanisms were plotted depending on changes in the interaxle distance of the driving and driven links. It was proved that in both gear-lever differential mechanisms under consideration the gear ratio changes with a change in the interaxle distance of the driving and driven links. However, the magnitude of the change in the gear ratio in a gear-lever differential transmission mechanism with a six-link double-circuit lever chain is less than in a gear-lever differential transmission mechanism with a four-link lever chain under the same geometrical and kinematic parameters of the mechanisms.</p>
<p>Paper ID</p>	<p style="text-align: center;">B A Khudayarov¹, and F Zh Turaev^{1*}</p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

211

¹*Tashkent institute of irrigation and agricultural mechanization engineers, Uzbekistan*

Title of presentation: Mathematical modeling parametric vibrations of the pipeline with pulsating fluid flow

Abstract: A mathematical model of the dynamics of a straight viscoelastic pipe conveying pulsating fluid has been developed in the paper. Using the Bubnov-Galerkin method, a mathematical model of the problem is reduced to solving a system of ordinary integro-differential equations, where time is an independent variable. Solution of integro-differential equations is determined by a numerical method based on the elimination of a singularity in the relaxation kernel of an integral operator. A system of algebraic equations is obtained according to the numerical method for unknowns. To solve the system of algebraic equations, the Gauss method is used. A computational algorithm is developed for solving the problems of the dynamics of viscoelastic pipelines conveying fluid.



ICECAE 2020

AGRICULTURAL ENGINEERING

<p>Paper ID 8</p>	<p align="center">U Ruzmetov^{1*}, N Mukhsimov¹, and S Ulugova¹</p> <p align="center"><i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: The influence of mineral fertilizers on the raw materials and yield of seedling of the <i>Calendula officinalis</i> L.</p> <p>Abstract: This article discusses the effectiveness of the use of mineral fertilizers when growing <i>Calendula officinalis</i> L. At the same time, the optimal ratio of nutrients - nitrogen, phosphorus, and potassium - was revealed. The use of different consumption rates of mineral fertilizers used in the experiments, it was proved that in spring and autumn the yield of <i>Calendula officinalis</i> seeds increased by 1.7-1.8 times in comparison with the control. The sufficient use of mineral fertilizers leads to an increase in their efficiency of plant development.</p>
<p>Paper ID 13</p>	<p align="center">D Yuldosheva^{1*}, O Khodjaev¹, and Sh Gulmurodova²</p> <p align="center"><i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p align="center"><i>²Department of Agricultural Phytopathology, Tashkent State Agrarian University, 39 Kari Niyazov, 700140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: A comprehensive impact of Clasterosporiosis and Polistigmosis diseases on almonds plantation: A brief review</p> <p>Abstract: A number of authors have reported on Clasterosporiosis and Polystigmosis diseases of almonds occurring in the Tashkent region. These diseases are common in the CIS in Central Asia, the Caucasus, Moldova, and Ukraine. As well as, these diseases are widespread in all almond growing regions in Uzbekistan. Clasterosporiosis and Polystigmosis are among the most damaging diseases of almonds in Bostanlyk district of the Tashkent region. Red spot disease was first reported in 1970 in the Iranian city of Shiraz and is widespread in the Mediterranean regions and in the Middle East. This disease is one of the most important almond diseases, as it slows down the process of photosynthesis and leads to early defoliation of trees. A drop in fruit production has also been caused by this disease. Polystigmosis (red spot) is caused by the fungus <i>Polystigma rubrum</i> (Po. <i>rubrum</i>). The disease does not quickly destroy the trees, but its damage reduces the quantity and quality of the crop, slows the development of new branches, and consequently weakens the tree. Thus, this brief review paper presents the recent studies focused on the comprehensive impact of Clasterosporiosis and Polistigmosis diseases on almonds plantation.</p>
<p>Paper ID 16</p>	<p align="center">E A Butkov¹, B Kh Mamutov¹, L V Nikolyai¹, and A Kasimkhodjaev¹</p> <p align="center"><i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study on the selection of the best forms of walnut in Uzbekistan</p> <p>Abstract: This paper provides information on the status of work on walnut selection in Uzbekistan. The requirements for the identification of commercially valuable forms of walnut, which are suitable for producing different sorts of walnut, are highlighted and defined. As well as, the presented forms are dedicated to the creation of new sort of walnut for cultivation in plantations in Uzbekistan.</p>
<p>Paper ID 36</p>	<p align="center">Sh Abdurokhmonov^{1*}, D Alijanov², and Kh Ismaylov³</p> <p align="center"><i>¹Department of Tractors and Automobiles, Tashkent Institute of Irrigation and Agriculture Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p align="center"><i>²Department of Agricultural Machinery, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p align="center"><i>³Department of Silkworm Breeding, Mechanization and General Zootechnics, Termez branch of Tashkent State Agrarian University, 191200 Termez, Uzbekistan</i></p> <p>Title of presentation: Forces affecting the grain movement in the working chamber of the</p>



 **ICECAE 2020**

	<p>rotary crusher Abstract: The article deals with the issue of reducing energy consumption by improving the design of the working bodies of the feed crusher. The equations of movement of grain particles, the impact of force on it and movement in structures made differently at the bottom of the rotor groove of the working chamber of the crusher are given. It is also implemented using one of the numerical methods on the PC using Matlab computing systems.</p>
<p>Paper ID 37</p>	<p>S Yu Khidirov¹, R Gulmurodov^{2*}, M S Mamiev³, and D Yuldosheva¹ <i>¹Research institute of Forestry, 111104 Tashkent, Uzbekistan</i> <i>²Department of Agricultural Phytopathology, Tashkent State Agrarian University, University str. 2, 100140 Tashkent, Uzbekistan</i> <i>³Department of Agrobiotechnology, Tashkent State Agrarian University, University str. 2, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Propagation of fungi in the soils: A case study of scientific experimental fields of forestry of Tashkent region Abstract: The sphere of forestry in our republic is developing in the current years. For the purpose of landscaping the territory of our country, reproduction and cultivation of paper67ia firs, abina firs, pine species, cypress trees, eastern biota, western camel, spruce and other deciduous trees from coniferous trees is widely established. These ornamental trees differ from other ornamental trees and shrubs in their heat-cold, drought resistance. Different landscapes and forest trees are initially planted in germination plants and seedlings from their seeds. In Uzbekistan, diseases of decorative and forest trees, especially their diseases in the germination period, have almost not been studied. The fact that many different diseases are encountered in landscape trees in recent years is known from different sources. The article provides information on the influence of the seasons on the spread of fungi that have appeared on the soil of some plantations and seedlings in Tashkent region.</p>
<p>Paper ID 46</p>	<p>I R Dusboev^{1*}, B S Nasirov¹, and U Y Charshanbiev¹ <i>¹Department of Farming and Reclamation, Tashkent State Agrarian University, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Effects of agrotechnical and chemical control of weeds in fine-fiber cotton fields Abstract: Today, in the world agriculture, especially cotton growing sphere plays an important role in the national economy. In the cultivation of cotton one of the main problems in the fields is weeds. When estimating the damage caused by weeds to cotton fields, it accounted for 75 bln. USD. This scientific article presents data on the effectiveness of pre- and post-application of herbicides against weeds in the areas where the tillage was done with double-toothed plow in the fall before preparing beds in the fine-fiber cotton fields under typical gray soils condition. Effective eradication of annual and perennial weeds (86.8-90.2%) was observed, when a single herbicide Ankosar (3.0, 4.0, 5.0 l/ha) was applied (information of 2017-2019). When the herbicides Step 500 (4.0 l/ha) and Ankosar (4.0 l/ha) were applied consecutively, the effect on annual weeds was noted (90.5-93.0%). Perennial weeds were reduced by 88.9-93.3% when the abovementioned preparations are applied one after another. Cotton yield will increase by 1.8-5.4 c/ha compared to the control variant. It is recommended to apply the herbicides consecutively in the order Ankosar (4.0 l/ha), Step 500 (4 l/ha) and Ankosar (4.0 l/ha) against annual and perennial weeds.</p>
<p>Paper ID 47</p>	<p>N T Toshpulatov <i>Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: The mechanism of destruction of plant rhizomes under the influence of an electric pulse discharge Abstract: The elimination of the harmful effects of weeds is a global challenge to the present day. The problem has become especially important from the clogging of cultivated</p>



ICECAE 2020

	<p>areas with perennial rhizomatous magpies such as Humay, finger pigs. It should be noted complexity problems associated by preventing invasion harmful perennial rhizomatous weeds which is associated with versatility reproduction (reproduction seeds and rhizomes under any weather-climatic and soil conditions) lack of specific measures and means of destruction, poor quality of quarantine or failure to timely comply with measures to prevent harmful effects, high cost or increased danger of chemicals. Given the above-described circumstance in the article is discussed solution to problems of destruction perennial rhizomatous weeds using dielectric strength pulse and current with high voltage.</p>
<p>Paper ID 48</p>	<p>R Bahramov^{1*}, S Khojahmedov¹, D Yuldosheva¹, and G Yodgorova² <i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i> <i>²Tashkent State Agrarian University, University str. 2, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Technologies for growing Magnolia Grandiflora in forest nurseries: A case study of Uzbekistan</p> <p>Abstract: The article provides, according to the planting rate and phenological observations, the cultivation of annual saplings of Magnolia grandiflora when growing saplings from seeds. In order to accelerate the cultivation of young seedlings of the magnolia plant, work is underway to apply mineral fertilizers in various ways, and the results are recorded in a field journal. Experiments were carried out on a variation basis and 30 plant samples were obtained for each variation. In addition to the application of experimental fertilizers, additional preparations were used to protect our plants from various external influences: 1 g/l of succinic acid was prepared from the roots and leaves in 5-7 days to remove leaves from stress. In addition to mineral fertilizers, organic (rotten manure) fertilizers were also used. The growth, development and characteristics of magnolia seeds were studied at the Andijan branch of the Research Institute of Forestry. As well as, growth rates, duration of ontogenetic cycles, moisture and mineral nutrition requirements, disease and pest resistance were also determined.</p>
<p>Paper ID 49</p>	<p>R Bahramov^{1*}, A Mamatyusupov², F Tokhtaboeva¹, J Khomidov², and H Yuldashev¹ <i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i> <i>²Andijan State University, 129 str. University, 170100 Andijan, Uzbekistan</i></p> <p>Title of presentation: A comprehensive application of fertilizers for growing plantations in forest nurseries: A brief review</p> <p>Abstract: Agricultural sectors must provide, clothe, and feed an increasing world population with energy while mitigating the impact on the atmosphere and on other undesirable factors. The land available to agricultural production in most parts of the world is small. Thus, the only way to increase output is to increase the yield from land currently being used. Crop yields without proper plant nutrition are minimal. Responding to the production challenge in an environmentally friendly manner requires a thorough comprehension of plant nutrition by fertilizers as a component of crop production, which encompasses many critical factors, including improved crop varieties, water management, and integrated pest management, etc. This paper is a state of art on the numerous update and feasible technologies of application of various fertilizers for growing plantations in forest nurseries.</p>
<p>Paper ID 53</p>	<p>A Kh Hamzayev¹, B I Eshankulov¹, M Z Kholmurotov², and M M Inomova^{1*} <i>¹Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i> <i>²Tashkent State Agrarian University, University str. 2, 100140 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study on cultivation of pistachio (Pistacia vera L.) seedlings in containers</p> <p>Abstract: This article highlights the results from the effect of changing the volume of containers on the growth and development of pistachio seedlings, as well as the effect of hydrogel, moisture-accumulating substances on the preservation of pistachio seedlings planted on plantations. According to the research, seedlings of pistachio, planted on</p>



 **ICECAE 2020**

	<p>containers 20x40 cm in size, reached an average height of 18.2 cm, an average diameter at the root collar of 4 mm and an average root length of 30.4 cm. Pistachio seedlings (planted in a permanent place) grown by this method reached safety 95%, which is 122% compared to control group. It is possible to maintain a high field moisture capacity for 2-3 years by adding moisture-accumulating substances - hydrogel to the soil. This allows retaining moisture sufficient for the preservation and growth of pistachios in dry conditions. The preservation of moisture is necessary for pistachio seedlings for good growth and development, branching, budding, to shorten the period of entry into fruiting and increase the yield. Studies, conducted on the effect of hydrogel on transplanted annual shows that the most effective rate is 100 grams/plant. At this application rate, the average plant growth was 20.5 cm, which is 113% compared to control group, the average growth of lateral branches is 6.5 cm, which is 118.0% compared to control group.</p>
<p>Paper ID 54</p>	<p>B Khudayarov^{1*}, A Mambetsheripova², and B Sarimsakov¹</p> <p>¹<i>Department of Agricultural Machinery, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>Department of Industrial Technology, Karakalpak State University named after Berdakh, 230112 Nukus, Karakalpak</i></p> <p>Title of presentation: Technological working process of the centrifugal pneumatic apparatus for spraying mineral fertilizers and their mixtures</p> <p>Abstract: The object of research is the process of centrifugal disk pneumomechanical apparatus for smooth application of mineral fertilizers and their mixtures on the field surface. When mineral fertilizers or their mixtures are sown in the field, the process of separation of grains into fractions is observed. This process takes place after they are thrown from the apparatus, that is, in space motion. This means that the quality control of mineral fertilizers is a factor independent of the technological process of the centrifugal disk apparatus. A pneumatic-mechanical hardware scheme was developed using the method of analysis of technological processes of centrifugal devices in existing and patent information materials and the combination of structural elements for high-quality spraying of fertilizer mixtures in them. The pneumomechanical apparatus consists of a horizontal disc with a diameter of 600 mm, 4 logarithmic coil-shaped blades on the disc, and 4 additional air-generating devices under each disc under the disc. The centrifugal pneumomechanical device has two functions at the same time, the first is to spray mineral fertilizers, and the second is to create an additional air flow and direct it behind the discarded fertilizer grains, which ensures even spraying of component fertilizers of different sizes, shapes and densities.</p>
<p>Paper ID 59</p>	<p>D Sh Sherkuziev¹, Kh Sh Aripov¹, U K Alimov², and M A Maxmudova¹</p> <p>¹<i>Department of Chemical Technology, Faculty of Chemistry Technology, Namangan Institute of Engineering and Technology, Kasansay str. 7, 160115 Namangan, Uzbekistan</i></p> <p>²<i>Institute of General and Inorganic Chemistry, Academy Sciences of Uzbekistan, 100170 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Research of agrochemical and mechanical properties of soils processed with hydrogel</p> <p>Abstract: The results of many years of research on the effect of polymer hydrogels for agriculture on soil structure were presented. By sampling soils at various depths, the biological changes of microorganisms that occur under the influence of hydrogels were studied. It was shown that the use of hydrogels leads to an improvement in the basic physicochemical properties of non-irrigated agricultural lands and an increase in soil fertility. The use of hydrogel absorbent on typical non-irrigated lands allowed increasing soil moisture and improving its properties.</p>
<p>Paper ID 74</p>	<p>A Lee^{1*}, S Allaniyazov², Z Sharipov¹, B Norov¹, M Sattorov¹, and I Xudaev¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i></p>



 **ICECAE 2020**

	<p>²<i>Nukus branch of Tashkent State Agrarian University, Nukus, Uzbekistan</i></p> <p>Title of presentation: Cleaning process simulation of the dielectric sorting device Abstract: The article presents theoretical studies to substantiate some parameters of the dielectric sorting device of alfalfa seeds, in particular: the width of the outlet slot of the hopper, the step and depth of the metering groove, the length of the limiter and the angle of its installation. When developing a theoretical study to substantiate the parameters of the sorting device, the physical and mechanical properties of a heap of alfalfa seeds were taken into account. Substantiated parameters make it possible to improve the design and thereby improve the technological process of sorting and cleaning of alfalfa seeds of a dielectric sorting device.</p>
<p>Paper ID 97</p>	<p>K D Astanakulov¹, G G Fozilov^{2*}, B Kh Kodirov³, I Khudaev¹, Kh Shermukhamedov¹, and F Umarova¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, K.Niyazi str. 39, Tashkent, Uzbekistan</i> ²<i>Scientific-Research Institute of Agricultural Mechanization, Samarkand str. 41, Tashkent region, Uzbekistan</i> ³<i>Namangan Engineering-Construction Institute, Islom Karimov str. 12, Namangan, Uzbekistan</i></p> <p>Title of presentation: Theoretical and experimental results of determination of the peeler-bar parameters of corn-thresher Abstract: A new type corn-thresher was developed and tested for farms in Uzbekistan. Unlike to the existent threshers, this corn-thresher peels the husks of corn-cobs and threshes the kernel. At first parameters of the peeler-bars were researched theoretically, then three types of peeler bars were installed symmetrically on the surface of rotor of the corn-thresher and compared experimentally. The corn-thresher works qualitatively and it requires least metal and energy. The weight of corn-thresher is just 350 kg, consumes power amount is 5 KW and the work performance of the thresher in the pure time is 4600 kg/hour. During the theoretical research, the results were determined that, width of the peeler-bar should be bigger or equal than 4.8 cm ($bp \geq 4.8$ cm). Also, the distance between peeler-bar and concave should be equal to 38 mm ($Sc = 38$). While we researched experimentally the types of peeler bars, three type of them, namely straight tooth, sloped tooth and fluted bar were tested. Their surface was compared between 36-44 mm distance of peeler-bar and concave. When the distance between sloped tooth peeler-bar and concave was 38-40 mm, we achieved to peeling well the husk of corn-cob, threshing better the kernels than other peelers, the most important was that any grain had not damaged when we analyzed results.</p>
<p>Paper ID 104</p>	<p>A R Babajanov^{1*}, and B N Inamov²</p> <p>¹<i>Land Use Department, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan</i> ²<i>State Scientific Research and Design Institute on Land Management "Uzdavyeloyiha", Tashkent, Uzbekistan</i></p> <p>Title of presentation: Issues of involvement in circulation of unused agricultural lands in Uzbekistan Abstract: This article examines the reasons for the withdrawal of highly valuable irrigated arable land from agricultural turnover in the Republic, provides a number of statistical data in this direction, indicates ways to eliminate this situation with the help of state measures, and based on a comprehensive analysis, provides scientific and practical recommendations for the return of unused areas of irrigated arable land to agricultural production.</p>
<p>Paper ID 106</p>	<p>D Ermatova^{1*}, Sh Imomov², and F Matmurodov³</p> <p>¹<i>Faculty of Agriculture and Mechanization, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i> ²<i>Department of Tractor and Automobiles, Tashkent Institute of Irrigation and</i></p>



ICECAE 2020

	<p><i>Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i> <i>³Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i></p> <p>Title of presentation: Mathematical modeling of the interaction of the main parts of a wheel tractor and the numerical determination of the operator's seat oscillation Abstract: In article is given mathematically modeling of fluctuation, movement and kinematic forward axle, suspension bracket of a skeleton, engine, cabin and seat of the wheel tractor. It is given an analytical type of the equation, the describing vertical fluctuations and longitudinally angular fluctuations of a cabin and the main parts of the tractor. Using this model will be found as far as distances are displaced the main parts of the tractor at vibration. The equations of linear system fluctuation with one degree of freedom of the under cabin damper, which shock-absorber of the tractor, are described.</p>
Paper ID 107	<p>N Toshpulatov¹, O Tursunov^{1,2,3}, D Kodirov¹, and G Kholmuratova⁴ <i>¹Department of Power Supply and Renewable Energy Sources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i> <i>²School of Mechanical and Power Engineering, Shanghai Jiao Tong University, 200240 Shanghai, China</i> <i>³Research Institute of Forestry, 111104 Tashkent, Uzbekistan</i> <i>⁴Department of Management, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Environmentally friendly technology for the destruction of tobacco mosaic viruses (TMV) from selected species of plants Abstract: The article provides information on diseases of plants of melons and gourds of tomato, and cucumber. The analysis was carried out to identify the current state of the problem of infection and morbidity of tomato and cucumber plants with tobacco mosaic viruses (TMV). The positive and negative aspects of existing methods and methods of combating pathogens are described. The structure of the pathogen, the structure of cells in a spiral for the purpose of their destruction and elimination of harmful effects were studied. The description of the use of electric current discharges on the possibility of using TMV for breaking the cell spiral with the aim of destroying them is given.</p>
Paper ID 112	<p>K V Turdaliev¹, A Lee^{2*}, A Qosimov¹, G Makhkamov¹, S Komilov¹, and J Pulatov² <i>¹Department of General Technical Disciplines, Namangan Engineering-Construction Institute, 12 Islam Karimov str., Namangan, Uzbekistan</i> <i>²Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyazov str., 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Modeling the movement of onion seeds after the seeding machine Abstract: One of the most important issues of sowing small-seeded crops (in the example of onions) is considered. The method of sowing has a great influence on crop yields. The choice of planting method is due to the need for a more uniform distribution of plants over the field area in order to optimize the conditions for their development. Studying the movement of seeds during the sowing process is the most important task, as the seeds are object of sowing. The article provides an analysis of previous work on the precision sowing of small seed crops. And also, the flight and the trajectory of the seeds from the ejection window to the bottom of the groove were studied theoretically. In the research, methods of higher mathematics, classical mechanics, and impact theory were used in which it was possible to obtain the necessary equation. Based on the numerical solution of the obtained equation, graphs are constructed that determine the trajectory of falling onion seeds when ejected from the sowing apparatus and the graphical dependence of the recovery coefficient on the height of the sowing apparatus. Also, the installation height of the metering unit was installed.</p>
Paper ID 115	<p>M I Ashirov¹, B M Ashirov¹, F B Bakhriddinov¹ and K R Khaidarov¹ <i>¹Scientific-Research Institute of Livestock and Poultry, Russian Academy of Natural</i></p>



ICECAE 2020

	<p style="text-align: center;"><i>Sciences, 117105 Moscow, Russia</i></p> <p>Title of presentation: Productive qualities of Swiss cows depending on the genotype of bulls Abstract: This study highlights the use of European breeding bulls in the selection of breeding stock of Swiss cattle in Uzbekistan in order to improve the productive qualities of cows and create highly productive families. In experimental herds, milk yields of mature cows exceed the requirements of the breed standard by 935 - 1219.4 kg, the ancestors of families are 1627 - 1816 kg higher than the requirements of the breed standard, which indicates their high genetic potential.</p>
Paper ID 131	<p style="text-align: center;">A S Kudratillaev <i>Academy of Sciences of the Republic of Uzbekistan, 100047 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Innovative technology to increase the yield of cotton, wheat and other agricultural crops to ensure the acceleration of their maturation, resistance to diseases and to ensure environmental cleanliness of the crop Abstract: The article briefly describes the innovative technology developed and implemented in the fields of many farms in the Tashkent, Kashkadarya regions, in the Ferghana valley and in the North-Eastern region of the Republic of Kazakhstan (Ust-Kamenogorsk) for processing seeds of cotton, wheat and other agricultural crops in high-voltage electric fields. The novelty of this technology, in contrast to the known methods of pre-sowing seed treatment in an electric field, is that the seeds of these crops are subjected in series and in parallel to the effects of high-intensity electric fields of alternating, direct and pulsed currents of different intensity, duration of exposure and sequence of action. In addition, a number of technological solutions have been implemented in the seed processing line to improve the quality of their processing. The results of this technology can significantly increase crop yield (for example, for cotton at least 25 %, for wheat at least 40 %); improve crop quality; accelerate its maturation for 12-20 days, depending on the type, variety of plants and climatic conditions of the area; reduce the amount of seed material (seeds) by 2-2.5 times; get an environmentally friendly crop and eliminate the use of pesticides, plant diseases and crop.</p>
Paper ID 136	<p style="text-align: center;">K D Astanakulov^{1*}, M R Karimov², I Khudaev¹, D A Israilova¹, and F B Muradimova¹ <i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyazov, 100000 Tashkent, Uzbekistan</i> <i>²Termez branch of Tashkent State Technical University, 24 Manguzar, Termez, Uzbekistan</i></p> <p>Title of presentation: The separation of light impurities of safflower seeds in the cyclone of the grain cleaning machine Abstract: At present, the grain cleaning machines used for cleaning safflower seeds are not effective in cleaning safflower seeds due to the high energy consumption, metal and material content. For this reason, in Uzbekistan an energy and resource-saver grain cleaning machine has been developed which meets the needs of the farms in the cleaning of safflower seeds. When cleaning safflower seeds, the unfamiliar compounds in its content, including 2-3% light impurities should be separated. The quality of safflower seeds cleaning from light impurities depends on the number of fan rotations, the slope and height of the suction pipe and the quenching of the separated light impurities depend on the cyclone parameters. According to the theoretical and experimental studies, light compounds falling into a cyclone with a diameter of less than 20 m/km rise with air and fall with large ones. In addition, the rotation frequency of the fan in the grain cleaning machine is 2200 rpm (air flow rate 5.1 m/s), the height of the suction pipe is 70-130 mm and the slope is in the range of 20-40 degrees and the separation of light impurities of safflower seeds were achieved at around 85 percent.</p>
Paper ID 138	<p style="text-align: center;">A Mukhammadiev¹, A Denmukhammadiev^{1*}, A Pardaev¹, and I Abdirakhmonov¹</p>



 **ICECAE 2020**

¹*Tashkent institute of irrigation and agricultural mechanization engineers, 100000
Tashkent, Uzbekistan*

Title of presentation: Study of the electrical resistance of the components of healthy cotton seeds and those infected with gummosis

Abstract: The article provides data on the impact of high-voltage current of electric spark discharges on the culture of gummosis located on the surface of a cotton seed, special electrodes were made to determine electrical resistance, a method for conducting research experiments was developed, the liquid was from the outside of the peel, an electronic megohmmeter was used for measurement, for conducting experiments have drawn up a block diagram of the research methodology. The analysis of the works shows the absence of any data on the electrophysical parameters of the moistened pubescent seeds before sowing. Therefore, the study of the electrophysical characteristics of sown moistened pubescent cotton seeds is of scientific and practical importance for substantiating the operating parameters of electric spark treatment. Before sowing, pubescent cotton seeds are sorted (low-quality seeds are separated up to 10-15%), then moistened. The morphology and the mechanism of wetting cotton seeds are reflected in the analyzed works, and in the sectional view of the cotton seed. In the process of moistening, the main site of moisture absorption at the initial stage of moistening after backfilling is chalaza. Together with moisture, oxygen also enters the crumpled cotyledons, after which the root makes its way through the micropile. The peel protects the seed core from excessive oxygen supply. At the same time, the skin of the seed prevents the rapid flow of moisture into the seed. An electrical circuit is presented that ensures the completeness of seed treatment. And also the materials are given regarding the "electric hardening" of the water being humidified. Preconditions have been made for the automation of the seed moistening process.

K Shovazov¹, M Shoumarova¹, T Abdillayev¹, Sh Yusupov^{1*}, and B Xusainov²

¹*Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent
Uzbekistan*

²*Urgench State University, Khorezm, Uzbekistan*

Title of presentation: Quality of friction drive moving spindels of cotton picking machine with vertical spindel

Abstract: The article provides some information on the quality of cleaning the external friction (V-belt) drive, which drives the spindles of the vertical spindle of cotton picking machine, produced in the Tashkent Agricultural Tractor Plant.

It is known that the main indicator for assessing the technological process of the cotton picking machine is the level of harvesting of ripe cotton. The degree of picking depends on many factors, the most important of which is that the amount of rotation velocity of the spindle around its axis, which meets the cotton ball, does not change. Factually, the degree of picking depends on the amount of absolute velocity of the spindle tooth, which acts like a double-sided blade, especially on its direction, as determined by previous fundamental research [1-4].

The absolute velocity of the tooth is the geometric sum of the working velocity of the machine in the field V_m , the rotational velocity of the spindle drum V_b and the rotational velocity V_{sh} given by the rotation of the spindle around its axis. It is explained that since the motor of a machine used in the field is always running at rated velocity, the values of V_m and V_b remain constant, but for various reasons, the angular velocity of the spindle, i.e. the rotational velocity of the tooth, remains the same as the constructor fixed. If the velocity of a single V_{sh} changes, the absolute velocity of the tooth will change, and in some cases it will not be possible that the tooth cannot grind cotton. In a horizontal-spindle cotton picking machine, the "rigid" drive, which transmits motion to the spindles, ensures that the angular velocity of the spindle in the spinning zone is always within the limits set by the constructor. Therefore, its picking rate does not change. The disadvantages of the vertical spindle device are that the Tashkent Agricultural Tractor Plant does not pay attention to the fact that its parameters do not meet the technical requirements in the production of the above-

Paper ID 139



 **ICECAE 2020**

	<p>mentioned friction drive for the spindle. For example, the tension of the three piston belts in a friction drive is not controlled in the assembly shop. Due to the fact that the tension of the belts is not the same, the pressure exerted by the belts on the spindle roller, and therefore the frictional forces that rotate the spindle, will be different. When the spindle tooth is stuck to the cotton ball and the resistance to rotation is increased, the angular velocity of the spindle decreases and the direction of the absolute velocity of the tooth becomes uncomfortable. The article examines the tension of the outer straps of the friction drive in 28 new devices assembled at the plant and presents the results of the analysis.</p>
<p>Paper ID 140</p>	<p style="text-align: center;">S B Gulomov¹, and A G Sherov¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Study on drip irrigation system as the best solution for irrigated agriculture</p> <p>Abstract: This article analyzes the current research on drip irrigation for the efficient use of water resources caused by increasing global warming, examines their various designs, advantages, disadvantages, and low-pressure drops created at the Tashkent Institute of Irrigation and Mechanization Engineers. Irrigation method was applied on apple sort of “golden” in the meadow gray soils of the Tashkent region according to the mechanical composition of sandy loam soils. With the use of an apple orchard, water savings and high productivity have been achieved.</p>
<p>Paper ID 149</p>	<p style="text-align: center;">S Kh Isaev^{1*}, R U Rakhmonov², S S Tadjiev³, G I Goziev¹, and S Z Khasanov^{1,4}</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000, Uzbekistan</i></p> <p style="text-align: center;"><i>²Scientific Research Institute of Cotton Breeding, Seed Production and Cultivation Agrotechnology, Tashkent 100140, Uzbekistan</i></p> <p style="text-align: center;"><i>³Bukhara branch of the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Bukhara 200100, Uzbekistan</i></p> <p style="text-align: center;"><i>⁴Tashkent State Agrarian University, Tashkent 100140, Uzbekistan</i></p> <p>Title of presentation: Efficiency of irrigation water discharged to furrows in combating irrigation erosion</p> <p>Abstract: In this paper, the approach to reduce the risk of irrigation erosion in the irrigated areas where ‘Andijan 37’ and ‘Namangan 77’ varieties of cotton were sowed, in which the topsoil is formed by typical gray soils and which are vulnerable to erosion, was validated. In cotton irrigation, while watering with a device with a 15 mm of irrigation hollow, the cotton water-demand was improved and an optimal and favorable condition to uptake the potential moisture and nutrient for cotton breeding was created. This enabled to harvest 3.6 quintals more cotton yield per ha in contrast to the usual condition, to gain the net profit accounted for 700,309 sums per ha, and to improve the profitability by 38%.</p>
<p>Paper ID 157</p>	<p style="text-align: center;">I B Sapaev¹, G E Eshchanova¹, U A Nullaev¹, F R Begov¹, D A Isroilova¹, and L R Babakulova¹</p> <p style="text-align: center;"><i>¹Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan</i></p> <p>Title of presentation: The implementation of optimized drip irrigation system based on semiconductor sensors</p> <p>Abstract: This article presents an optimized version of a drip irrigation system based on semiconductor sensors. In this study, the organizational parts of the drip irrigation system based on semiconductor sensors are fully automated, namely: control of the water base, water volume in the pipe, water velocity in the pipe, soil moisture, salinity, temperature, ph of hydrogen content in the soil, pressure regulator valves. The electrical properties of a drip irrigation system based on semiconductor sensors have been proven, on the basis of which a semiconductor material can achieve an optimal result. The system provides economic</p>



 **ICECAE 2020**

	<p>indicators for one hectare of land and an analysis of the complete replacement of imported products.</p>
Paper ID 160	<p>A Jumanov¹, S Khasanov^{1,2*}, A Tabayev¹, G Goziev¹, U Uzbekov¹, and E Malikov¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Kary Niyazi str. 39, Tashkent, Uzbekistan, 100000</i></p> <p>²<i>Tashkent State Agrarian University, University str. 2, Tashkent province, Uzbekistan, 100140</i></p> <p>Title of presentation: Land suitability assessment for grapevines via laser level in water-scarce regions of Uzbekistan (in the case of Kashkadarya province)</p> <p>Abstract: The most suitable arable land for viticulture is mainly located in the rain-fed areas such as in the foothills and mountainous regions of Uzbekistan where vineyards reach the acme point of the yield productivity. Irrigating with rainwater in the vineyard has a great potential for obtaining stable yields at the low cost of irrigation water which is proven by experimental and theoretical studies. This paper aims at implementing and testing the advantage of sustainable irrigation methods in water-scarce regions of Uzbekistan by scrutinizing the hydraulic characteristics of irrigation water and slope of the study area. We considered the maximum evapotranspiration rate in general for all phases to calculate the amount of irrigation water required per one vine tree since considering the water scarcity in the maximum growing season is important. We firstly aimed at constructing the pool to store raindrops. To perform this, we used the laser level for checking land suitability and a standardized 20 Ø irrigation pipe to deliver rainwater from the pool to the furrows of the vineyard. The results of the geodetic survey showed that the average slope of the pilot area was equal to 0.022 and enabled to implement the rainwater irrigation.</p>
Paper ID 170	<p>Sh Rakhmanov^{1*}, A M Nematov¹, N Sh Azizova¹, D A Abdullaeva¹, and E E Tukhtaev¹</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100007 Tashkent, Uzbekistan</i></p> <p>Title of presentation: Mathematical modelling of the hydrodynamic structure of flows in the apparatus for cultivating chlorella: Parametric identification of the mathematical model</p> <p>Abstract: This article discusses the mathematical modeling of the hydrodynamic structure of flows in the apparatus for cultivating chlorella and the parametric identification of the mathematical model. Since in the considered reactor there is rather active longitudinal and radial mixing, the diffusion model is still more acceptable. However, such a model is described by partial differential equations and is associated with certain difficulties associated with determining the coefficients of radial and longitudinal diffusion. Therefore, when describing such phenomena, it makes sense to resort to the cell model. The mathematical description of the hydrodynamic structure of flows in the form of a cell model consists of a system of linear differential equations of the first order. On the basis of the obtained kinematic equations and the control of the hydrodynamic structure of flows in the reactor, a generalized mathematical model of the microalgae cultivation process is being drawn up. The model of the process under consideration obtained by analytical methods is a system of equations describing various aspects of the research object, taking into accounts the kinetic parameters and real hydrodynamic regimes. These specific values of the coefficients can be used to solve various engineering problems.</p>
Paper ID 172	<p>I Marupov¹, Sh Imomov¹, D Ermatova^{1*}, J Majitov², N Kholikova¹, V Tagaev¹, and I Nuritov¹</p> <p>¹<i>Department of Tractors and cars, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 39 Kori Niyoziy street, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>Bukhara engineering-technological institute, 15a str.K.Murtazayeva, 200100 Bukhara, Uzbekistan</i></p> <p>Title of presentation: Research of vertical forces for acting tractor unit</p>



ICECAE 2020

	<p>Abstract: This article provides an important study of the vertical forces acting on the tractor unit. At the same time, it is shown that the undercarriage of a stationary tractor perceives the operating weight of the tractor itself, mounted agricultural machines and fertilizers. Thus, with a steady motion of the tractor unit, the values of the loads on the front and rear wheels change due to the resistance forces of the working tools and the rolling resistance force. And it is also shown that the rolling resistance force reduces the vertical loads on the steering wheel and the drive wheels are loaded by the same amount due to the redistribution of loads along the axles.</p>
<p>Paper ID 185</p>	<p style="text-align: center;">G G Umarov¹, Sh E Buronov^{2*}, and M O Amonov¹</p> <p style="text-align: center;">¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent 100000 Uzbekistan</i></p> <p style="text-align: center;">²<i>Karshi Engineering-Economics Institute, 225 Mustaqillik Ave, Karshi 180100 Uzbekistan</i></p> <p>Title of presentation: Justification parameters of mechanized dryer unit</p> <p>Abstract: This article presents an analysis of the creation of a unit for drying stem agricultural crops and justification of its main parameters, which is aimed at growing large and high-quality products through this process. The purpose of creating such unit and justification of its parameters was that during drying, products were dried unevenly, resulting in some parts of the product were dried more than necessary, and some areas rotted without complete drying. Therefore, the shape of unit for drying products must be such that the product simultaneously dries. Based on theoretical and experimental studies on this criterion, was developed a nomogram, the shape and parameters of the dryer device were theoretically analyzed by using analytical dependencies</p>
<p>Paper ID 189</p>	<p style="text-align: center;">B D Allashov^{1*}, M X Zulfikarov², and F Toreev²</p> <p style="text-align: center;">¹<i>Scientific-Research Institute of Livestock and Poultry, Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Tashkent State Agrarian University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Effective agrotechnology for cultivation of forage crops</p> <p>Abstract: In order to develop agrotechnology for the cultivation of fodder crops, crops were studied in different versions and in different rates of sweet clover of the white variety "Kibray", oats "Uzbek broadleaf", rye "Shalola", triticale "Prag Silver" and corn "Uzbekistan-2018". In variants planted in a two-component mixture, 4 variants were tested in each. Each variant was analyzed for valuable agricultural traits, especially the yield of the zeed mass. The cost-effectiveness of each option was also examined. An effective variant of sowing white melilot in combination with cereals and legumes was revealed.</p>
<p>Paper ID 190</p>	<p style="text-align: center;">B D Allashov^{1*}, M X Zulfikarov², and M N Sattarov³</p> <p style="text-align: center;">¹<i>Scientific-Research Institute of Livestock and Poultry, Tashkent, Uzbekistan</i></p> <p style="text-align: center;">²<i>Tashkent State Agrarian University, Tashkent, Uzbekistan</i></p> <p style="text-align: center;">³<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Primary seed production of fodder crops</p> <p>Abstract: In recent years, for a number of reasons, there has been a decrease in attention to seed production of many forage crops for seed reproduction. Many varieties have lost their yield, resistance to diseases and various unfavorable climatic conditions, for which it is necessary to carry out regular work on the primary seed production of varieties. In our studies, work was carried out on primary seed production on the varieties of fodder beet "Uzbekistan-83", corn "Uzbekistan-2018", oats "Uzbek broadleaf" and triticale varieties "Silver Prague". This article presents the results of primary seed production on forage crops of the above varieties.</p>
<p>Paper ID 191</p>	<p style="text-align: center;">A A Nurmatov¹, B D Allashov^{1*}, Sh Sh Jabborov¹, I Rustamova², and Sh Tursunov²</p> <p style="text-align: center;">¹<i>Scientific-Research Institute of Livestock and Poultry, Tashkent, Uzbekistan</i></p>



ICECAE 2020

	<p>²<i>Tashkent State Agrarian University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Feeding farm animals based on the new innovative total mixed ration (TMR) technology</p> <p>Abstract: The main part of the meat products produced in the country is beef. Currently, the number of cattle is over 12 million, of which 94% are livestock, and 90% are meat products. The efficient use of livestock feed plays an important role in improving digestion and increasing productivity. Feeding the animals with Korean total mixed ration (TMR) technology leads to improved feed efficiency and, at the same time, increased productivity. In this regard, research work on the application and implementation of TMR technology in farms of the population of Uzbekistan for cattle is relevant. This article presents the results of studies of feeding using Korean technology in households.</p>
Paper ID 192	<p>A A Nurmarov^{1*}, B D Allashov¹, B Yunusov¹, and Sh Sh Jabborov¹</p> <p>¹<i>Scientific-Research Institute of Livestock and Poultry, Tashkent, Uzbekistan</i></p> <p>Title of presentation: The influence of natural biologically active additives on the growth and development of stallions of the Karabair breed</p> <p>Abstract: The Karabair horse breed is the oldest breed created in Uzbekistan, and today their number is more than 90% of horses in the republic. It is a versatile breed used in sporting games, with good performance, well adapted to local conditions as well as for sports. It is important to study the needs of the Karabair horse breed for mineral supplements and vitamins, replenish them with natural biologically active additives, determine the norms and study the effect of non-traditional dietary supplements on the growth and development of Karabair horses. This article presents the results of a study of the effect of mineral and vitamin supplements obtained from by-products of the grape industry on the growth and development of stallions.</p>
Paper ID 196	<p>Sh Rakhmanov^{1*}, T T Turgunov², Z K Kusharov², and A A Mengnorov²</p> <p>¹<i>Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100007 Tashkent, Uzbekistan</i></p> <p>²<i>Department of Information Technologies and Mathematics, Tashkent State Agrarian University, Tashkent, Uzbekistan</i></p> <p>Title of presentation: Econometric methods for solving problems of analysis and forecasting dynamics of yield of agricultural crops</p> <p>Abstract: This article is devoted to the use of limited resources in agricultural production, forecasting profitability and productivity, improving the integration of agricultural enterprises, analyzing the results of factors-dependent, using economic-mathematical and econometric (additive, multiplicative and multiple (proportional)) models, econometric studies based on the application of econometric methods for planning and forecasting agro-economic development of agriculture, and also search for new scientific approaches to agro-economic forecasting.</p> <p>The range of key objectives of agro-economic forecasting is defined, that is, determining the level of satisfaction of demand for agricultural products in the near future, as well as creating an effective production management system and ensuring sustainable economic development, and its relationship with industry and other sectors in the region. The optimal solutions are achieved due to higher economic identification of factors and sources of economic growth, systematic analysis of conditions in the implementation of an integrated approach in economic processes.</p>
Paper ID 204	<p>U Umurzakov¹, F Mamatov^{2*}, N Aldoshin³, and B Mirzaev⁴</p> <p>¹<i>Faculty of Organization and Management of Water Resources, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 100000 Tashkent, Uzbekistan</i></p> <p>²<i>Department of Scientific-applied Researches and Innovation, Karshi branch of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Karshi, Uzbekistan</i></p>



TIAME
Tashkent Institute of Irrigation and
Agricultural Mechanization Engineers



Politechnika Krakowska
im. Tadeusza Kościuszki



ICECAE 2020

³*Department of Agricultural Machines, Russian State Agrarian University - Moscow
Timiryazev Agricultural Academy, Moscow, Russia*

⁴*Faculty of Mechanization of Hydromeliorative Works, Tashkent Institute of Irrigation
and Agricultural Mechanization Engineers, Tashkent, Uzbekistan*

Title of presentation: Study on soil cultivation technologies in the Republic of Uzbekistan

Abstract: The aim of the study is to analyze soil cultivation technologies and development trends of tillage machines in the Republic of Uzbekistan. The prospects of using dump and non-dump soil tillage are shown. Existing basic processing technologies are presented. The advantages and disadvantages of traditional technologies and plows for primary tillage are analyzed. The advantages of the new technology of smooth plowing and frontal plows for its implementation are given. The expediency of developing and implementing combined machines that carry out various technological processes in one pass of the unit and special-purpose plows for working in gardens and on slopes based on frontal plows is substantiated. The perspectives of the application of technologies and tools for anti-erosion and land reclamation cultivation, phytomeliorative works based on minimal narrow-band soil cultivation and sowing are shown. Directions of developments in the field of mechanization of tillage in the future are given.

Please use the ZOOM link below to join ICECAE 2020 conference:

<https://us02web.zoom.us/j/86777730144?pwd=bGVwUmV5NDF3K09nampacEhNd0NMQT09>

Conference ID: 867 7773 0144

Access code: 12345

Use the same link during the second day of the conference also. Once all participants enter the conference online platform, then they will be distributed to three rooms (sessions): room-1 (Session: Energetics), room-2 (Session: Civil Engineering), and room-3 (Session: Agriculture Engineering).

All presenters will have access to demonstrate their presentations (pdf or ppt files) on their PC screen.

Regarding the time, to be sure of the time in the agenda is correct, please keep in mind that Conference starts:

14 October 2020 at 11:00 a.m. (Tashkent, Uzbekistan)

15 October 2020 at 11:00 a.m. (Tashkent, Uzbekistan)

For poster presenters!

Please use the link below to prepare your poster:

<https://www.posterpresentations.com/free-poster-templates.html>

All posters will be uploaded on the ICECAE 2020 website.

Posters should be sent to icecae2020@gmail.com; icecae@tiiame.uz before **October 15**.