GF-TADs Africa

GLOBAL FRAMEWORK FOR THE
PROGRESSIVE CONTROL OF
TRANSBOUNDARY ANIMAL DISEASES

Food and Agriculture
Organization of the
United Nations

World Organisation
for Animal Health
Founded as OIE

African
Union

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FAO decision support tool for Avian Influenza (AI DST) and its country application

Early Warning Team, NSAH

Ismaila Seck

Animal Health Officer, FAO

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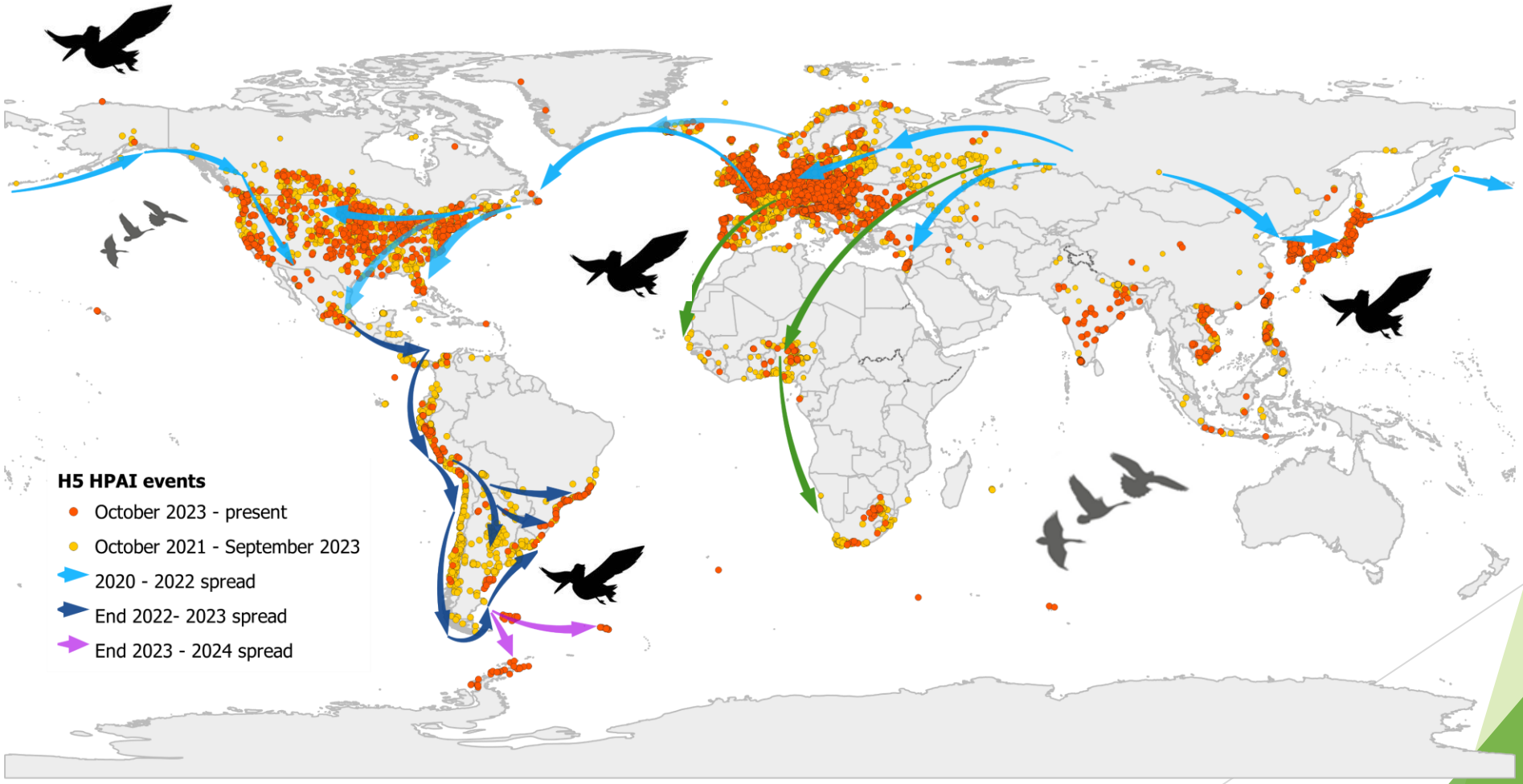
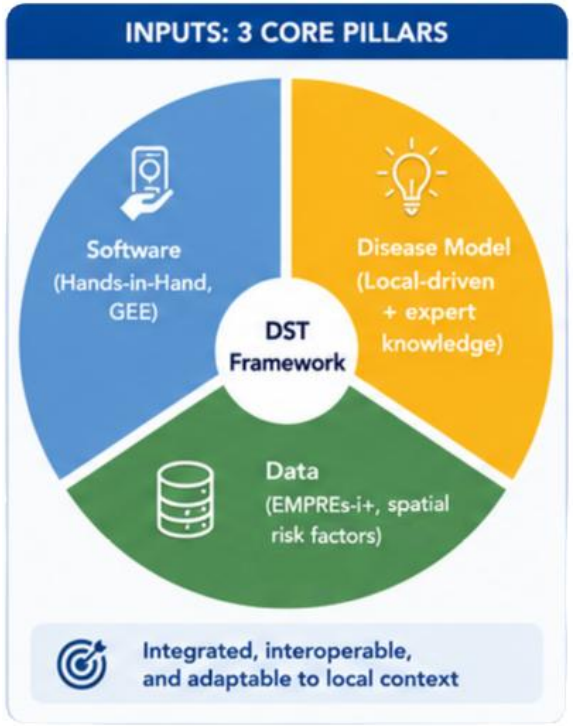
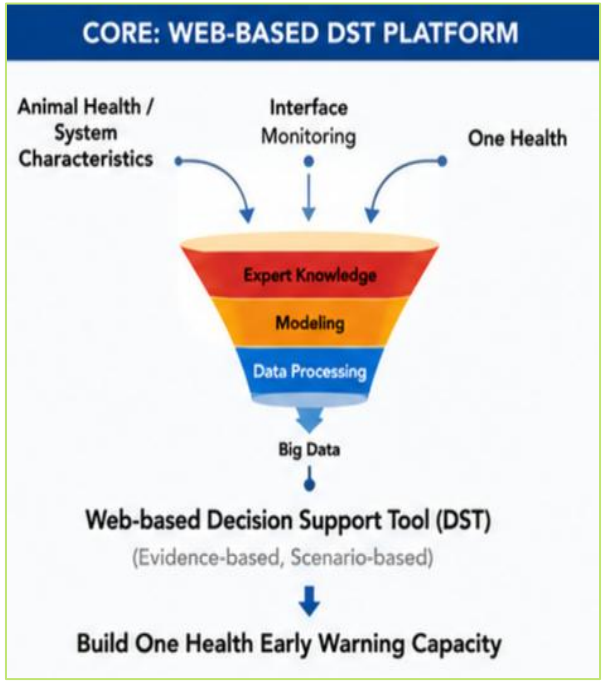
AVIAN INFLUENZA IS A GLOBAL CONCERN



One framework, many diseases: from RVF to avian influenza





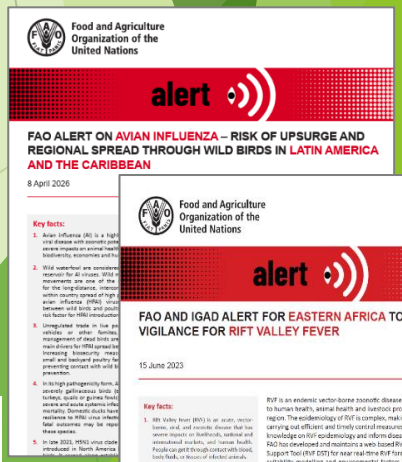


From data and signals to anticipatory action





Alerts !





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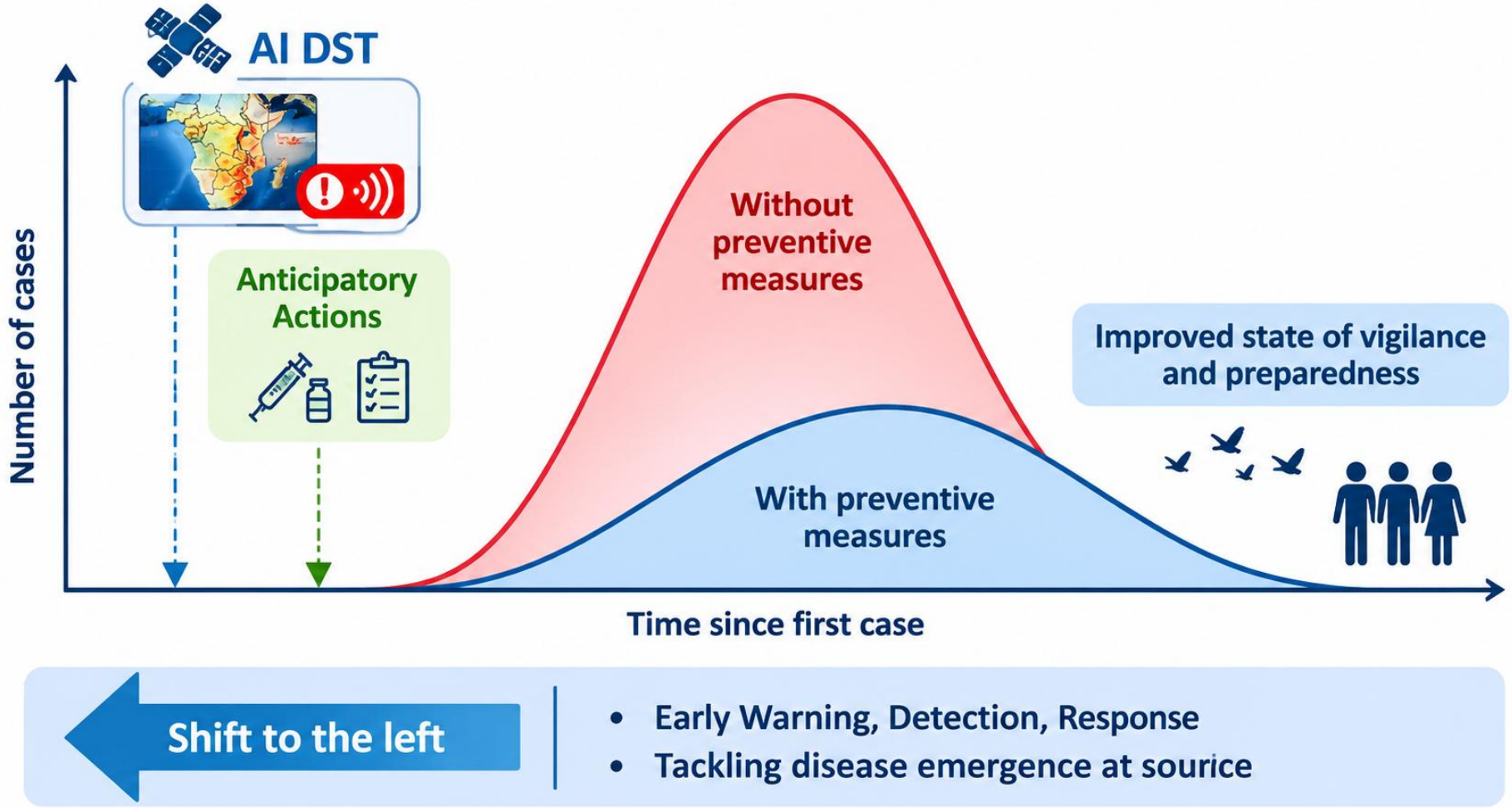
Earth observation data and risk modelling to monitor climate variability a disease risk factors



Acting before the peak: early warning flattens the epidemic curve

Two complementary models of wild bird distribution

Different approaches to the same question: where do wild and domestic birds meet?

Area of Habitat

Sapienza University

How it works

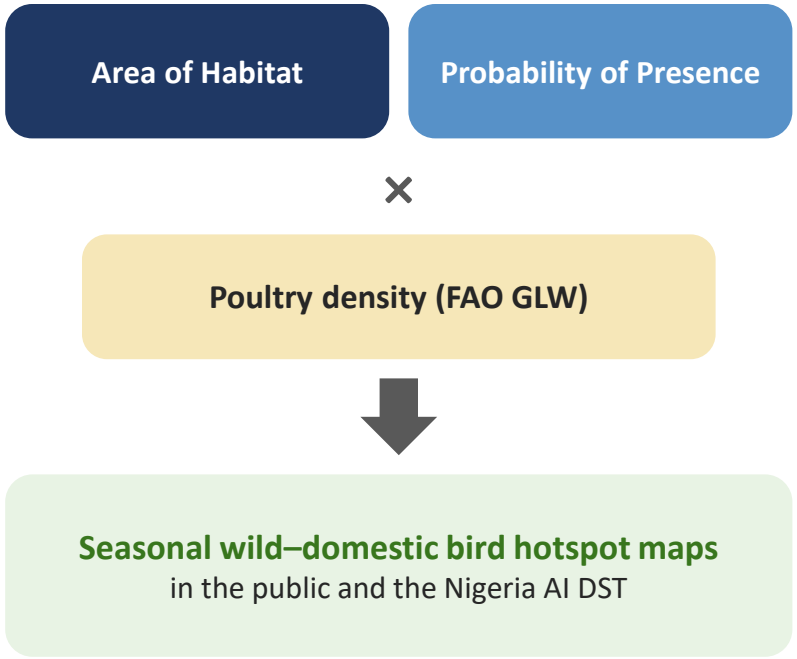
Expert range maps, refined by each species' habitat and elevation needs

Strength

Covers every species, even where field records are scarce

Limit

Maps suitable habitat, so it can overestimate presence



Probability of Presence

Université libre de Bruxelles

How it works

Machine learning on bird observations (eBird, Wetlands International) and environmental data

Strength

Reflects where birds are actually seen, season by season

Limit

Depends on observation effort, which is low in parts of Nigeria

Complementary, so both need validation

Where the models agree, confidence is higher. Where they differ, we check first.

1. Compare with outbreak data (EMPRES-i, national line lists)
2. Field checks at wetlands and live bird markets
3. Consultation with national stakeholders: vets, wildlife, public health, poultry sector

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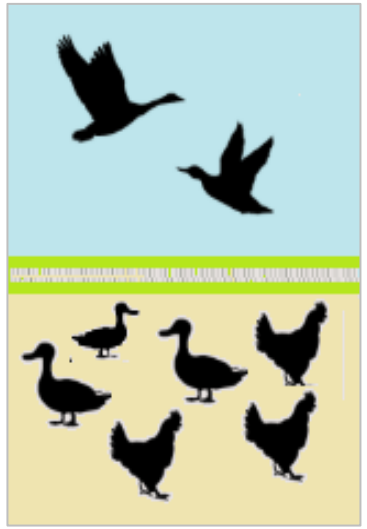
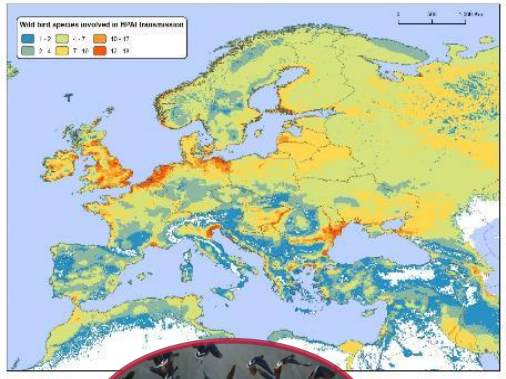
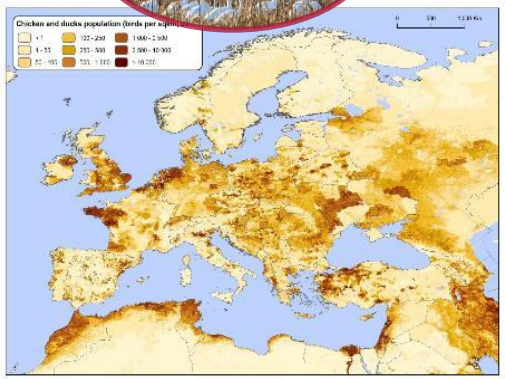
A new approach to identify wild / domestic bird interfaces for the risk of HPAI spillover



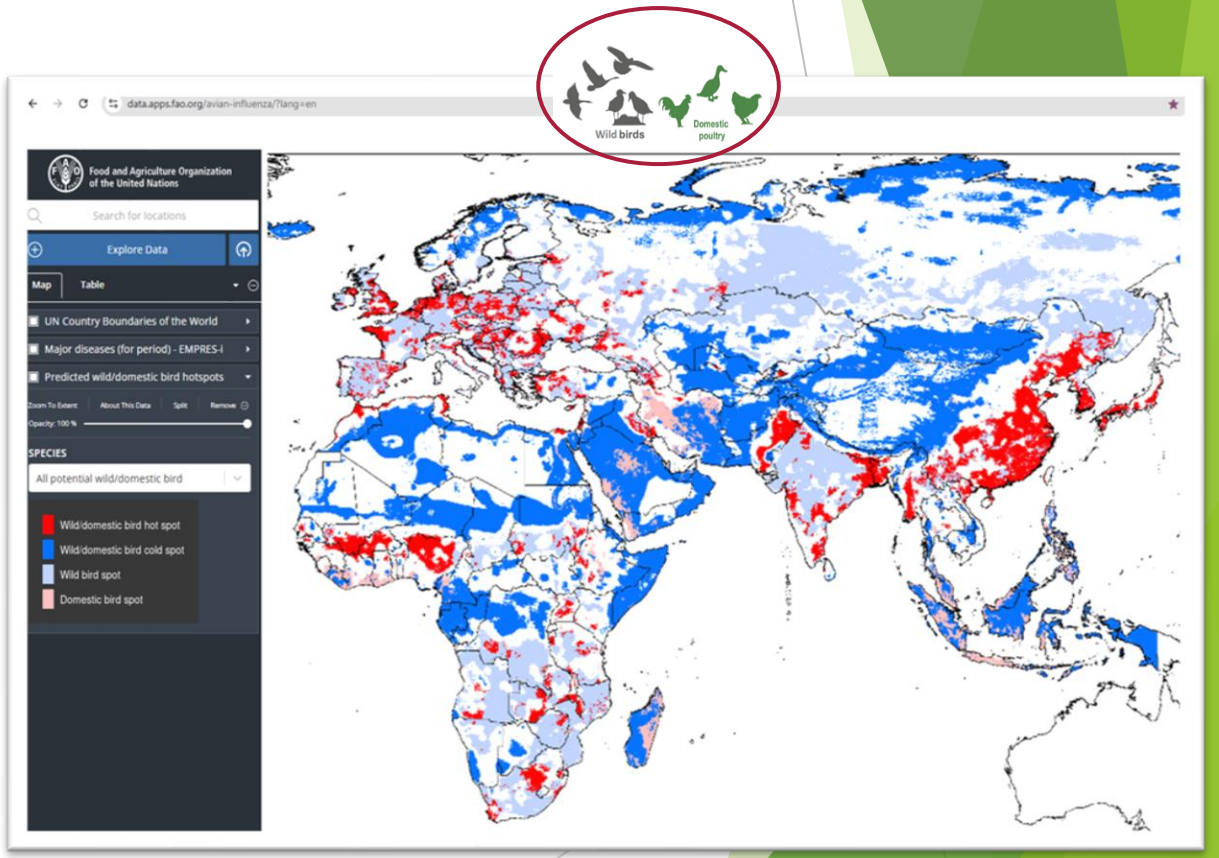
Wild bird species richness



Risk of spillover



Chicken & duck density



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AI DST: what you can do with it

One web tool, from global hotspot maps to your own district

1 Explore risk maps

Seasonal wild–domestic bird hotspot maps, in a **protected country version** (for national confidential data)

2 Use the data catalogue

Rainfall, water, land cover, poultry, wild birds and people, with metadata; maps download as GeoTIFF

3 Overlay outbreaks

EMPRES-i+ and national outbreak data, played on a timeline

4 Analyse any area

Draw an area and get charts and tables over space and time

5 Share and communicate

Share a live map link, print it or build a story map

6 Add national expertise

National expert input (MCDA), linked key documents, English and French

Day 2: you will use these tools on the 2021 Nigeria HPAI epidemic

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The AI DST journey: from AI DST to ELEVATE

A stepwise approach to integrating wild bird ecology, livestock data and mobility intelligence.



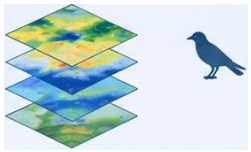






1 — RVF DST Framework

Sapienza University



Habitat suitability based on expert opinion to map wild bird richness (across seasons)

2 — ULB Partnership

Université libre de Bruxelles



Improved bird presence models with a statistical approach

3 — Dynamic Richness Maps



Monthly dynamics of wild bird species richness

4 — Pilot Countries (West Africa)



Calibration and validation in Guinea and Ghana

5 — ELEVATE Project



Mobility intelligence and livestock mobility, with countries and stakeholders

A progressive approach to deliver an integrated, operational AI DST

from ecological modelling to multi-sectoral, country-level application

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Capturing the ecological dimension of HPAI risk across space and time

The **ULB collaboration** expands the analytical capacity of AI DST through seasonal and emerging monthly modelling approaches.

- **Seasonal intelligence**
  Breeding and non-breeding distributions, species richness and regional risk patterns.
- **Scientific validation**
  Spatial cross-validation and model performance assessment.
- **Dynamic modelling**
  Monthly species distribution models with time-varying environmental conditions.
- **Scalable methodology**
  Transferable across African subregions and beyond.

From scientific modelling to operational intelligence

A more detailed understanding of wild bird distributions, seasonal patterns and potential interfaces with domestic poultry, supporting more informed HPAI surveillance and risk assessment.

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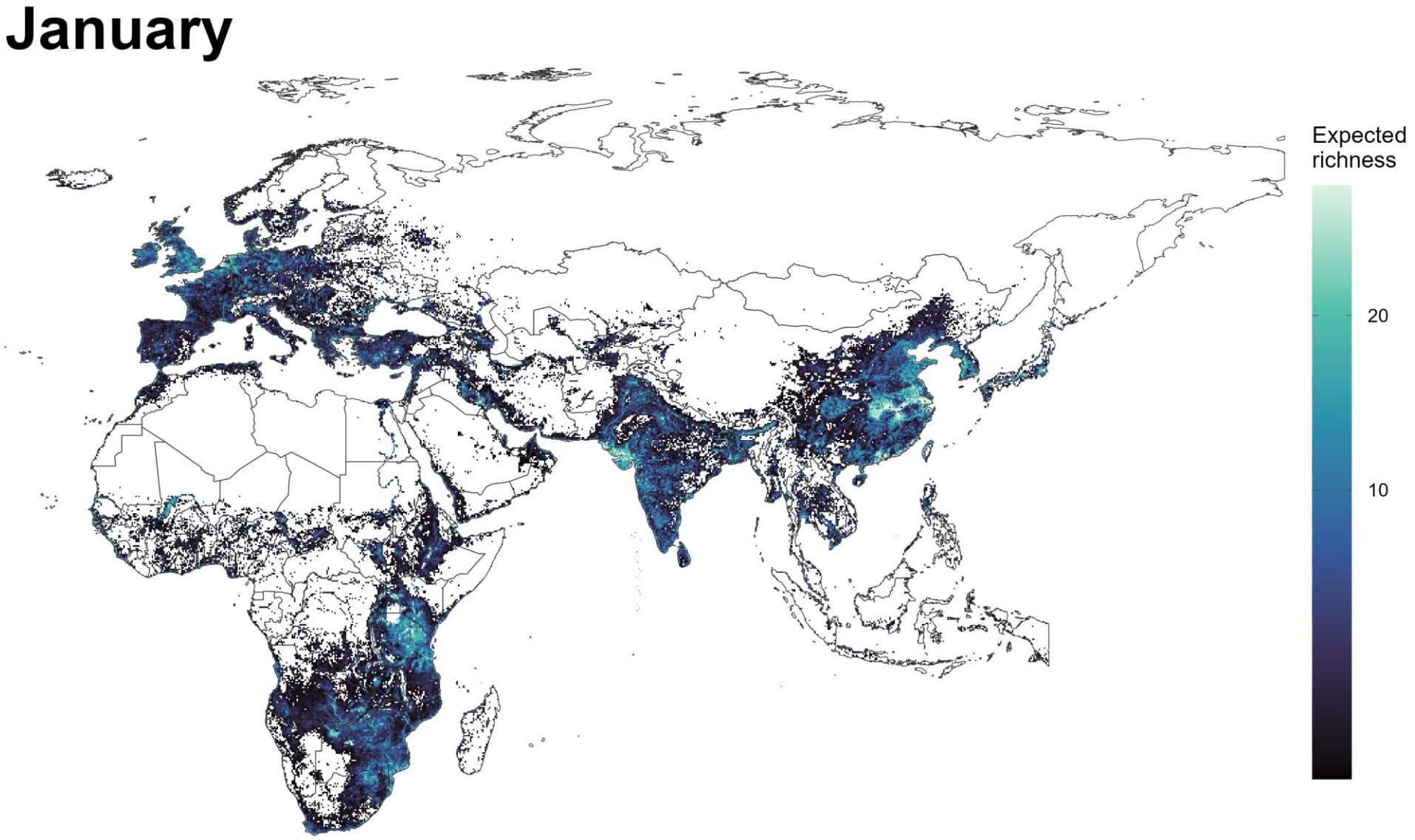
Want to see how wild bird species richness changes from month to month? Play the video!



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From mapping disease risk to understanding how risk moves

ELEVATE extends FAO's AI DST by introducing an Animal Mobility Intelligence Framework to better understand how animal movements and wildlife–livestock interactions shape AI risk.



Integrated mobility intelligence

Environmental, animal density, trade and surveillance data.



Wildlife-livestock interface

Bird flyways, poultry production and market networks.



Community-driven intelligence

Local reporting by farmers, market actors and wildlife stakeholders.

> **New insight**
> See where animals are, where they move and where they interact.

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Bridging the science-policy gap

From scientific evidence to operational action

The AI DSTs translate complex scientific analyses into accessible tools that support practical decision-making.



From data to action

Advanced modelling and participatory, user-centred approaches support risk-based surveillance and disease management.



Secure and collaborative

Country-level access to confidential data strengthens veterinary services and cross-sectoral coordination under a **One Health approach**.



Scalable and adaptable

The framework can be extended to other priority diseases, supporting global situational awareness and country-level decision-making.

Ultimately
transforming scientific evidence into actionable intelligence for better preparedness and more targeted disease prevention and control

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Thank you!

Ismaila.seck@fao.org