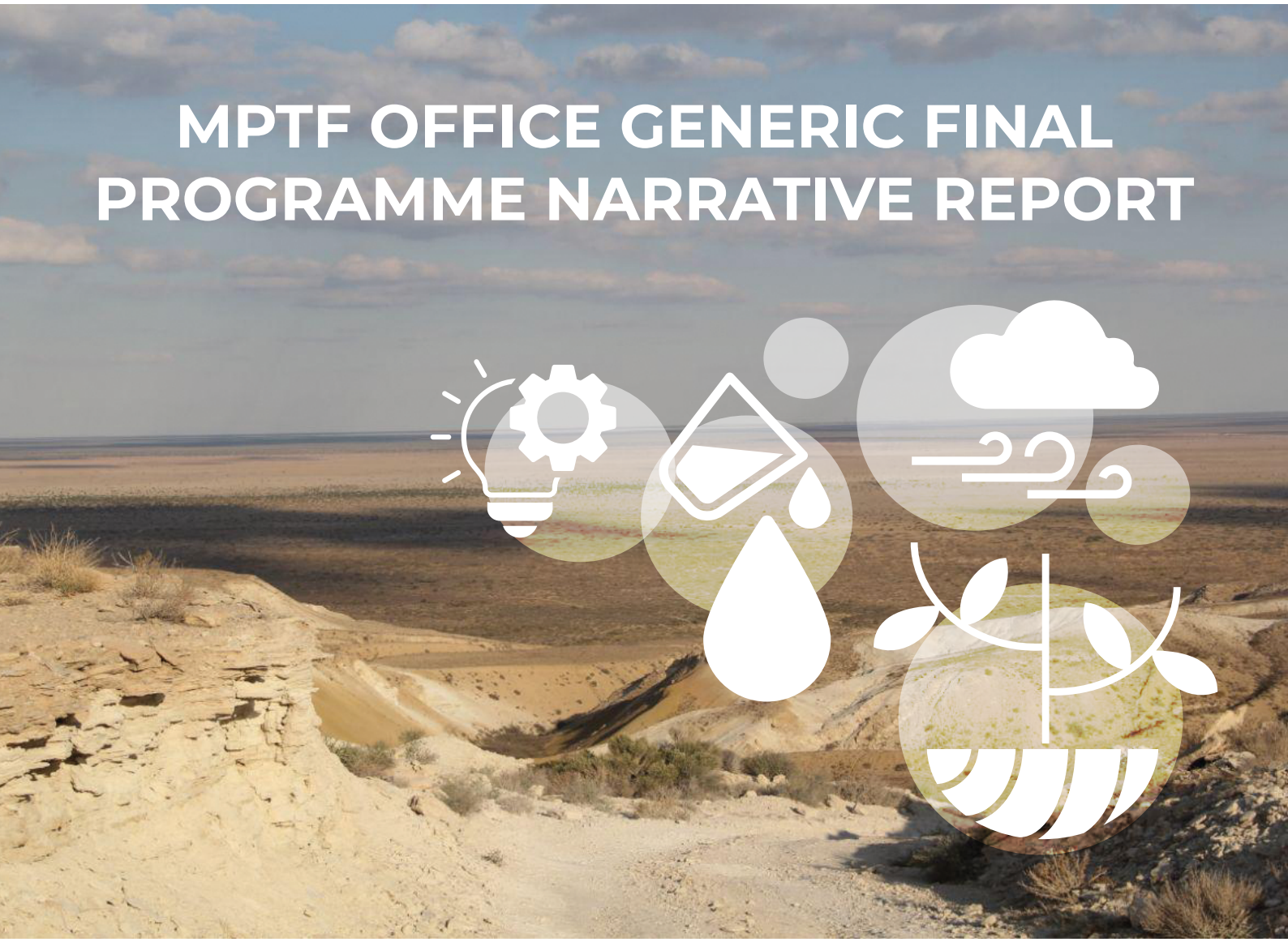
Food and Agriculture Organization of the United Nations

UNDP and FAO Joint Progamme
"Building knowledge and skills of local partners and communities to address environmental insecurities through innovative air, land, and water management solutions in the Aral Sea Region"

MPTF OFFICE GENERIC FINAL PROGRAMME NARRATIVE REPORT



Reporting period: 9 July 2024 – 31 December 2025

THE SEA IS GONE PEOPLE ARE NOT

UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan

This Joint Programme is funded by the UN Multi-Partner Human Security Trust Fund for the Aral Sea region in Uzbekistan, wich is generously supported by the Goverment of Uzbekistan, Norway, Finland, the Republic of Korea, the European Union, and Alwaleed Philanthropies

Government of the Republic of Uzbekistan
Government of Norway
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Suomi Finland
Government of the Republic of Korea
Alwaleed Philanthropies
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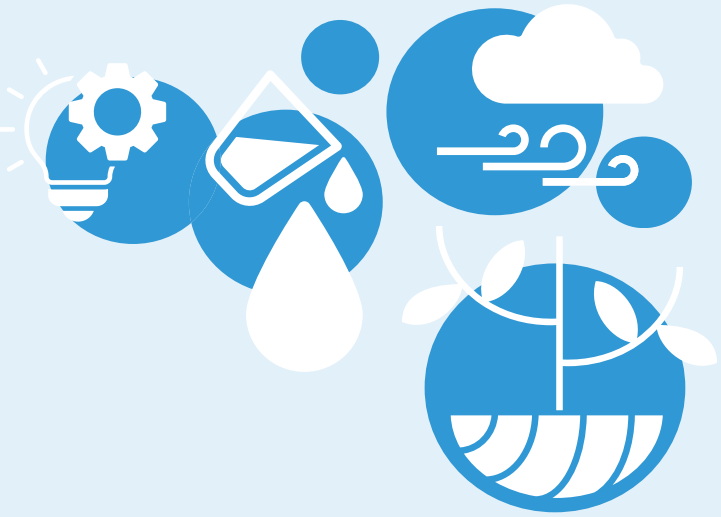
Programme Title & Project Number	Country, Locality(s), Priority Area(s) / Strategic Results
• **Programme Title:** UNDP and FAO Joint Progamme "Building knowledge and skills of local partners and communities to address environmental insecurities through innovative air, land, and water management solutions in the Aral Sea Region" • **Programme Number:** 01002834 • **MPTF Office Project Reference Number:** 00140724	**Country/Region:** Uzbekistan, the Republic of Karakalpakstan, Muynak, Kungrad, Takhtakupir districts **Priority area/strategic results:** • UNSDCF Priority B – "Inclusive human capital development leading to health, well-being and resilient prosperity"; • UNSDCF Priority C – "Sustainable, climate responsible and resilient development" • Outcome 5: – by 2025, innovative, sustainable, age- and gender-sensitive climate change adaptation and mitigation initiatives are developed and implemented at the national and regional levels in the agricultural sectors economy, healthcare, water supply, transport, energy production and construction/housing sector, with a focus on regions at risk, including the Aral Sea region.
Participating Organization(s)	**Implementing Partners**
Organizations that have received direct funding from the MPTF Office under this programme: • UNDP • FAO	• National Committee on Ecology and Climate Change of the Republic of Uzbekistan • Uzhydromet • The Council of Ministers of the Republic of Karakalpakstan • The Ministry of Water Resources of the Republic of Uzbekistan • The Ministry of Agriculture of the Republic of Karakalpakstan • The International Innovation Centre for the Aral Sea Basin • The Scientific-Information Center of the Interstate Commission for Water Coordination in Central Asia (SIC ICWC) • The Forestry Agency under the -National Committee on Ecology and Climate Change of the Republic of Uzbekistan • District Khokimiyats of Muynak, Kungrad and Takhtakupir
Programme/Project Cost (US$)	**Programme Duration**
Total approved budget as per project document: **USD $1,313,189.00** MPTF /JP Contribution by Agency: • UNDP - $1,063,189.00 • FAO - $250,000.00 Agency Contribution • **N/A** Government Contribution (if applicable) Other Contributions (donors) (if applicable) **TOTAL: $1,313,189.00**	Overall Duration (months) 18 Start Date (dd.mm.yyyy) 09/07/2024 Original End Date (dd.mm.yyyy) 31/12/2024 Current End Date (dd.mm.yyyy) 31/12/2025
Programme Assessment/Review/Mid-Term Eval.	**Report Submitted By**
Assessment/Review - if applicable please attach Yes **No** Date: dd.mm.yyyy Mid-Term Evaluation Report – if applicable please attach Yes **No** Date: dd.mm.yyyy	• Name: Ms. Akiko Fujii • Title: UNDP Resident Representative in Uzbekistan • Participating Organization (Lead): UNDP • Email address: akiko.fujii@undp.org

CONTENTS

LIST OF KEY ACRONYMS

AQMS	Automatic Air Quality Monitoring Systems
CDP	Community Development Plan
COVID-19	Coronavirus Disease 2019
CSO	Civil Society Organization
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPS	Global Positioning System
GoU	Government of Uzbekistan
ICT	Information and Communication Technology
IICAS	The International Innovation Centre for the Aral Sea Basin under the Ministry of Ecology of Uzbekistan
IT	Information Technology
IAQMS	Integrated Air Quality Management Systems
JP	Joint Programme
MPHSTF	UN Multi-Partner Human Security Trust Fund for the Aral Sea region in Uzbekistan
NGO	Non-Governmental Organization
OISCA	Organization for Industrial, Spiritual and Cultural Advancement
OMO	Chamber of Forest Engineers in Türkiye
PB	Project Board
PRA	Participatory Rural Appraisal
PRM	Participatory Resource Mapping
SDG	Sustainable Development Goal
SIC ICWC	Scientific Information Center of the Interstate Coordination Water Commission of Central Asia
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNSDCF	United Nations Sustainable Development Cooperation Framework
VCC	Village Council of Citizens



EXECUTIVE SUMMARY

The UNDP and FAO Joint Programme (JP), Building knowledge and skills of local partners and communities to address environmental insecurities through innovative air, land, and water management solutions in the Aral Sea Region, made significant progress between July 9th and December 31st, 2024. During this period, the program focused on laying the groundwork for sustainable ecosystem restoration and enhancing community resilience in response to the Aral Sea crisis.

To deepen the understanding of ecosystems and actively engage communities, a comprehensive assessment of ecosystem services was initiated. A national consultant was hired, and surveys and interviews with local stakeholders, including shepherds, were conducted to gather invaluable local knowledge for effective restoration strategies. Additionally, efforts were made to attract eco-volunteers for ecosystem mapping, ensuring long-term community involvement. Furthermore, Tugai forest territories were analyzed, and local pasture usage information was collected.

In developing restoration strategies and building capacity, an international consultant collaborated with key stakeholders, such as the Forestry Agency, to develop an Ecosystem Restoration Guideline. This guideline provides practical strategies for ecosystem recovery and sustainable land management, informed by expert discussions and field visits. Technical support was also extended to forestry departments for establishing nurseries and expanding afforestation efforts. Demonstration plots with oleaster seedlings were established, incorporating innovative water-saving technologies to assess their effectiveness in harsh conditions. Additionally,

capacity-building initiatives were prioritized through intensive training courses on Tugai forest improvement, equipping local forestry personnel and university students with sustainable management techniques.

To enhance monitoring and data-driven decision-making, a needs assessment for air quality monitoring was conducted, leading to the selection of priority locations for automatic air quality monitoring systems (AQMS) and the launch of a procurement tender. A comprehensive environmental assessment was carried out across six key districts, focusing on water and soil quality to support informed decision-making in agricultural practices, land use, and environmental protection. Meteorological stations were deployed to monitor climate variables, providing integrated data for ecosystem restoration and climate resilience strategies. Additionally, technical support was provided to the International Innovation Center for the Aral Sea (IICAS) for the procurement of a mobile laboratory to analyze soil composition and monitor sand and dust migration. The tender for contracting the laboratory's delivery was completed, and a vendor was contracted. Furthermore, field research in collaboration with the Academy of Sciences of the Republic of Karakalpakstan was initiated, focusing on sand and dust storms and assessing loss and damage to ecosystem services.

These achievements collectively contribute to the JP's overarching goal of improving ecosystem service management and building community resilience. By integrating scientific expertise with local knowledge and innovative technologies, the program is driving sustainable development in the Aral Sea region. The Joint Programme is funded by the MPHSTF for the Aral Sea region, with generous support from the Governments of Uzbekistan, Norway, Finland, the Republic of Korea, the European Union, Alwaleed Philanthropies, and the Government of the Federal Republic of Germany.

I. PURPOSE

The ultimate goal is to establish robust environmental quality management and regulatory practices. The programme addresses challenges related to ecosystem degradation, biodiversity loss, climate-induced changes, water scarcity, deforestation, and air pollution in the Aral Sea Region. Through awareness-building, capacity development, practical interventions (equipment installations, demonstration plots), and regulatory frameworks, the project aims to contribute significantly to improve the Region's environmental well-being.

The Programme's goal and objectives are fully aligned with the policies and strategies of the Government of Uzbekistan on the development of the Aral Sea region, including the Presidential Decree on Aral Sea region adopted on July 29, 2021, which includes an action plan of activities by key ministries and agencies in line with the implementation of the special UN Resolution to transform the Aral Sea region into a Zone of Ecological Innovations and Technologies; Cabinet of Minister's degree on Integrated Roadmap for the sustainable development of the Aral Sea region adopted on 25 January 2022, the Government's comprehensive Development Programme for Karakalpakstan for 2020-2023 as well as the Green Transition Strategy adopted in 2019, which outlines the key priorities on green development, covering the Aral Sea region; Resolution of the Cabinet of Ministers Resolution, #31 dated 18th January 2022 on additional measures to create a "Green Cover" — Protective Forests on the Dried-Up bottom of the Aral Sea.

The project seeks to improve the wellbeing of communities affected by the Aral Sea crisis through the following objectives, which fully align with the Multi-Partner Human Security Trust Fund (MPHSTF) Programmatic Framework and Results Matrix as they contribute to addressing the multiple insecurities of people living in one of the most vulnerable districts of Karakalpakstan. The JP has three outcomes:

Outcome 1. Assessment of ecosystem services in the Aral Sea Region to enhance local management practices.

Outcome 2. Adopting new approaches in water purification, afforestation, and soil stabilization in the Region (UNDP, FAO).

Outcome 3. Promoting integrated air, water, and soil quality monitoring systems to facilitate regulatory practices in the Region.

The programme's first objective focuses on enhancing community understanding of local ecosystems and their services by aligning with international standards and sharing experiences through field trips, the aim is to address challenges such as limited awareness, insufficient data on ecosystems, and the negative impact of climate change on forestry. The approach ensures an innovative and people-centered strategy, incorporating technology transfer, participatory methods, and a focus

on the specific needs and capacities of local communities. Under this objective, a participatory resource mapping (PRM) approach is applied using local knowledge and experience to analyse geo-referenced information on tugai and pasture ecosystem services. Local communities are involved from the beginning in method selection, application, evaluation, and verification. This "inclusive participatory ES mapping" will be conducted in selected villages in three pilot district sites. The participatory ES mapping can facilitate social learning, provide the foundation for the creation of social and natural capital, and equip the community with sufficient spatial information to improve local ecosystems ecosystem management.

The participatory ES mapping approach can be used as a model to support local and regional decision-making processes and to enhance community-based ecosystem management in other regions of the country and beyond. This initiative will facilitate enhanced policymaking in land management, thereby bolstering regional food security. Community eco volunteers will be selected in pilot districts with further engagement into the assessment process; Moreover, the initiative aims to enhance community understanding of local ecosystems by aligning with international standards and sharing experiences through field trips. It addresses challenges like limited awareness, insufficient ecosystem data, and climate change impacts on forestry. The approach integrates technology transfer, participatory methods, and community-specific needs. Traditional knowledge of pasture enrichment and tugai rehabilitation, combined with improved water management, is key to sustainable practices. Ecosystem restoration empowers communities, fostering responsibility for ecological balance and local livelihoods.

The second objective focuses on adopting new approaches in water purification, afforestation, and soil stabilization in the Region. Firstly, it augments the success stories from previous years in the afforestation efforts of the Government, international partners (including UNDP and FAO) and other stakeholders. Capitalizing on the findings of the series of efforts on the flora and fauna of the dried Aral Seabed, this output aims to establish nurseries in the three target districts with salt resilient plants. In addition, the Programme envisions collaborating with local actors (IICAS and others) to enhance technical capacity to monitor land degradation and salinization in the Region to formulate sand and dust migration models. The Programme will support startup initiatives on soil stabilization such as chlorella, biohumus, zoohumus, buried diffuser technologies as well as establish nurseries specialized in growing drought-resistant plants in pilot communities, based on the results of the science-based expeditions to the dried seabed, that covered the area of 2,7 million hectares of land. Secondly, it centers on the restoration and sustainable management of tugai forest ecosystems. Through a series of activities, including assessments, seminars, workshops, and field trips, the aim is to address challenges related to water shortage, deforestation, and soil degradation. By piloting innovative technologies and practices, this output seeks to contribute to sustainable livelihoods and environmental resilience. This output contributes to the reduction of environmental stress by focusing on sustainable management and

restoration of tugai forest ecosystems. The activities aim to pilot new technologies and approaches. The proposal integrates context-specific solutions, considering the unique conditions of the Aral Sea Region by involving communities in planning and implementation. The focus on technology transfer and partnerships aligns with the call's emphasis on innovation and integrated solutions.

The third objective focuses on facilitating integrated air quality management systems and regulatory practices, as well as enhanced comprehensive environmental quality management and regulatory practices. Integrated Air Quality Management Systems (IAQMS) refer to comprehensive approaches to managing and improving air quality. These systems typically involve a combination of monitoring, assessment, and control measures to address air pollution and protect public health and the environment. The Programme aims to set up automatic air quality monitoring systems in at least eight locations within Karakalpakstan, integrating these systems into the national air quality monitoring network. It will also provide support for a minimum of three community-led startup initiatives that focus on monitoring air, soil, and water, with a special emphasis on the participation of youth, girls, and women. Community eco-volunteers will be engaged in promoting air quality monitoring systems along with project partners. Moreover, data generated from the automatic air monitoring systems will be used to formulate national standards in line with SDG 11 for the Aral Sea Region. The initiative addresses environmental pollution, water resource management, and the link between environmental change, human health, and agriculture. It focuses on improving water, air, and soil quality through enhanced management and regulations, including monitoring networks. The approach integrates technology, community training, and policy recommendations to ensure sustainable solutions. By piloting new technologies and involving communities in planning and implementation, the proposal is innovative, context-specific, and multidimensional. It aligns with the MPHSTF's Theory of Change, emphasizing technology transfer, participatory methods, and cross-sector partnerships for long-term environmental sustainability.

II. RESULTS

i) Narrative reporting on results

Outcome	Key Activities	Key Results / Outputs
Outcome 1 Participatory ecosystem restoration and community-based ecosystem management	Community consultations, ecosystem assessments, innovation support	◆ **3 thematic meetings** with VCCs, forestry departments, and communities in Muynak, Kungrad, and Takhtakupir ◆ **Ecosystem surveys** conducted; geo-referenced data collected ◆ **Eco-volunteer platform** established linking environment and health volunteers ◆ **3 startup teams** supported through a 3-month incubation programme with IT Park ◆ **International mission** from the Chamber of Forest Engineers (Türkiye) conducted field visits and consultations ◆ **Ecosystem Restoration Guideline** for the Aral Sea Region developed and translated into Uzbek
Outcome 2 New approaches in water purification, afforestation, and soil stabilization	Nature-based solutions, training, demonstration plots, community initiatives	◆ **14 community initiatives** equipped with machinery and tools ◆ **72 households** trained in Cistanche cultivation ◆ **4 hectares** of demonstration plots established with oleaster trees ◆ **3,200 seedlings planted** using three planting methods ◆ **200 Waterboxx devices** deployed for water-efficient tree planting ◆ **Mobile laboratory** delivered for soil and dust monitoring ◆ **Knowledge product** "Dust Migration Model for the Southern Aral Sea Region" developed ◆ **4 community initiatives** implemented (street lighting, youth media club, low-carbon heating system, clean drinking water access)
Outcome 3 Integrated air, water, and soil quality monitoring systems	Environmental monitoring, infrastructure development, data collection	◆ **37 air quality monitoring stations** installed across Karakalpakstan ◆ Stations integrated into **Uzbekistan's national monitoring system** ◆ **Situation center** for air quality monitoring established ◆ **Training conducted for eco and health volunteers** on air quality monitoring ◆ **Environmental assessment** conducted in 6 districts ◆ **Water and soil quality** analyses completed ◆ **6 meteorological stations** installed for climate monitoring

The results achieved under the Joint Programme (JP) during the entire operational period from 9 July 2024 to 31 December 2025 are summarized in this report. In accordance with narrative reporting procedures, the report also specifically highlights the results achieved during the final year of implementation (2025). Geographically, the JP focuses mainly on the three pilot districts of Muynak, Kungrad, and Takhtakupir in Karakalpakstan but not limited, which are among the areas most severely affected by the ecological crisis in the Aral Sea region. Throughout the implementation period, and particularly during the final year of operation, the Joint Programme addressed the impacts of the Aral Sea disaster by strengthening ecosystem service management practices at the local level, promoting efficiency and innovation in combating environmental degradation, and supporting communities facing multiple socio-economic and environmental vulnerabilities.

During this period, the key activities undertaken contributed to the following outcomes of the project:

Under **Outcome 1,** Participatory ecosystem restoration to enhance community-based tugai and desert pasture ecosystems management (UNDP/FAO):

- 3 thematic meetings with the representatives of VCC heads, forestry departments and community members in three target districts were conducted. During the meetings problems of using biological resources in the ecosystem were discussed, as well as measures to be taken to conservate and restore ecosystem services in the pilot districts. Consultations, surveys and discussions with residents of communities were held on existing ecosystem services and the importance of awareness raising campaigns. Survey allowed to find out that the forest ecosystem in the pilot districts consists mainly of turanga, oleaster, tamarisk and shrubs, the turanga population dominates there. The population of the villages are mainly engaged in cattle breeding. Livestock includes sheep, goats and cattle. During the interview, it was found out that local residents use the tamarisk bush (Tamarix laxa) to heat their houses and bake bread, using this wood according to the quota from the district forestry. Valuable tree plantations are protected by forest inspectors. Concept on attraction of eco-volunteers developed for the upcoming project initiatives;
- Forests, pastures and desert territories were visited and analysed in three target districts. Geo-referenced information was obtained for planning future activities within the project. Community eco-volunteers were involved into the assessment process through the established platform through integrating them into the existing health-volunteers platform to link the environment and health issues of the region;
- A three-month incubation program was organized in partnership with IT Park to enhance the capabilities of youth and women in specific areas such as entrepreneurship and startup development. Three startup teams specializing in innovative land, soil, and water monitoring systems received targeted technical

support and co-financing, enabling them to pilot and scale data-driven solutions for sustainable natural resource management;

- An international consultant from the Chamber of Forest Engineers in Türkiye (OMO) visited Uzbekistan, engaging with key stakeholders, including the Forestry Agency and its district-level departments. The consultant conducted field visits to Muynak and Kungrad districts to assess local conditions and opportunities, contributing to the development of an Ecosystem Restoration Guideline aimed at addressing the severe environmental degradation caused by the Aral Sea disaster;
- The Guideline focuses on restoring degraded ecosystems, enhancing biodiversity, and promoting sustainable land management. Stakeholders included the **Forestry Agency of Uzbekistan** and its regional and district-level departments. Meetings facilitated knowledge exchange on regulations, ongoing initiatives, and local challenges;
- As a result, the **Ecosystem Restoration Guideline for the Aral Sea Region** was developed by the Chamber of Forest Engineers in Türkiye (OMO) within the project. This document, now available in Uzbek translation, will be shared with the relevant governmental agencies for practical application. It is being used for their planning, and strategy formulation activities.

Under **Outcome 2**, Adopting new approaches in water purification, afforestation, and soil stabilization in the Region (UNDP/FAO), the following results have been achieved:

- Technical support was provided to state forestry departments in pilot districts to establish nurseries. As a result, 6 hectares of nursery area were developed, producing approximately 1.2 mln. seedlings of climate-resilient species such as saxaul and other drought-tolerant plants. The support included machinery, equipment, and technical guidance, which improved operational efficiency and reduced dependence on external suppliers. These strengthened nurseries now provide a reliable supply of planting material for afforestation and land restoration, contributing to soil stabilization, desertification control, and ecosystem recovery in the Aral Sea region;
- 14 selected high-impact initiatives were fully equipped with the necessary machinery and tools, including biohumus production units, borehole drilling services, chlorella and zoohumus production systems, motocultivators, hotbeds with drip irrigation systems, and pellet-making and crushing machines, enabling their effective operational launch and sustainability;
- Practical training on Cistanche cultivation organized for 72 households in pilot districts and who were able to increase knowledge and skills on new method of afforestation, soil stabilization and income generation;

- IICAS was equipped with a mobile laboratory for analyzing soil composition and monitoring sand and dust migration in the region, strengthening technical capacity for environmental monitoring and evidence-based decision-making;
- Knowledge product titled “Dust Migration Model for the Southern Aral Sea Region” was issued on October 22, 2025 in collaboration with the Academy of Sciences of the Republic of Karakalpakstan;
- 4 community-led initiatives in the Aral Sea region were successfully implemented. Street lighting installation in Mamiy village (Shumanay district) reached its final stage, enhancing safety and accessibility for all residents, including persons with disabilities. A youth media club was established in Kegeyli district, strengthening journalism skills among young people. A modern low-carbon heating system was installed at Preschool No. 11 in Takhtakupyr district, improving winter conditions for children. In Kaishyly community (Chimbay district), families gained reliable access to clean and safe drinking water;
- Demonstration plots covering 4 hectares featuring oleaster (Elaeagnus angustifolia) were established in Kungrad and Taxtakupir districts to promote sustainable land management and ecosystem restoration in the Aral Sea region;
- A total of 3,200 oleaster seedlings were planted using three different methods—Waterboxx technology, hydrogel planting, and traditional planting—to assess their effectiveness in harsh environmental conditions. Innovative water-saving technologies, including 200 Waterboxxes, were deployed to ensure seedling survival with minimal irrigation; FAO team has carried out monitoring activities after the project ends. Waterboxxes are still being used in both districts (Kungrad and Taxtakupir) and district level government agencies expressed their interest in expanding the usage of Waterboxxes in planting activities;
- Intensive training courses on Tugai forest improvement were conducted in Karakalpakstan by international experts to enhance local forestry capacity where 60 forestry personnel from Kungrad and Taxtakupir, as well as university students, which equipped them with sustainable management techniques for Tugai forests, which plays a crucial role in biodiversity conservation and soil protection. These initiatives aim to inspire local communities and stakeholders to adopt sustainable practices for the long-term restoration of the Aral Sea region.

Under **Outcome 3**, Promoting integrated air, water, and soil quality monitoring systems to facilitate regulatory practices in the Region (UNDP/FAO), the following results were achieved:

- Needs assessment of air quality monitoring systems in the region, covering 37 points in Karakalpakstan was carried out jointly with the expert organization “Davlat Ekologik Sertifikatlashtirish va Standartlashtirish Markazi” (Davekosertifikat) in collaboration with Uzhydromet and the Ministry of Ecology, compatible air quality monitoring systems that align with the existing national monitoring frameworks have been identified;

- 37 priority points (locations) in Karakalpakstan were identified and selected for the installation of the automatic air quality monitoring systems (AQMS) and a Technical Specification for this equipment was developed by an expert organization Davekosertifikat;
- 37 stations of Automatic air quality monitoring systems (AQMS) have been established in Karakalpakstan. All AQMS equipment and stations have been fully delivered to Karakalpakstan, installed at selected locations and integrated into the national system of Uzbekistan.
- A two-day training seminar was held to increase the knowledge of local eco and health volunteers in the region to promote an integrated air quality monitoring system to facilitate regulatory practices in the Aral Sea region, as well as to build the capacity of regional partners to monitor air quality systems
- A situation center under the Committee on Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan for air Quality monitoring has been established.
- A comprehensive environmental assessment focused on water and soil quality to support ecosystem restoration and sustainable land management was conducted in six key districts of Karakalpakstan: Muynak, Kungrad, Taxtakupir, Chimbay, Amudarya, and Ellikala.
- **Water Analysis.** Evaluated salinity levels, nutrient content, and pollutants (e.g., pesticides, heavy metals). Assessed water suitability for irrigation and aquatic habitat restoration. Data will guide water quality improvement and sustainable water management strategies.
- **Soil Analysis.** Assessed soil composition, fertility, salinity, and contaminants. Determined land potential for agriculture, forestry, and other uses. Findings will support soil conservation, sustainable farming, and land restoration.
- **Climate Monitoring.** Six meteorological stations were installed across the districts. Equipped with advanced sensors to track temperature, precipitation, humidity, wind speed, and solar radiation. Data will support climate-resilient strategies for ecosystem restoration and sustainable development.
- **Outcomes & Impact.** The collected data will help: Identify priority areas for restoration. Develop sustainable land management practices. Monitor and adapt restoration strategies. Build climate resilience and mitigate future environmental challenges.
- This initiative provides a scientific foundation for decision-making, empowering local communities, government agencies, and international partners to work towards a sustainable and prosperous future for the Aral Sea region.

Outputs:

Outputs 1.1 Inclusive participatory ecosystem services mapping (UNDP).

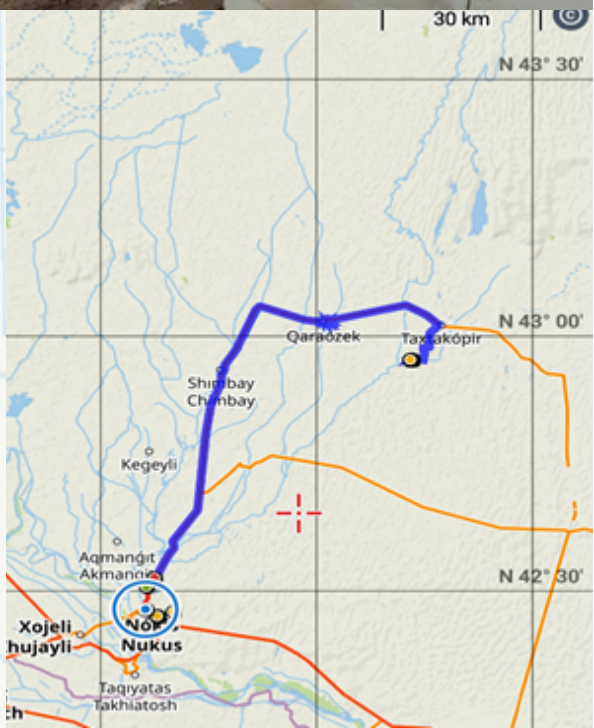
In partnership with forestry departments under the Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan an assessment of ecosystem services in the Aral Sea Region to enhance local management practices has been undertaken.

- 3 thematic meetings with the representatives of VCC heads, forestry departments and community members in three target districts were conducted. Consultations, surveys and discussions with residents of communities were held on existing ecosystem services and the importance of awareness raising campaigns. Necessary activities were held to attract eco-volunteers for the upcoming project initiatives. Working groups with local people and experts formed and organized to co-create maps that reflect their knowledge and expertise. 60 hectares of forests, pastures, and desert areas visited and analyzed across the three districts to identify and evaluate ecosystem services. GPS points taken and maps marked by using Geographic Information Systems (GIS) to visualize the collected information.

Photos 1,2,3,4. Meetings with the representatives of VCC heads, forestry departments and community members in three target districts

- Forests, pastures and desert territories were visited and analysed in three target districts.

Photos 5,6,7,8,9,10. Visit to potential sites of the projects. Geo-referenced information was obtained for planning future activities within the project.



- A three-month incubation program was organized in partnership with IT Park to enhance the capabilities of youth and women in specific areas such as entrepreneurship and startup development. 1 startup contest was launched in air, soil and water monitoring systems development. A startup contest focused on air, soil, and water monitoring systems was also conducted. Necessary equipment and inventory transferred to the startup teams for further development of the startup initiatives in the field of air, soil, and water monitoring systems. Installation of smart air, soil and water monitoring systems in farmers' irrigation networks improved water efficiency, sustainability, and crop productivity. Real-time monitoring of water flow, soil moisture, and usage allowed farmers to optimize irrigation schedules, reduce water losses, and prevent over-irrigation. As a result, farmers saved water and energy, lowered operational costs, and achieved more stable crop yields while contributing to the sustainable management of scarce water resources. These pilot initiatives serve as a model for future interventions in other districts of the Aral Sea region.

Photos 11, 12, 13, 14, 15, 16. Incubation program and startup contest launch.

Output 1.2 Enhanced Ecosystems Services (FAO)

Under this subcomponent Ismail Belen, Chief forestry officer of the Chamber of Forest Engineers in Türkiye (OMO) visited Uzbekistan and had several meetings with actors including the Forestry agency and its district level departments. Jointly with him analysis of conditions of potential sites in Muynak and Kungrad districts conducted.

Photos 17,18,19,20,21. Visit of international consultant to potential sites of the projects.

The objective of the visit and analysis was development of the Ecosystem Restoration Guideline. This initiative recognizes the urgent need for a structured approach to address the severe environmental degradation impacting the region, stemming from the Aral Sea's disaster. Developed Guideline aims to provide practical strategies and best practices for restoring degraded ecosystems, enhancing biodiversity, and promoting sustainable land management in this ecologically sensitive area.

Specifically, the stakeholders included the Forestry Agency of Uzbekistan, the primary governmental body responsible for forest management and environmental protection, as well as its regional and district-level departments. These meetings facilitated a crucial exchange of knowledge, expertise, and local insights, allowing Mr. Belen to gain a deeper understanding of the existing regulatory framework, ongoing initiatives, and specific challenges encountered on the ground.

As a result of exploration and analysis, Ecosystem Restoration Guideline for the Aral Sea Region has been developed by the Chamber of Forest Engineers in Türkiye (OMO) within the project. The Guideline provides a science-based framework that helps align international donor efforts with localized restoration needs. By offering a standardized approach, it serves as a valuable tool for donors to ensure their investments in the Aral Sea region are based on expert technical methodologies.

The methodologies and technical standards outlined in the document were designed with transferability in mind. While the Aral Sea region presents unique environmental challenges, the core ecological principles are highly adaptable and could certainly serve as a blueprint for similar restoration initiatives in other parts of Uzbekistan. the Guideline is intended to be a long-term reference document.

Output 2.1. Supporting sustainable afforestation and land revitalizing practices in the Aral Sea Region (UNDP)

State Forestry departments in the Takhtakupyr, Muynak, and Kungrad districts, as well as Qoraqalpoqyo'lko'kalam UE, were provided with technical support for the procurement of agricultural machinery and equipment to expand and maintain regional nurseries. This support strengthens local capacity for afforestation and land restoration, enhances the production of climate-resilient seedlings, and contributes to combating desertification in the Aral Sea region.

Specialized machinery and technical equipment have improved nursery operations in pilot districts, enabling mechanized soil preparation, irrigation, and seedling cultivation. This has reduced staff workload and increased the production of climate-resilient seedlings, including saxaul and other drought-tolerant species. The strengthened nurseries now provide a reliable supply of planting material for afforestation programs. These interventions support ecosystem restoration on the dried Aral Sea seabed, stabilizing soils, reducing dust and salt storms, and enhancing long-term climate resilience in the region.

In collaboration with qualified specialists from OISCA, a three-day practical training on Cistanche cultivation was conducted, covering essential techniques for host tree cultivation, afforestation, and parasitic planting. The training aimed to equip local families with new agricultural skills, create seasonal employment opportunities through Cistanche farming, and introduce an innovative approach to afforestation and soil stabilization. A total of 72 households were trained and engaged in Cistanche cultivation, contributing to enhanced income-generating opportunities for rural communities.

Photos 22,23,24,25,26. Technical support to forestry departments in pilot districts.

As a result, participating families gained new opportunities for income generation and seasonal employment through Cistanche farming. The initiative also introduced an innovative nature-based approach to land restoration, as Cistanche cultivation requires host tree planting, contributing to afforestation, soil stabilization, and improved vegetation cover in degraded areas of the Aral Sea region. By combining livelihood support with ecosystem restoration, the activity strengthened community resilience and promoted sustainable land-use practices.

Technical support was provided to IICAS in the procurement of a mobile laboratory for analyzing soil composition and monitoring sand and dust migration in the region. The mobile laboratory arrived at the end of March 2025 and is currently fully operational.

During its first year, the mobile laboratory conducted over 25 field missions across the dried Aral Sea bed and surrounding districts, analyzing more than 300 soil and dust samples on-site. This enabled near real-time assessment of soil salinity, mineral composition, and sand and dust movement, supporting afforestation planning and land restoration activities. Researchers reported improved efficiency in fieldwork, reduced logistical constraints, and faster response to emerging environmental issues. The laboratory has also strengthened collaboration between scientific institutions and forestry departments, becoming a key tool for evidence-based environmental management in the region.

Photos 27,28,29,30. Screenshots from trainings in pilot districts.

Photos 31. Mobile laboratory arrived to IICAS

Jointly with the Academy of Sciences of the Republic of Karakalpakstan, a field research study was conducted focusing on sand and dust storms and the assessment of loss and damage to ecosystem services. Findings of the research were presented and discussed with relevant institutions in a round table held on May 7, 2025. As a result, a knowledge product titled “Dust Migration Model for the Southern Aral Sea Region” was issued on October 22, 2025.

The model can support government agencies, research institutions, and development partners in risk assessment, environmental planning, and the design of targeted land restoration measures. It also offers practical value for improving early warning systems, guiding afforestation initiatives, and informing regional cooperation efforts aimed at reducing the environmental and socio-economic impacts of dust storms in Central Asia.

Link for download: https://www.undp.org/uzbekistan/publications/dust-migration-model-southern-aral-sea-region

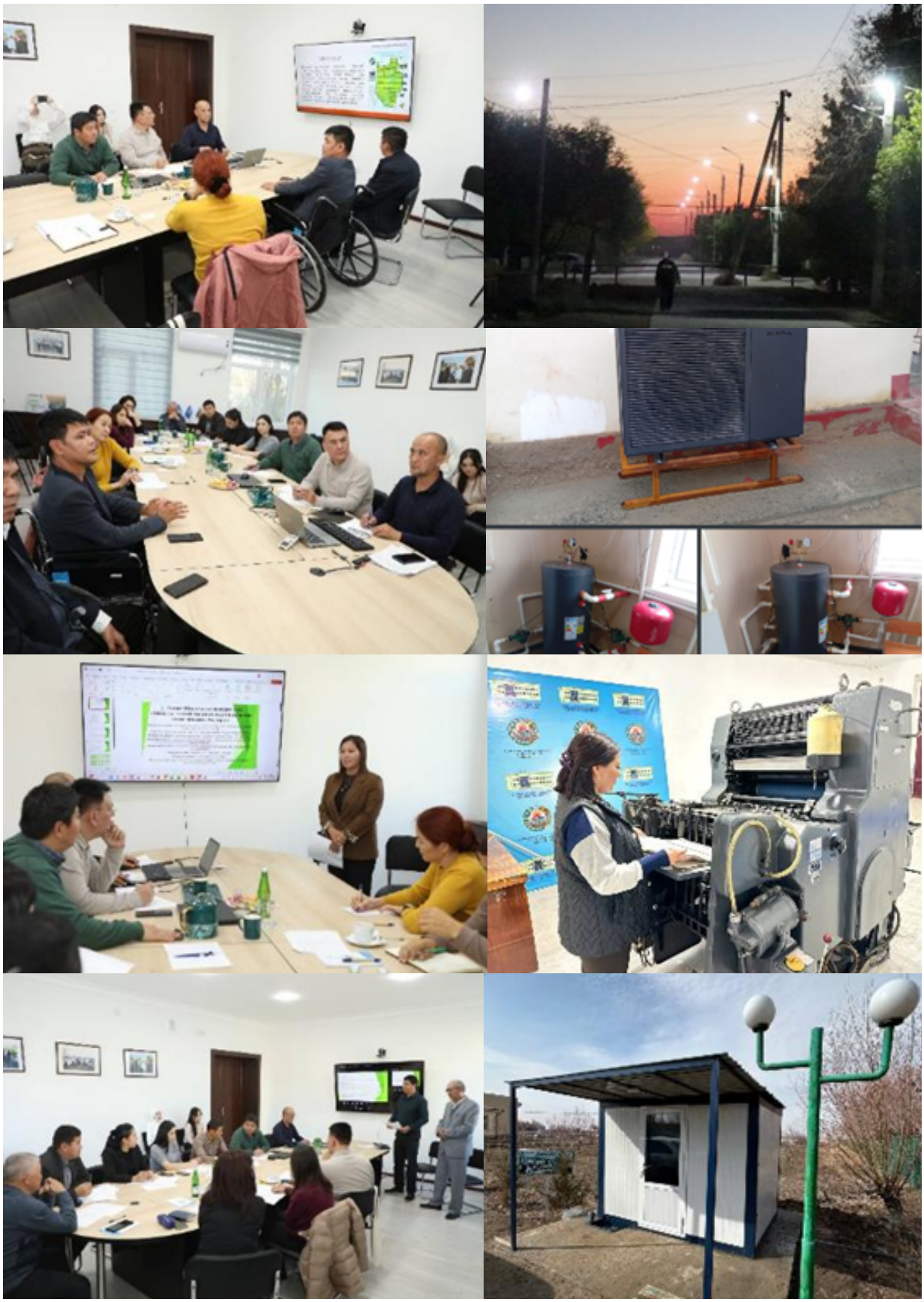
Photos 32,33. Screenshots from the round table discussions.

Following the launch of a call for proposals in February 2025 to support and foster local startup initiatives in the pilot districts, a total of 127 applications were received from households and local entrepreneurs. After a preliminary screening process, 38 shortlisted candidates presented their proposals to the review committee on March 14, 2025. Based on the evaluation results, 14 high-potential initiatives were selected for support. The required equipment and machinery were subsequently procured and delivered, including biohumus production units, borehole drilling services, chlorella and zoohumus production systems, motocultivators, hotbeds with drip irrigation systems, and pellet-making and crushing machines, enabling the operational launch of the selected initiatives.

Photos 34,35,36,37,38,39. Screenshots from project beneficiaries.

In October 2025, the project launched a call for proposals to support community-driven initiatives in the Aral Sea region, targeting local NGOs and CSOs. A total of 22 applications were received, and four high-impact projects were selected by the review committee, each awarded a USD 10,000 grant. Implementation has reached its final stage, delivering tangible results: street lighting installation in Mamiy village (Shumanay district) is enhancing safety and accessibility for all residents, including persons with disabilities; a youth media club has been established in Kegeyli district, strengthening journalism skills and civic engagement among young people through the provision of a mini printing station and a computer, which significantly enhanced its operational capacity.; a modern low-carbon heating system has been installed at Preschool No. 11 in Takhtakupyr district, improving winter conditions for children; and families in Kaishyly community (Chimbay district) have secured sustainable access to clean and safe drinking water.

Photos 40,41,42,43,44,45,46,47.
Screenshots from review committee and filed visit sites.



LinkedIn: https://www.linkedin.com/posts/undp-uzbekistan_safer-streets-media-empowerment-warmer-activity-7397533438817316864-n3Od

Output 2.2 Enhanced Integrated Management and Restoration of Tugai Forest Ecosystems for Sustainable Livelihoods and Environmental Resilience (FAO)

To showcase innovative approaches to ecosystem restoration and promote sustainable land management in the Aral Sea region, demonstration plots featuring oleaster (Elaeagnus angustifolia) were established in the Kungrad and Taxtakupir districts. These demonstration plots, carefully designed and implemented, serve as living laboratories, showcasing the effectiveness of different planting techniques and providing valuable learning opportunities for local communities and stakeholders. Each district received a 2-hectare demonstration plot, resulting in a total of 4 hectares dedicated to this initiative.

Photos 48,49,50,51. Planting oleaster with application of waterboxx and traditional methods in pilot districts

Within these plots, a total of 3200 oleaster seedlings were planted, with the objective of demonstrating the potential for this drought-tolerant species to thrive in the harsh environmental conditions of the Aral Sea region. Oleaster was specifically chosen for its ability to withstand drought, improve soil fertility, and provide habitat for wildlife, making it an ideal species for restoration efforts in this degraded ecosystem.

Recognizing the critical importance of water availability in arid and semi-arid environments, a particular emphasis was placed on utilizing innovative water-saving technologies. As part of this innovative approach, 200 Waterboxxes were deployed across the demonstration plots. The Waterboxx is a reusable device that collects rainwater and condensation, providing a continuous supply of water to the seedling during its critical establishment phase. This innovative technology significantly reduces the need for traditional irrigation, making it a sustainable and cost-effective solution for restoring degraded landscapes.

To rigorously evaluate the effectiveness of different planting methods, three distinct approaches were implemented in the demonstration plots:

1. **Waterboxx Planting:** Oleaster seedlings were planted using the Waterboxx technology, providing a continuous source of water and protection from harsh environmental conditions.
2. **Hydrogel Planting:** Oleaster seedlings were planted with the incorporation of hydrogel, a water-absorbing polymer that helps retain moisture in the soil and reduce the need for frequent watering.
3. **Traditional Planting:** Oleaster seedlings were planted using traditional methods, serving as a control group for comparison with the other two innovative approaches.

By comparing the survival rates, growth rates, and overall performance of the oleaster seedlings under these three different planting methods, the demonstration plots will provide valuable insights into the most effective and sustainable approaches to ecosystem restoration in the Aral Sea region. The data collected from these plots will be used to inform future restoration efforts and guide the selection of appropriate planting techniques for different site conditions.

The establishment of these oleaster demonstration plots represents a significant investment in the future of the Aral Sea region. By showcasing innovative water-saving technologies and demonstrating the potential for drought-tolerant species to thrive in degraded landscapes, these plots serve as a catalyst for change, inspiring local communities and stakeholders to embrace sustainable land management practices and contribute to the restoration of this vital ecosystem. The lessons learned from these demonstration plots will be invaluable in guiding future restoration efforts and ensuring the long-term sustainability of the Aral Sea region.

In addition to that, building upon ongoing efforts to restore the Aral Sea region, a series of intensive training courses focusing on Tugai forest improvement were conducted in Karakalpakstan by a team of international experts[1]. These specialized training sessions aimed to enhance the knowledge and skills of local forestry professionals

1 **Aibek Baibulov** - Senior project coordinator of biodiversity and climate change in Central Asia WWF Program. Candidate of Science in Biology. Specialization: Geobotanist, GIS, remote sensing data analysis. Current focus: Restoration of riparian tugai forest in South part of Balhash Lake. Analysis of ecosystem, ecological niches.
Anastaisa Mazneva - Currently she works as a small grants manager in the Critical Ecosystems Partnership Fund (CEPF) project in the Mountains of Central Asia biodiversity hotspot, where she manages mainly community-based forest and grassland restoration projects. Two M.Sc. degrees – in Soil Science from the Lomonosov Moscow State University and in Environmental Engineering from the Czech University of Life Sciences. Specialized in sustainable land use, restoration of degraded lands, increasing of soil fertility and soil organic carbon, land use practices contributing to climate adaptation of communities and local biodiversity conservation. Participated in WWF projects in Kazakhstan in vicinity to riparian ecosystems, where she conducted land degradation analysis, analysis of soil data and climate change vulnerability with consequent adaptation plans for local smallholders.

and build local capacity in the sustainable management and restoration of these vital ecosystems. Tugai forests, characterized by their unique riparian vegetation adapted to fluctuating water levels, play a crucial role in maintaining biodiversity, preventing soil erosion, and providing essential ecosystem services in the Aral Sea region. The international experts visited Karakalpkakstan and conducted trainings on Tugai forest improvement in the districts.

Photos 52,53. Screenshot pictures from the training in pilot districts

The training courses were designed to reach a diverse group of stakeholders involved in forestry management, including personnel from the Kungrad and Taxtakupir departments of the Forestry Agency, the governmental body responsible for managing forest resources in the region. Recognizing the importance of building local capacity at all levels, the training targeted approximately 60 staff members, ranging from experienced forestry officers to field-level technicians. The inclusion of staff from both Kungrad and Taxtakupir departments ensured that the knowledge gained would be widely disseminated across key regions directly affected by the Aral Sea crisis.

Furthermore, recognizing the critical role of education in fostering long-term sustainability, the training program actively involved students from the forestry faculty of the local University. By providing hands-on training and exposure to cutting-edge techniques, the program aimed to cultivate the next generation of forestry professionals with the skills and knowledge necessary to address the complex challenges facing the Aral Sea region. The participation of these students also facilitated the transfer of knowledge from international experts to local academics, ensuring the sustainability of the training efforts. The content of the training courses encompassed a wide range of topics related to Tugai forest improvement

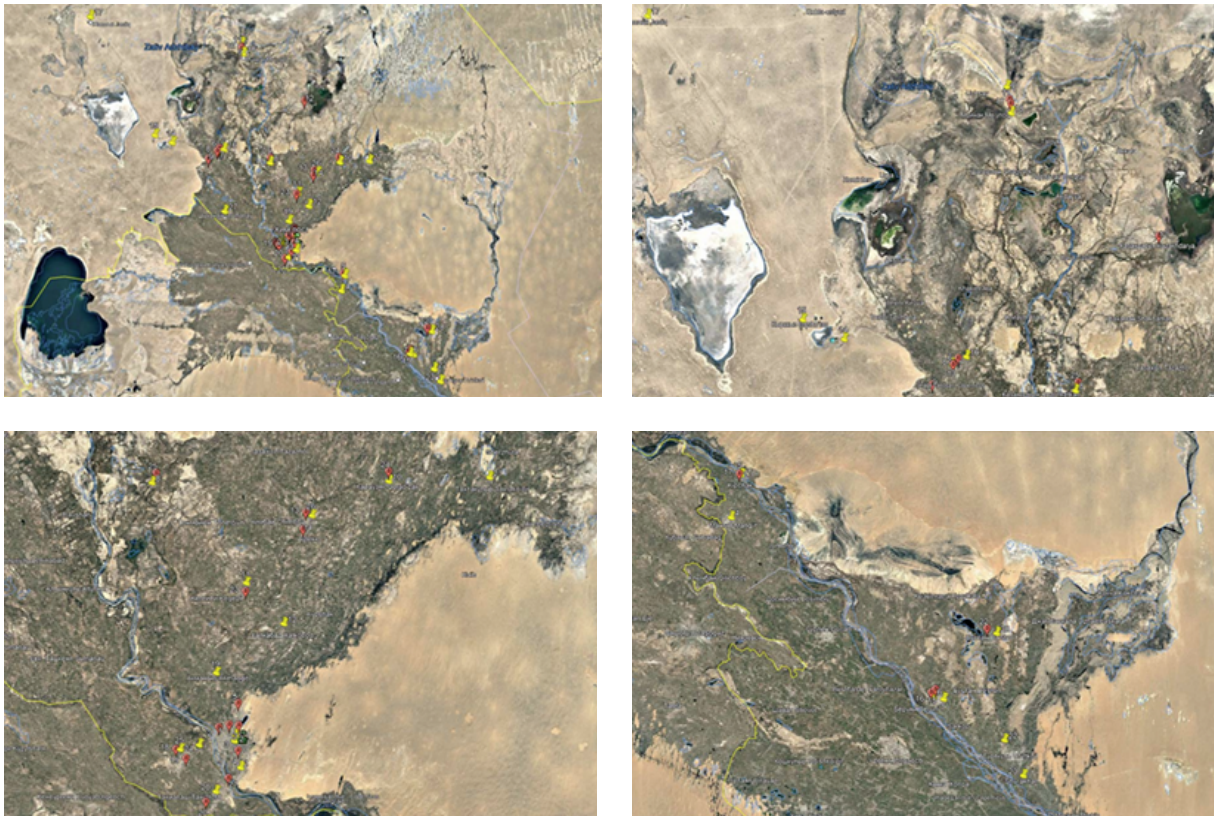
Photos 54,55. Screenshot pictures from the training in pilot districts

Output 3.1 Facilitating Integrated Air Quality Management Systems and Regulatory Practices (UNDP).

Needs assessment of the air quality monitoring systems in Karakalpakstan, covering 37 locations. The assessment was carried out jointly with expert organization “Davlat Ekologik Sertifikatlashtirish va Standartlashtirish Markazi” (Davekosertifikat) and compatible air quality monitoring systems with existing national monitoring systems have been identified in cooperation with Uzhydromet and the Ministry of Ecology. 37 priority points (locations) in Karakalpakstan were identified and selected

for the installation of the automatic air quality monitoring systems (AQMS) and a Technical Specification for this equipment was developed by an expert organization Davekosertifikat. Based on the needs assessment and Technical Specification, a tender has been announced for the supply, installation and commissioning of the Automatic air quality monitoring systems (AQMS).

Photos 56,57,58,59: Screenshots from conducted needs assessment of the AQMS in Karakalpakstan



During the reporting period, the Programme achieved a major milestone in strengthening environmental monitoring infrastructure in Karakalpakstan. A total of 37 Automatic Air Quality Monitoring Stations (AQMS) were successfully established across the region: in the first phase, 17 stations were installed; in the second phase, 20 stations were installed with additional funds from the MPTFHS, which were approved by the Steering Committee in September 2024. All equipment was fully delivered, installed at strategically selected locations, and made operational. Importantly, each station has been integrated into the national air quality monitoring system of Uzbekistan, ensuring real-time data transmission, centralized analysis, and alignment with national environmental standards. This expanded network significantly enhances the region's capacity to monitor air pollution, respond promptly to environmental hazards, and provide timely information to authorities and communities. By moving from limited manual monitoring to a modern, automated system, the initiative represents a transformative step toward improved public health protection, environmental management, and evidence-based policymaking in Karakalpakstan.

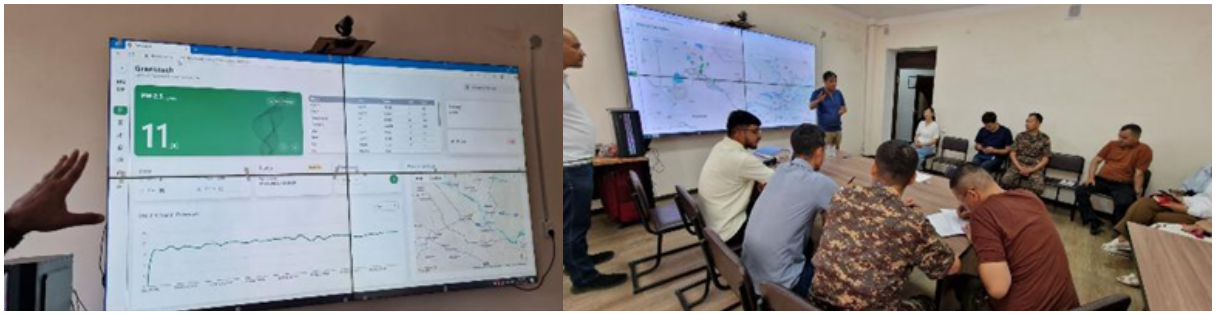
Photos 60,61,62,63: Established AQMS equipment in Karakalpakstan

To strengthen local capacity and promote sustainable environmental practices, a two-day training seminar was conducted for eco- and health volunteers in the Aral Sea region. The seminar aimed to enhance participants' understanding of the integrated air quality monitoring system and its role in supporting improved regulatory practices. The training also focused on building the technical and institutional capacity of regional partners to effectively operate, interpret, and utilize air quality data. By equipping local stakeholders with the necessary knowledge and skills, the initiative fosters community engagement, strengthens environmental governance, and supports evidence-based decision-making to protect public health and the environment.

Photos 64,65,66,67: A two-day training seminar for local eco and health volunteers

As part of efforts to strengthen institutional capacity for environmental governance, a Situation Center for Air Quality Monitoring was established under the Committee on Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan. The Center serves as a coordination and data management hub, enabling real-time analysis of air quality information generated by the automated monitoring network. It enhances the capacity of authorities to respond promptly to environmental risks, improve regulatory oversight, and ensure timely communication of air quality data to relevant stakeholders and the public. This milestone represents a significant step toward building a robust, technology-driven environmental management system in the region.

Photos 68,69: Established Situation Center under the Committee on Ecology, Environmental Protection and Climate Change of the Republic of Karakalpakstan.



Output 3.2 Enhanced Comprehensive Environmental Quality Management and Regulatory Practices (FAO).

To establish a robust foundation for informed decision-making in the Aral Sea region, a comprehensive environmental assessment was conducted, focusing on water and soil quality across six key districts of Karakalpakstan: Muynak, Kungrad, Taxtakupir, Chimbay, Amudarya, and Ellikala. This assessment recognized the critical importance of understanding the current state of these fundamental resources to guide effective ecosystem restoration and promote sustainable land management practices.

The water analysis involved a detailed evaluation of various parameters, including salinity levels, nutrient content, and the presence of pollutants such as pesticides and heavy metals. This investigation aimed to determine the suitability of water resources for diverse uses, ranging from irrigation to the restoration of aquatic habitats. The data collected will inform strategies for improving water quality and ensuring the sustainable management of this precious resource in the face of increasing water scarcity.

Simultaneously, a thorough soil analysis was performed to assess soil composition, fertility, salinity, and the presence of contaminants. This analysis is essential for understanding the potential of the land for agriculture, forestry, and other land uses. The data obtained will guide the selection of appropriate land management practices, including soil conservation techniques, sustainable farming methods, and the restoration of degraded lands.

Photos 70,71,72,73: Environmental assessment process, focusing on water and soil quality

Recognizing the crucial role of climate in shaping the environment and influencing the success of restoration efforts, a network of six meteorological (meteo) stations was strategically deployed across the six districts. These stations are equipped with advanced sensors to continuously monitor key climate variables, such as temperature, precipitation, humidity, wind speed, and solar radiation. The collected data will provide valuable insights into climate trends, seasonal variations, and extreme weather events, enabling the development of climate-resilient strategies for ecosystem restoration and sustainable development.

The data generated from the water and soil analyses, coupled with the long-term climatic data gathered by the meteo stations, will create a powerful knowledge base for informed decision-making at the farm level, district level. Also, the scientific research institute was also involved in the process. This information will be instrumental in:

- Identifying priority areas for restoration efforts.
- Developing sustainable land management practices that minimize environmental impacts.
- Monitoring the effectiveness of restoration efforts and adapting strategies as needed.
- Building resilience to climate change and mitigating the impacts of future environmental challenges.

This comprehensive environmental assessment represents a significant commitment to evidence-based decision-making in the Aral Sea region. By providing a clear understanding of the current state of water, soil, and climate resources, this initiative will empower local communities, government agencies, and international partners to work together towards a more sustainable and prosperous future for the region

Photos 74,75,76,77: Screenshots from field works installation of advanced sensors to the meteo stations




Extension of the Programme

1. First extension

Overall, the Joint Programme implemented the majority of its activities timely. However, JP has experienced some delays in the following activities and therefore initiated extension with some amendments of the Programme for 5 months until 31st May, 2025. Extension/Amendment was approved by the decision of the 1st Project Board Meeting dated November 12, 2024 and eventually by the MPHSTF Steering Committee in Dec 2024. Delays occurred in activities within **Objective 1**, particularly Output 1.1. where initially hiring an international consultant was envisioned and it took more time to make negotiations with potential candidates, as a result a local expert was decided to be hired after consultation, noting shortage of time. All work has been completed in April 2025 and results transferred to the national partner – Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan.

Within **Objective 2**, particularly Output 2.1 where development of concept and agreeing with potential beneficiaries for the creation of nurseries to expand afforestation initiatives, planting chistanche with the involvement of communities as well as technical specifications for mobile laboratory equipment for soil analysis required longer time than expected. All work has been completed in April 2025 and transferred to the beneficiaries. Also Output 2.2 required extension where 2 demonstration sites were created to pilot innovative technologies and practices to promote sustainable livelihoods and environmental sustainability, however extension needed for monitoring and transfer of the results of these methods to beneficiaries and partners which was possible only in the spring of 2025.

Within **Objective 3**, particularly in Output 3.1 an assessment of the needs of air quality monitoring systems is carried out and technical characteristics of the required equipment were developed in the reporting period. It required several months to conduct a full-fledged tender for purchase and install the required air quality monitoring system/equipment. Also, events to raise awareness about the air quality monitoring system with the involvement of local volunteers were organized after the installation of the system itself. In this regard, it was necessary to extend the implementation until May 2025. Also Output 3.2 a water quantity and quality monitoring network has been established by installing 6 stations. It included various parameters, including weather conditions, soil moisture, river and reservoir levels, as well as atmospheric dust, and was used to conduct experiments comparing traditional and regenerative agricultural practices using sensors based on the Free Station. Based on the monitoring results, training materials to be developed and awareness-raising sessions to be organized to disseminate knowledge about the One Health approach and the effects of sand and dust storms. Due to the fact that it took some time to conduct monitoring and obtain results, it was necessary to extend the implementation until May 2025.

2. Second extension

The project implementation period was extended by 3.5 month, from 15 September 2025 to 31 December 2025, to allow the completion of newly introduced and ongoing activities, as well as sufficient time for monitoring, reporting and knowledge transfer. Extension/Amendment was approved by the decision of the MPHSTF Steering Committee dated September 5, 2025.

According to the project document under Objective 2 "Adopting new approaches in water purification, afforestation, and soil stabilization in the Region" of the Joint Programme, additional activity was added to **Output 2.1 (UNDP)** - "Supporting sustainable afforestation and land revitalizing practices in the Aral Sea Region". This new activity engaged Civil Society Organizations (CSOs) where new small grants introduced to engage local NGOs/CSOs in Karakalpakstan focusing on introduction of innovative approaches to mitigate the impacts of the Aral Sea crisis. Call for proposals was announced in September 2025 with further expected contracting in October 2025 and delivery time of 3-5 months. Therefore, the implementation and completion of the current initiatives took several months, namely from September 2025 to November 2025. After completion of the work in 2025, it was necessary to ensure monitoring of the results and then transfer them to the relevant beneficiaries and partners.

According to the project document, under Objective 3: "Promoting integrated air, water, and soil quality monitoring systems to facilitate regulatory practices in the Region" of the Joint Programme, and according to **Output 3.1 (UNDP):** "Facilitating Integrated Air Quality Management Systems and Regulatory Practices", an assessment of the needs of air quality monitoring systems was carried out and technical characteristics of the required equipment on integrated air quality monitoring system (AQMS) for the Aral Sea region was developed and 17 units were successfully installed. Building on current work under Objective 3, an additional activity was introduced to expand the Air Quality Monitoring Systems (AQMS) in districts of the Aral Sea region that remain uncovered. Therefore, it took 3.5 months to conduct a full-fledged bidding, purchase and instalment of the required air quality monitoring systems/equipment.

Challenges

Facilitating Integrated Air Quality Management (IAQM) systems and regulatory practices faced several challenges, including: conducting effective assessments required specialized knowledge in air quality science, data analysis, and environmental policy; engaging multiple stakeholders, including government agencies, industries, and communities, required effective communication and collaboration, which was difficult to achieve in short period; raising awareness about air quality issues and the benefits of integrated management among the general public was essential, yet often challenging; lack of technical expertise and capacity within regulatory agencies to manage and analyze air quality data limited effective decision-making.

Strengthening IAQM requires capacity-building programs for regulatory agencies, stakeholder engagement strategies, and public awareness campaigns.

Cistanche Cultivation Training & Employment. Since it is a new initiative adopted by rural people, periodic communication and support will be necessary to ensure long-term adoption and expansion of new farming skills by local families and it is important for rural people to acknowledge that Cistanche harvest can be received after 2-3 years of cultivation. Cistanche cultivation success depends on continuous training, periodic follow-ups, and awareness campaigns highlighting the long-term benefits.

Effectiveness of Restoration Methods. Uncertainty regarding the success rates of different planting methods (Waterboxx, hydrogel, and traditional planting) in extreme conditions. To improve restoration method effectiveness, pilot studies and adaptive management will identify the most suitable techniques for extreme conditions.

Capacity Building & Knowledge Gaps. Local forestry personnel and students require continuous training on Tugai forest improvement and sustainable land management. Ensuring long-term knowledge retention and application of trained techniques remains a challenge. Addressing capacity-building gaps involves developing long-term training programs, mentorship initiatives, and practical field-based learning.

Data Collection & Informed Decision-Making. Environmental assessments require long-term monitoring to understand trends and impacts fully. Establishing meteorological stations is a step forward, but data utilization and integration into policy remain key challenges. Enhancing data collection and informed decision-making requires investment in automated monitoring systems, data integration frameworks, and policy-driven environmental reporting mechanisms.

Mitigation and adaptation measures taken by the Programme

JP initiated an extension of its term for 5 months until May 31, 2025 as an adaptation measure which helped JP to mitigate risks of incompletion of envisioned activities. Proper communication with stakeholders and beneficiaries was organized where commonly agreed decision was made to complete efficiently planned activities within extended period.

To mitigate the challenges in facilitating Integrated Air Quality Management (IAQM) systems and regulatory practices measures have been taken, including: a specialized organization was hired that had extensive and first-hand experience in conducting effective assessments with expertise in air quality science, data analysis, and environmental policy; developed a structured framework for engaging multiple stakeholders, including government agencies, industries, and community groups, involving regular meetings that promoted open dialogue, enabling the sharing of ideas, challenges, and potential solutions.

Lessons learned

Active involvement of local institutions (forestry enterprises, mahalla committees, academia) and community members (eco-volunteers, households) proved essential for sustainability. Joint ecosystem mapping and volunteer engagement strengthened trust, built local capacity, and ensured continued use of tools and knowledge beyond project interventions. Joint ecosystem mapping, volunteer monitoring and community engagement practices should be integrated into the annual workplans of forestry and environmental institutions, requiring limited additional resources beyond coordination support and small operational budgets. This will ensure that capacities, tools and trust built during the project are sustained beyond its lifetime.

Installation of meteorological stations, mobile laboratories, and AQMS systems demonstrated that advanced technologies can be successfully introduced in remote regions when combined with training, institutional partnerships, and alignment with national monitoring systems. As a next step, responsible national agencies should assume formal ownership of the installed equipment within 12 months, align data with national monitoring systems, and incorporate operation, maintenance and calibration costs into regular state budgets. Short-term capacity-building support will be required to ensure smooth handover and long-term functionality.

Cooperation with FAO, IT Park, the Academy of Sciences, TIIAME-NRU, OISCA (Japan), and the Turkish Chamber of Forestry Engineers enhanced technical quality, introduced innovative approaches, and strengthened institutional learning at both regional and national levels. Modest investments in knowledge products and professional exchanges will help ensure that innovative approaches are absorbed into national systems and replicated on scale.

Best practices

The Programme established 37 Automatic Air Quality Monitoring Stations (AQMS) across the region, fully operational and strategically installed. All stations were integrated into the national air quality monitoring system of Uzbekistan, enabling 24/7 real-time data transmission and centralized analysis. This shift from manual to automated monitoring significantly strengthened environmental governance, improved rapid response to pollution risks, and enhanced the evidence base for public health and climate-informed policymaking. The initiative represents a scalable model for advancing data-driven environmental management nationwide.

Hands-On Training & Community Engagement. Practical training (e.g., Cistanche cultivation) equips local families with valuable farming skills, creating employment opportunities and promoting sustainable land use. Involving communities in afforestation and soil stabilization ensures long-term adoption and economic benefits.

Multi-Sectoral Collaboration & Innovation Partnering with international experts (e.g.OISCA), research institutions, and local agencies enhances knowledge exchange and adapts global best practices to local conditions. Encouraging entrepreneurship through startup initiatives fosters economic diversification and self-sufficiency in pilot districts.

Testing & Implementing Innovative Planting Techniques by using Waterbox technology, hydrogel planting, and traditional methods in demonstration plots allows for comparative analysis and selection of the most suitable afforestation techniques.

Capacity Building Through Practical Training of 60 forestry personnel and students in Tugai forest improvement strengthens local expertise and ensures sustainable forest management.

To ensure the identified best practices have a broader impact, we propose sharing findings with UN agencies, national ministries, and international organizations through reports, policy briefs, and knowledge-exchange events. Pilot projects will be established in different regions to test adaptability, while collaboration with policymakers will integrate successful methods into national reforestation and climate strategies. Capacity-building initiatives, such as training centers and online modules, will empower local communities and professionals. Additionally, partnerships with the private sector will support sustainable entrepreneurship, and a long-term monitoring framework will track progress, ensuring continuous improvement and scalability.

Qualitative assessment

Overall, within the Joint Programme number of objectives has been achieved on time. The JP established sound partnerships with key stakeholders at regional, district and grassroot levels, and local communities have been fully engaged in implementing the activities. Through its interventions at every stage, the project promoted gender mainstreaming principles. When organizing initiatives, committees or panels, the project always ensured that the voices of the most vulnerable groups of the population, including those of women, youth and the elderly, were all represented and heard. Since One UN model is a mandatory approach, JP fully promoted it through smooth coordination between UNDP and FAO, in terms of joint planning and implementation of activities.

ii) INDICATOR-BASED PERFORMANCE ASSESSMENT

	Achieved Indicator Targets	Reasons for Variance with Planned Target (if any)	Source of Verification
Outcome 1. The stress on local communities due to the deteriorating environmental situation reduced (UNDP, FAO)			
Indicator: # of tugai forests with restored ecosystems **Baseline:** N/A **Planned Target for 2024:** 3	3		Monitoring visit reports
Indicator: % of air quality forecasting efficiency is increased **Baseline:** N/A **Planned Target for 2024:** 10 %	10		
Output 1.1. Inclusive participatory ecosystem services mapping			
Indicator 1.1.1 # of people (women/men/ youth) engaged to ecosystem services mapping exercise **Baseline:** 0 **Planned Target for 2025:** 45	45		Reports, validation workshops and etc.
Indicator 1.1.2 # area of degraded tugai/ pasture/other ecosystems (hectare) covered by participatory mapping **Baseline:** 0 **Planned Target for 2025:** 60ha	60		Maps, GIS
Indicator 1.1.3 # of people (women/men/ youth) benefitted from knowledge sharing and capacity building events disaggregated by gender and types of occupation **Baseline:** 0 **Planned Target for 2025:** 30	45		Reports, validation workshops and etc.
Indicator 1.1.4 # of design of education, communication and outreach materials for various target groups at local, regional and national levels. **Baseline:** 0 **Planned Target for 2025:** 1 promo material (social video, leaflets and etc) 100 people	2 promo materials 450 people		Reports, TV and social network materials etc.
Output 1.2. Enhanced Ecosystem Services (FAO)			
Indicator 1.2.1 #of guidelines developed for ecosystem restoration, NBS, native trees conservation **Baseline:** 0 **Planned Target for 2025:** 2 reports	2		Reports, Records of meetings, workshops, or consultations
Indicator 1.2.2 # of people who gained access to improved ecosystem services (women/men/youth) with the project support **Baseline:** N/A **Planned Target for 2025:** 150	238		Expert estimates

	Achieved Indicator Targets	Reasons for Variance with Planned Target (if any)	Source of Verification
Outcome 2. Adopting new approaches in water purification, afforestation, and soil stabilization in the Region (UNDP, FAO)			Reports
Output 2.1. Supporting sustainable afforestation and land revitalizing practices in the Aral Sea Region			Reports, Meetings, Transfer of acts, etc, Research Reports
Indicator 2.1.1 # sand and salt resilient plants nurseries are established in target districts **Baseline:** 3 **Planned Target for 2025:** 3	6		
Indicator 2.1.2 # of land and soil analysis mobile labs are established **Baseline:** N/A **Planned Target for 2025:** 1	1		
Indicator 2.1.3 # of local farmers and smallholders (women/men/youth) with improved knowledge and skills on sustainable afforestation and pasture management practices **Baseline:** N/A **Planned Target for 2025:** 60	72		
Indicator 2.1.4 # of seasonal job places (including women, youth and others) created in planting and maintaining nurseries **Baseline:** N/A **Planned Target for 2025:** 30	60		
Indicator 2.1.5 #of small grants mechanism introduced to engage local NGOs/CSOs in Karakalpakstan **Baseline:** 0 **Planned Target for 2025:** 3	4		
Output 2.2 Enhanced integrated management and restoration of Tugai forest ecosystems for sustainable livelihoods and environmental resilience			Reports, Records of meetings, workshops, or consultations
Indicator 2.2.1 # of participants attending the workshop **Baseline:** 0 **Planned Target for 2025:** 40 people	55		
Indicator 2.2.2 # of ha of restored tugai **Baseline:** N/A **Planned Target for 2025:** 4ha	4ha		
Indicator 2.2.3 #of Waterboxx installed **Baseline:** 0 **Planned Target for 2025:** 200	200		
Outcome 3. Promoting integrated air, water, and soil quality monitoring systems to facilitate regulatory practices in the Region (UNDP, FAO)			
Output 3.1 Facilitating Integrated Air Quality Management Systems and Regulatory Practices (UNDP)			Reports, Meetings, Act of transfers
Indicator 3.1.1 # of air quality monitoring systems established integrated to the network of UzHydromet **Baseline:** 1 **Planned Target for 2025:** 9	37		

	Achieved Indicator Targets	Reasons for Variance with Planned Target (if any)	Source of Verification
Indicator 3.1.2 # of developed national standards for the air quality in the Aral Sea Region in line with SDG11 **Baseline:** 0 **Planned Target for 2025:** 1	1	Uzbekistan has adopted the National Standard No. O'z MSt 194:2024 «Automated monitoring stations for atmospheric air pollution control» valid from 28.08.2024.	Reports, Meetings, Manuals and guidelines developed
Indicator 3.1.3 # of population in 8 spots are benefited from the air monitoring quality systems **Baseline:** 0 **Planned Target for 2025:** 691900	2 020 000		
Output 3.2 Enhanced Comprehensive Environmental Quality Management and Regulatory Practices (FAO)			
Indicator 3.2.1 # of comprehensive reports generated **Baseline:** 0 **Planned Target for 2025:** 2	2		Reports, Records of meetings, workshops, or consultations Reports, Records of meetings, workshops, or consultations Manuals
Indicator 3.2.2 # of training materials developed **Baseline:** 0 **Planned Target for 2025:** 1	1		
Indicator 3.2.3 # of monitoring network stations installed **Baseline:** 0 **Planned Target for 2025:** 5 stations	6		

iii) SPECIFIC STORIES

Cistanche Cultivation in Aral Sea Region: way to boost local agriculture, employment and health

November 21, 2024

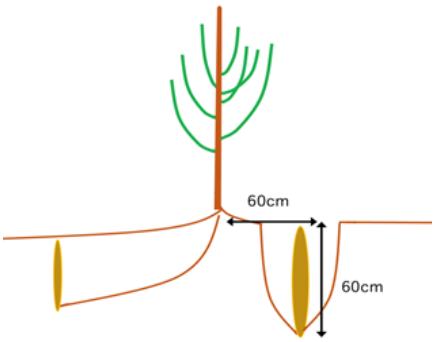
Link: Cistanche Cultivation in Aral Sea Region: way to combat environmental challenges and boost local agriculture, employment

Karakalpakstan, November 21, 2024. In a new effort to tackle the environmental and economic challenges of the Aral Sea region, more than 60 local households in Muynak, Kungrad, and Takhtakupir have completed training on how to grow Cistanche, a hardy desert plant with important health benefits. The training, conducted from November 18-21, 2024, equips these families with the skills necessary to grow Cistanche in their local environment and provides them with seeds to begin cultivation.

Cistanche, a parasitic plant that thrives in arid conditions, is known for its health benefits, particularly in traditional medicine where it is used for boosting energy, improving health and supporting the immune system. Cistanche is distributed from inland China to Inner Mongolia and Central Asia. Cistanche thrives in harsh desert conditions, making it an ideal crop for cultivation in regions like the Aral Sea basin, where environmental conditions are challenging, yet the potential for sustainable agricultural development is high. It is well-suited to desert environments and can grow in poor soil, on shrubs like saxaul and tamarix, and in areas with strong sunlight and little water.

Over three days, qualified specialists from the Japanese Organization for Industrial, Spiritual and Cultural Advancement (OISCA) conducted instruction on artificial cultivation of Cistanche, which include essential techniques for host tree cultivation, afforestation, and parasitic planting. The goal of the training is to help local families gain new farming skills and provide seasonal employment through Cistanche farming. This will help boost the local economy, which is facing environmental challenges.

By adopting Cistanche cultivation, local farmers will not only contribute to the rehabilitation of desert lands but also tap into the lucrative market for medicinal plants. Cistanche has significant potential for export due to its health benefits, providing local families with an opportunity to earn a living through sustainable, environment-friendly farming.



Cultivation of Cistanche with other plant

The cultivation method emphasizes the importance of selecting suitable sites and host plants for Cistanche, which requires minimal soil conditions, with a preference for neutral to slightly alkaline pH (7.5-9) and good drainage. Cistanche thrives in environments with low salinity and can be planted on abandoned or lightly saline land, sandy wastelands, and even areas affected by desertification.

Key steps in Cistanche cultivation:

1. Site selection and preparation

Cistanche thrives in well-drained soils with moderate salinity. Ideal areas for cultivation are those with sandy or lightly saline soils. The land must be leveled and furrows should be created to facilitate proper irrigation. Ensuring good soil drainage is critical for the growth of Cistanche, as waterlogged conditions can hinder its development.

2. Host tree selection

Cistanche is a parasitic plant that attaches to specific host species, with Saxaul and Tamarix being the most suitable. The success of Cistanche cultivation heavily depends on the careful selection of healthy, disease-free seedlings of these host trees. These trees should be chosen for their robust growth and ability to support the parasitic relatioship with Cistanche.

3. Afforestation methods

The planting of Cistanche begins with selecting first-year saplings of Saxaul or Tamarix, which are then carefully planted in rows. The planting density typically ranges from 1*2 meters to 1*3 meters, depending on the site conditions and afforestation method. The best planting season for Cistanche is from autumn to early spring, as this ensures optimal growth before the hot summer months. Proper afforestation methods are crucial for establishing a thriving environment where Cistanche can parasitize its host plants effectively.

The introduction of this cultivation method also provides seasonal employment, creating work opportunities during the planting and harvesting periods. This initiative is seen as a vital step in addressing the long-term economic challenges faced

by the Aral Sea region, which has suffered from ecological degradation and lack of water resources for decades.

The local authorities, in collaboration with agricultural experts and environmental organizations, plan to expand the initiative to other parts of the Aral Sea region.

UNDP and Uzbekistan join forces to combat dust storms in the Southern Aral Sea region

May 7, 2025

Link: https://www.undp.org/uzbekistan/press-releases/undp-and-uzbekistan-join-forces-combat-dust-storms-southern-aral-sea-region

Nukus, 7 May 2025. A large-scale study aimed at combating one of the most acute environmental threats in the region, dust storms, has been completed in the Southern Aral Sea region. The project was implemented within the framework of a Joint programme of the UNDP and FAO "Building knowledge and skills of local partners and communities to address environmental insecurities through innovative air, land, and water management solutions in the Aral Sea region".

The Southern Aral Sea region regularly suffers from increasing dust storms formed under the influence of the Kyzylkum, Karakum, Ustyurt and newly formed Aralkum deserts. These storms carry with them salts and fine particles, threatening public health, agriculture and ecosystems. The issue was highlighted at the 21st session of the United Nations Committee to Combat Desertification (CRIC-21), where Uzbekistan called for better measures to reduce the negative effects of dust storms.

The relevance of the initiative is confirmed by Decree of the President of the Republic of Uzbekistan No. PP-338 dated September 24, 2024, which outlines priority measures to combat dust storms and improve atmospheric air quality.

Photo: UNDP Uzbekistan

Scientific models — at the service of nature and society

In the course of the study, two innovative models for analyzing dust migration were developed:

- Long-term Exposure Model (LME): Estimates the concentration of dust in the air over a certain period (for example, a month) and helps identify high-risk areas.
- The Atmospheric Dust Dynamics Model (MDA): tracks long-term changes in the level of dust in the atmosphere and identifies stable trends.

Photo: UNDP Uzbekistan

Special attention is paid to the ecosystem role of forest plantations on the drained bottom of the Aral Sea. For the first time, the effectiveness of vegetation cover in reducing salt removal has been calculated — in digital terms (millions of tons per year) — depending on the area and density of plantings. The model was created in the MS Access environment specifically for analyzing data on the Aral Sea.

Practical significance: from science to problem solving

The results obtained open up opportunities for:

- Development of effective environmental protection measures;
- Planning an environmental monitoring system;
- Consideration of atmospheric dust in climate strategies;
- Protection of public health, especially in vulnerable areas of the Aral Sea region.

"This study is a clear example of how modern technologies and a scientific approach can become a tool for sustainable development and environmental protection," the UNDP representatives noted.

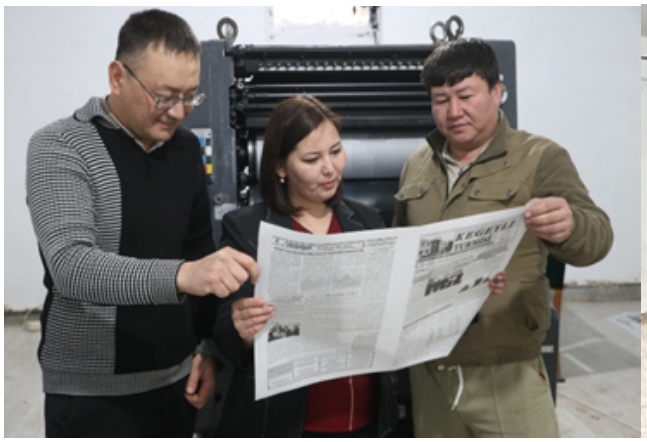
The project highlights the importance of integrating scientific data into the decision-making process and demonstrates how joint efforts by international organizations and the Government of Uzbekistan can contribute to improving the environmental situation in one of the country's most affected regions.





Kegeyli's Voice Restored:
Local Newspaper Resumes After Years of Silence

Link: https://www.linkedin.com/posts/undp-uzbekistan_aralsea-activity-7439603190607642624-WG2p?utm_source=share&utm_medium=member_ios&rcm=ACoAAEbOOwYBupvxZ1lXyP8TItJRv8X9Y4GT-Mw



For over 70 years, the "Kegeyli Turmysy" newspaper served as the voice of Kegeyli district — a daily connection between community members, a source of local news, and a platform for civic dialogue. But in 2024, the editorial office fell silent.

The challenge had been building for years. Without printing facilities in the Republic of Karakalpakstan, more than 30 local newspapers had relied on the neighboring Khorezm region for printing — creating higher costs, delays in distribution and operational cahllenges. For "Kegeyli Turmysy," these operational challenges resulted in a pause in publication in 2024–2025 during which the editorial staff were not active, and the district lacked access to locally produced news.

The impact extended beyond the newsroom. Residents lost their primary source of community news. Local voices — farmers sharing insights on crop management, teachers announcing school events, officials communicating policy updates — had limited ways to reach their neighbors. The editorial office, once a hub of community storytelling, was inactive.

Support from the UNDP–FAO Joint Programme "Building knowledge and skills of local partners and communities to address environmental insecurities through innovative air, land, and water management solutions in the Aral Sea Region," funded by the UN Multi-Partner Human Security Trust Fund for the Aral Sea Region in Uzbekistan, helped reverse this trend.

A USD 10,000 grant enabled the editorial office to acquire a mini printing press capable of producing 5,000–7,000 A2-format newspapers per hour — bringing printing capacity to Kegeyli district for the first time. The team also purchased a modern computer, allowing journalists to prepare layouts independently and control the entire production process locally.

The results reached beyond equipment. Two young journalists found employment at the revived newspaper — their first professional opportunity in local media. The editorial office established a Young Journalists Club, creating a pathway for youth interested in storytelling, reporting, and community journalism to develop their skills and contribute to local media.

Today, "Kegeyli Turmysy" is publishing again. Residents once more have access to news that reflects their community — stories written by their neighbors, about issues that matter to their daily lives. The newspaper's return strengthens local information access and revitalizes the role of community journalism in Kegeyli district.