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ENHANCING EFFICIENCY AND TRACEABILITY OF AGRICULTURAL VALUE CHAINS IN MONGOLIA THROUGH INNOVATIONS AND ICTS

October 2021

SDGs:



Country:

Mongolia

Project Code:

TCP/MON/3706

FAO Contribution:

USD 141 000

Duration:

1 July 2019 – 30 June 2021

Contact Info:

FAO Representation in Mongolia

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Implementing Partners

Ministry of Food, Agriculture and Light Industry (MoFALI), Communications and Information Technology Authority.

Beneficiaries

General Authority for Veterinary Services (GAVS) and stakeholders in the meat and livestock sector.

Country Programming Framework (CPF) Outputs

Priority Area 1: Promotion of sustainable livestock development through improved quality, health and productivity of livestock and increased pasture, feed, fodder and water supply; Priority Area 4: Development of value chain: improvement of food products, food safety standards and food marketing.



BACKGROUND

Traditionally a rural economy focused primarily on herding, Mongolia is rapidly changing as a consequence of urbanization and rapid growth in the mining sector. However, despite the large contribution of mining to Gross Domestic Product and exports, the agriculture and food sectors remain hugely important for the economy, social make-up and ecology of Mongolia. The livestock sub-sector accounts for almost 10 percent of export earnings and about 80 percent of total agricultural production. Agriculture employs 35 percent of the total labour force.

With 25 percent of the overall population living below the poverty line, and one third of youth unemployed, the creation of inclusive employment and the improvement of livelihoods are top national priorities. The agriculture and food sectors offer the best opportunity to increase inclusive employment.



Mongolia has the human and natural resource base needed to produce sufficient 'green' livestock products and selected vegetables for import substitution on the domestic market and a comparative advantage for producing 'green' livestock products for export. However, supply chain inefficiencies and a lack of traceability mechanisms hold back the potential in both domestic and international markets. Blockchain-based transactions are being piloted in many sectors, including the financial, manufacturing, energy and government sectors. They are also being used in relation to agriculture supply chains, land registration and digital identities. Initially born out of a need for a more decentralized financial system, the technology is finding innovative uses in a wide range of applications. The current project was designed to assist in introducing and demonstrating the value of blockchain technology in the enhancement of value chain efficiency and traceability.

IMPACT

The project has improved the efficiency of livestock product value chains by enhancing national capacities and introducing innovative information and communication technology (ICT) solutions. It has contributed significantly to government efforts in two priority areas: i) the promotion of sustainable livestock development through the improved quality, health and productivity of livestock and increased pasture, feed, fodder and water supply; and ii) the development of value chains through the improvement of food products, food safety standards and food marketing. By supporting the Government's aim to increase meat exports, it has also improved the economic condition of producers in the meat processing value-chains. Finally, by enhancing the trust of end-users abroad, the blockchain solution has contributed significantly to meat exports in the developed country market.

ACHIEVEMENT OF RESULTS

The project was designed in alignment with the strategic goals of the E-Mongolia programme and the E-Agriculture Strategy of Mongolia. Its overall aim was to improve the efficiency of livestock product value chains through enhanced national capacities and innovative ICT solutions. A blockchain system was developed to underpin the Animal Health Information System (MAHIS), thus improving the efficiency of livestock traceability. As a result of its activities, the efficiency of the meat and livestock value chain was enhanced in terms of accuracy of animal health information and hygienic control for meat processing by GAVS.

The project had three outputs. The first was dedicated to the development and testing of a system, application and process that would facilitate livestock traceability. Under the second output, the project developed the guidelines and legislation needed to sustain such an ICT-based intervention for livestock traceability and an improved livestock value chain. The final output involved capacity-building at national level in the utilization of emerging technologies to achieve improved traceability and piloting in two selected value chains in Mongolia. All three outputs were successfully achieved.

IMPLEMENTATION OF WORK PLAN AND BUDGET

Project activities were implemented in a timely manner, and no significant backlash was caused by the COVID-19 pandemic and other obstacles. Although the overall budget was insufficient for a project of this scale, all expected outcomes were achieved thanks to the support provided in all aspects of project management.

In terms of project performance, risks deriving from the COVID-19 pandemic were mitigated by the support and team spirit of GAVS and the FAO office.

FOLLOW-UP FOR GOVERNMENT ATTENTION

The blockchain concept was new to Mongolia and its use in the specific case of the meat industry value chain was a highly innovative solution. The project beneficiary intends to make every effort to continue this activity on its own; however, its ability to pursue this goal independently may be impeded by a lack of resources, including financial support. It is essential that further support be provided.

SUSTAINABILITY

1. Capacity development

As the meat industry in Mongolia had no standard operating procedure (SOP) it was necessary that one be developed and deployed. With the solid support and interest of GAVS, this goal was achieved and a system was developed in line with a new SOP.

The project was implemented at the request of GAVS and is well aligned with the interests and goals of this agency. In terms of partnership and alliances, the FAO office in Mongolia established a well-connected and trusted network with its implementing partners, including MoFALI and GAVS. The latter, as the beneficiary agency, is now in a position to continue activities on its own and in a sustainable manner.

2. Gender equality

Gender equality was a priority as the livestock industry and the meat processing industry depend almost equally on male and female workforces, and any improvement in these industries affects both men and women. Although the project was generally gender neutral, its impact in terms of equity was very high for both genders.

3. Environmental sustainability

The project improved value chains for the livestock and meat processing industry, contributing significantly to enhancing the economic conditions of participants. Environmental sustainability has been affected positively as a result of improved management in the sector covering animal health monitoring and the meat processing industry. These now meet international standards, leading to an improved impact on the environment.

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

The project aimed at improving conditions for the public in terms of safe food and a safe food network; these have been enhanced significantly as a result of the project. Labour conditions for both genders, including children, have also been improved by an appropriate online control by GAVS with regard to the hygienic conditions of meat processing in line with the new SOP.

5. Technological sustainability

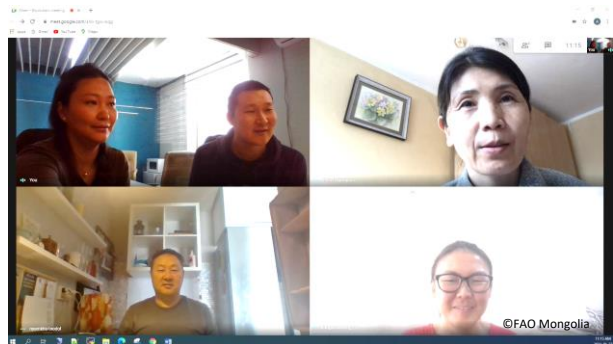
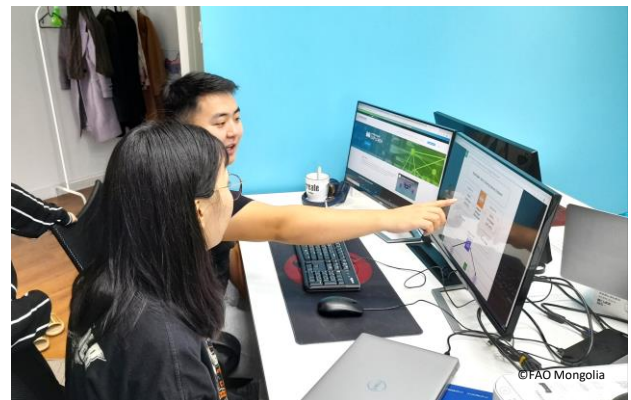
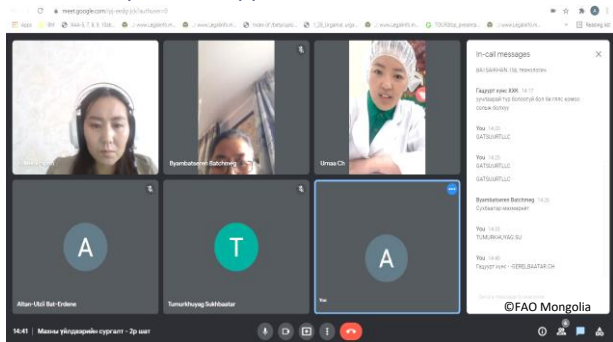
The technological solution provided under the project is well aligned with the demands of the local beneficiaries and end-users. The selection of state-of-the-art technology as a requirement also means that the system is expected to be operational in the foreseeable future without many problems. However, a lack of resources, including financial support, may impede this. Further support to the beneficiary partner is therefore essential.

6. Economic sustainability

As a result of the project, a network for the livestock and meat processing industry, including the Government, the private sector and all other stakeholders, is now active. Despite its limited resources, the Government is prepared to pursue this issue with potential donors in the private sector, which is more specialized in this area. The system has now been handed over to the project beneficiary for further maintenance and development. The system is affordable, fully automatic and reduces the burden of controlling factories throughout the country. However, the technical resources available are still limited and need further support in terms of increased technical capacity.

DOCUMENTS AND OUTREACH PRODUCTS

- ❑ The SOP for meat processing factories in Mongolia. Approved by GAVS, Mongolia, in January 2020. 9 pp.
- ❑ **S. Enkhbayar (ed.)**. Training materials on SOP for meat processing factories. January 2020. 500 copies. FAO 2020 (translation into Mongolian). Meat Processing Technology, FAO 2007 (English version). 496 pp.
- ❑ **Digital Medic LLC., SP Company**. Project report for blockchain network of Meat Factory Operating System (MFoS)/MAHIS systems in Mongolia. January 2021. 25 pp.
- ❑ **Digital Medic LLC., SP Company**. Project report for MFoS system deployment covering 150 meat factories throughout the country. July 2021. 15 pp.
- ❑ **Digital Medic LLC., SP Company**. A brief introduction on blockchain network for MFoS system. February 2021. 18 pp.



ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Improved efficiency of livestock product value chains through enhanced national capacities and innovative ICT solutions		
Outcome	Innovative strategy and technology underpinning the deployment of sustainable ICT solutions that accelerate achieving efficiencies in livestock value chain		
	Indicator	Number of innovative strategies and technology underpinning deployment.	
	Baseline	0	
	End Target	One	
	Comments and follow-up action to be taken	The aim was to improve the efficiency of livestock product value chains through enhanced national capacities and innovative ICT solutions. A blockchain system was developed with the aim of underpinning MAHIS to improve the efficiency of livestock traceability.	
Output 1			
	Systems, applications and process developed and tested for facilitating livestock traceability		
	Indicators	Target	Achieved
	Number of applications developed to facilitate livestock traceability.	One	Yes
Baseline	0		
Comments	A blockchain-based system for MAHIS was developed. This is the first blockchain system developed by a national company in Mongolia. Storing animal health information in the blockchain network makes it impossible to modify, replace or delete animal traceability and animal health information, rendering traceability information more reliable and accurate at end-user level.		
Activity 1.1	Engaging with key stakeholders to identify bottlenecks and tangible solutions to over challenges (processes)		
	Achieved	Yes	
	Comments	Several obstacles impede the implementation of government policy on the promotion of meat exports. One of these is the control of animal and meat hygiene and its reliability. FAO developed a new meat factory information system, based on the animal health control system. This meat factory system was subsequently converted into a blockchain-based system. In doing so, FAO worked closely with GAVS to translate the basics of the meat processing system into the blockchain. In the future, this system is expected to be further expanded to become a national network for storing information on agricultural products.	
Activity 1.2	Streamlining of the processes involved in livestock traceability and asset tracking (system)		
	Achieved	Yes	
	Comments	Within the framework of the abovementioned cooperation, GAVS experts conducted an analysis of the existing system and optimized the process of monitoring the operation of the meat processing system, such as which data to enter and store at which points of the production process. In the next phase of the system's implementation, there is a need to optimize and further refine these processes.	
Activity 1.3	Number of applications developed to facilitate livestock traceability (technology)		
	Achieved	Yes	
	Comments	A meat certificate is the result of the operation of the MFoS. The certificate is maintained by a blockchain network developed by a national company. This was the first independent blockchain network in Mongolia. However, the blockchain network is still at an early stage and needs to be further expanded to save data for agriculture sector products.	

Output 2	Guidelines and legislation needed to sustain ICT-based interventions for livestock traceability and improving livestock value chain developed		
	Indicators	Target	Achieved
	Framework/toolkit for implementation of livestock information management system developed.	One	Yes
Baseline	0		
Comments	An SOP for meat processing plants was developed and implemented as part of the FAO's Support to Income Creation in Mongolia (SECIM) project. FAO also implemented a monitoring system (MFoS) to monitor compliance with these SOPs. The system is now being deployed. Amendments to the relevant rules and regulations have been proposed and approved by MoFALI and GAVS.		
Activity 2.1	Linkages with e-government masterplan		
	Achieved	Yes	
Comments	Mongolia's E-Government Master Plan aims to increase opportunities for citizens and businesses to deliver services electronically by supporting e-government in all industries and making operations as online as possible. Project activities were fully compatible with the E-Mongolia programme and were implemented within the framework of this plan.		
Activity 2.2	Exploring inter-sectoral leverage opportunities (eg: banks for loans and insurance; telecom regulator for network coverage and application support, etc.)		
	Achieved	Partially	
Comments	No specific work was done in this area under the project. However, banks now offer loans to small and medium-sized enterprises to develop the meat industry as part of a package to support the agricultural sector. A telecom sector regulator is also working to increase network coverage among mobile operators.		
Activity 2.3	Development of a framework/toolkit for implementation of livestock information management system in Mongolia		
	Achieved	Partially	
Comments	The FAO SECIM project has developed a related SOP to develop the value chain of the meat industry. The MFoS system developed by FAO is based on this SOP, which has been approved by GAVS. The system needs to be further developed and improved.		
Output 3	Capacity-building at the national level to utilize emerging technologies to achieve improved traceability and piloting in two selected value chains in Mongolia		
	Indicators	Target	Achieved
	Number of workshops conducted.	Two	Yes
Baseline	0		
Comments	The MFoS system was introduced in over 150 meat processing plants, including large meat processing plants, nationwide. As a result, processed meat has been certified and stored in a blockchain network. Online training for system deployment was organized for 450 people from more than 150 factories nationwide.		
Activity 3.1	Two national workshops		
	Achieved	No	
Comments	A national workshop was envisaged under the plan, but was cancelled following the outbreak of COVID-19. In its place, a series of online training events on the introduction of MFoS systems in meat processing plants was organized online.		
Activity 3.2	Engaging with Mongolian food industry and selected entrepreneurs willing to pilot blockchain technology in their product value chains		
	Achieved	Yes	
Comments	For the first time in Mongolia, a Mongolian company has successfully tested and developed a blockchain network. Currently, meat certificates issued by the MFoS system are stored in a blockchain network. It is expected that agricultural product information will be stored in this network in the future.		
Activity 3.3	Deploying the blockchain, Global Positioning System, Internet of Things, Narrowband Internet of Things (as applicable and appropriate) in selected value chains		
	Achieved	Yes	
Comments	A blockchain network was created and developed. It is expected that this system, which was deployed in the meat industry, will make a significant contribution to increasing Mongolia's meat exports.		
Activity 3.4	Documenting lessons learnt from the pilots and working with government and relevant stakeholders for scaling up and dissemination		
	Achieved	Yes	
Comments	Reports for system development by the strategic partner (SP) were received in a timely manner. The system was received by GAVS, relevant training events were organized, and a training manual was developed in cooperation with GAVS and the SP company.		

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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