Better lives through livestock

Traditional food chains–some thoughts on terminologies, perceptions and how-to-de-risk them to cope with food safety and pandemic threats

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International Livestock Research Institute (ILRI)

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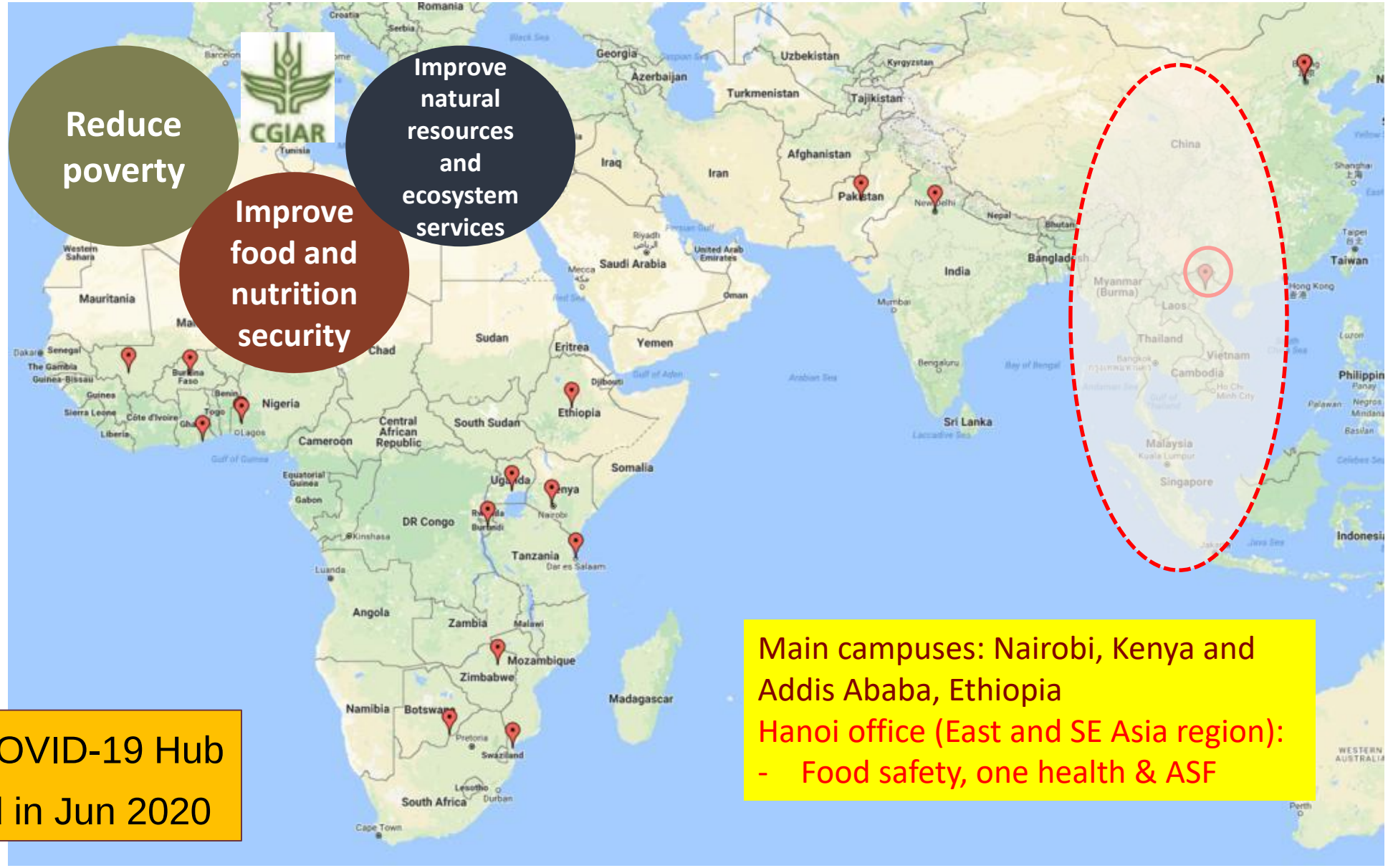

CGIAR COVID-19 Hub launched in Jun 2020

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Menti-Question

HEALTH

FOOD

Go to **menti.com**, and enter code **5887369**

Where do you usually buy animal source food (e.g. chicken)

(click only one but most valid option)

-Traditional retail
-Supermarket or convenient stores
-Organic/healthy food stores
-Directly at producer
-Other

Contents

- Livestock, SDG, food system change & consequences
- Food safety - global
- Traditional food chains
- Food safety performance - Vietnam
- Intervention example
- Way forward and future research

Agenda 2030's Sustainable Development Goals

Livestock contribute to all 17 of the SDGs and directly to at least 8 of the goals.

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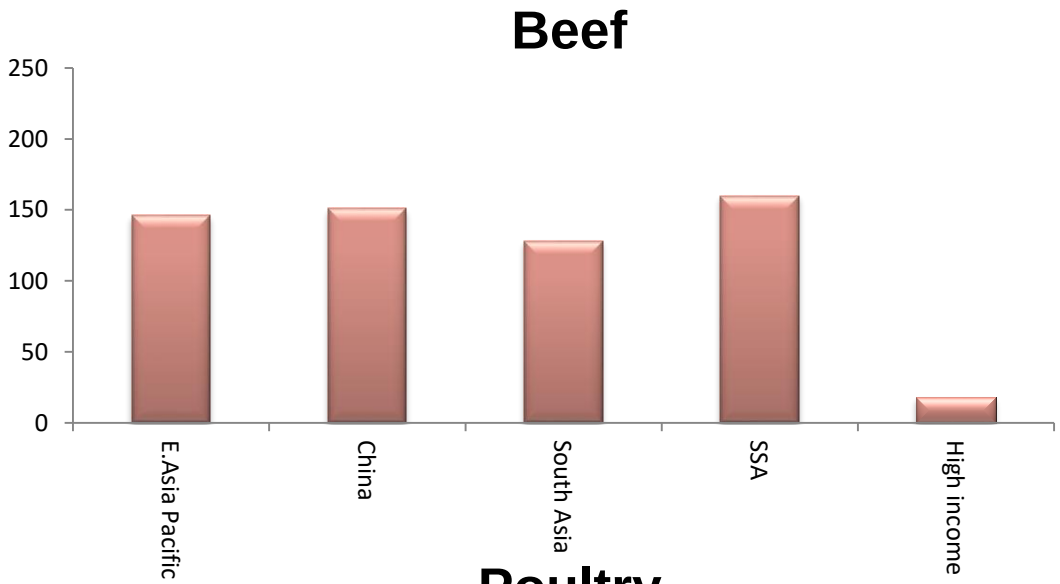
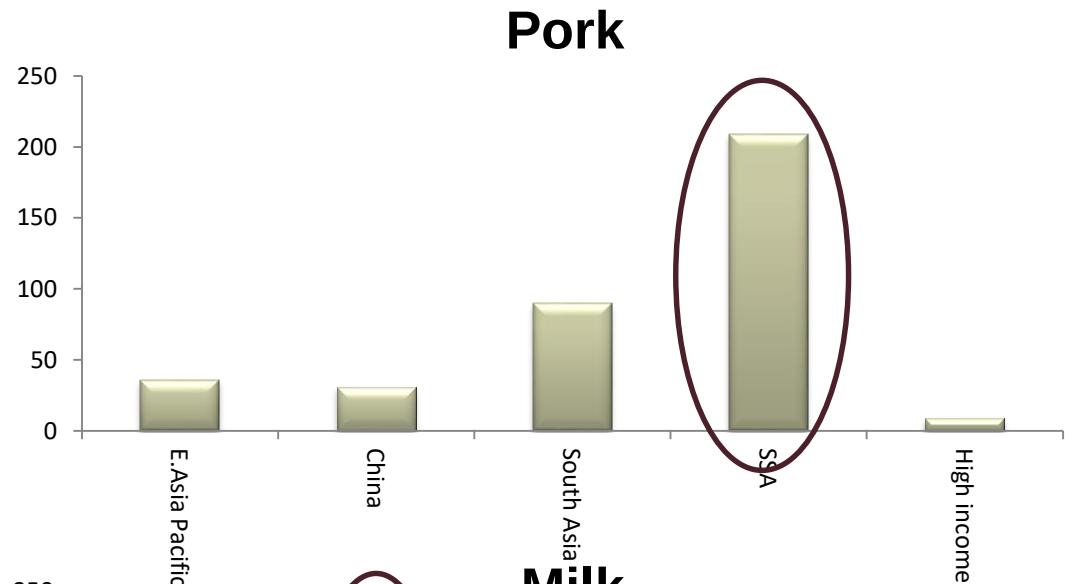
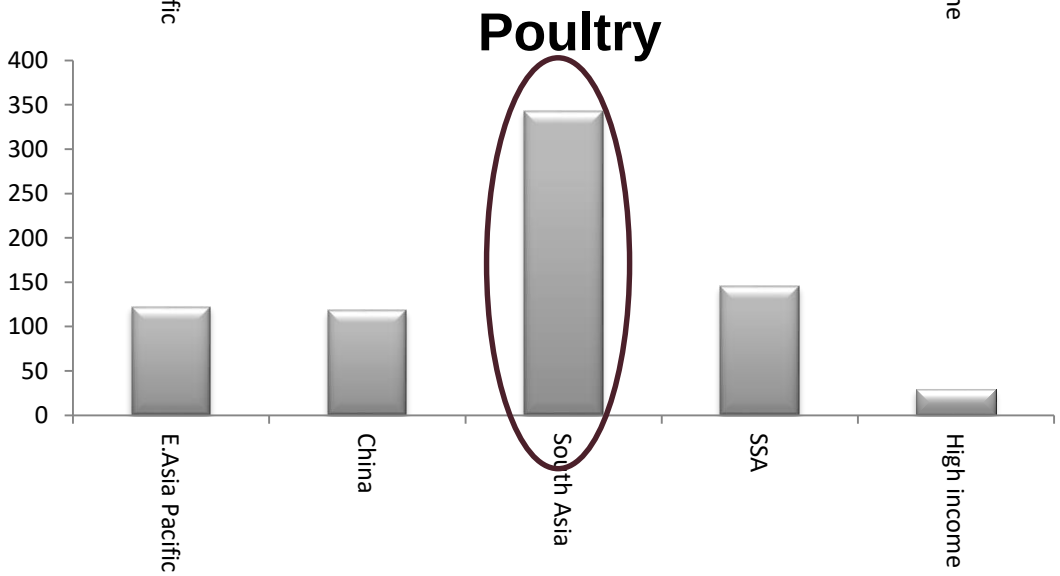
Population grow & urbanization

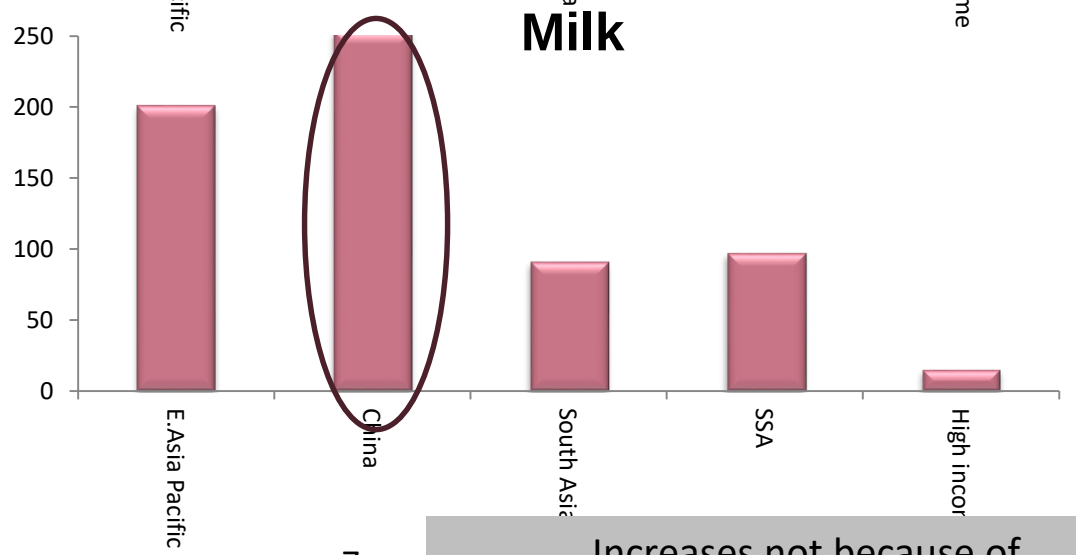
- World population was estimated at **6.8 billion in 2009**, with 5.6 billion living in the less developed regions (UN, 2009)
- Current estimates are that the population **will grow to 9.1 billion in 2050**, with most of the growth occurring in developing countries (UN, 2009)
- **Population living in urban areas is projected to rise** from 3.3 billion in 2007 to 6.4 billion 2050 (World Urbanization Prospect)

% growth in demand for livestock products to 2030 (versus 2005)





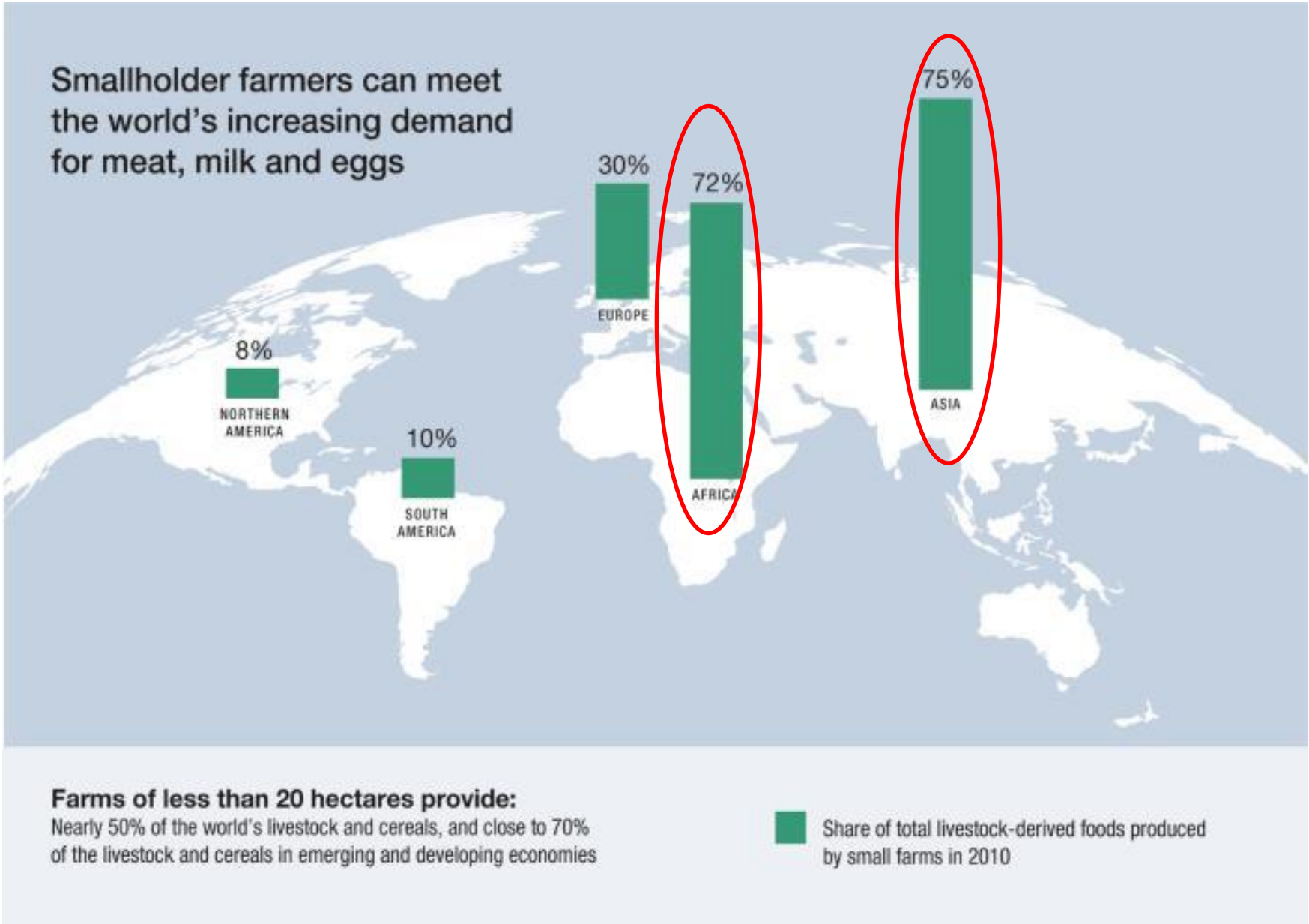




Estimates of the % growth in demand for animal source foods in different World regions, comparing 2005 and 2030. Estimates were developed using the IMPACT model, courtesy Dolapo Enahoro, ILRI.

Increases not because of overconsumption!

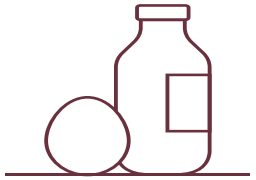
Proportion of livestock-derived foods produced by small farms in 2010



Source: *Options for the Livestock Sector in Developing and Emerging Economies to 2030 and Beyond.* World Economic Forum White Paper January 2019

Food system change & consequences

- **Food systems are rapidly changing** in many developing countries, e.g. including Vietnam, 4-5 % grow of livestock sector
- These transitions are likely to be associated with more **consumption of risky food**
  - Milk, meat, aquatic products and crops
- **Food safety** is an **emerging** public health problem worldwide

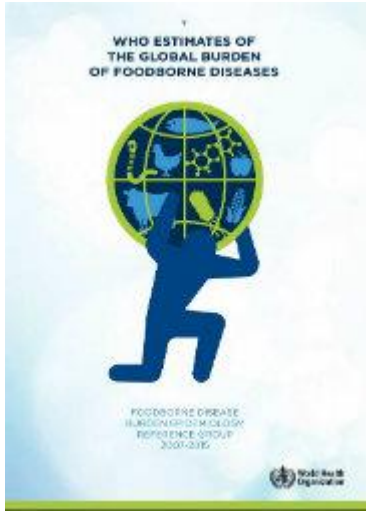


Food safety – global perspective

WHO's report: Global estimates of foodborne diseases

- For the global estimates, **31 foodborne hazards** causing 32 diseases were included, being diarrheal disease agents, invasive infectious disease agents, helminths and chemicals
- Estimated global burden these 31 hazards **was 33 million** DALYs
  - **Comparable** with burden from **Malaria, HIV and TB**
- Almost **1 in 10 people fall ill** every year from eating contaminated food
- **Children under 5 years** of age from low income countries are at particularly high risk
- **Highest burden** observed for **Africa** (East and Central SH Region) **followed** by **South East Asian** (region II)

http://www.who.int/foodsafety/publications/foodborne_disease/fergreport/en/



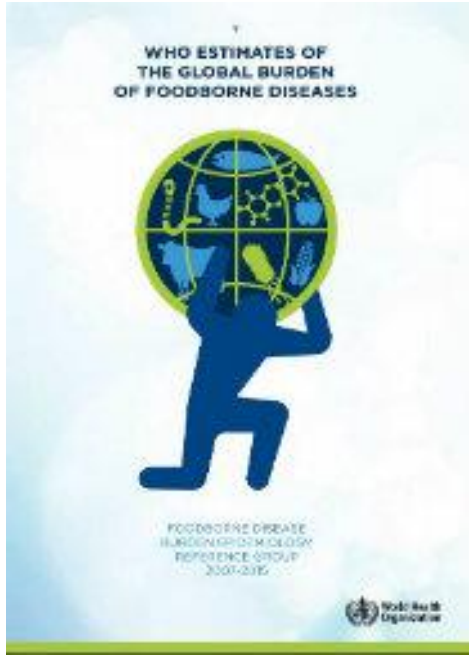
HEALTH FOOD

Food safety – global perspective

1 NO POVERTY | 2 ZERO HUNGER | 3 GOOD HEALTH AND WELL-BEING

WHO's report: Global estimates of foodborne diseases

- **Diarrhoeal diseases** responsible for more than **half of the global burden of foodborne diseases**, with 230 000 deaths every year.
- **Major causes** of diarrhoea: norovirus, *Campylobacter*, non-typhoidal ***Salmonella* and pathogenic *E. coli***.
- **Causes and impact** of **FBD** vary widely e.g. by region: *Taenia solium*, O. V., and aflatoxins.



http://www.who.int/foodsafety/publications/foodborne_disease/fergreport/en/

Traditional food chains – (traditional)/wet markets

Terminology

- It refers to **traditional markets** which sell mainly fresh foods such as meat, some seafood, fruits and vegetables.
- Usually less regulated
- Consist of different stalls with independent owners
- **Frequent use ice** to keep food fresh and **often wash products** to keep them clean and fresh.

“wet market”

Photo credit: Chea Rortana /ILRI 2020

Formal versus informal retail

- **Formal** retail: supermarkets, convenient stores, “healthy” food shops
- **Informal** retails include:
  - ✓ traditional markets and or ‘wet markets’
  - ✓ Street and /or street food vendors
- **Traditional, wet or ‘informal’** markets **supply >80%** of the food consumed in **sub-Saharan Africa***, but also the region e.g. Vietnam and Cambodia
- Often **escape** structured sanitary **inspection** and lack modern infrastructure and modern management

*Predicted to still meet 50 to 70 % of consumer demand for food by 2040

Photo credit: Chea Rortana, Chi Nguyen /ILRI 2020

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Why customers prefer traditional/wet markets

- **Accessibility**, numerous in urban areas but often the only source in rural areas
- **Cheaper** than formal/modern retail (opposite to developing countries – "organic" markets – pricy)
- **Addressing specific** consumer **demands**
  - ✓ Sell of traditional foods (including wildlife)
  - ✓ Certain meat pie, blood pudding
- Livelihood contribution
  - ✓ Income for retailers (many are women) & smallholder
- **Consumers associate** wet markets **with fresh, local, "healthy by nature** foods"
- Tourist attractions

Photo credit: Unger, Chi Nguyen /ILRI

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Traditional/wet markets are not the same

- Many markets **sell fresh meat** (often from animals killed that morning)
- **Live birds and live aquatic food**, often **killed on spot** or taken home alive
- **Only a minority** of markets **sell wildlife**: may be alive or freshly killed
- Markets **vary from permanent** structures with electricity, running water and concrete walls and floors to wooden structures with semi thatch covering, **to food sold on the ground** in the open air
- **Operation time** varies: **daily, some days week or less**

Photo credit: Chea Rortana, Chi Nguyen /ILRI

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Risk at traditional/wet markets

The **risk to human health is little understood** and variable.
There are both **risk amplifying and mitigating practices** and characteristics in wet markets. Some of these are shown below:

Risk mitigating and risk amplifying characteristics of wet market

Risk mitigating	Risk amplifying
Separation between types of fresh food (fresh/cooked or intestines and meat)	Direct or indirect contact with body fluids or between intestines and meat
Basic infrastructure: water, electricity, easy to clean surface	Keeping and slaughter live animals
Rapid turnover, selling in small amount	Selling on the ground/floor
Trust in vendor	Lack of effective, risk based inspection
Short value chain	Poor infrastructure: lack of water and electricity

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Will modern retail replace traditional/wet markets?

Modern retail:

Based on experiences on rapid growth of modern retail from other parts of the world (America, Europe, Australia, South America) the same was assumed for Africa and Asia.

But there are crucial differences.

- **Modern retail in Asia and Africa** does **not offer** offered fresh food **at lower cost** than traditional retail
- There is also a strong **preference for "warm fresh meat" =** not chilled or frozen food in Africa and Asia.
- **Selection process** of meat may include even check of consistence /"touching" of meat
- Perception that **modern retail uses more "chemicals**" e.g. grow promoters & consequently different perceived meat taste and quality

"premium shops"

Shops specialising in selling "health" fresh food at a premium (rather small outlets)

Co-existence of traditional and modern retail

For richer customers, wet markets and modern retail **may be complementary** rather than competitive

- people buying packaged food in supermarkets and fresh food in wet markets

Photo credit: Chi Nguyen/ BacTom ILRI

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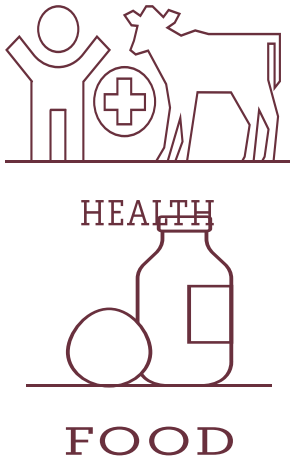
Shall we worry about wet markets?



Food safety

Wet markets often lack adequate infrastructure and food safety measures:

- **Hazards can be high, but risks can be low** if post processing involves a reliable control step
- **The informal sector is not always dangerous** and the **formal sector is not always safe**.
- The **formal sector is more vulnerable** to system failures

Transmission of emerging diseases

- **HPAI** pandemic - many **efforts to** regulate or **stop e.g. sale of live bird**s but not always effective
- **Coronavirus** emergence has also been **associated with** sale of wild animals **in wet markets** but majority wild animals are not sold in wet markets.
- Role of wet markets in the recent pandemic not fully understood

How to reduce risk from wet markets

Attempt and challenges:

- **Improve infrastructure**
  - ✓ But without changing retailers behaviour and practice tends to be unsustainable
- **Training** retailers helps to improve food safety
  - ✓ **But without incentives**, improvements are **not sustained**
- **Ban wet markets** have **usually failed** and often had serious un-intended consequences.
- **Enforcing high standards such as modern retail often failed** to
- So far there was l**imited investment and research** into informal markets

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What can be done differently?

Existing regulations sometimes inappropriate or not exist e.g. for small-scale slaughter

Rather gradual upgrading of existing structure than infrastructure change

- Provide simple technologies to make food safe (e.g. cheap, easy to clean surfaces)

Participatory, risk-based, demand-led approaches seem most promising (not-top down or purely regulatory)

Understanding health risk from informal markets (as opposed to presence of hazards)

Tackling most **risky features first**

Implementing and **evaluating potentially scalable** and sustainable interventions

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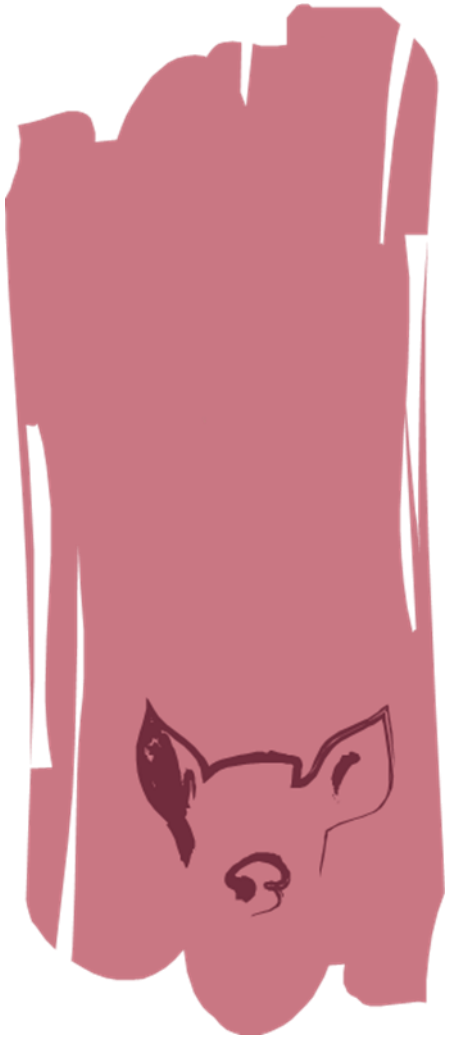
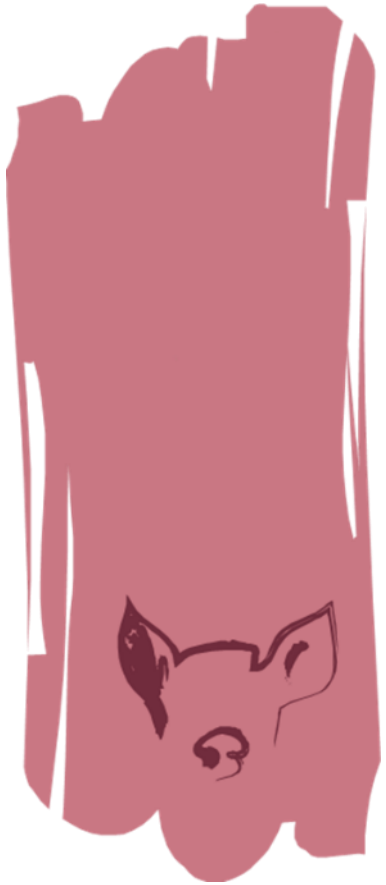
ILRI's current research on pork value chains in Vietnam & Cambodia



- **Pork is most important meat** diet for consumers (similar in Laos, Thailand and Cambodia)
- Most of this is **produced, slaughter and sold in traditional** markets
- **Food safety** has become an increasing **concern** (consumers & policymakers)
- Concerns include contamination with **chemical and microbiological** hazards
- **Little information on the actual risks** or how to manage them.

Food safety performance tool **Aim & pillars:** Safety, scalability and societal concerns



Aim: Allow rapid assessment of food safety outcomes in value chains

Safety: Core of the tool using a **risk-based approach** to provide robust assessments of food safety outcomes food commodity (e.g. pork).

⬇

A value chain may provide safe food but have little potential for scaling (e.g. niche products)

⬇

Sustainability and scalability assessment of the value chain.

- **Business performance** (e.g. market share, expected trends, potential for change) and supply chain **governance** (e.g. trust and interventions).

Societal concerns

- **supplementary to pillar 1 and 2** such as **gender** and equity, **cultural norms** etc. which may synergize or trade-off with food safety.

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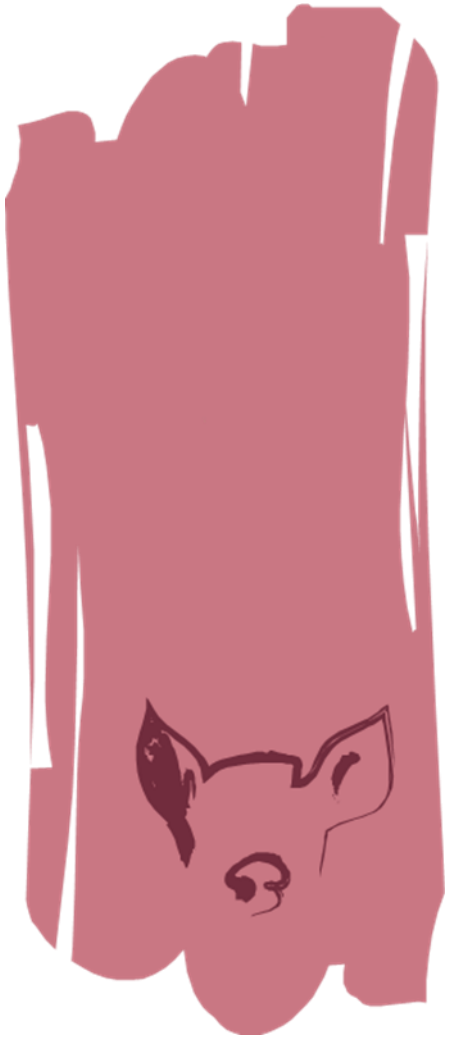
How the tool was used



- **Qualitative** (focus group discussions, FGD, key informant interviews, KII)
  - > 500 KII and 12 FGD
  - Content: Business scale & trends, trust, governance, KAP, intervention (perception)
  - Farm to fork
- **Quantitative** (biological sampling and observational checklist) using a probabilistic sampling design to ensure representativeness.
  - >700 samples collected across different pork value chains
- **Value chains** (Sep 2018 – May 2019):

Traditional/ wet market (all sites)

Street food, Hanoi

Canteens, Hanoi

„Boutique“ food chains, niche but emerging, Hanoi

Supermarket convienient stores, Hanoi

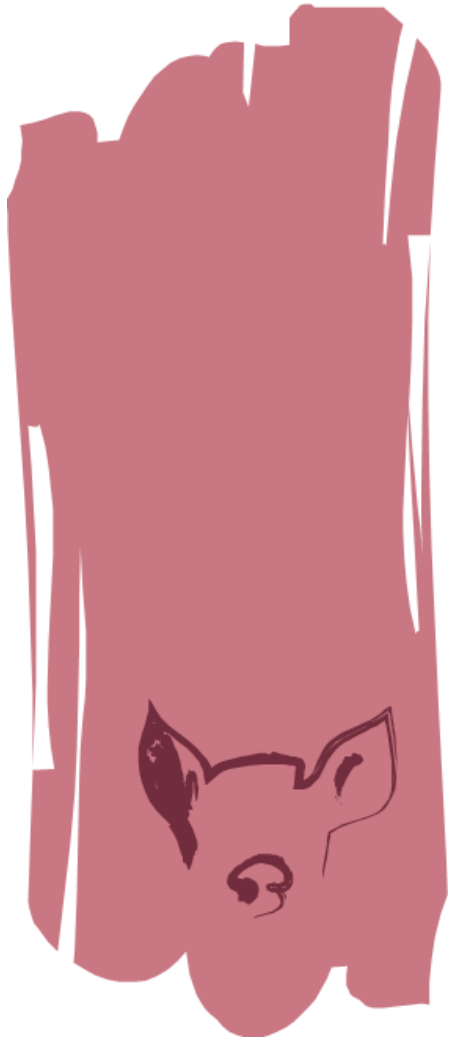
Native pigs, Hoa Binh, „safe by nature“

*Photo credit: Chi N/ILRI and BacTom 2018

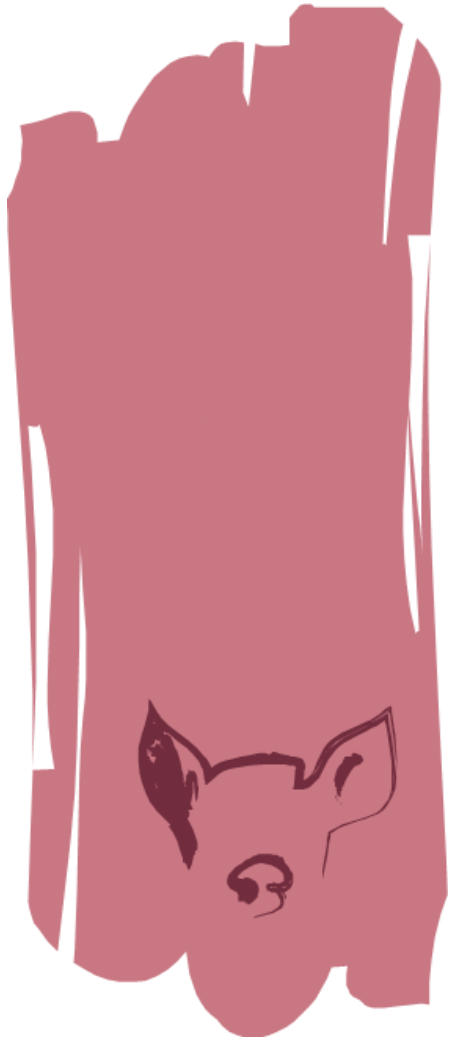
Key results

Safety:

- **Poor food safety outcomes** across all retail types
- Value chain actors **incorrectly perceive** chemical **hazards** as more important than microbiological
- **Poor hygiene was blamed** as the main reason leading to foodborne disease, **but** this **perception wasn't** necessarily **translated into better practice**



Key results



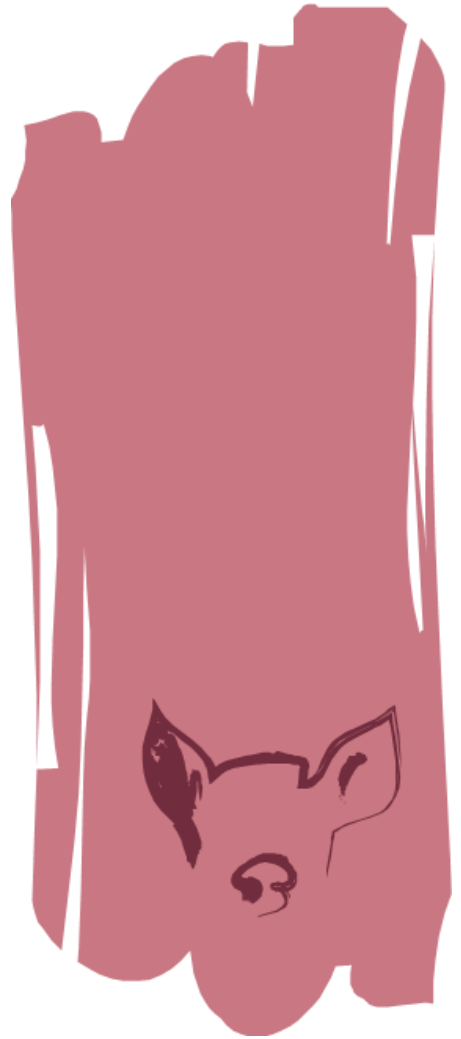
Scalability/sustainability:

- Business of **pork value chain slowly recovers** from ASF, rather minor affect of COVID-19
- Overall **trust** levels on food safety **decrease from rural to urban** areas
- Trust was **lowest with social media** and highest with TV and local radio
- **Traditional** markets and slaughter **will continue to provide most pork** and should continue to be a focus

Key results

Societal norms:

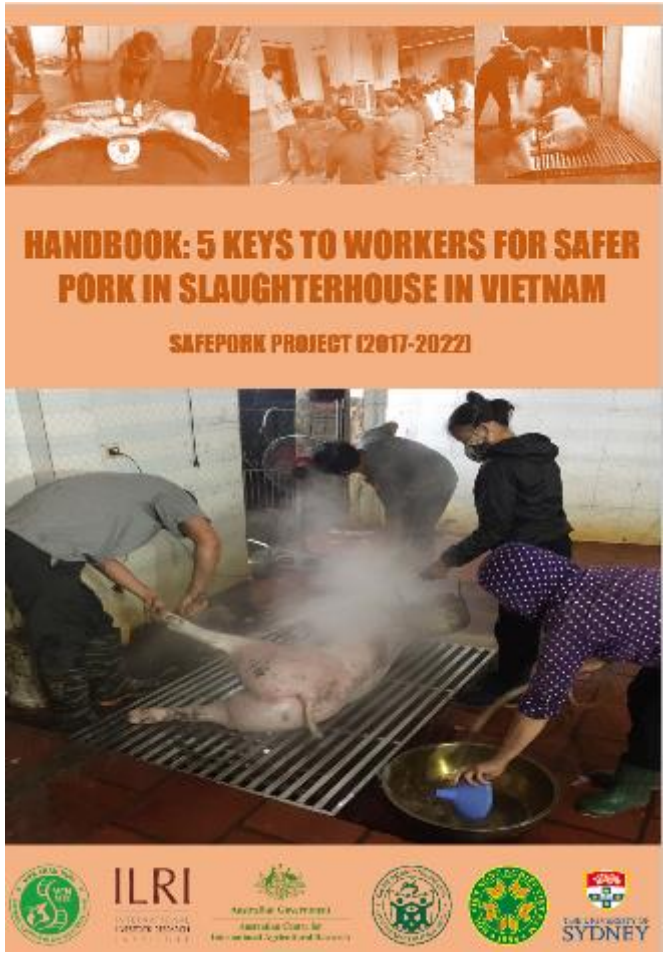
- **Women seem more cautious about chemical** residues in pork/food than men.
- **Women** also **worry more about foodborne disease** more frequently than men.
- **Man** more in **favour of purely technical interventions** than woman



Chosen value chains for intervention based on results from FS performance:

✓ Small-scale traditional sector (slaughter and retail)

Food safety intervention at slaughter* and retail



Approach:

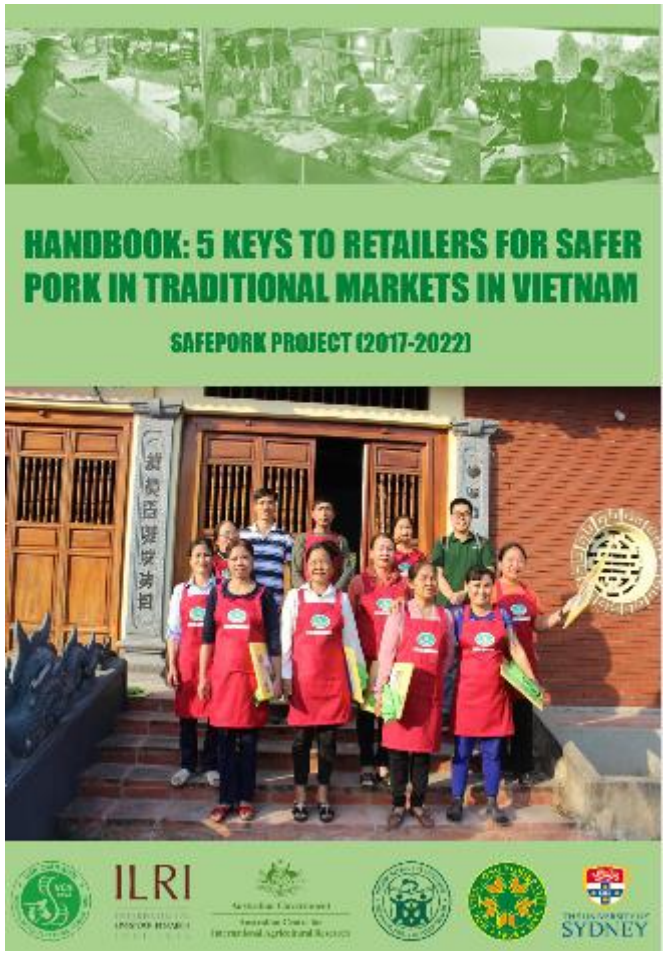
- Participatory risk-assessment
- Supportive formative research with model retailers
- Risk communication

Key content*:

-Grid slaughter
-Frequent washing (and disinfection)
-Training
-Separation clean/dirty
-Branding

Key content:

-Easy to clean surface
-Frequent washing (and disinfection)
-Separation (fresh/cooked)
-Training
-Hygienic cutting board
-Branding



Handbooks

*only Vietnam

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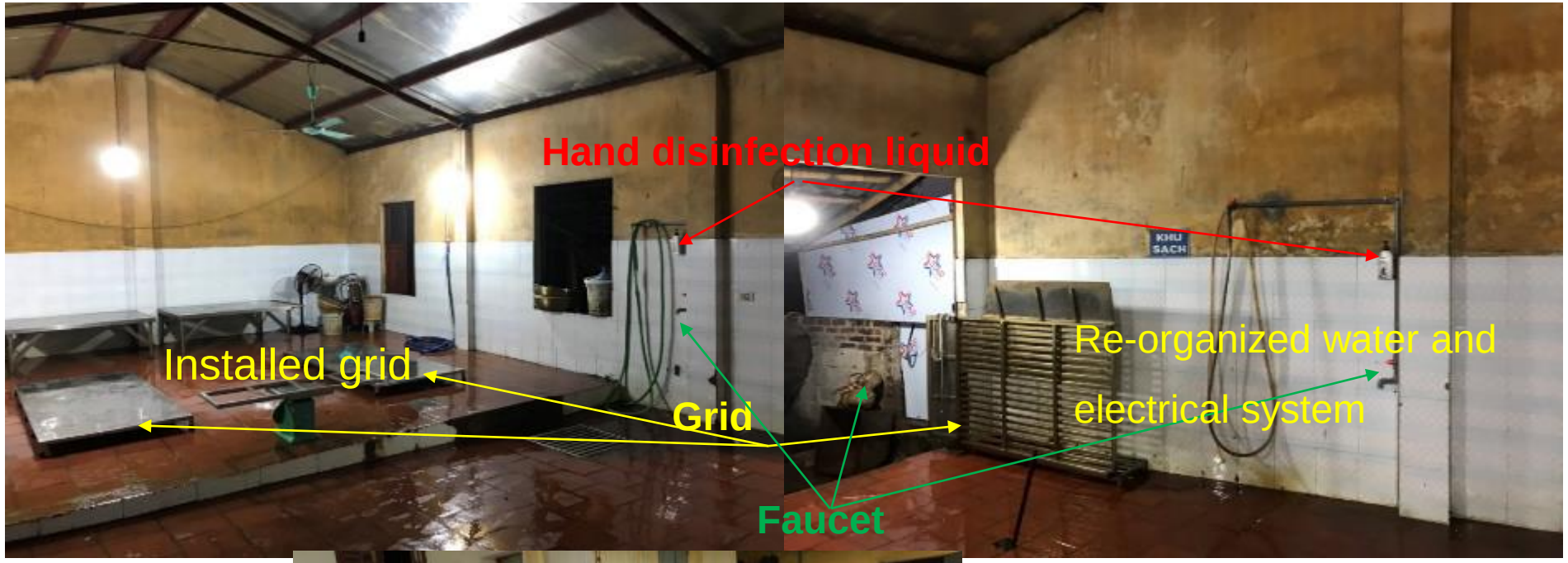
Food safety intervention at slaughter - example



Training for SH owners & workers

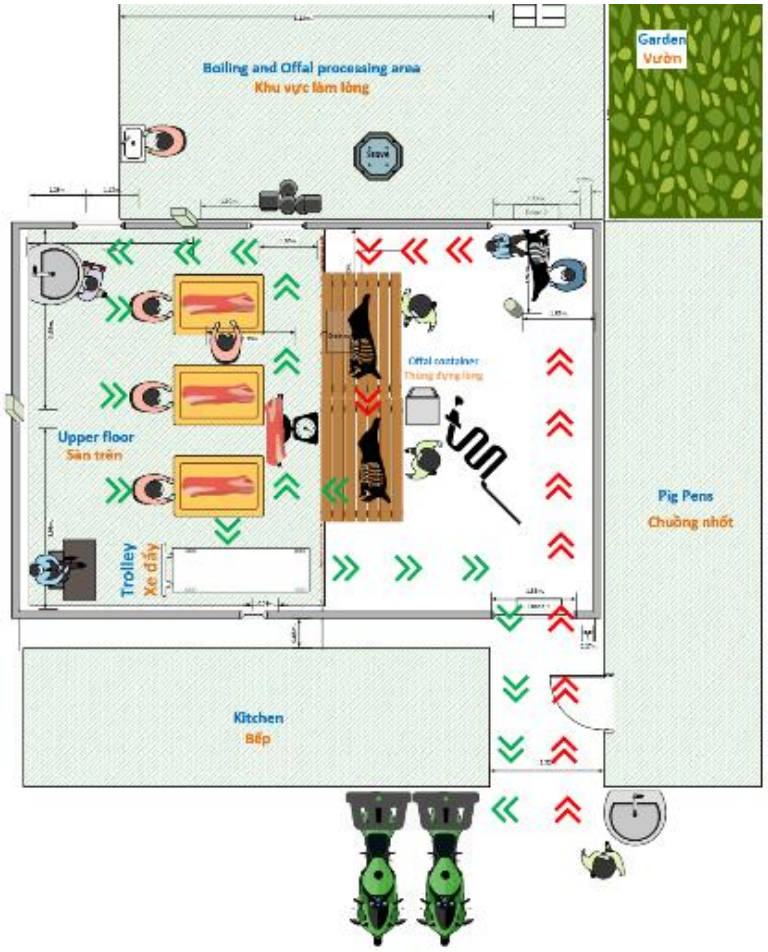
Photo credit: Sinh Dang Xuan/Chi Nguyen ILRI 2020

Food safety intervention at slaughter - example

Avoid floor slaughter

Photo credit: Sinh Dang Xuan/Chi Nguyen ILRI 2020

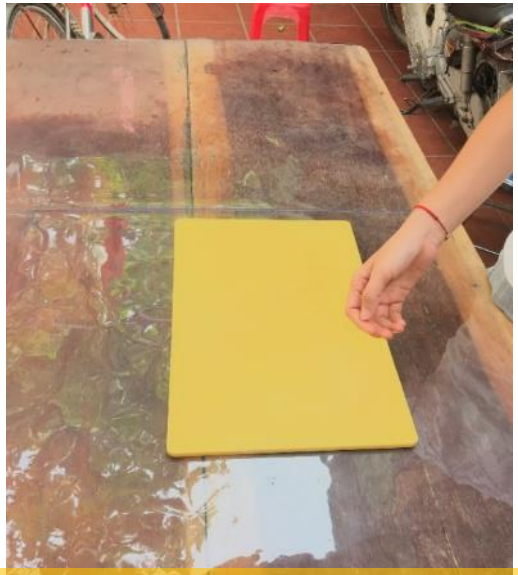
Change of workflow (clean/dirty)

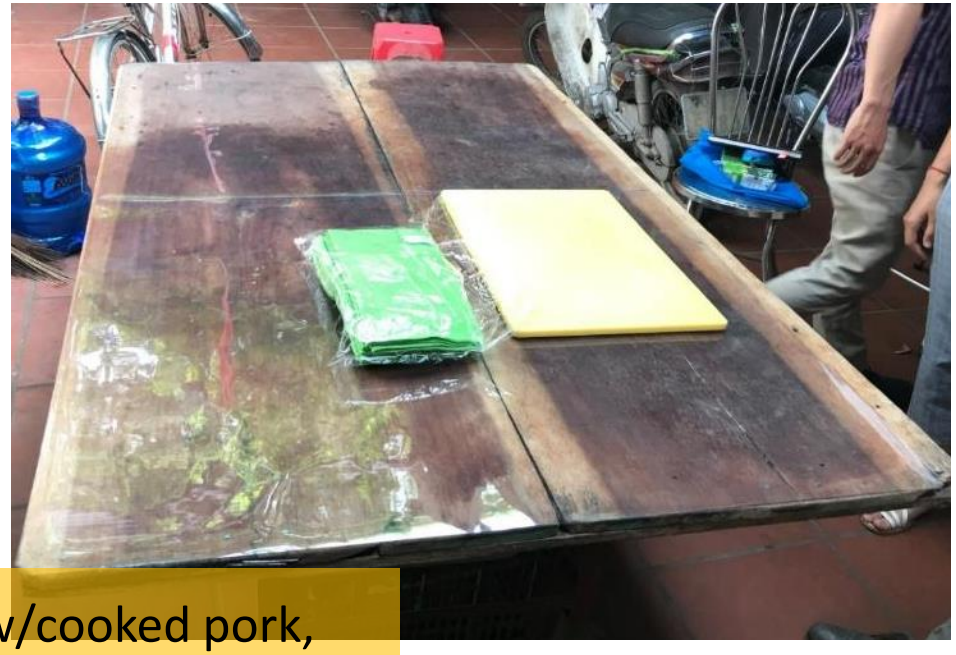


Posters to support behavior change

- Marked decrease of coliforms; investment 100 -1500 USD
- COVID-19 concerns help to convince butchers and retailers to use disinfectant

Food safety pilot intervention at retail – Vietnam





Package: Easy to clean table surface, inox tray, separation of raw/cooked pork, cutting board, and detergent/disinfection & training: **less than 25USD**

Tendency of hygienic improvement (surfaces)

Photo credit: Sinh Dang Xuan ILRI 2020

Food safety pilot intervention at retail - Cambodia

Photo credit: Rortana Chea ILRI 2020

Package: Easy to clean table surface, separate meat from intestine, inox tray, cuttings board, cloths and detergent/disinfection & training: **less than 20USD**

Tendency of hygienic improvement (pork)

Since COVID 19 emergence we see some better compliance on the use of disinfectant

Preliminary results from COVID-19 impact survey at traditional retail in Vietnam

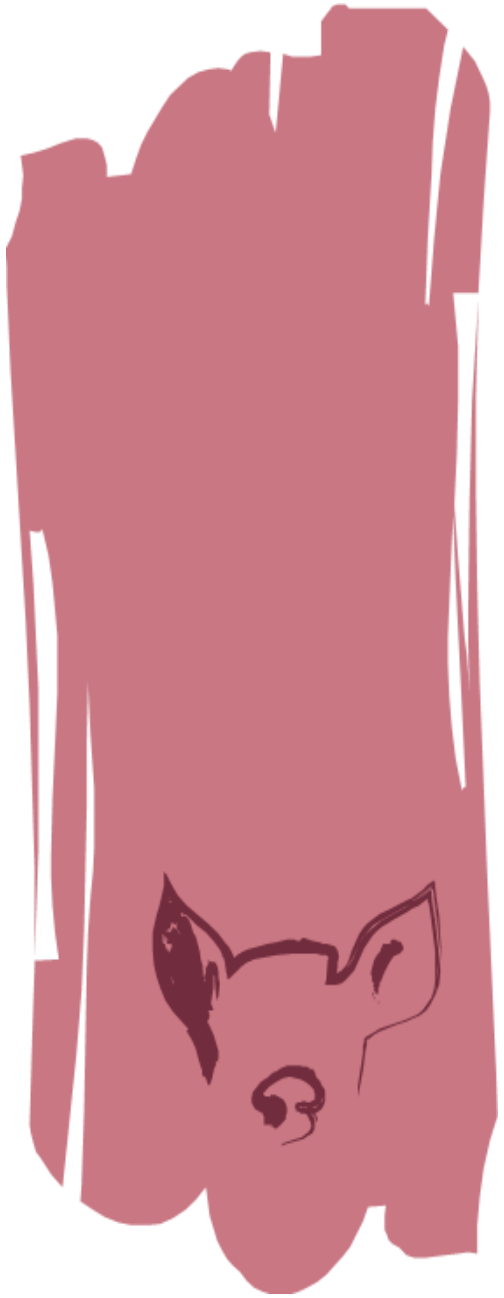
Methodology: 150 traditional retailers (**75 urban and 75 rural**), KII on impact and hygienic practice change, also done in Thailand, Laos and Cambodia

Hygiene behaviour & practices changes – before/during/after lock down

- **Cleaning/sanitizing** working facilities/tools - **more frequent**, especially in urban context
- **Most observed changes**: in washing & **sanitizing hands** AND **wearing masks** & gloves during working (selling), especially in urban
  - remained after lockdown although less popular in rural
- **Keeping meat chilled** or **frozen** becoming (somewhat) more frequent, especially in urban
- **During lockdown**: **less eating at** meat **stalls** BUT **after lockdown resuming** in urban while remaining in rural *(perhaps because of the longer selling/working time in urban?)*

Take home messages

- ✓ Population grow and **aligned higher demand for livestock** may lead to **increase risks**
- ✓ **Traditional retail plays** an **important role** in Asia and Africa and will remain to do so
- ✓ The **informal sector** is **not always dangerous** and the **formal sector** is **not always safe**
- ✓ **Western based mitigation approaches** to cope with risks from informal sector **may not be effective**
- ✓ Results from **pilot interventions** at traditional slaughter and retail **are promising** but further consolidation required
- ✓ **COVID-19 pandemic** tends to result in better compliance of retailers



Future research around traditional retail my include:

- **Understanding typologies, harms and benefits** of formal and informal markets across criteria such as: health, nutrition, livelihoods, accessibility
- Understanding **health risk** from those markets (opposed to presence of hazards)
- Participatory risk-assessment
- Identification of **risk mitigating, scalability** and **practices** at **these**
- Consider also **societal aspects**
- Identify **low-cost solutions** combined with training and incentives
- Explore **COVID-19 as an opportunity** for **better compliance** of food retailers

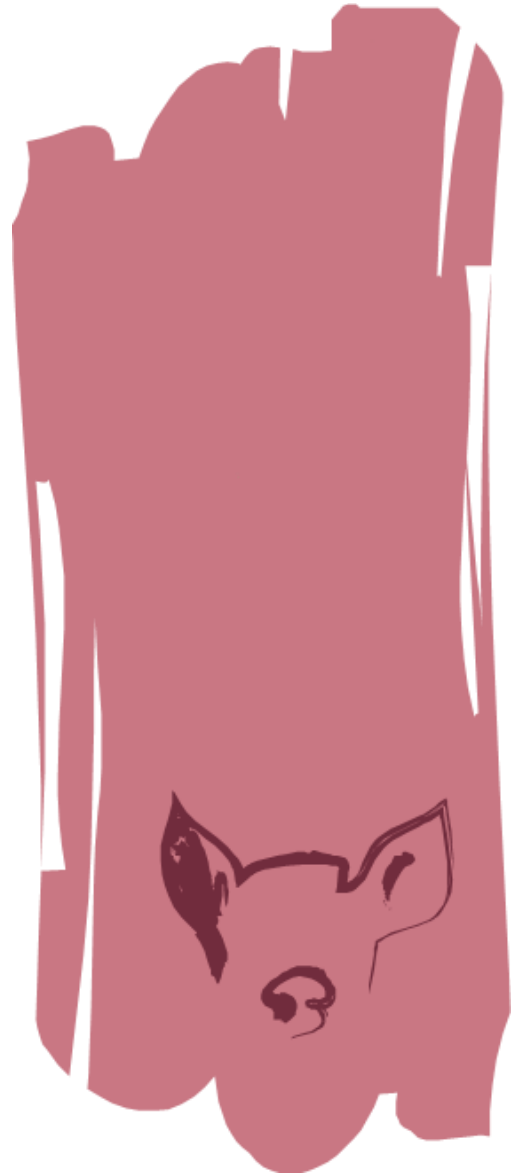


Photo credit: Unger/Rortana Chea/Sinh Dang Xuan/Chi Nguyen/Unger ILRI 2020

Further readings:

Video: https://www.youtube.com/watch?v=-CZVyxCG8Zk

Research briefs: https://cgspace.cgiar.org/handle/10568/108320; https://hdl.handle.net/10568/108768; https://hdl.handle.net/10568/108769; https://hdl.handle.net/10568/102172

Reports: https://www.worldbank.org/en/country/vietnam/publication/food-safety-risk-management-in-vietnam-challenges-and-opportunities

CGIAR COVID-19 Hub: http://a4nh.cgiar.org/covidhub/

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