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DIALOGUE

Integrated Natural Resources Management in Drought-prone and Salt-affected Agricultural Production Systems in Central Asia and Turkey (CACILM-2)

"Green Pedestal": Zhanyl Bozayeva, National Coordinator of the FAO/GEF Project in Kazakhstan, was listed as world's top 100 young employees of the Organization

Two hundred people and ten teams from all parts of the Food and Agriculture Organization of the United Nations (FAO) were awarded for remarkable performance under extraordinary circumstances in an exceptional year. The global FAO Employee Recognition Awards 2020 was held (like all events in 2020) virtually.

One of the awardees was Zhanyl Bozayeva, national manager of the CACILM-2 in Kazakhstan.

This annual initiative, launched by FAO Director-General Qu Dongyu, recognized 100 young and 100 experienced but "young at heart" employees of the Organization for achievements in innovation, knowledge sharing, operational efficiency and effectiveness, teamwork and partnership.

The 200 awardees – selected through an FAO-wide poll out of 600 nominations – represent more than 90 nationalities and come from offices based in over 80 countries. Below is an interview with Zhanyl Bozayeva.

Why did you choose the Food and Agriculture Organization of the United Nations (FAO)?

Working for the United Nations was a childhood dream of mine. When I was a child, I took interest in humanities, and the foreign language was one of my favorite subjects at school. I had a strong desire to work in a multicultural environment where I could communicate in several languages, and the UN is just such a platform for communication.

As a child, I imagined the UN as a pedestal of "green color" where stand the people who do good things for the planet and I wanted to do the same.

It may sound trite, but since my 8th grade at school I was going to have a profession in the field of international relations, I focused on the history and other subjects that could be useful to me on the international arena.

Having received a gold medal upon my graduation from school, I took the first step in realizing my dream and entered the university to study
international relations, and since I was always close to land, agriculture became my second specialty. I worked in various ministries, but my dream remained unfulfilled, so I started looking for a job in international organizations, in the UN, FAO. And so, it happened – my dream came true.

What was the year 2020 for you? What lessons did you learn, what was unusual and what have you achieved?

Like for all people, 2020 was difficult for me, first of a kind in my life, very strange and unusual. The whole planet is facing the pandemic and an environment where everything depends on discipline. Everyone in the UN system switched to telecommuting since March.

This became the biggest challenge because when you have to work with people in the field, you have to personally coordinate the activities: leave the office and work in the field. You know how to do it, and it is of the utmost importance. However, in 2020 everyone was forced to stay at home and work remotely. Therefore, we had to look for the most unusual ways and approaches to continue the dialogue with partners.

This is especially challenging in agriculture, because in this industry face-to-face relations are more important than anywhere else. The pandemic changed everything, we had to go to

the virtual space and communicate with beneficiaries and partners there only, using all possible platforms - Zoom, Skype, WhatsApp and other communication channels. This is complicated by the fact that many farmers do not have access to Internet.

This meant even more difficult tasks and presented the key problem. Moreover, in 2020 we had to urgently create a national team to implement the project in the country, and the team had to work twice as much to complete the tasks outlined by the project for two years.

As I said, all meetings and discussions with national partners, beneficiaries and other stakeholders had to be organized online which inevitably affected both the process and the timing of the project.

All planned capacity building activities for the project partners had to be arranged as webinars. But the CACILM-2 team quickly adapted to the new realities, and we could finally rejoice at the results: by mid-December 2020, we trained more than 600 project beneficiaries on sustainable land management technologies (by the end of 2020, we had 1 webinar and 2 round tables to deliver). We should say that participants of these important trainings in many areas of sustainable natural resources management were not only partners from Kazakhstan – scientists, researchers, practitioners, farmers, but also stakeholders from all countries of Central Asia.

But knowledge sharing was just one of the project components. We also arranged purchases and found opportunities to deliver machinery, equipment and seeds to partners on site, we prepared the most relevant recommendations for farmers and all country partners for publication. We have established close collaboration and complete mutual understanding with leading research institutes in Kazakhstan whose efforts are focused on better and rational use of natural resources in the country. Our team closely followed the field works in pilot areas, and we even managed to hold a number of “live” field workshops in the autumn of 2020 to take stock of this uneasy year.

What does this award mean to you?

I was very surprised to be nominated as one of the FAO world’s top 100 young employees, and I got to this list by a secret ballot. This was a huge surprise for me, because I never thought that my work would be noticed.

But once I knew that I was on the list of the best young and promising employees in the world, I realized that our efforts were not in vain, that our inputs did not go unnoticed.

No one is left behind – I see it from my own experience. Wherever you work, whatever you do– if you put your heart and knowledge into your work and strive to do your job in the best possible way, it will not go unnoticed.

This award became a sign to me that I am on the right track. Thanks to the award, I realized that I was appreciated. And when a person realizes that he/she is appreciated, powerful internal motivation wakes up and one wants to bring even more benefits to people with his work and do everything for the good of the planet.

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In this Newsletter:

Innovative approaches and technologies to combat salinization of marginal lands in Central Asia

the guidelines on “Innovative approaches and technologies to combat salinization of marginal lands in Central Asia” were published within the framework of the project in Kazakhstan.

Climate change, population growth and crises negatively affect the economic status of agricultural producers and diminish the productivity of saline, arid and degraded lands in Central Asia.

Raising level of groundwater, its mineralization in the Aral Sea basin and an unfavorable environment in this region, increasing salinization, waterlogging, soils drainage, migration, and accumulation of toxic salts in the root zone have a detrimental impact on potential productivity of the region’s land and plant resources, and once fertile lands become unsuitable for irrigated farming.

“In such an environment, application of integrated, scientific and innovative approaches to the use of limited natural resources is becoming paramount to ensure long-term and sustainable development and food security”, said one of the authors of the guidelines Kristina Toderich, FAO international expert on sustainable drylands management, professor at Tottori University, Japan; consultant of the International Center for Bio -Saline Agriculture (ICBA).

Integrated management of natural resources implies a set of measures to support the rational use of natural resources via integration of approaches and coordination of actions between all stakeholders. This takes into account all environmental and socio-economic factors (including the impact of various economic and social factors on the environment and natural resources), as well as all components of the environment and resources (such as air, water, biota, land, geological and natural resources).

The guidelines cover land quality control and salinization management; use of marginal water resources technologies for feed production; technologies for growing drought and salt tolerant crops; technologies for the assessment of high-yielding genetic lines of varieties for seed production, quality control and other issues of agricultural development on marginal lands, which are important in the farming sector.

The guidelines were prepared as a follow-up of the webinar On “Innovative approaches and technologies to combat salinization of marginal lands in Central Asia”, which was held in Kazakhstan in mid-August 2020 as part of the CACILM-2. The publication is intended to train and build the capacity of farmers and decision-makers in the field of integrated management of natural resources in drought-prone and salt-affected agricultural production landscapes of the Central Asian region; and to scale up existing best practices and approaches.
The publication can be downloaded from the

link: https://cloud.mail.ru/stock/4icPtrx8gc4okaWC5fMB6G52

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Phyto-amelioration for desalinization and better soil fertility: Field Day in the Balkhash district of the Almaty region

Early November, within the framework of an agreement between the Kazakh R&D Institute of Soil Science and Agrochemistry and the FAO-GEF CACILM-2, a field seminar was held in the Akdala array of the Balkhash district of the Almaty region to discuss the results of 2020 on cultivation of salt-tolerant crops on saline soils of the array.

Studies show that saline soils contain mineral salts in quantities that are harmful to plants. The oppression of agricultural crops begins when the soil profile contains more than 0.25% of salts. Most plants with an increased content of water-soluble salts in soils cannot be developed, or they give very low yields. It has been proven that the yield of grain crops decreases by 15% in case of a low degree of salinity, with a medium degree – by 35%, and with a strong degree – by 85%. The main reason underlying high soil salinity is a growing level of groundwater in irrigated areas, which in turn occurs due to the progressive destruction of collector-drainage networks associated with the lack of sufficient funding for their proper operation.

The agreement signed on 26 December 2019 between the country's leading scientific institution engaged in fundamental and applied research in the field of soil and agrochemical sciences and the FAO/GEF project, whose key mission is an integrated management of natural
resources in drought-prone and salt-affected agricultural production landscapes in Central Asian countries, including Kazakhstan, seeks to reduce soil salinity to increase the soil fertility and improve the environment.

Recently, phyto-ameliorative and meliorative crop rotations have been used to improve soil reclamation. Practice shows that the cultivation of salt-tolerant perennial grasses – phytomeliorants – increases the biological activity of saline soils and improves its structure. Phytomeliorants, especially fodder legumes, have desalination properties, they accumulate biological nitrogen and have a high nutritional value. During the phytomeliorants' root systems development in the soil, microorganisms' activity increases and organic matter accumulates, which ultimately contributes to better soil fertility.

In addition, crop diversification by introducing and integrating different farming practices in saline and degraded lands, increases agricultural productivity which can contribute to farmers' income generation.

Therefore, in 2020 with the support of the FAO/GEF project, the Institute of Soil Science began to implement approaches for desalination of saline soils in the Akdala irrigation array in the Balkhash district of the Almaty region. For this purpose, five varieties of salt-tolerant fodder crops were sown: barley of the Arna variety, alfalfa of the Galkede variety, sorghum of the Kazakhstanskaya 16 variety, Sudanese grass of the Izumrud variety and the Asimtal alfalfa .

At the same time with the field research, awareness raising was provided to the head of the Keleshek farm, an agronomist and farmers. First of all, the institute specialists assessed the current level of soil fertility and salinity on 5 hectares of arable land of the Keleshek farm and mapped them. Maps classified the fields of a given farm into different contours depending on the amount of nutrients in the soil. Farmers also received maps of soil salinity with a depth up to one meter.

The main measures to implement phytomeliorative options in the Keleshek farm included the delivery of seeds of salt-tolerant fodder grasses, agrotechnical preparation of 5 hectares of arable land for seeds and grasses sowing.

This contributed to the reduction of soil salinity and preservation of soil fertility, as fundamentals of agricultural production. The participants of the field workshop were convinced that the introduction of unconventional and so far not widely used fodder and leguminous crops will reduce the level of soil salinity, enrich it with necessary nutrients and restore the soil structure .

The participants of the field workshop were also acquainted with the halophytes plants, which help with desalination and phyto-amelioration of soils, since most of them can remove mineral salts from soil or irrigation water and accumulate them in the surface biomass. The period of soil desalination by halophytes is 3-5 years, and in case of very strong salinity – 6-7 years. As a result of such measures, these lands can be used for the cultivation of traditional crops .

The head of the Keleshek farm Bolat Burshakbaev, head of the agriculture department of the Balkhash region Burkyt Mukanov, agronomist of the Dinara Production Cooperative Mahmud Zhanulov, representative of the akimat Zhanybek Lebay, as well as managers and farmers of interested farms in the Balkhash region took part in the workshop.

Note: a number of practices that are usually used in farming to increase salt tolerance in crops cultivation: seeds hardening with salt (soaking them in salt solutions for 1 hour before sowing); introduction of microelements (boron, manganese, copper) into the soil, which has a positive effect on weakly and moderately saline soils; selection of salt tolerant varieties; reclamation measures for salt washing; phyto-amelioration (cultivation of halophytes which extract salts from the soil and accumulate them in the vegetation mass, and their removal from the reclaimed area); use vegetable seeds and potato tubers grown in conditions of soil salinity for sowing.

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Support for vulnerable farms of the Kyzylorda region of Kazakhstan

The global crisis caused by the COVID-19 pandemic has put the resilience of smallholder farms in southern Kazakhstan at risk. In addition to difficult farming conditions, saline soils and frequent droughts, the pandemic closed borders and imposed significant restrictions on the movement of people in 2020 and farmers of the Kyzylorda region lost labour resources – internal migrants and migrants from neighboring countries.

Therefore, the project management decided to provide the farms most affected by COVID-19 with a one-time gratuitous aid in the form of alfalfa seeds.

The national team of the FAO-GEF regional project, together with specialists from the Department of Agriculture of the Kyzylorda region and the Chamber of Entrepreneurs of the Kyzylorda region, made an overview on the ground and compiled a list of the most vulnerable and most affected farmers and households on the pilot territory of the Kyzylorda region, which included fourteen farms from the Syrdarya, Shiyeli, Zhalagash and Kazaly districts, as well as several farms from villages and districts that are subordinate to the Kyzylorda city administration .

Four tons of premium drought-resistant alfalfa seeds with a total value of four million two hundred thousand KZT were purchased by the project through an open tender in accordance with FAO's transparent procurement procedures.

“We hope that the high-quality drought-resistant seed material you received today will help to preserve the stability of your farms and the well-being of your families,” said Makhmud Shaumarov, regional coordinator at the seed handover ceremony held in a virtual format on Friday, 4 December 2020.

Zvayda Sadakbayev, Head of the Agriculture Department of the Kyzylorda region, noted at the ceremony that the government did not leave farmers in trouble and provided them with support, but premium quality seeds are also important. In addition, alfalfa not only covers the needs of farms for animal feed but also significantly improves the soil composition.

“In the context of the state of emergency and quarantine, entrepreneurs, including those in the agricultural sector, found themselves in a difficult situation, and we are very grateful to the CACILM-2 for timely assistance in hard times,” said Zhasulan Serikov, head of department of the Chamber of Entrepreneurs .

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“There are several ways to garden: the best one is to entrust this business to a gardener”, says Bakyt Ainebekova, candidate of agricultural sciences

As a child, she dreamed of becoming a lawyer. “I thought that I would grow up and protect people. And now I protect our land! Apparently, the heredity played a role: my parents worked as agronomists all their lives, and I followed their example. I work as the head of the fodder production department at the Kazakh Research Institute of Livestock and Fodder Production LLP. And I understand very well that it is impossible to do farming if you do not love your business and the land where you work”.

For me, sustainable and efficient use of natural resources is not just a global and very important issue. We are all responsible for what we leave behind.

The practical application of technologies that do not destroy the environment, production of organic food products, and a careful and competent attitude towards chemicals in farming should become a standard. The earth must be protected, otherwise it will be very difficult for future generations to live.

For me and for our department, where women are a majority, participation in the CACILM-2 is, first of all, a great responsibility and an opportunity for growth. The project has been working for one year, but a lot has been done already.

Land must be handled by professionals because there is a saying: there are several ways to garden, the best one is to entrust this business to a gardener. And when we held Field Days, farmers were happy to participate, because they studied, learned new things, communicated, and shared practical recommendations. This is so necessary for everyone!

We are now studying 10 genotypes of drought-resistant crops. Mohar, sorghum, triticale, wheatgrass which are of great interest to livestock breeders. New things are always attractive, we have never grown African millet before, but now, thanks to FAO experts, we have learned that this crop can grow successfully in our area.

I have a big family: sisters and brothers, nephews who rejoice at my successes and always support me in difficult times. But we do not see each other as often as we would like to, because from early spring to late autumn I am in the fields, because an agronomist counts every day. My loved ones understand that work requires complete dedication. We have big tasks ahead, and we are ready to fulfill them.

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“A man without a dream is like a bird without wings”, says Dina Genzhegarayeva, successful farmer together with her husband

I am sixty years old. When I was young, I graduated from the Polytechnic Institute, but it so happened that I work on the ground. And I don't even think about a well-deserved rest! My husband and I started growing vegetables. We became real farmers. I say this with pride.

It's no secret that farmers’ work is difficult, not easy. The earth requires special attention, great love, painstaking care in any weather. It is hot outside – we are on the ground, it rains – we work, because the crops that we have planted cannot wait. But how happy the heart is when people thank us for the fresh and top-quality products that we supply!

We really want to grow vegetables without chemical fertilizers. Organic tomatoes, cucumbers, potatoes, onions are the future we are striving for. But this is impossible without knowledge. Therefore, we are very grateful to the FAO project whose specialists help us learn about latest technologies and modern farming practices. This is so important to succeed!

The project consultants told us about a new crop of sorghum. It turns out that this is an amazing crop that can give good harvests. In addition, it is resilient to cold weather, and in our changeable climate this is important. My husband and I decided to plant sorghum. We shouldn’t be afraid to experiment!

We also learned a lot when we started sharing experiences with other farmers. Field day has become a vital necessity for us.

Recently, I have been reading books on self-development, psychology and I learned from them: where you put your energy – there you will expect prosperity. And we direct all our energy to work!

My husband and I raised six children. Unfortunately, our family lost one son. And we survived largely thanks to the work! There are a lot of things to do – you need to have time to cook food, help children with their studies, take care of many household chores. But everything can be done, you only need a great desire.

A man without a dream is like a bird without wings. Our dream now is to support our children, see them marry. I also dream of traveling. My husband and I would like to see the world, new places. But the main thing for us is to live in our home country in peace and prosperity.

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"Soil is the fabric of life and biodiversity on Earth", the name of the online conference held in Kazakhstan and dedicated to the International Soil Day (5 December 2020), uniting Kazakhstan, Japan, Kyrgyzstan, Tajikistan and Turkmenistan.

International consultants from FAO, scientists of the Kazakh Research Institute of Soil Science and Agrochemistry, scientists and teachers of the Kazakh National Agrarian Research University delivered their presentations at the Conference.

In addition to the rational use of soil resources and agricultural lands, the Conference hosted a wide exchange of views among scientists on new approaches to the preservation and reproduction of soil fertility, including resources in arid and saline regions of the country.

With a rich content, scientific evidence and promising results of field research and scientific work, the report "Diversity of halophytic flora in Central Asia and its role in improving soil quality and ecosystem sustainability" was made by Kristina Toderich, international expert on salinization of CACILM-2, professor at Tottori University (Japan).

The report of Nagima Altynbekova, senior researcher of the Department of Geography, Genesis and Soil Assessment, was devoted to the history of soil research and its role in the soil resources conservation in Kazakhstan.

When welcoming the Conference participants, the regional coordinator of CACILM-2 Makhmud Shaumarov noted that climate change accelerates soil degradation, and counteracting this process, as well as developing and implementing technologies for the restoration of an important natural resource, is one of the project's priority areas and therefore fruitful cooperation with academia of Kazakhstan on these issues will be strengthened and expanded.

It is remarkable that along with experienced specialists who have dedicated many years to the study and practical research of soil resources in Kazakhstan, young scientists, recent graduates of specialized universities, as well as high school students of the Almaty gymnasium also took an active part in the Conference. For many years, students of the gymnasium school No. 152 have been under the mentorship of the Research Institute of Soil Science and worked under the guidance of the Institute staff.

The students presented to the results of the soil research supervised by an experienced tutor, and their views on the problem of preserving this most important natural resource.

In total, the Conference dedicated to the World Soil Day

gathered 44 people, including scientists from the Kazakh Research Institute of Soil Science and Agrochemistry named after U.U. Uspanov, scientists and teachers, students, undergraduates and doctoral students from the Kazakh National Agrarian Research University, soil scientists from Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, as well as school students from gymnasium No. 152.

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The Alley of Peace was laid in the Almaty Botanical Garden to honor the 75th anniversary of the UN

31 October 2020 is the launch date of the ecological project "Alley of Peace". Public botanical spaces are the initiatives rapidly gaining popularity in modern urbanism, science of the cities functioning and development inseparably from nature, sustainable solutions and clean renewable energy.

Botanical spaces acquire the status of "green lungs" of cities, places where people socialize, relax and fill themselves with the energy of creation. Such places should be comfortable, attractive, full of meaning and relevant content, both visual and cognitive.

"Alley of Peace" in Almaty is designed to become a place of attraction for people with a wide variety of interests, forming a comfortable oasis
"Communities of the World" in the very center of the metropolis.

In addition, it is a deliberate dialogue for a clean world, a symbol of the international and Kazakh diplomatic community rallying for an orderly and environmentally friendly space. In the future, the "Alley of Peace" can turn into a large-scale project and its initiative can be passed from country to country like a relay race, creating and expanding new oases of Peace and Goodness on the Planet.

The initiator of "Alley of Peace" was the NGO "Diplomatic Club of Almaty", with the support of the Representative Office of the Ministry of Foreign Affairs of the Republic of Kazakhstan. The project was implemented thanks to the active support from the leadership of the Main Botanical Garden, CACILM-2, diplomatic missions, as well as international organizations accredited in Almaty.

According to the Head of the Representative Office of the Ministry of Foreign Affairs of the Republic of Kazakhstan in Almaty E. Iskakov, the Alley's initiative, in addition to planting trees, includes the harmonious placement of sculptures, steles, small architectural forms and styles of art. At present, placement of installations on behalf of the French Republic and the Kingdom of Belgium is being worked out.

The final version of the Alley will be a proportionally adjusted ensemble that attracts the eye, creates a special feeling of harmony with nature and belonging. The opening of the Alley is scheduled for spring 2021.

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Digitization of land use maps continues in Kyrgyzstan with FAO assistance

Powerful computer hardware and servers' components contribute to better efficiency of Kyrgyzgiprozem employees and development of electronic agriculture in the country

In mid-December 2020, the Design Institute "Kyrgyzgiprozem" hosted a handover ceremony for 10 sets of computer equipment and servers' components seeking to improve the operations of the institute's staff and develop electronic agriculture in the country. The equipment was provided by the project of the Food and Agriculture Organization of the United Nations (FAO) and the Global Environment Facility (GEF), as part of a cooperation agreement on the digitization of land use maps in Kyrgyzstan.

As a strategic industry for Kyrgyzstan, agriculture has a high export potential, and it can help improve the living standards of the rural population. However, the development of agricultural production, profitability increase and effective management of natural resources in the country are impossible without the introduction of advanced (digital) technologies.

Since April 2020, specialists of the State Design Institute for Land Management "Kyrgyzgiprozem" under the Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic with financial and organizational support of the FAO-GEF project is pursuing the digitization of land use maps for Kyrgyzstan.

"For the successful completion of the digitization process, as well as further support and improvement of land use maps in digital format, the project decided to purchase powerful computer equipment for the Design Institute that can cope with the complex tasks set, noted Makhmud Shaumarov, regional project coordinator. We hope this will immensely facilitate decision-making processes leading to more sustainable land management in Kyrgyzstan at all levels".

Traditional approaches to land mapping are currently changing as dramatically as during the transition from handwritten maps to printed polygraphic prints. In this case, the concept of "digital maps" means not only their form but also their essence.

At present, geoinformation mapping of land resources means the automated compilation and use of maps of the land cadastral system based on geoinformation technologies, soil information databases and planning and cartographic materials in raster or paper form.

Given the complexity of the digitization process and further use of digital maps of country's land resources, specialists of the design institute needed more powerful equipment capable of supporting the necessary software programs, as well as providing the possibility of using GIS databases and satellite technologies.

FAO Representative in Kyrgyzstan Adnan Qureshi took part in the equipment handover ceremony. He stressed that as the leading global UN agency on all aspects related to agriculture and forestry, fisheries and aquaculture, and food security and nutrition, FAO works with the Government of Kyrgyzstan to develop innovative and effective approaches to digital agriculture, which is one of the foundations to stimulate the economic growth and raise the income of villagers by improving the efficiency of agricultural production and living conditions and developing value chains.

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“For some, work is a punishment, but for me it is an honor”, says Khuroson Kurbanova, *Istiklol Jamoat of Kushoniyon district, Tajikistan*

Khuroson Kurbanova was born in a large, very friendly and hardworking family in the Bokhtar district of the Khatlon region. Every family member worked on the land, and since she was a child Khuroson was accustomed to taking care of the backyard, where greens and vegetables were grown.

The girl studied well at school and dreamed of being a dressmaker. But the dream had to be postponed, because her parents did not have the opportunity to educate Khuroson. The dream came true when Khuroson married and found herself in a similar large family, where she was very well received and always supported in everything, including in obtaining new knowledge.

She gave birth to three children and learned to sew, but the land would not let her go. Then, along with sewing, the girl also decided to create a farm. So, in 2014 in Istiklol Jamoat of Kushoniyon district a farm named “Gulbarg” came into existence .
On three hectares in the arid zone, the farm tried to grow cotton and wheat, but hard work did not bring good harvests. There was a lack of knowledge, it was difficult to get suitable fertilizers and quality seeds .
This changed in 2019, when CACILM-2 came to the village and started educating villagers on how to work successfully on arid and saline soil. Khuroson not only became an active member of a group of 26 fellow villagers who face the same difficulties, but she was also unanimously elected as a leader of the group.

Things went better, the Gulbarg farm switched to safflower cultivation and received good harvests of this crop. A friendly group of villagers is actively involved in all trainings and practical classes, and uses the knowledge and successful practices on the ground, including weed control, sound use of fertilizers. Villagers were happy to accept the project's proposal to learn the basics of gender equality and leadership.

Now Khuroson looks to the future with confidence. “We were not only taught to grow new crops that do not deplete, but rather enrich the soil, we also learned the technologies of drying apricots and we are going to apply them this summer”, says Khuroson Kurbanova, a tireless activist, hard worker and head of the Gulbarg farm.

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When knowledge falls into the right hands -

the success story of Bobonazar Ismoilov

Bobonazar was born, raised and has lived all his life in the Garav village of the Dahan Jamoat, Yavan District, Tajikistan. His parents were farmers who worked hard on the collective farm fields all their lives, and Bobonazar helped them after school ever since he was little.

The Ismoilov family has always been large and every pair of hands was appreciated. Naturally, parents wanted Bobonazar, the eldest child in the family, to continue his education after school graduation, but the young man did not want to leave his native village and continued to work on the land.

Now he has the largest family, he is the father of six children and still continues to work on the land. Now he is not only the head of the family, but also the head of the Shaikh Ismoil farm, where the family grows wheat, potatoes, chickpeas and other important agricultural crops on three hectares.

"We have a difficult piece of land", says Bobonazar. We had a hard time without special knowledge. With the CACILM-2 specialists coming to our area, we have hope. Now there is a permanent farm school where we are taught a lot. How to get a good harvest on rainfed land, how to grow crops that are not afraid of saline and dry soil and much more".

Now the farmer knows how to select the right seeds, analyze the harvest, prepare compost and control pests and weeds. In addition to the fact that Bobonazar himself replenishes his collection of knowledge, he shares it with all the workers in his farm and fellow villagers.

And the knowledge gained is already yielding results. For example, the Shaikh Ismoil household received the highest harvests of safflower and mung bean in the village. The farmer sold the crop and is now building a greenhouse on his farm. "We will grow seedlings of early vegetables and provide them for our fellow villagers", says Bobonazar.

Thanks to cooperation with the project, in 2020 groups of active farmers in the Yavan region received free high-quality safflower seeds, a drought-resistant safflower of the zonal Shifo variety, bred by the Agricultural Research Institute of the Tajik Academy of Agricultural Sciences, and sowed the crop on an area of 75 hectares ... In the fall, farmers harvested and distributed the seeds of this highly efficient crop to other farmers for 2 hectares of crops each. As a result, in the spring of 2021, safflower will be sown in the Dahan Jamoat on an area of 225 hectares. Thus, the positive experience of the efficient use of natural resources is spreading to the arid territories of Tajikistan.

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FAO built and donated 14 greenhouses to residents of the Kashkadarya region

The residents of the Kamashy district of the Kashkadarya region now have new opportunities for the economic growth and inherent income generation. In early January 2021, a ceremony was held there to hand over 14 new greenhouses, which were gratuitously provided to the owners of the household plots of the Kamashy District. The assistance was provided under CACILM-2 and was part of the socio-economic response to the global crisis caused by the COVID-19 pandemic.

"With our decision to provide this assistance, we strived to fulfill the task of preserving agricultural households' means of agricultural production and food self-sufficiency during the pan-

demic and isolation, as well as to provide them with opportunities for further development after the end of the most difficult situation for the whole world, related to COVID", said Makhmud Shaumarov, regional project coordinator.

We recall that in 2020, to support the rural population, which faced certain difficulties during the quarantine period, FAO donated 31 water pumps, 10 motorized cultivators, as well as 30 000 seedlings of tomatoes, cucumbers, eggplants, peppers and 10 750 kg of mineral fertilizers to residents of Bukhara district of Bukhara region and Kamashy district of Kashkadarya region. Currently, CACILM-2 continues to provide assistance to villagers and contributes to food security.

The signing of the greenhouse's acceptance certificate took place in the khokimiyat of the Kamashy district of the Kashkadarya region. According to the document, new greenhouses have been installed in the Sarkash, Badakhshon and Loygasoy communities.

"Eligible low-income families were selected on the basis of an "iron notebook", a list of citizens who were unemployed during

the quarantine and in need of social protection. Over the past year, thanks to FAO, a number of positive results have been achieved in our area. We will further develop cooperation in order to provide employment and increase the incomes of residents of the most remote settlements, to raise their standard of living", said the khokim of the Kamashy district of the Kashkadarya region Batyr Togayev at the certificate signing ceremony.

Representatives of the khokimiyat and FAO experts also watched the process of new greenhouses installation and spoke with the owners of household plots.

"The greenhouse is comfortable and modern. We will grow various herbs, coriander, garlic, cucumbers and tomatoes in it. We hope to work and earn income throughout the year. If you try, you can make a profit of 10-15 million soums. Thanks to your help, my family is very happy. This is such a great support for our household", said the owner of one of the new greenhouses Muzaffar Zhovkiev.

A handover ceremony for another 20 new greenhouses from FAO was also held in the Bukhara district of the Bukhara region.

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Nurseries and sardobas to create oases in Karakum and Nokhur

At the end of December 2020, the construction of nurseries began in in the project regions of Nokhur and Karakum, and the construction of sardoba (water reservoirs) started in three remote auls in the Central Karakum Desert – Churchuri, Denli and Bukri.

Nurseries are being set up to grow planting material that will be used by local farmers to form protective belts around irrigated

fields, as well as to restore the plantings of Turkmen juniper, almond, foliage, and ornamental trees.

These nurseries will grow seedlings of well-proven indigenous crops that are well adapted to the mountainous and desert conditions of Turkmenistan. For example, in the mountainous region of Nokhur, the nursery will grow saplings of fruit, coniferous, ornamental trees and grapes, and in the desert region of Karakum – the saplings of saxaul, cherkez, kandym and other psammophytes, which will be used for intense restoration of the desert pastures productivity and consolidation of shifting sands.

"We are confident that creation of these nurseries will also give impetus for the development of horticulture and viticulture in these areas", said Makhmud Shaumarov, regional project coordinator. In addition, local communities will be able to generate additional income and organic products".

Schoolchildren from the two pilot regions will be able to visit nurseries and participate in practical classes on cultivation of various types of trees and shrubs, to enhance their skills and better understand the features of the desert and mountain flora of Turkmenistan.

Local field activists, in collaboration with local communities and schools, will take care of the plants in the nursery, and the grown saplings will be distributed in pilot districts free of charge based on agreed planting plans.

The main purpose of building three sardobas in the pilot region of Karakum is the rational use of the surface runoff of rain and melt water for the needs of the local population.

Used for centuries in Central Asia, sardobas were a prerequisite for the existence of the Great Silk Way. Nowadays, they make it possible to develop small-scale agriculture for melon crops and wineries, to grow fruit trees on personal plots and to solve the problem of full provision of livestock and young camels with fresh water.

In total, within the framework of CACILM-2, by the end of this year three nurseries will be created for growing saplings of trees, shrubs and semi-shrubs.

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Fertile land and pastures loss to be assessed in three pilot districts of Turkmenistan

Scientific and practical activities are planned in Turkmenistan, including the assessment of fertile lands and pastures loss as well as testing the ways how to return the degraded and saline soils into use in different soil and climatic conditions on the territory of three pilot districts: "Nokhur – mountain zone", "Karakum – desert zone" and "Territory of the etrap named after Gurbansoltan eje, Dashoguz velayat – irrigated zone".

This was the focus of the joint national webinar, organized within the framework of the regional project. This project is being implemented with the support of the Ministry of Agriculture and Environmental Protection.

Legal expert of the project Yolbars Kepbanov, "*Turkmenistan created intersectoral coordination mechanisms in the form of interdepartmental commissions on issues of the Caspian Sea,*

clean development mechanism related to climate change, and many others. Not so long ago, in October 2020, an interdepartmental commission was established to fulfill Turkmenistan's international obligations under environmental conventions and treaties. The recommendation for sustainable land management can be the development of a regulation for irrigated land, land management and soil protection.

It is also advisable to develop a National Plan for the implementation of the principles of integrated water resources management for the next 30 years .

Project expert Sultan Veisov:

"On one of the pilot sites located in the Central Karakum, we need to see to what extent the proposed and available adaptive practices are feasible, whether they contradict to the local mentality and established agricultural traditions. Approaches on adaptation to climate change must be acceptable, convincing in their effectiveness so that people themselves can see, evaluate and adapt certain practices that are effective in local soil and climatic conditions. The idea is that at the pilot site the project staff will show how to increase the productivity of pastures, fix shifting sands to protect households and crops, to restore degraded areas around wells where vegetation is trampled by animals, and to sow desert plants. And the main thing is to train the local population to use sand protection techniques. In this respect, cellular mechanical protective structures made of rough-texture reeds and cane are good. On high dunes, each cell "catches" up to one cubic meter of sand per year. The coulisse plantations are 1.4 m wide every 3 m,

arranged in a row, perpendicular to the dominant wind. In recent years, colleagues from Kazakhstan and other countries have come to Turkmenistan to learn from this experience. In this regard, it is possible to organize training sessions for young people from rural schools on climate issues, harmful aspects of drought, to organize joint green actions, for example, planting forests on school grounds. Teachers and high school students will have a chance to do other classes: ar-

rangement and repair of sardobas, pasture improvement practices".

Kurban Ovezmuradov, project expert:

«"The existing institutional water use arrangement at another pilot area – the irrigated agricultural landscape of the Gurbansoltan eje etrap of the Dashoguz velayat – has been deter-

mined by the quality of land and water. We are exploring the possibility to use surface runoff and groundwater, determine their salinity level. Soil salinization and degradation control remains to be a task. The pilot region is located 25 km away from the city of Dashoguz, in between 16 daikhan associations, whose lands, according to the latest reforms, have been given out for free use for 99 years.

Here, within the boundaries of the Lower Amudarya WMO, the organization "Gurbansoltanejesuvkhodjalyk" is working and studying the soil salinity. The land needs care, timely "treatment". The educational and outreach activities in the field of advanced water practices are underway. Such activities include the use of low-moisture drought-resistant agricultural crops: tur, mulch, alfalfa crop rotations, green manure, i.e. plants grown for subsequent
fixation in the soil in order to improve its structure, enrich it with nitrogen and suppress the growth of weeds, as well as for organic matter that is environmentally safe and naturally reduces the level of salinity.

Non-engineering solutions include the cultivation of drought-resistant crops or salt-resistant varieties, the search for a new profile of agricultural production. Such practices will be demonstrated and tested including those at the experimental site of the Turkmen Agricultural University, where you can show people how different technologies work".

Discussions took place at the end of the meeting; representatives of the pilot regions asked their questions to the project team.

The project manager and moderator of the meeting, Rahman Khanekov, said that the project plans to partner with the Turkmen Agricultural Institute in Dashoguz and scientists from the National Institute of Deserts, Flora and Wildlife.

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