



© FAO/Ryan Aquanno

SEPTEMBER 2019

# CHARACTERIZING LIVESTOCK MARKETS FOR REAL-TIME DECISION-MAKING: THE MARKET PROFILING APPLICATION

Livestock markets are a “hotspot” of disease risk along the value chain as many animals of different origin are combined into a single location. Moreover, as markets occur during periods of high stress for animals (e.g. transport), the need to identify and monitor the risk of disease transmission becomes particularly urgent.

Traditionally, studies documenting the risk of disease spread through livestock markets have mostly been limited to

static data gathering efforts and obsolete processing technologies. As a result, the findings rarely have practical significance at the field level, where disease control and prevention actions are applied.

In addition, veterinary services are facing increasing pressure from emerging zoonotic and transboundary diseases. As a result, it is becoming increasingly important to prioritize response activities in times of reduced resource allocation.

The *Market Profiling Application (MPA)* developed by the Food and Agriculture Organization of the United Nations (FAO) is an online, dynamic, real-time application to systematically collect, display and analyse epidemiologically relevant market data.

The MPA is an adaptable and reliable tool capable of providing veterinary services with the knowledge required to limit disease spread, by identifying high-risk locations within value chains and targeting mitigation measures.

## IDENTIFYING THE RISK OF DISEASE TRANSMISSION ALONG ANIMAL VALUE CHAINS

In 2016, the FAO Emergency Centre for Transboundary Animal Disease (ECTAD) office in Viet Nam began piloting the MPA in the country to categorize live bird markets (LBMs) based on risk factors such as infrastructure, facilities, and slaughter practices, and to map animal movements between LBMs to further study the country's trade networks.

These profiles are automatically mapped, analysed and shared with veterinary services to inform decision-making, so as to limit or even prevent disease transmission related to animal movement and trade. To date, more than 500 LBMs have been profiled in Viet Nam and more than 1 000 trade connections have been mapped.

From 2018, Ethiopia, Uganda, the Democratic Republic of the Congo, Rwanda and Mozambique have also been collecting market data.

# KEY FACTS

## MARKET PROFILING APPLICATION

DEMOGRAPHIC CHANGES, IMPROVED DISEASE DETECTION CAPABILITIES, AND LIMITED RESOURCES ARE PRESSING VETERINARY SERVICES TO TARGET DISEASE RESPONSE TO HIGH-RISK AREAS

LIVE ANIMAL MARKETS ARE HOTSPOTS FOR THE TRANSMISSION OF TRANSBOUNDARY ANIMAL AND ZOO NOTIC DISEASES

FAO'S MPA SYSTEMATICALLY COLLECTS, DISPLAYS, AND ANALYSES EPIDEMIOLOGICAL MARKET DATA TO INFORM DECISIONS ON PREVENTING OR MITIGATING DISEASE

USE OF THE MPA BY VETERINARY SERVICES CONTRIBUTES TO MINIMIZING THE RISK OF TRANSBOUNDARY ANIMAL AND ZOO NOTIC DISEASE OUTBREAKS

IN VIET NAM, MORE THAN 500 MARKETS HAVE BEEN MAPPED THROUGH THE APPLICATION, AND THOUSANDS OF TRADE CONNECTIONS CHARACTERIZED

THE MPA INTERFACE EASILY FOR THE FUTURE MAPPING OF OTHER SITES OF EPIDEMIOLOGICAL INTEREST, SUCH AS ABATTOIRS, FARMS AND BORDER CHECKPOINTS

## FAO-MARKET PROFILING APPLICATION

### E-MAILS

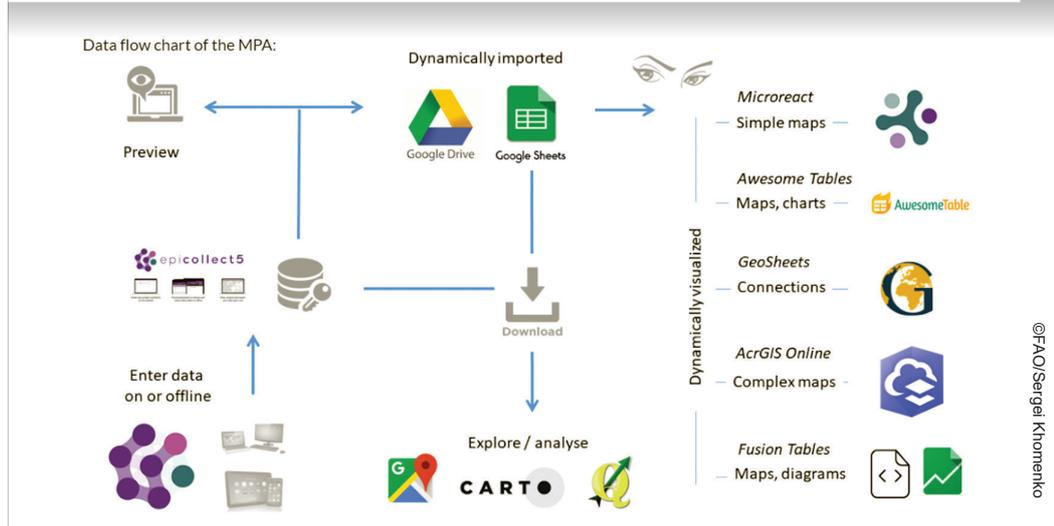
[Food-Chain-Crisis@fao.org](mailto:Food-Chain-Crisis@fao.org)  
[EMPRES-Animal-Health@fao.org](mailto:EMPRES-Animal-Health@fao.org)

### WEBSITES

[www.fao.org/food-chain-crisis](http://www.fao.org/food-chain-crisis)

Food and Agriculture Organization of the United Nations

## CHARACTERIZING LIVESTOCK MARKETS FOR REAL-TIME DECISION-MAKING: THE MARKET PROFILING APPLICATION



This initial expansion into Africa has helped shed light on key differences between Vietnamese and select African LBMs: helping ensure that the data collected is locally relevant and can inform decision-making and field actions.

### DATA PROCESSING, WORKFLOW, AND VISUAL ANALYSIS

The MPA uses Google Forms or Epicollect5 (desktop and mobile versions) to collect market data, based on four separate questionnaires: Basic Market Info, Commodities, Bio-security, and Connections. These data are then automatically transferred to Google Drive for storage. The data may be gathered by country veterinary services during routine fieldwork; alternatively, experts may be specifically recruited to gather or update market information.

Data validation at the central level is recommended to confirm locations or identify formatting errors, before the profiles are made accessible in the application.

The MPA displays outputs automatically as web maps, statistics or graphs using Google Spreadsheets, Google My Maps, Fusion Tables, Microreact, Awesome Tables, GeoSheets and ArcGIS Online. A multitude of other online visualization tools can be connected depending on the purpose of the exercise. The records are dynamically accessed and updated via the online interface; they are securely stored and privately retrievable for individual country governments and authorized users.

### FROM REAL-TIME REPORTING TO DECISION-MAKING

The MPA provides veterinary services with the knowledge required to prevent or mitigate disease transmission and to minimize the risk

of transboundary animal and zoonotic disease outbreaks.

The outputs of the application can provide policy-makers with much-needed evidence for identifying optimal disease prevention, detection, and control options, including targeted surveillance and mitigation activities. These advanced features and visualization options offer significant field-level capacities previously unavailable to veterinary services. However, even simply mapping livestock markets within a country provides the opportunity to better respond to disease events, through the identification of high-risk markets in close proximity to outbreaks, or by overlapping market locations with third-party risk maps, such as those for disease endemicity or incursion.

### FUTURE PROSPECTS

In Viet Nam, the MPA has proven to be practical and versatile, and has generated valuable feedback on the cost-effective implementation of data-gathering activities. While FAO expands the use of the MPA in Africa and Asia, and also begins to incorporate other types of livestock markets, it is fundamental to anticipate challenges in order to ensure the sustainability and uptake of the application. FAO has already begun designing strategies to:

- Develop sustainable methods for market data collection in different countries, such as incentive creation and the exploration of impediments to the application's use;
- Generate dialogue between policy-makers and field staff to ensure effective uptake of the tool within the national surveillance system; and
- Determine best practices for routine disease surveillance and control interventions available to veterinary services using the application.



Some rights reserved. This work is available under a CC BY-NC-SA 3.0 IGO licence