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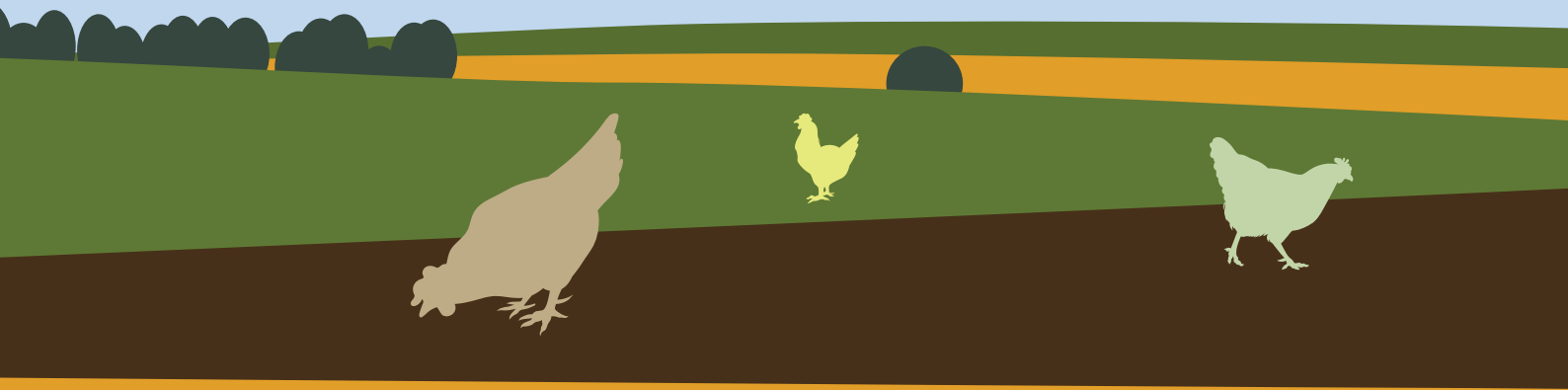
Istituto Zooprofilattico Sperimentale delle Venezie

OIE Twinning project between Italy and Nigeria

Improving NVRI laboratory capacity for a better control of the Avian Influenza virus at National and Regional level



A valuable tool for sustainable capacity building and networking for control of AIV in Africa

What is a twinning?

The OIE is applying the concept of twinning to laboratories to build expertise for the most important animal diseases and zoonoses in priority regions, in direct support of the OIE strategy to improve global capacity for disease prevention, detection, and control through better veterinary governance. Through twinning, OIE aims to provide a more balanced north-south distribution of advanced expertise, allowing more countries to access high quality diagnostic testing and technical knowledge within their own region, thus facilitating early disease detection and rapid control.

- Each twinning project links an existing **OIE Reference Laboratory** or Collaborating Centre with a selected **candidate laboratory**. Knowledge and skills are exchanged through this link over a determined project period.
- The project is designed to make the OIE Reference Laboratory expertise available to the candidate Institute by establishing an appropriate and close working relationship, aiming at the **improvement of the technical and scientific capacity** of the candidate laboratory.
- Twinning projects provide **mutual benefits for both laboratories** by setting up joint research opportunities aimed at strengthening global disease surveillance networks for the benefit of the whole international community.

Background

The spread of the **Highly Pathogenic avian influenza** (HPAI) viruses of the H5 subtype descendant of the H5N1 virus A/goose/Guangdong/1/1996 in West Africa has caused huge economic losses in the **Nigerian poultry sector**. This, combined with the detection of the potentially zoonotic H9N2 virus in West Africa since early 2017, warrants further attention to the AI situation in this African region.

Within this challenging scenario, the Project is designed to make the OIE Reference Laboratory expertise available to the candidate laboratory by establishing an appropriate and close working relationship in a real collaborative spirit, aiming at a more effective control and response to this serious threat.

The **National Veterinary Research Institute (NVRI)** in Vom, Nigeria and the **Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe)** in Padova, Italy had already experienced successful research collaborations dating back to 2006 with the first incursion of HPAI in Africa.

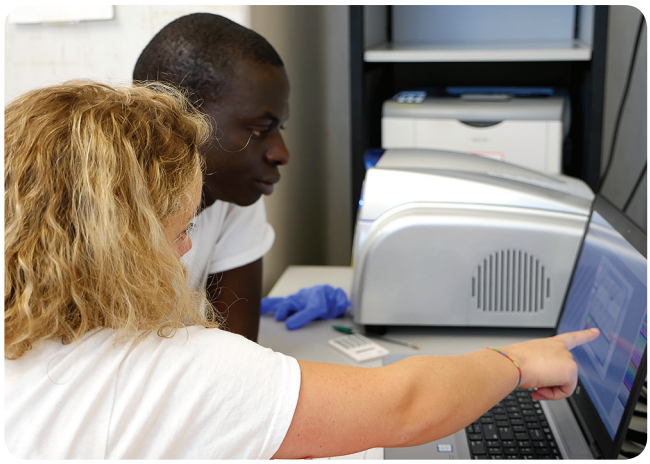
In 2018, OIE supported the two-year twinning project between NVRI and IZSVe with the purpose of establishing the scientific expertise of the candidate institute as a tool for supporting its role as reference diagnostic centre in the West African region.

Activities

The project started with the launch meeting held at the NVRI, which combined a **baseline assessment** of the laboratories and management skills of the candidate institute with a **round table** that allowed for a thorough gap analysis and agreement on the expected results of the project. NVRI experts participated in **capacity-building trainings** during their visits at the IZSVe. The activities focused on:

- Classical virology and molecular methods for AI diagnosis;
- Sequencing and molecular epidemiology for enhancing AIV characterization;
- GIS and epidemiology applied to AIV;
- Biosafety and Biosecurity;
- Quality Management System.

The project also promoted the establishment of a network for avian influenza diagnosis and control in West Africa involving the NVRI in Nigeria and the Accra Veterinary Laboratory of the Veterinary Services of Ghana through the implementation of shared training programmes on data management.



As follow-up to the baseline assessment and capacity building, the IZSVe organised a **Proficiency Test (PT)** to evaluate the progress of the NVRI. The Accra veterinary laboratory in Ghana was also invited to participate in the PT in order to strengthen the cooperation between the main actors in the region.
Despite the difficulties that emerged in light of the SARS-COV-2 pandemic, thanks to the enthusiasm shown in previous years, NVRI and IZSVe were able to organise both the **remote final assessment** and the **closing meeting**. The latter, implemented as a webinar, allowed the participation of all actors in the West African region. The event made it possible not only to present the results of the twinning programme and the success of the capacity building process, but also to discuss the current avian influenza situation in the African continent.

Benefits

Besides **sharing technical-scientific knowledge** and expertise, the project has enabled the Nigerian colleagues to become more aware of the importance of establishing a **quality assurance system** and improving the management of **biosafety and biosecurity** measures. As highlighted in the final assessment questionnaire, among the many improvements achieved after implementing the capacity building activities, the NVRI has organized and provided regular biosafety training to

lab staff, while the Quality assurance system has been enriched with new and updated SOPs, thus improving the overall laboratory management, including the maintenance of equipment.

On the other hand, the IZSVe laboratory was provided with **African reference viruses** and had the opportunity to apply different protocols and evaluate their effectiveness on strains circulating in West Africa.

The measurable outputs of the project include three peer-reviewed papers published in the two-year collaboration period, as well as the successful outcome of the PT exercise **(98% corrected results** in molecular biology and classical virology and serology, respectively). These achievements, together with the possibility of extending the twinning for another year, encouraged the **collaboration between the two Institutes to move forward beyond avian Influenza** thanks to the application of the EU initiative "Development Smart Innovation through Research in Agriculture" and the approval of the LIDISKI project, focused on the control of Newcastle and Pest des Petites Ruminants in Nigeria.

Dissemination and publications

- Fusaro *et al.* "Disentangling the role of Africa in the global spread of H5 highly pathogenic avian influenza", *Nature Communication*, 2019.
- Poster presentation: European Congress of Virology, 28 April-1 May 2019, Rotterdam, Netherlands.
- Shittu *et al.* "First detection of highly pathogenic H5N6 avian influenza virus on the African continent". *Emerging Microbes Infect*. 2020 Dec;9(1):886-888.
- Shittu *et al.* "Fatal multiple outbreaks of equine influenza H3N8 in Nigeria, 2019: The first introduction of Florida clade 1 to West Africa". *Vet Microbiol.* 2020 Aug 13;248:108820.
- Laleye *et al.* "Genetic characterization of Highly Pathogenic Avian Influenza H5Nx clade 2.3.4.4b reveals independent introductions in Nigeria" *(submitted)*.
- Poster presentation: European Congress of Virology, 28 April-1 May 2019, Rotterdam, Netherlands.

People involved

NVRI (Nigeria)
Tony Joannis
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Kayode Olawuyi
Clement Meseko

IZSVe (Italy)
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Francesca Ellero
Nicola Ferré
Matteo Mazzucato
Paola Carnieletto
Francesco Bonfante

OVERVIEW

WHO: Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe) and National Veterinary Research Institute (NVRI)

WHERE: Italy (Legnaro, PD) – Nigeria (Vom)

WHEN: two years + 1 year of extension, 2018-2020

WHAT:

Assessment

- Baseline evaluation of facilities and management of diagnostic activities at the animal influenza laboratory at NVRI
- Proficiency Test
- Final assessment through remote questionnaire

Capacity building trainings

- Virology and serology
- Molecular biology
- Sequencing and molecular epidemiology
- Epidemiology and GIS
- Data management
- Biosecurity and biosafety
- Quality management system

HIGHLIGHTS

6 People trained at IZSVe

7 Different capacity-building activities

3 Papers published during the period

17 Standard Operating Procedures established

2 Course certificates on the Use of GIS in animal disease response

98% Correct results at molecular biology PT