



# Fish and livestock-based research programs

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3<sup>rd</sup> MARD-CGIAR Coordination Meeting

**Hanoi, 10 December 2021**

Presented by: ILRI

Contributors: ABC & WorldFish





## Challenges & country priorities

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### Livestock

- **Promote development of livestock production** (domestically and for export)
  - African swine fever heavily impacted the pork industry resulting in the death or culling of nearly six million pigs, or more than 20% of the 2020 country's pig population.
- **Diversify livestock species** to bring into play advantages of each region
  - Explore potential and performance of Indigenous breeds (pigs and chicken)
- **One Health, given high priority under OHP (phase II)**
  - Antimicrobial resistance (AMR) is recognized as a major threat by government, NAP, Farmers & humans have **easy access** to AM drugs
  - Zoonotic diseases control (joint circular 16, MOH – MARD)



## Challenges & country priorities

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### Fish

- Aquatic **broodstock production and breeding** technologies: shrimp, prawns, catfish, tilapia, clams, trout
- Technologies for **disease prevention & control** for key species (shrimp, fish, oysters, trout)
- **Climate change impact** on fisheries and aquaculture
- **Integrated management and farming approaches** to make use of potential water bodies (rivers, lakes, reservoirs, etc.) for fisheries and aquaculture production



# Key achievements – Livestock health

## Epidemiology & control of major production pig diseases

	PRRS	ASF	FMD
Tools developed for disease transmission (SIR)	X	X	
Mitigation scenarios modelled (vaccine, depopulation, Movement control)	X	X	
Seasonal pattern and cluster identified		X	X

## African swine fever impact research

- **Highest impact in medium- and large-farmers** whose livelihoods are largely derived from pig production; outbreaks also affected other value chain actors
- At sector level, the outbreaks posed impacts on the domestic supply and demand for pork, especially in the traditional sector. Modern sector less affected
- At national level, different model simulation scenarios showed a sharp reduction in total gross domestic product (GDP) and a substantial loss of jobs.



frontiers  
in Veterinary Science

ORIGINAL RESEARCH  
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## An Assessment of the Economic Impacts of the 2019 African Swine Fever Outbreaks in Vietnam

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# Key achievements - Li-chăn

## Livestock development through the eyes of artists and farmers



Sentimental thoughts



Friendship



FF9 - Story by Yếu



FF8 - Story by Thuận



Herding cows whilst playing the flute



The pig



<https://livestockpanorama.ilri.org/en/livestock-through-eyes-artists>

<https://livestockpanorama.ilri.org/en/livestock-development-farmers-perspective>



SUB-DAH  
SON LA



RESEARCH  
PROGRAM ON  
Livestock

# Key achievements - Li-chăn

## Livestock development through intersectoral interventions



### Genetics

- 109 households trained
- Promotion of AI for cattle and pigs

### Animal Health

- Simple biosecurity on-farm measures
- 110 farmers and 20 animal health professionals trained
- Low costs demonstration farms (15 from 6 villages)

### Feeds & Forage

- 145 farmers trained on animal nutrition
- farmers-led field trials with 4 grasses and 3 legume species

### Environment

- Awareness raising with 145 farmers on soil fertility management, erosion control and compost making
- Studies performed on nutrient balances and environmental impact of livestock interventions

### Livelihoods

- Common Interest Groups (CIGs) created to generate collective action around marketing and access to inputs



Building a new pen for pigs



Photo credit: Huy, ILRI



# Achievements - emerging zoonoses in urban areas



## Japanese encephalitis JE (Mosquito-borne disease) emerging in urban cities

### Key results

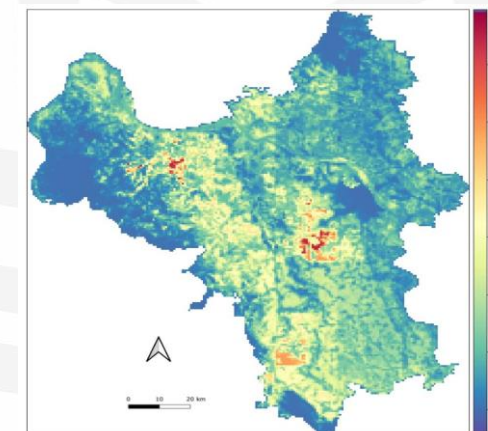
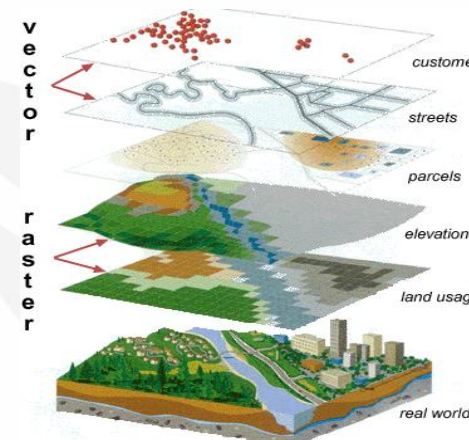
- **High seroprevalence in pigs for Japanese encephalitis virus (73%)**
- JE virus also detected **collection of mosquito**
- **3 types of Dengue virus circulating** in a Hanoi hospital at the same time!
- **Barriers for mosquito control identified**
- **Predictive risk map for mosquito distribution developed**



### Impact

8 peer reviewed papers (some IF >4)

Dissemination materials piloted and shared





## Key achievements Epidemiology & control of zoonoses



### Challenges:

- **Indigenous pigs** (Ban pigs) often raised by ethnic groups in **extensive production systems** which **pose a risk** for important parasitic zoonoses (**trichinella & cysticercosis**)

### Key results:

- **Low risk for pork consumers** for both zoonosis (Hoa Binh, Son La and Lao Cai)
- **Loudspeaker campaigns** reaching a wide audience, impact assessment done
- Capacity building for **mobile butchers** and **handbook**

### Impact:

- Risk communication through **loudspeakers** reach **40% of Ban pork community members** in Hoa Binh (25,000, 50% are woman) → model to replicate
- Com materials used by OIE regional office
- **Ban pork brand established** to improve market access

GIẤY CHỨNG NHẬN ĐĂNG KÝ NHÃN HIỆU SỐ: 3692  
Mẫu nhãn hiệu:



Safer indigenous pork and healthier ethnic minorities in Vietnam through better management of parasitic pig-borne diseases

### Handbook

Prevention of parasitic pig-borne diseases and improvement of hygiene practices in the pork value chain

(with emphasis on indigenous pigs)

Hanoi, December 2020





# Key achievements – AMR research in Livestock



- ✓ **Mapping drivers for antimicrobial use (AMU) and AMR patterns (VIDA-PIG)**
  - 90% of AM sold without prescription
- ✓ **AMR One Health Surveillance system, USYD, ILRI, PH & Vet**
  - Main challenge at animal health side (lower capacity)
- ✓ **Test interventions and cost benefit to reduce antimicrobials in pig farms**  
Probiotic on-station and Nano silver trial in fattening pigs
  - **No positive effect of antimicrobials on weight gains** compared AM free groups
  - **Probiotics in feed resulted in improved carcass quality**



## CGIAR Antimicrobial Resistance Hub, launched in 2019 led by ILRI

Aim: Support the efforts of low- and middle-income countries (LMICs) in controlling agriculture-associated AMR risks, through promoting and facilitating transdisciplinary partnerships.

## Outputs of AMR research in Vietnam:

MSc thesis (2) & peer reviewed papers (3)  
Private sector partnership

# Key achievements - One Health approach

## One Health side and One Health lab



### Thai Nguyen One health field side

- **Demonstration site** for One Health practices
- **6 key partners** (4 academic institution from Thai Nguyen, ILRI and VOHUN)
- Key achievements: *Joint research:*
  - *E.g., Safe PORK – interventions*
  - *AM – stewardship, AMR One Health & Livestock CRP*



### One Health Lab

Promoting research collaboration  
(AMR, COVID 19, Zoonoses  
& One Health Day)  
Joint papers (>30)



### Opportunities:

- To develop **teaching materials**
- To generate *One Health field model*
- *Research*
- *Communication activities etc.*

# Key achievements- Promoting climate smart aquaculture practices along the coastal areas of North Central Vietnam (ECO-SAMP)



RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security





# Key achievements - Mixed aquaculture systems: shrimp, tilapia, seaweed, mud crab in North central of Vietnam



- Food security

- Increase HH' s income:

- + 40.56-50.72% of total aquaculture income

- + 16.9-18.8 % of total HH incomes

- Available fish for local consumption

- Enhance adaptation & resilience

- Low habitat modification; stable income to cope with shocks; reduce failure risks ; make use ecosystem services; better environment; diversification

- Contribute to GHGs reduction

- Reduce input use (FCR: 0.2- 1.06); remove organic materials and wastes; reduce labor use for pond cleaning



*Pond without tilapia integration*



*Pond with tilapia integration*

## Way forward & recommendations - Livestock



- **Biosecurity:**

On-farm biosecurity needs to be tailored to farm type and integrated in cross-sectoral/center intervention (feed, breed and health)

- **African swine fever related:**

Improvement of market linkages through organization of farmer groups & compensation system with greater emphasis on developing risk-sharing and funding across national and local levels

- **Breeding:**

Improved breeding strategies for local chicken breeds (AsCGG project)  
(South – South exchange)

# Way forward & recommendations – Livestock



- **One Health**
  - ✓ **Parasitic zoonoses:** replicable low-cost mass-communication campaign
  - ✓ **OH field site and lab** – tested future model for One Health in practice
  - ✓ One Health partnership (ICD MARD)
  - ✓ **AMR:** Promising findings for AM free feed supplements – further scaling requires more awareness & compliance of farmers
- **Integrate achievements into new initiative** e.g.,
  - ✓ One Health (livestock, zoonoses, wildlife)
  - ✓ SAPLING (AH/zoonoses, livestock)
  - ✓ and SHIFT (Food system, including livestock)



## Way forward & recommendations- – Fisheries & aquaculture

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The One-CGIAR will be assisting with delivery of innovation packages to assist with the improved food production in the Asian Mega Deltas (Ganges and Brahmaputra; Ayeyarwady; and Mekong):

- Fisheries and aquaculture research in this program will focus on nutrition sensitive aquaculture interventions and the balance between habitat restoration for improved capture fisheries and aquaculture development.

Foresight research to support fisheries and aquaculture structural transformation.



# Thank you for listening!



Photo credit: Unger, ILRI