Implementation of *Collect Mobile* in Kazakhstan: an IT solution for dairy processors allowing for an accurate mapping of milk catchment areas.

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within the framework of the FAO/EBRD project
“Supporting an inclusive dairy value chain development in Kazakhstan”
About the project

- The project is financed by the EBRD and FAO. Start: April 2016, end of the project - October 2017.

- Main objective of the project is to increase the competitiveness and inclusiveness of the Kazakh dairy industry by:
  - **greater involvement** of small and medium-sized milk producers into the value chain
  - larger **volumes** and better **quality** of raw milk, and
  - optimization of **milk collections** schemes

- The transfer of the *Collect Mobile technology* to the Kazakh agribusinesses so they can do an accurate mapping of their raw milk catchment areas, as well as the implementation of a pilot map with the EBRD clients, is one of the three components of the aforesaid project.
The training cycle

- 5-days training in Astana (September 2016):
  - 8 participants: 4 factories (*Food Master-Pavlodor, Natizhe, Raimbekagro, Shortandy Creamery*) and the Dairy Union of Kazakhstan

- 5-days training in Almaty (March 2017):
  - 12 the participants: 5 factories (*Adal, Danone Berkut, Food Master-Issyk, Leader-2010, Maslodel*) and IT/GIS experts (for the selection into the national group of experts)

- Outreach: dairy companies that have attended the training collectively represent some 40% of the market (retail value)
Our partners

- We thank our partners – the Dairy Union of Kazakhstan and the National Chamber of Entrepreneurs – for their support in the delivery of the training sessions!
The trainers

- **Inna Punda**, Agribusiness Specialist, in charge of the project (FAO, Rome)
- **Farsad Mohaghegh**, Dairy Specialist (consultant, Iran)
- **Giulio Marchi**, Geospatial Analyst (FAO, Rome)
- **Stefano Ricci**, Collect Developer (FAO, Rome)

(From left to right): Farsad, Inna and Giulio. Almaty - 2017
Hands-on sessions: in the class with the smartphone
... and on farms!
Please meet: Collect & Collect Mobile

- Both programmes are part of the FAO developed *Open Foris* suite

- Collect software runs on a computer and serves to design the survey structure and to manage survey data

- **Collect Mobile** – mobile application for the Android device for data collection

- **Maximized data quality** thanks to the incorporated data validation rules (e.g., number of dairy cows can’t be less than 25% and not more than 85% of the total herd) and the GPS-generated geocode.

- All products are **free** and open-source software

- **Collect Mobile** does not require **Internet access** to run

- Easy **integration** with Google products and much more
Survey structure

- More than 40 questions.
- **Blocks** of the questions:
  - Supplier data
  - Dairy herd
  - Dairy operation
  - Feeding
  - Animal welfare
  - Scoring
  - Milk parameters
- The **questionnaire** and the **validation rules** were developed by the FAO experts in consultation with the Kazakh dairy plants
- Survey data are **to be collected** by the Milk Procurement staff of the dairy plants
- **Answers**: directly collected data (questions, visual assessment) and automatic filling-in (i.e., average milk yield is a formula)
- Thanks to a **geocode** obtained by the GPS embedded in the mobile device, there is no doubt about the reality of data collection (manual input of coordinates is not allowed!)
Different questions - for different types of suppliers. For example, in case of Milk Collection Centres (MCCs) it is important to know the number of households owning cattle, while the farming systems is known by default (= question will not appear).

Record ID = Supplier name + Survey time. This allows monitoring the situation in space and also in time.
Collect Mobile workflow

Milk procurement staff of the Plant A
Milk catchment area A data

Head of Milk Procurement Unit
FAO group of experts
(Charts & tables)
Maps with data
Maps

Milk procurement staff of the Plant B
Milk catchment area B data
Example of analysis in Saiku

- **Saiku** – is a free and user friendly application that allows doing quick analysis of data in tabular and graphic forms.

- For example:
  - Milk supply structure by yields/herd size/etc.
  - Annual change in winter yields or supplier’s evolution according to the scoring system.
  - Land under various feed crops in different areas and the cropping structure.
  - Milk yields obtained by farmers that apply good practices (feeding, management, etc.)
Example of analysis using the Google Fusion Table

- **Fusion Tables** – is a free and easy-to-work-with Google application that allows for the flexible data analysis on a map.

- Case study 1:
  
  *A company sources the milk from small and medium-sized farmers. In 2019, the company plans to launch a new processing facility manufacturing yoghurts. To strengthen its raw material base, the company has envisaged to invite an international consultant specialized in dairy cattle feeding, however the funds to covers consultant’s work are limited.*

- Identify and locate on the map farmers for the consultant’s visit. These are:
  - farms with more than 30 ha of land
  - farm scored from 1 to 2 on management
  - farms supplying milk that has a protein content of less than 3%
  - display farms by cooling tank capacity (up to 0.5 t., 0.5-1.5, 1.5 and more)
  - highlight on the map areas with the highest protein content in milk
farms with more than 30 ha of land

farm scored from 1 to 2 on management

Results of the analysis displayed on the Google map (1/3)
farms supplying milk that has a protein content of less than 3%

display farms by cooling tank capacity (up to 0.5 т., 0.5-1.5, 1.5 and more)
highlight on the map areas with the highest protein content in milk
Challenges of the Kazakh dairy industry

- Highly fragmented supply of raw milk (82% by farming households)
- Very long distances
- Undeveloped milk collection and cooling network (including ref-trucks)
- Acute shortage of skilled staff (zoo-technicians, vets, agronomists, etc.)
- Absence of the advisory services / extension
- "Unfair" competition with the dairy companies that do not operate according to the technical regulation in force (= can afford a higher purchase prices)
- Large raw milk quantities are sourced by milk traders, who often do not comply with the regulation
- Middleman is the most interested party to keep the farmer uninformed and the processor in deficit
Solutions for Milk Procurements Units

- Accurate mapping of raw milk catchment areas
  - Inventory of the suppliers
  - Diagnostics of the problems
  - Direct dialogue “milk producer-dairy processor”. Better understanding and higher degree of trust along the chain

- Analysis
  - Problem-finding and cause-root analysis
  - Calculations related to the location of MCCs and their capacity
  - Optimization of milk collection logistics
  - Identification of champion-farmers for knowledge transfer

- Monitoring
  - Tracking performance indicators of various suppliers in space and in time

✓ Manual data collection and input goes replaced by a modern information technology
✓ Improved milk collection systems in the existing milk collection zones
✓ Targeted advisory service provision to farmers towards better farm operation, hence overall farming community development and consolidation of milk producers (establishment of business cooperatives, transition of farming households into dairy farming business)
✓ Development of new milk catchment zones
At present, Kazakhstan has its own experts on *Collect Mobile*

- Under the project, a group of the national IT/GIS experts was trained to work with the *Collect Mobile* and various data analysis products
- During two months they are available to support all EBRD's clients willing to introduce the technology
- The national team is remotely mentored from FAO headquarters in Rome

Denis Kirillov, Head of the team, Geographical Information Systems Expert (Astana)

Almaz Sadykov, Data Analyst (Almaty)

Aizhan Ismagulova, Data Analyst (Almaty)
Practical steps to implement the technology

- Approval of the **survey structure** according to the requirements of the company's Milk Procurement Unit
- Selection of **milk catchment areas** for mapping
- Express trainings for the staff of Milk Procurement Unit who work directly with the suppliers (4 hours). Training to be provided by the national team experts together with the staff of the dairy factory who has been trained by the FAO. Installation of *Collect Mobile* software on mobile devices, import of the survey structure
- It is assumed that factory’s staff has their own mobile devices (Android)
- Milk Procurement Managers **collect data** on each supplier in the selected area. Field survey is done on-farm and directly by the factory representative (not by milk trader or farmer him/herself)
- Collected data are **centralized in a database** run by the head of the Milk Procurement Unit for further analysis. The national team of experts provides support in performing the analysis and displaying the data on the map for further analysis. FAO recommends data to be collected 3 times a year
- Most of the **costs** related to introduction of the technology are related to the design of the survey structure and training of staff. These have been covered by the project.
Products currently available to the Kazakh dairy plants

- **Survey structure** for Android device (smartphone or tablet)
- **Step-by-Step** User Guide (including on how to work with some Google products)
- **Scoring cards** methodology to evaluate your supplier on-the-fly
- **Economic model** designed to facilitate the dialogue with the supplier (in Excel)
- **Trained group of local experts** to assist plants in using the technology
Thank you for your attention

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