Food and Agriculture Organization
of the United Nations

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STRENGTHENING FOOD SAFETY AND PLANT HEALTH PROTECTION SYSTEMS

December 2024

SDGs:	2 ZERO HUNGER
Country:	Mongolia
Project Code:	TCP/MON/3902
FAO Contribution:	USD 250 000
Duration:	7 July 2022–30 June 2024
Contact Info:	FAO Representation in Mongolia FAO-MN@fao.org

Implementing Partners

Ministry of Food, Agriculture, and Light Industry (MOFALI), the Agriculture School of the Mongolian University of Life Sciences (MULS), Plant Protection and Hygiene, Digital Medic LLC, and the Institute of Plant and Agricultural Sciences (IPAS).

Beneficiaries

Stakeholders from MOFALI, Mongolian Customs General Administration (MGCA), provincial departments, public and private laboratories, and farmers.

Country Programming Framework (CPF) Outputs

CPF 2020-2021 Outcome 2

Sustainable improvements of crop and livestock productivity.

Output 2.1: Promote and support good practices in i) animal health, and husbandry, ii) pasture management, iii) plant production, protection and health, iv) soil health, v) public health and vi) micro-nutrient rich foods including fruits and vegetables.


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Background

In Mongolia, plant pests pose a critical challenge to agricultural yield, crop quality, and food safety. However, in addressing this issue, the use of chemical-intensive methods has raised concerns regarding health risks to agricultural workers, food contamination, and soil degradation. Although national laws, standards, and monitoring systems exist to control pesticide residues in food, their implementation has been constrained by limited technical capacity. Additionally, while there are laboratories capable of testing plant and soil samples, these facilities require additional support and resources to expand their analytical scope. As a net food-importing nation, Mongolia also requires robust phytosanitary measures to ensure compliance with international standards in pest detection and plant quarantine. Despite joining the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in 2018, Mongolia's genetic resources information system remains limited to spreadsheet programs, restricting information exchange with international gene banks.

In this context, the Government of Mongolia requested assistance from the Food and Agriculture Organization of the United Nations (FAO) to strengthen the country's food safety and plant health systems through multiple interventions, namely by establishing a pesticide residue monitoring system, enhancing laboratory testing capabilities, conducting soil fertility assessments, improving compliance with International Standards for Phytosanitary Measures (ISPM), and developing a modern plant genetic resources registration system. The project aimed to implement these interventions through capacity development activities, technical guidance documents, and equipment procurement to build a more resilient agricultural sector.

Impact

Through improved institutional capacity, implementation of best practices, and adoption of sustainable pest management approaches, stakeholders will be better able to regulate food safety and plant health in compliance with international standards. These efforts will contribute to improving access to adequate, affordable, and healthy food for all Mongolians while safeguarding public health and agricultural sustainability.

Achievement of Results

In collaboration with the Ministry of Food, Agriculture, and Light Industry (MOFALI), the FAO developed and implemented the National Residue Control Programme (NRCP), which was adopted and incorporated into MOFALI's 2024 workplan. The programme included a pesticide residue monitoring plan and guidance document outlining methods for sampling, testing, and analysing pesticide residues in plant-based products. To demonstrate the monitoring system, samples from wheat, potato, and vegetable harvests were collected from four provinces for testing at the Medimpex International LLC Demo Laboratory. Of the 35 samples analysed, 15 contained pesticide residues. Notably, sea buckthorn fruits contained elevated levels of the insecticide acaricide dimethoate that exceeded the Codex Maximum Residue Limits (MRL). Under the monitoring plan's protocols, laboratories must notify MOFALI of such findings to implement corrective and preventative measures. The project also targeted laboratories and significantly enhanced their testing capabilities. An assessment of eight laboratories (seven state-owned and one private-sector) revealed that only three were actively testing for pesticides as of early 2023, with capabilities limited to 40 pesticide types.

To improve testing capacity, the project equipped four laboratories with new technology, including portable pesticide residue detectors, compact centrifuges, and vortex mixers. Through project support, the Medimpex LLC Demo Laboratory expanded its capacity to detect 152 pesticide types. To enhance technical knowledge, the project conducted two training sessions for laboratory technicians. The first workshop trained 52 participants from 23 organizations, covering fundamental aspects of pesticide management, including pest control, application methods, protective clothing, toxicity categories, and poisoning symptoms. The second session trained 20 lab technicians in more specialized topics such as sample processing methods, calibration of lab equipment, qualitative and quantitative data analysis, and troubleshooting procedures. For soil fertility improvement, the project conducted surveys in central and eastern cropland regions in close collaboration with the Agriculture School of the Mongolian University of Life Sciences (MULS) and MOFALI. The resulting study provided region-specific recommendations detailing optimal application practices and fertilizers for different soil types. To support extension services, the project equipped two laboratories that receive the highest volume of farmer requests with mobile soil testing tools. Technicians from these selected laboratories received training on soil kit operation and data interpretation. To strengthen phytosanitary measures, the project translated 12 International Plant Protection Convention (IPPC) standards into Mongolian, with four approved for adoption and six awaiting approval. The project enhanced implementation of ISPM by building the capacities of inspectors and high-level officials from MOFALI, the Mongolian Customs General Administration (MGCA), and provincial departments through training on plant quarantine inspection and pest risk analysis. Additionally, the project developed guidance documents outlining treatment and disinfection protocols for specific crops and their common pests. The project established the Registration and Information System for Plant Genetic Resources, which is operated by the Institute of Plant and Agricultural Sciences (IPAS). This system enables researchers to exchange gene bank information with other institutions, as it is compatible with various platforms. Researchers can exchange gene bank information with other institutions, as the system is compatible with various platforms. Training sessions were organized by the project partner Digital Medic to train staff on system operation and maintenance.

Implementation of work plan and budget

All project activities were implemented within the approved project budget and timeline. The project team encountered no problems or delays.

Follow-up for government attention

To ensure long-term sustainability, it is recommended that the Government of Mongolia establish a unified food safety system that clearly defines stakeholder responsibilities for safeguarding public health. Priority actions include strengthening the NRCP and developing a pesticide risk management system that aligns with international standards. Regular capacity building for laboratory staff will be essential to maintain technical expertise. Additionally, reforms to border quarantine inspection systems are needed, particularly the establishment of treatment facilities at border points and the development of nationally appropriate pest treatment protocols.

Sustainability

1. Capacity development

The established pesticide residue monitoring system and enhanced laboratory capabilities will enable the MOFALI to better regulate chemical use in agriculture and ensure compliance with food safety standards. With their newly built capacities and guidance documents, stakeholders are well equipped to independently detect and control harmful pesticide residues in the food supply. As part of the capacity development activities, several trainings and awareness-raising workshops were conducted to improve capacities of laboratory technicians regarding phytosanitary measures and analytic devices, and various international guidelines for pesticide handling and residue analysis were translated into Mongolian. Furthermore, partnerships formed with MOFALI, MGCA, MULS, Medimpex International LLC, IPAS, and Digital Medic will further contribute to sustaining project results through their enhanced capabilities and strengthened inter-institutional dialogue.

2. Gender equality

While no specific gender-sensitive activities were implemented, the improved monitoring of pesticides benefited vulnerable groups, including women and children, thereby contributing to safe food for all.

3. Environmental sustainability

The project promoted environmental sustainability through its pesticide residue monitoring system, which encouraged responsible chemical use in agriculture. The strengthened phytosanitary measures and improved soil fertility management practices will support sustainable production while protecting both plant health and public health.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

Project activities supported food safety laws, consumer protection and food security. Enhanced monitoring systems, laboratory capabilities, improved standards, and information systems will help ensure the right to safe and healthy food.

5. Technological sustainability

The project ensured technological sustainability by procuring new equipment and training for laboratory technicians in their operation and maintenance.
The IPAS will manage the registration and information system for plant genetic resources, enabling continued information exchange across institutions.

6. Economic sustainability

Laboratory equipment was procured during the project, requiring no financial resources from beneficiary institutions. In order to continue supporting the Plant Genebank System after Digital Medic’s contract ends, the IPAS engaged to include the system in their annual budget and to maintain the platform.

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Documents and Outreach Products

- **FAO.** 2023. *Guide to develop and strengthen national pesticide residue monitoring programmes.* Mongolia, FAO**.**
- **FAO.** 2023. *The pesticide residue monitoring plan.* Mongolia, FAO.
- **FAO.** 2023. *Guidelines on Good Laboratory Practice in Pesticide Residue Analysis.* Mongolia, FAO.
- **FAO.** 2024. *Recommended Methods of Sampling for the Determination of Pesticide Residues for Compliance with MRLs.* Mongolia, FAO.
- **FAO.** 2024. *Guidelines for Quality Control of Pesticides.* Mongolia, FAO.
- **FAO.** 2024. *Guidelines on Performance Criteria for Methods of Analysis for the Determination of Pesticide Residues in Food and Feed.* Mongolia, FAO.
- **FAO.** 2024. *Guidelines for The Recognition of Active Substances or Authorized Uses of Active Substances of Low Public Health Concern That are Considered Exempted from The Establishment of Maximum Residue Limits or Do Not Give Rise to Residues.* Mongolia, FAO.

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Achievement of results - Logical framework

<table>
<tr><td>Expected Impact</td><td colspan="2">Enhanced access to adequate, affordable, nutritious, and healthy food for everyone</td></tr>
<tr><td rowspan="5">Outcome</td><td colspan="2">Strengthened food safety and improved plant health through institutional capacity building, and implementation of model best practices and standards</td></tr>
<tr><td>Indicators</td><td>– Increased number of samples tested for pesticide residue from local food systems and food importers
– Increased crop yield per hectare
– ISPM is implemented and enforced
– Plant genetic resource system is in place and internationally available</td></tr>
<tr><td>Baseline</td><td>– 620 samples for 12 types of pesticides
– Wheat – 14.4 (2021) centner/ha
– 0
– 0</td></tr>
<tr><td>End Target</td><td>– 1 000 samples of 30 pesticides
– Wheat – 15.5 centner/ha
– 1
– 1</td></tr>
<tr><td>Comments and follow-up action to be taken</td><td>Within the framework of the project, the following activities were implemented:
– The pesticide residue monitoring programme and plan were developed and reviewed. Priority areas were identified, outlining activities to be implemented during the project period.
– A guidance document on developing monitoring plans for pesticide residues in plant-based products was developed.
– Laboratory facilities were identified to assess their capacities for pesticide formulation and residue analysis in plants and plant products.
– Essential equipment required for pesticide residue testing were identified and procured.
– Guidance material on sampling, testing, analysing and recording of pesticide residue testing in plant-based products were prepared.
– Guidelines and standards for handling pesticides and testing pesticide residues, based on international standards, were translated into Mongolian.
– Analyses of pesticide residues on edible portions of selected crops were carried out, including samples of wheat, potatoes and vegetables.
– Trainings sessions on pesticide residue analyses targeted experts both from state and private laboratories and covered safety handling, pesticide storage and transportation.
<u>Actions to be taken in the future</u>:
It is recommended that stakeholders establish a national food safety system to unify responsibilities and protect public health and food safety. The operationalization of this system could focus on the following activities: facilitating effective participation in the Codex Alimentarius, strengthening the prevention of and response to food safety emergencies, developing risk-based food inspections, establishing quality standards, conducting food safety risk analyses, providing scientific advice on food safety, and strengthening laboratory services and activities related to pesticide residues.</td></tr>
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<table>
<tr><td rowspan="3">Output 1</td><td colspan="3">Pesticide application is controlled, monitored and measured nationwide with the domestic farm food products tested for pesticide residue in accordance with a plan</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>National pesticide residue monitoring programme adopted and implemented.</td><td>1</td><td>Yes</td></tr>
<tr><td>Baseline</td><td colspan="3">0</td></tr>
<tr><td>Comments</td><td colspan="3">The pesticide residue monitoring plan was developed in accordance with Resolution No. 36 of the Mongolian Parliament, which outlines measures to be taken to improve the legal framework for food, agriculture, and light industry sectors. The pesticide residue monitoring plan was shared with relevant organizations for comments, and a subsequent discussion with their representatives was held to review the feedback. The programme outlined the legal framework, the implementation plan, measures, and indicators. After incorporating suggestions provided by the relevant organizations, the plan was revised and sent to the Crop-Farming Policy Implementation and Coordination Department of MOFALI. The Department has since included the pesticide residue monitoring plan in its 2024 workplan.
Activities to be implemented in the future:
– The development and strengthening of the NRCP, including the creation of comprehensive tools and knowledge for its implementation.
– The creation of a pesticide risk management system according to international and regional guidelines and policies.</td></tr>
</table>

<table>
<tr><td rowspan="3">Activity 1.1</td><td colspan="2">Prepare a guidance document on development of pesticide residue monitoring plan for plant-based products, outlining contents, methods and approaches with respect to what food products are to be tested, sample size, sampling, testing, analysis and reporting, warning, and corrective and preventive actions needed. The roles and responsibilities of stakeholders should also be outlined</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>The guideline was prepared based on FAO's Guide to develop and strengthen national pesticide residue monitoring programmes[1].
It was prepared for public authorities responsible for the development and implementation of the pesticide risk management system and the national pesticide residue monitoring programme. It can also be used by government officials, pesticide manufacturers, importers, primary food producers, food entrepreneurs, food importers/exporters, researchers and other relevant stakeholders.
The guidance document described the types of national pesticide residue monitoring programmes, specified which products should be tested, provided methods for sampling, testing, analysis, and reporting, and explained the roles and responsibilities of different stakeholders.</td></tr>
<tr><td rowspan="3">Activity 1.2</td><td colspan="2">Draw up and implement an annualized residue monitoring plan for selected food products (cereals, potatoes, vegetables, fruits and their by-product).</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>The project prepared a monitoring plan for pesticide residues in selected plant-based products, including cereals, potatoes, vegetables, fruits and their products, and carried out an analysis of pesticide residues.
When harvesting wheat, potatoes and vegetables, samples were taken to determine pesticide residues and analyses were conducted at the Medimpex International LLC Demo Laboratory, which is currently able to determine residues from the widest variety of pesticides in Mongolia.
Analyses of pesticide residues in the edible portion of selected crops were carried out, including samples of wheat, potatoes and vegetables from eight soums of four provinces, and one district in the city of Ulaanbaatar.</td></tr>
<tr><td rowspan="3">Activity 1.3</td><td colspan="2">Issue a warning once the levels of residue exceed the set limits to start appropriate corrective and preventive actions, with the roles and responsibilities of relevant stakeholders clearly outlined.</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>Although Mongolia has a national standard (MNS 5868:2008) that sets the maximum permissible level of pesticide residues in food products, very few food samples are analysed. According to the lab results, out of the 35 wheat, potatoes, vegetables and sea buckthorn samples analysed by the Demo Laboratory, 15 contained pesticide residues, with insecticides found in most samples.
Of the samples taken from sea buckthorn fruits in the Darkhan-Uul province, three types of pesticides were identified, two of which were insecticides. Residue from the insecticide and acaricide dimethoate was detected in sea buckthorn fruits at a concentration of 0.06 mg/kg, which is 0.01 mg/kg greater than the limit stipulated in the Codex Maximum Residue Limits. When pesticide residue levels exceeded the established limit, specialists from MOFALI were notified so they could take appropriate corrective and preventive measures, including the training of relevant stakeholders.</td></tr>
</table>

[1] **FAO**. 2022. *Guide to develop and strengthen national pesticide residue monitoring programmes.* Bangkok. https://doi.org/10.4060/cb8289en

Output 2	Improved capacity of lab equipment and lab technicians to carry out residue testing through skill building programmes (training and workshops)		
	Indicators	Target	Achieved
	Increased number of samples tested for pesticide residue from local food systems and food importers.	1 000 samples for 30 pesticides.	Partially
Baseline	620 samples for 12 types of pesticides		
Comments	Approaches to strengthen the capacity of laboratories used a combination of the following components: – Upgrading physical infrastructure, such as lab equipment – Enhancing human resource capabilities through training sessions The details of each component are discussed in the next section. In the first half of 2023, the three laboratories that were testing for pesticide residues in plants and plant products were able to analyse 40 types of pesticides. By the end of the project, the Demo laboratory was able to detect residues of 152 types of pesticides. These laboratories have the capacity to analyse pesticide residues in 10-15 samples per day.		

Activity 2.1	Identify the laboratories engaged in pesticide residue testing and assess existing capacity of these laboratories	
	Achieved	Yes
	Comments	An assessment was carried out to determine the capabilities of seven state-owned laboratories and one private-sector laboratory in testing pesticide residues in plants and plant-based food products. It involved in-person laboratory visits, meetings with laboratory management and staff, and a questionnaire. The questionnaire was developed to assess laboratory capacity, identify training needs, and develop pesticide residue monitoring plans. Of the laboratories involved in the assessment, three actively determine pesticide residues in plants and plant-based food products, three tested in the past, and two plan to in the future. The National Reference Laboratory for Food Safety identifies the largest number of pesticides (200 types) in many samples of numerous products, but some pesticide identification equipment is not functional and needs to be repaired. Medimpex International LLC's Demo Laboratory similarly identifies a large variety of pesticides (152 types) residues in plants and plant-based food products. The Pesticide Testing Laboratory, which belongs to the Research Institute of Plant Protection, is capable of qualitatively testing 40 types of pesticides, as well as determining the type and concentration of active substances. This laboratory also analyses pesticide residues in soil, grains, potatoes, vegetables, and fruits. Other laboratories that plan to perform pesticide residue testing and pesticide quality testing are currently installing equipment and training staff. Regarding daily capacity, the National Reference Laboratory for Food Safety can analyse 15 samples a day, while the other two actively testing laboratories can analyse 10 samples. However, all of them are able to test imported and domestic commodities for pesticide residues. Further consideration: The assessment found that laboratories faced challenges in accessing reagents, equipment maintenance and quality assurance schemes. To ensure effective national surveillance and improve case management capabilities, it is crucial to strengthen quality assurance, procurement, training, supervision and monitoring systems.
Activity 2.2	Develop, introduce and/or adapt guidelines, instructions, recommendations, methodologies and standards for pesticide handling and residue testing based on those developed by international organizations	
	Achieved	Yes
	Comments	International guidelines and standards for pesticide handling and residue analysis were translated into Mongolian, including: – "Guidelines on Good Laboratory Practice in Pesticide Residue Analysis", CAC/GL 40-1993; – "Recommended Methods of Sampling for the Determination of Pesticide Residues for Compliance with MRLs" CAC/GL 33-1999; – "Guidelines for Quality Control of Pesticides"; – "Guidelines on Performance Criteria for Methods of Analysis for the Determination of Pesticide Residues in Food and Feed" CXG 90-2017; and – "Guidelines For the Recognition of Active Substances or Authorized Uses of Active Substances of Low Public Health Concern That are Considered Exempted From The Establishment of Maximum Residue Limits or do not Give Rise to Residues" CXG 97-2022.

<table>
<tr><td rowspan="3">Activity 2.3</td><td colspan="4">Provide the identified laboratories (public and private) with the tools, equipment and reagents needed to perform residue testing, including the quality and composition of pesticides, in plant origin materials and food products</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">To support the analysis of pesticide residues, the project provided essential equipment to four laboratories (Laboratory of the Research Institute for Plant Protection, National Reference Laboratory for Food Safety, Demo Laboratory and Laboratory of the Chemical and Chemical-Technological Institute), of which three actively analysed pesticide residues in plant-based products. The procured equipment included a QuEChERS Shaker, a rack starter kit, an analytical scale, a portable pesticide residue test detector, a Vortex mixer and a compact centrifuge.</td></tr>
<tr><td rowspan="3">Activity 2.4</td><td colspan="4">Assist laboratories in adoption of good laboratory practices (GLPs) and applying for accreditation</td></tr>
<tr><td>Achieved</td><td colspan="3">Partially</td></tr>
<tr><td>Comments</td><td colspan="3">There is a lack of accreditation and certification system in this field, so more time is needed to support the national adoption of GLP standards. To facilitate progress, the CAC/GL 40-1993 “Guidelines on Good Laboratory Practice in Pesticide Residue Analysis”, developed by FAO and WHO, has been translated into Mongolian.</td></tr>
<tr><td rowspan="3">Activity 2.5</td><td colspan="4">Conduct test skills improvement trainings for laboratory technicians</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">Two training sessions were conducted in Ulaanbaatar:
– A total of 52 people from 23 organizations, including employees of testing laboratories and specialists of pesticide importing companies, were trained on the classification of pesticides, pest control, formulations of pesticides, understanding information on pesticide labels, toxicity categories, pesticide application equipment and methods, symptoms of pesticide poisoning, respiratory protection devices, protective clothing, and pesticide storage.
– Twenty laboratory technicians were trained in the fundamentals of gas chromatography-mass spectrometry, ionization techniques, separation methods, specimen processing methods, qualitative and quantitative analysis, equipment calibration, and addressing potential obstacles.
To keep up with future advancements in pesticide testing tools and methods, regular training will be necessary.
Follow-up Actions:
– It is recommended that technical staff regularly participate in local, regional and international workshops and training sessions to keep abreast of updates in the field of food safety.</td></tr>
<tr><td rowspan="3">Output 3</td><td colspan="4">Increased capacity of agricultural extension services to test soil quality, apply mobile soil testing kits and overall soil health management is improved</td></tr>
<tr><td colspan="2">Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td colspan="2">Mobile soil test extension services are provided and sustained.</td><td>1</td><td>Yes</td></tr>
<tr><td>Baseline</td><td colspan="4">0</td></tr>
<tr><td>Comments</td><td colspan="4">Mobile soil testing tools were given to the two laboratories that received the highest number of service requests from farmers. These laboratories will continue to provide extension services using the new tools. Farmers should be informed about the labs offering mobile soil testing services.</td></tr>
<tr><td rowspan="3">Activity 3.1</td><td colspan="4">Identify gaps and challenges in extension services with respect to soil health management</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">There were 16 public and private soil testing laboratories in Mongolia. The project conducted a pre-selection process and shortlisted five laboratories for further assessment. While these laboratories performed similar types of soil analyses for various purposes, their methodologies differed, which could result in varying outcomes. To ensure consistency and reliability, it is essential that all soil laboratories adopt unified methodologies so that results are standardized.</td></tr>
<tr><td rowspan="3">Activity 3.2</td><td colspan="4">Provide extension service providers necessary mobile tool kits for soil fertility tests</td></tr>
<tr><td>Achieved</td><td colspan="3">Yes</td></tr>
<tr><td>Comments</td><td colspan="3">The two laboratories selected to receive mobile soil testing tool kits were the Soil and Agrochemistry Laboratory of the Agroecology School (Mongolia University of Life Sciences [MULS]) and the Soil and Agrochemistry Laboratory of the Institute of Plant and Agriculture Sciences. The tool kits included an IRIS visible spectrophotometer, a portable pH/EC/TDS/temperature metre, reagents, cuvettes, Munsell soil colour charts, a soil auger, soil sampling bags, and a carrying case.</td></tr>
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<tr><td rowspan="3">Output 4</td><td colspan="3">Improved technical capacities and skills of extension service providers and farmers groups through providing an access to trainings and improved technologies for sustainable soil fertility management and practices</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Increased number of requests for extension services by farmers at aimag level</td><td>30</td><td>Yes-</td></tr>
<tr><td>Baseline</td><td colspan="3">20</td></tr>
<tr><td>Comments</td><td colspan="3">The Soil and Agrochemistry Laboratory at the Institute of Plant and Agricultural Sciences received requests for mobile soil testing from approximately 28 private cereal companies, while the Soil and Agrochemistry Laboratory at the Agroecology School of MULS received requests from around 16 companies in the eastern region.</td></tr>
<tr><td rowspan="3">Activity 4.1</td><td colspan="3">Set up a capacity development programme on sustainable soil fertility management for pilot sites</td></tr>
<tr><td>Achieved</td><td colspan="2">Partially</td></tr>
<tr><td>Comments</td><td colspan="2">The project evaluated the current soil fertility status, management practices, and knowledge gaps in the central and eastern cropland regions. Based on this evaluation, a stakeholder meeting was organized, bringing together key agricultural companies, farmers, extension workers, national and local government officials, and academic institutions. The purpose of the meeting was to present the assessment results. During the discussion, stakeholders emphasized the need for rapid and mobile soil testing solutions. Once agricultural companies acquire mobile soil testing toolkits, laboratory technicians trained through the project can teach them how to use the kits and interpret the results.</td></tr>
<tr><td rowspan="3">Activity 4.2</td><td colspan="3">Develop training/learning materials on integrated soil fertility management to increase stakeholders' knowledge and awareness of the soil fertility</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">In close cooperation with the Agroecology School of MULS and the MOFALI, the project conducted a survey on soil fertility in the central and eastern cropland regions. Based on the different soil types in these agricultural regions, the study determined the area (in hectares) that can be represented by a single soil sample. Additionally, the survey recommended the most suitable types of fertilizer and application practices according to the soil classes in these areas. This information will be used to determine the annual quota for fertilizer imports when MOFALI issues import permits, and the report will serve as a learning material on soil fertility in the central and eastern cropland regions. Similar surveys should be conducted in other cropland regions to expand understanding of soil fertility in Mongolia.</td></tr>
<tr><td rowspan="3">Activity 4.3</td><td colspan="3">Conduct trainings on soil fertility survey, soil tests and interpretation of soil chemical properties for agricultural technicians and field extension officers</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">The project trained technicians from the two selected laboratories on the use of mobile soil kits and interpretation of data. These mobile soil kits will be a valuable tool to help farmers rapidly assess the health of their agricultural land. If further analysis is needed, farmers can send samples to the labs for detailed examination.</td></tr>
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<tr><td rowspan="3">Output 5</td><td colspan="3">A set of globally and nationally relevant resource pool is established to strengthen core functions of National Plant Protection Organizations (NPPOs) to implement ISPMs</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Resource pool is established and operational.</td><td>1</td><td>Yes-</td></tr>
<tr><td>Baseline</td><td colspan="3">0</td></tr>
<tr><td>Comments</td><td colspan="3">To build and establish a resource pool, the following actions are recommended:
– Determine the goals and objectives of the plant health and plant protection policy according to new laws and the IPPC.
– Research best practices of NPPOs from other countries, including IPPC recommendations and guidelines on the structure and operation of NPPOs.
– Organize ongoing activities such as trainings and seminars for plant quarantine inspectors and officers from the NPPO to strengthen plant health and plant quarantine systems.
These activities are essential for the implementation of the newly adopted law on Plant Health and Plant Protection.</td></tr>
<tr><td rowspan="3">Activity 5.1</td><td colspan="3">Conduct a baseline study to access the existing capacities and perspectives of the NPPOs</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">Several meetings with high-level officials from the MGCA were held to evaluate the legal condition of the plant quarantine inspection, structure and activities of the related organizations. The meetings also assessed the implementation of national and international standards and requirements on plant quarantine inspection, plant health, pest surveillance, and prevention.
The project team also met with delegations from the MGCA and the MOFALI and visited Zamiin Uud, Altanbulag, Bulgan Borshoo and Tsagaannuur border points between April and May 2023.
After the plant quarantine inspection organization was integrated into the MGCA, it became apparent that high-level MGCA officials had limited awareness of the importance of plant quarantine inspection. This led to infrequent inspections and allowed pests to enter through border points.
Following the visits and meetings with high-level officials and plant quarantine inspectors, the project team identified a number of key issues:
– Limited knowledge: High-level MGCA officials had a limited understanding of plant quarantine inspection and its social and economic consequences.
– Poor plant quarantine inspection: Border point inspections were inadequate, including the detection of regulated pests, disinfection and treatment.
– Limited training: Treatment facilities and inspectors, especially those in remote areas, had limited access to training, seminars and information.
Inspectors asked the project team to address the following issues first:
– The development of methods and guidelines on phytosanitary measures for plant derived products, particularly non-processed plant products, for the detection of regulated pests in imported products and the establishment of measures.
– The organization of seminars and workshops for high-level officials of the MGCA on the importance of plant quarantine inspection, and the national requirements and responsibilities to adhere to the IPPC as a member country.
– The organization of trainings for inspectors on ISPM standards and IPCC requirements.
To address these issues, it is recommended that the Government of Mongolia review the jurisdiction, independence, structure and activities of the organization in charge of border quarantine inspection and make reforms in accordance with the IPPC.</td></tr>
<tr><td rowspan="3">Activity 5.2</td><td colspan="3">Apply at national level the selected ISPMs (6-surveillance, 3-guidelines for the export, shipment, import and release of biological control agents and other beneficial organisms, 4-requirements for the establishment of pest-free areas; 15-regulation of wood packaging material in international trade)</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">To facilitate the approval, implementation, and enforcement of the International Plant Hygiene Standards approved by the IPPC, 42 standards and 6 annexes out of 47 approved standards were translated into Mongolian.
The MOFALI and the MGCA revised 12 standards and selected ten for adoption. However, during the project period only four standards were submitted for adoption due to the short implementation period. Those four standards were then approved at the subcommittee meeting on plant protection and agricultural standardization.
Although the remaining six standards were also submitted to the subcommittee, the subcommittee meeting was not held before the end of the project.</td></tr>
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<table>
<tr><td rowspan="3">Activity 5.3</td><td colspan="2">Support building the technical capacity to implement the selected ISPMs</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>As requested by the MGCA, the project organized a seminar for high-level officials and a training session for plant quarantine inspectors, held on 10 October 2023 in the MGCA meeting room in Ulaanbaatar. A total of 21 participants from organizations, including the MOFALI, the FAO, the MGCA, and Customs departments from Altanbulag, Chinggis Khan, Darkhan-Uul, Tsagaannuur, Ulaanbaatar and Zamiin Uud, attended the event.
Following visits to border points and meetings with the MGCA's quarantine inspection division, feedback highlighted the need for training on ISPM, specifically on conducting pest risk analyses. In response, a training session on pest risk analysis was successfully conducted from 11 to 12 October 2023 in the MGCA meeting room and included 15 presentations and 11 group exercises. It involved the participation of 40 inspectors from the MOFALI, the MGCA, and provincial departments such as Bayan-Ulgii, Darkhan-Uul, Dornod, Dornogovi, Govi-Altai, Hovd, Huvsgul, Orkhon, Tuv, Uvs and Zavkhan.
Moving forward, it will be essential to organize additional training sessions and seminars for plant quarantine inspectors to enhance their awareness on the implementation of ISPMs. Moreover, fostering cooperation with other countries in plant health protection, trade facilitation, biodiversity protection, experience exchange, and project implementation will also be beneficial.</td></tr>
<tr><td rowspan="3">Activity 5.4</td><td colspan="2">Development of guidance on implementation of phytosanitary measures for plants and plant-derived products</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>In recent years, the import of plant-based raw materials and products into Mongolia has increased significantly. This has led to the discovery of many pest-infested products during border quarantine inspections.
Currently, products infected with low-prevalence pests are entering the country without treatment, due to the lack of approved methods, guidance, and professional organizations for implementing phytosanitary measures. As approximately 90 percent of the country's fruit and 40 percent of vegetables are imported, there was a significant risk of introducing and establishing quarantine pests, which could negatively impact the country's biosecurity, food safety, and economy.
In response to these concerns, a terms of reference (ToR) for the was developed according to ISPM 28 (Phytosanitary Treatments for Regulated Pests) for the development of guidance on the implementation of phytosanitary measures for plants and plant-derived products.
The following methods were developed by the service provider:
– Guidance on the treatment and disinfection of apples infected by the European red mite (Panonychus ulmi, Koch), which is present at low prevalence in the country.
– Guidance on the treatment and disinfection of tomatoes, cucumbers, and sweet peppers infected by the greenhouse whitefly (Trialeurodes vaporariorum, Westwood).
– Guidance on the treatment and disinfection of broccoli, spinach, and other fine greens infected by the cabbage aphid (Brevicoryne brassicae).
These pests are present at a low prevalence in the country.
This work was carried out and completed by the NGO Plant Protection and Hygiene. The contractor tested methods including chemical, biological treatments, and air composition changes using the device Ozonbox AIR-30 at the Altanbulag and Zamiin Uud border points. The ozonation tests demonstrated the possibility of reducing the number of harmful organisms in a well-sealed environment without negative effects on the environment and food products so, as a result, instructions for operating the ozonizer were translated and prepared, and guidance documents for the treatment and disinfection of each pest were developed. For this work, an ozone generator and various biological and chemical substances were purchased.
Future activities could include:
– Capacity development.
– Establishing well-sealed facilities at border points for conducting treatments.
– Developing appropriate treatment methods for regulated pests (weeds, plant diseases, and insects) at the national level for various crops.</td></tr>
</table>

Output 6	An independent registration and information system infrastructure for plant genetic resources is established		
	Indicators	Target	Achieved
	Registration and information system is fully operational.	1	Yes
Baseline	0		
Comments	The registration and information system for plant genetic resources was developed and is now fully operational at the IPAS. Researchers can exchange gene bank information with other institutions, as the system is compatible with various platforms. Previously, gene bank information was managed using Excel spreadsheets, which limited the ability to share data.		

Activity 6.1	Determine and establish the optimal digital platform/server for the development of the system	
	Achieved	Yes
	Comments	Digital Medic, a professional information technology (IT) company, was selected as the service provider to collaborate closely with gene bank researchers at the IPAS. Together, they identified and established the optimal digital server for developing the Registration and Information System for Plant Genetic Resources, which is now named the Plant Genebank System of IPAS.
Activity 6.2	Develop and ensure sustainability of website for intended plant genetic resources system	
	Achieved	Yes
	Comments	The Plant Genebank System of IPAS was successfully developed, with significant involvement from the IT division of MOFALI. As the gene bank plays a crucial role in crop production, the system was integrated into MOFALI's website. The server was housed within MOFALI, ensuring its long-term sustainability.
Activity 6.3	Upgrade software and build capacity to develop and maintain software upgrade	
	Achieved	Yes
	Comments	Digital Medic organized a series of training sessions for IPAS gene bank staff and researchers, demonstrating how to use, update, and maintain the system. Digital Medic engaged to be responsible for system maintenance until the end of 2024. After that, IPAS is expected to allocate funds from the state budget for ongoing system maintenance.

Partnerships and Outreach
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