

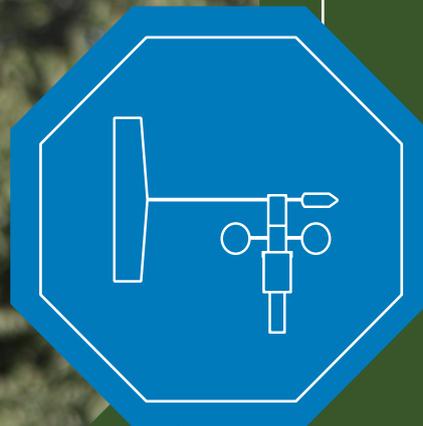


From  
the People of Japan



# FINAL THEMATIC REPORT ON KEY RESULTS

UNDP/ Uzhydromet project "Climate resilient livelihoods of horticultural producers in Fergana Valley in Uzbekistan", funded by the Government of Japan



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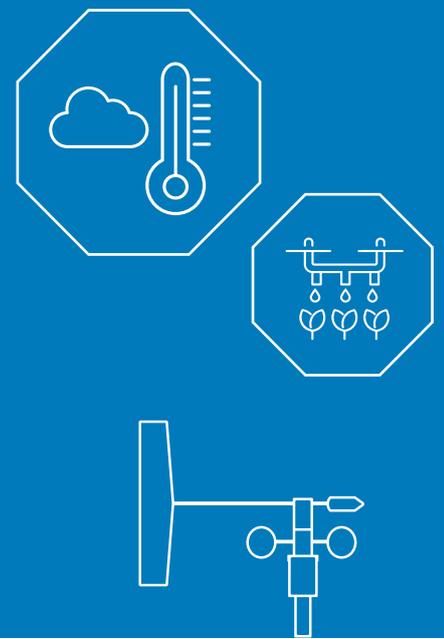
# INTRODUCTION

Implemented by UNDP Uzbekistan in partnership with the Center of Hydrometeorological Services, the “Climate resilient livelihoods of horticultural producers in Fergana valley in Uzbekistan” project aimed to orientate agrometeorological information services towards vulnerable agricultural communities, improving observation, forecasting, and extension services for farmers, while also introducing greater knowledge about climate variability into horticultural planning.

Funded by the Government of Japan, this project has been run during the period March 2022 – July 2023 and focused to achieve the following outcomes:

- Agrometeorological services shaped, and early warnings produced;
- Agrometeorological observation networks modernized;
- Data processing and user services improved;
- Climate-informed planning introduced.

This Final Project Progress Report presents the results achieved by the project, lessons learnt from the project implementation, impact and sustainability of the results on resilience of climate-sensitive horticultural production and livelihoods of climate-affected rural communities in Fergana Valley in Uzbekistan.



# PROJECT MOTIVATION AND ALIGNMENT WITH NATIONAL PRIORITIES



Warming trends observed in Uzbekistan since 1951 have been occurring at more than twice the rate of the global average and significant climate risks have already become evident. Reductions in water resources and changing precipitation patterns are predicted to further exacerbate prolonged droughts and extreme weather events. This poses widespread and cross-cutting challenges to human security, including economic, food and environmental risks, and calls for urgent, people-centered, comprehensive and prevention-oriented approaches to empower the most marginalized to respond to these issues.

Agriculture is an important sector of Uzbekistan economy employing 32% of the population. The horticultural sub-sector is a key source of both rural livelihoods (49% of total population are households) and high-value exports (up to 40%), with half of this production sourced from rural households and micro, small- and medium-size enterprises (MSMEs).

The current and especially future horticulture production by MSMEs and rural households is increasingly threatened by drought, aridity, scarcity of water and frequency of extreme weather events, and increase of agricultural plant pests and diseases was indicated by farmers and households in Fergana Valley as one of the most negative phenomena associated with climate change.

Urgent and well-informed adaptation action in agriculture sector is needed to prevent yield and productivity losses, secure livelihoods and food supply of the most vulnerable rural communities in the face of climate change.

In 2020, the President of Uzbekistan prioritized the importance of improving hydrometeorological services, which cannot meet increasing demand for timely and credible climate information for agriculture and other sectors.

The priority actions included: (i) enhanced coverage of the agro-meteorological network; (ii) development of an intelligent operational system for agro-meteo monitoring based remote sensing and modern modelling; (iii) improving reliability of forecasting and early warning systems.

The project was aimed to orientate the agro-meteorological information services towards the vulnerable agricultural communities in the Fergana Valley employed horticultural sector. Project will have positive spill-over effects on neighbouring communities living the Fergana Valley (Tajik and Kyrgyz parts) through strengthened regional cooperation in the exchange of hydrometeorological information from observations in transboundary territories.

The project activities also contributed to strengthening the country's climate adaptation efforts indicated in more ambitious NDC adopted by Uzbekistan in October 2021 and were in line with COP26 outcomes and decisions.



# MONITORING AND EVALUATION



# SUMMARY OF THE ACHIEVED RESULTS

The project was aimed to achieve the main country output: “Resilience of climate-sensitive horticultural production and livelihoods of climate-affected rural communities in Fergana Valley in Uzbekistan strengthened through improved agrometeorological services”. Long-term impact of the changes introduced will bear fruit in the years to come.

## *Shaping agrometeorological services and producing early warnings*

To achieve this result a comprehensive analysis of ground-based observations, remote sensing, and modern methods of mathematical modelling has been finalized. Project experts presented the report to stakeholders and international partners during the Conference “Adapting Agriculture to Climate Change: Challenges and Solutions for Uzbekistan”, which was conducted on 23 March 2023. Findings of the report

In addition, three Agrometeorological Situational Centres in the Namangan, Fergana and Andijan regions of the Fergana Valley have been established. They function as an intelligent system for operational monitoring of agrometeorological data by gaining access to online agrometeo information produced by automated weather stations and agrometeorological stations and conducting videoconferencing with Uzhydromet staff. For these Centres, the project procured, delivered and installed LED Panels and supporting equipment.





These Centres benefit more than 40 agrometeorologists and Uzhydromet agropost specialists from Fergana Valley sub-divisions – 22 people (4 women) in Andijan region, 8 people (2 women) in Namangan region, and 10 people (2 women) in Fergana region. Now, these specialists have access to real-time agrometeorological data, that ensures continuous awareness of the status of climate risks and weather conditions, as well as enables timely analysis of the agometeo situation and taking/coordination of the necessary response actions, such as issuing early warnings on extreme weather events.

## *Modernising agrometeorological observation networks for more precise weather data*

Climate change has a significant impact on agriculture, for example, farmers are unprepared for temperature fluctuations and this leads to major crop losses. The installation of agrometeorological stations provides an opportunity to reduce the negative impact of climate change on agriculture, farmers' financial well-being, and the country's economy in general.

The project purchased and installed in Fergana Valley 15 automated weather stations manufactured by Micro-Step Company (Slovakia). Every meteorological station provides a coverage area of 30–35 sq. km for meteo data collection.

They are operational and form an integral part of Uzhydromet's Fergana Valley and national meteo observation networks.





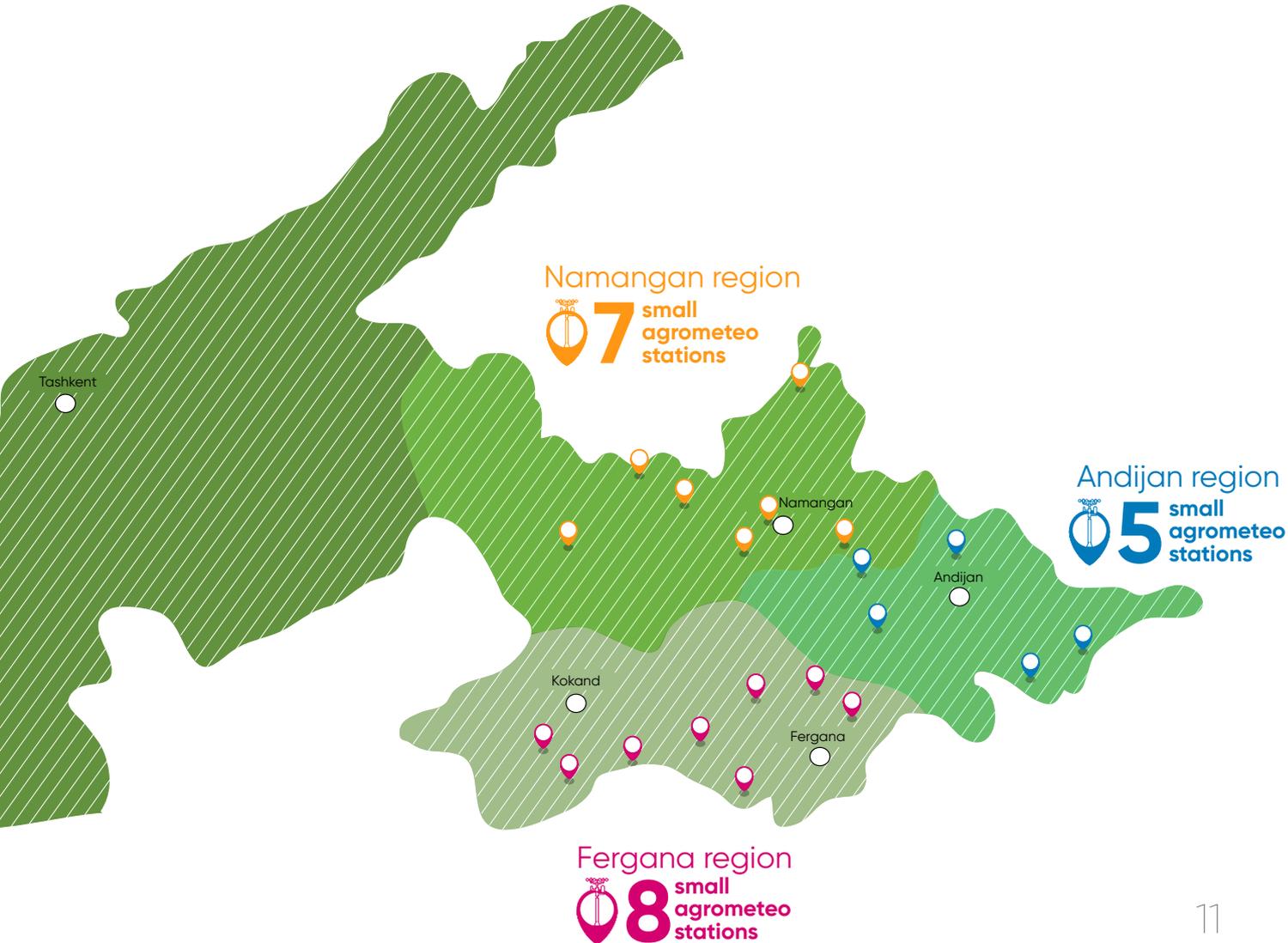
- 1. Andijan region** – 5 meteo stations (*Asaka, Izboskan, Balikchi, Bulokboshi, and Oltinkul districts*)
- 2. Fergana region** – 4 meteo stations (*Dasht, Mezon, Rishton, and Vuadil districts*)
- 3. Namangan region** – 6 meteo stations (*Gova, Turakurgan, Namangan city, Uchkurgan, Chust, and Yangikurgan districts*)



the agrometeo network in Fergana Valley and increase the coverage and forecast preciseness 40 small agrometeorological stations have been installed in Fergana Valley.

Project experts carefully selected locations for agrometeorological stations so that the service radius of multiple weather stations does not overlap, allowing to cover the largest possible area of the Fergana Valley. Today, agrometeorological stations serve as a tool for obtaining agrometeorological data horticultural producers. The access to agrometeorological data will enable farmers to implement climate-informed planning, reduce farming costs, and improve product quality.

The total coverage area of all 55 meteostations, including the automated weather stations and the small agrometeorological stations, is \_\_\_\_\_ sq. km.



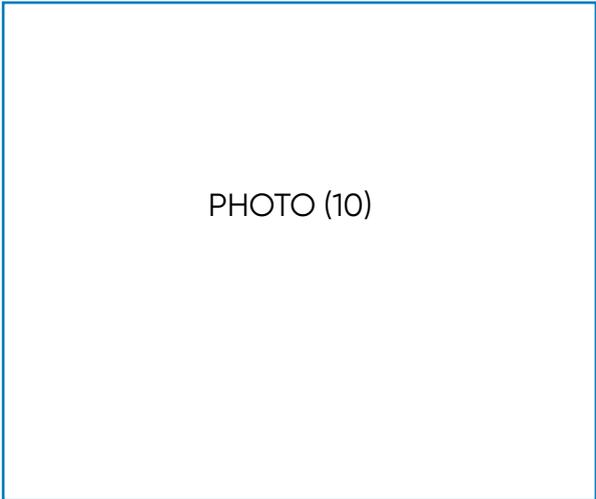
## *Upgrading and modernising IT capacities and expertise of Uzhydromet*

The quality and promptness of agrometeorological data processing depends on the technical capacity of Uzhydromet and the competencies of specialists in charge.

To improve data processing and user services, which are providing by Uzhydromet, the project has upgraded IT capacities of the Agency by procuring IT equipment, including 2 servers (1 main and one as backup), 2 switches, 2 uninterruptible power supplies and a server cabinet. In addition, licenses for virtualization and operating systems have been provided for both new and existing servers. This technical solution with proper server virtualization by the responsible 5 administrators of servers from the Center for Development of Information Technologies in Hydrometeorology (Meteoinfocom) will help to increase the capacity of server infrastructure by up to 50%.

Moreover, the project provided PCs and uninterruptible power supplies for 33 specialists from Uzhydromet – 10 for Andijan department, 10 for Namangan Department, 10 for Fergana Department, 3 for Central department. Also, 32 tablets procured and delivered to the departments of Uzhydromet in Fergana Valley (10–11 per each department).

With the aim to expand expertise of Uzhydromet's specialists, a series of workshops have been organized, that helped build dialogue between experts from different organisations and departments on main climate change issues, exchange knowledge with international specialists and expand skills in maintaining agrometeorological stations.



In September 2022, the project organized a workshop to bring together representatives from academia, the public sector, and international organizations involved in climate change adaptation in Uzbekistan. Participants were able to share their experiences and receive advice on how to resolve difficult situations, as well as identify opportunities for future collaborations.



## PHOTO 12

In May 2023, 17 experts from Uzhydromet, including specialists from regional departments, were trained online on how to maintain small agrometeorological stations.

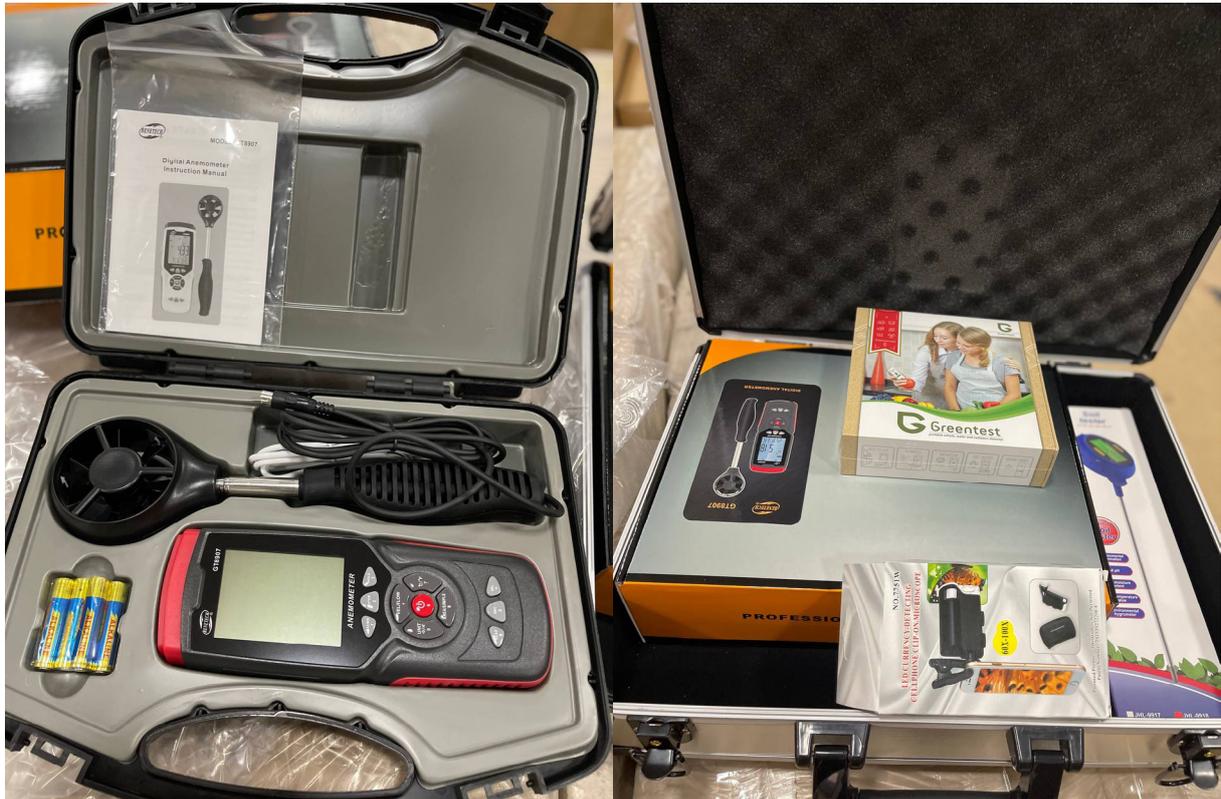
### *Improving delivery of and access to agrometeorological information for climate-resilient fruit and vegetable production*

A major factor affecting yields and production in Uzbekistan is the inter-seasonal weather variation. Access to agrometeorological information enables farmers to implement climate-informed planning, reduce farming costs, and improve product quality.

In March 2023, in Fergana Valley, 27 fruit and vegetable producers were trained on how to apply agrotechnical activities in specific weather conditions. Participants also learned how agrometeorological data and proper processing can help protect grape, apricot, and cherry gardens from pests and diseases.



Furthermore, Uzhydromet’s specialists in Fergana Valley have been equipped with “Agroclimatologists cases” – sets of tools, including an anemometer, pH, temperature, and conductivity in water and soil meter, soil Sampling, etc. Farmers and private households are now able to obtain a service that measures agrometeorological indicators and provides recommendations for further agrotechnical activities.



### *Developing and disseminating data in gender responsive, inclusive, and accessible approach*

To help fruit and vegetable producers adapt to climate change, raise awareness of climate change issues and develop skills for efficient production, the project has organized a series of training workshops.

In October 2022, to raise farmers’ awareness on how to use data provided by agro-meteorological stations, the project held training sessions for more than 50 specialists from Uzhydromet, Agency for Plant Quarantine and Protection, and horticultural producers. During the training sessions, participants learned about the ways to process agrometeorological data and take necessary measures to adapt to weather changes. Furthermore, experts provided information about agricultural techniques that are important to undertake during the winter time. Training sessions have been held in Namangan, Andijan and Fergana.



In November 2022, 30 horticultural producers and representatives from Uzhydromet, Agency for Plant Quarantine and Protection were trained on how to develop fruit and vegetables protection and nutrition programmes. During the seminar, participants learned about modern methods of working with horticultural and vegetable crops, the necessary agrotechnical methods and the schedule for their implementation based on weather conditions, ensuring plant nutrition, and pest control. During the workshop's practical part, participants were able to improve their skills in developing nutrition schemes for horticultural and vegetable crops, as well as pest control.





PHOTO (23,24)

A series of communications materials have been produced by the project with the aim to raise public awareness of climate change impact on agriculture and the role of agrometeorological stations in efficient horticultural production.

As part of the project contribution to COP27 “NDC Implementation in Action – Innovation and Technology in Climate Promise Countries” at UNDP Pavilion, a brief informational video has been created. The video depicts problems farmers face in their work and how agro-meteorostations will deliver concrete climate impact for people and the environment through the project.

In general, the project created three video, a series of posts on social media channels, a newsletter with project updates for partners, press-releases and news posts published in local mass media and on partners’ corporate websites.



## *Introducing climate-informed planning*

Climate change threats can be reduced by increasing the adaptive capacity of farmers as well as increasing resilience and resource use efficiency in agricultural production systems. Climate-informed planning helps implement flexible, context-specific solutions, supported by innovative policy and agro technical activities.

The project has developed an analytical paper on Advancing Agroclimatology. The document provides information about international best practices on climate change adaptation and environmental sustainability in agriculture, reviews international best practices on agroclimatology and agrometeorological data exchange, and proposes the most suitable options that can be adopted in Fergana Valley. It contains practical advice on how to improve data exchange and analysis.

In addition, an instruction booklet was developed on Generating NDVI and EVI from MODIS/Terra MOD13Q1 16-day vegetation indices in Google Earth Engine. The booklet is useful for the professionals and describes how to access, process, and visualize MOD13Q1 data as an animated distribution map and time series chart for Uzbekistan in Google Earth Engine (GEE) developed by the project Climate, Remote Sensing and Modelling Specialist. It also includes information on how to download these visualizations.



## ENGAGEMENT OF WOMEN

The project activities have been implemented in accordance with the principles of gender equity and parity. All of the project's events have kept gender representation in mind and ensured that both genders are adequately represented in project activities and events.



# LESSONS LEARNT FROM THE PROJECT IMPLEMENTATION



# SUSTAINABILITY OF THE PROJECT RESULTS







































