

*Rural Livelihoods and Institutions
for Livestock Promotion and
Animal Health:
Evidence from the GMS*

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11 January 2012

EcoHealth, One-Health Lecture series:

*EcoHealth: Global change, local action, and interdisciplinary
challenge for global health and sustainability*

Chiang Mai University, Thailand

Project Background - Acknowledgements

The research reported here was conducted under UKAID (DfID) sponsorship, entailing a three year collaboration between UN/FAO, UC Berkeley, and the Royal Veterinary Academy (UK).

This presentation is the result of joint work with many colleagues, including the speaker and Joachim Otte, Dirk Pfeiffer, and David Zilberman.

We are especially grateful to Jennifer Ifft, Sam Heft-Neal, and Drew Behnke for outstanding research assistance, as well as many others who helped us.

Livelihoods

1.2 Poultry sector dynamics and consumer preferences

1.3 Household poultry keeping and marketing

3.1 Driving forces of HPAI control

3.2 Applied control measures and their efficacy

3.3 Livelihoods and economic impacts of HPAI & HPAI control

3.4 Alternative approaches to HPAI control

4.1 General observations about livestock disease control in the
GMS

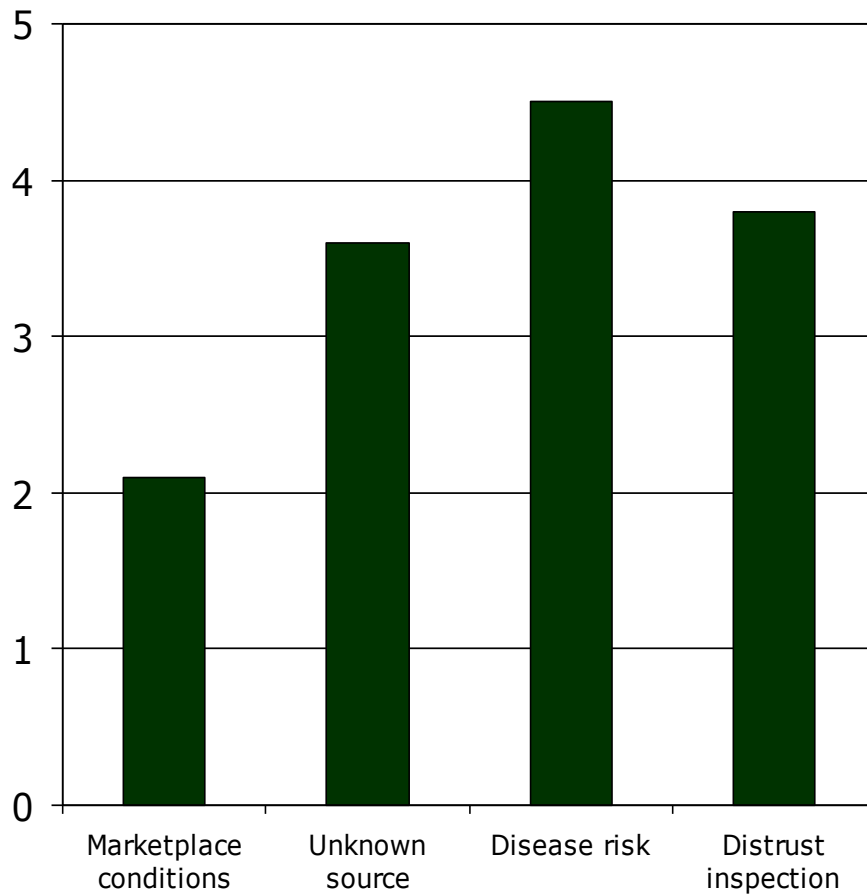
NB: Outline numbers refer to the supporting project document.

1.2 Poultry sector dynamics and consumer preferences

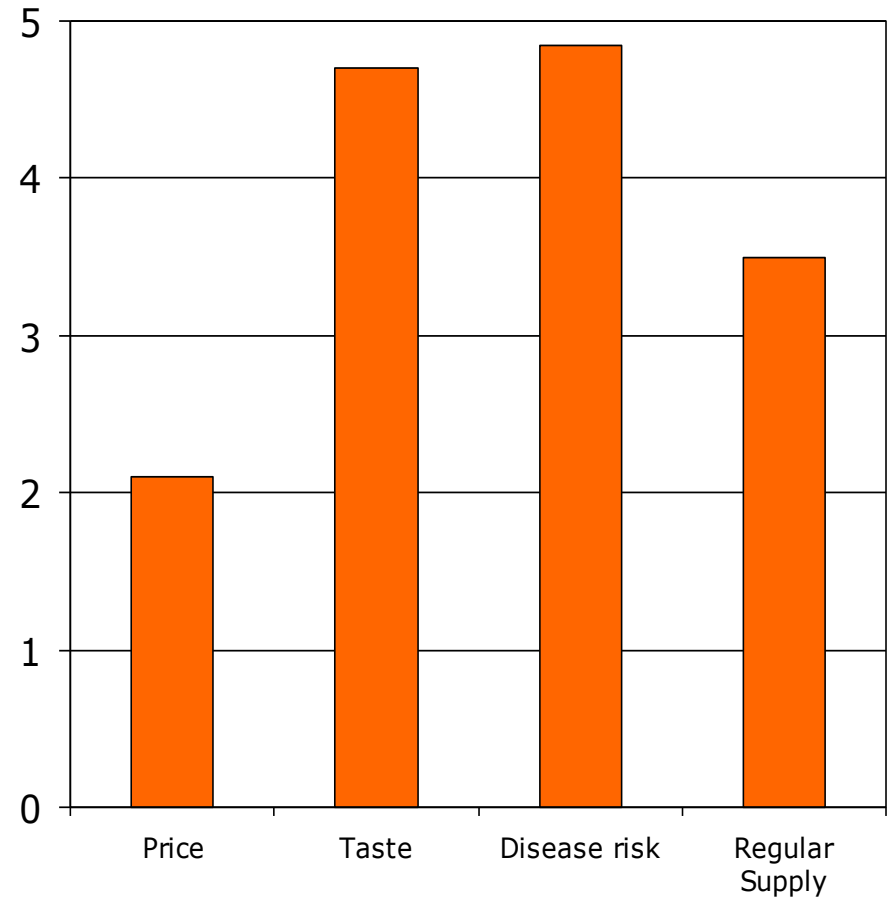
1. Most urban consumers remain regular patrons of wet markets, and are very discerning consumers of fresh poultry products, preferring 'traditional' to 'industrial' chicken.
2. Consumer surveys consistently value food safety ahead of other food product characteristics, with taste a close second.
3. Demand for local varieties of poultry often exceeds supply in local markets .

Consumer Concerns & Preferences

Ranking of Safety Concerns

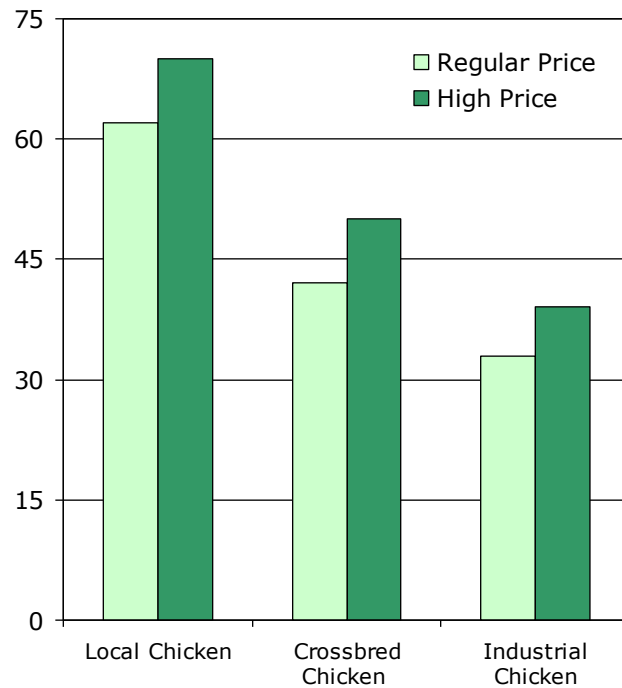


Ranking of Chicken Attributes



Price Profile of Chickens

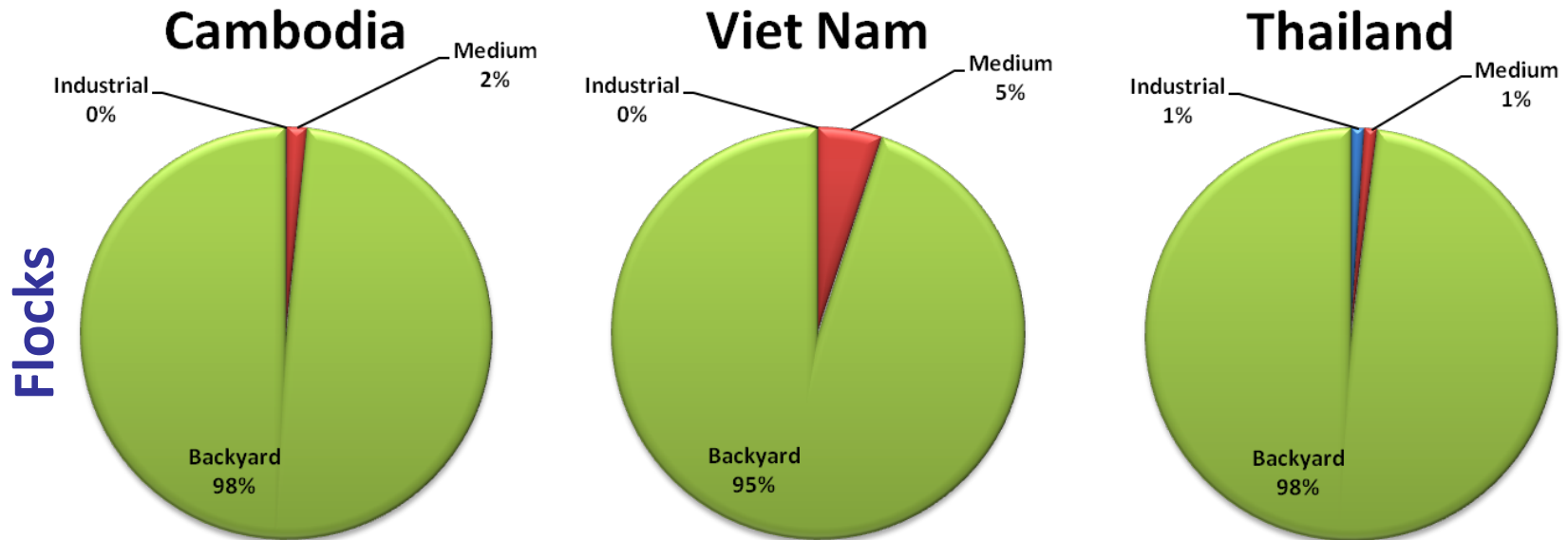
Price by Chicken Type (VND in '000)



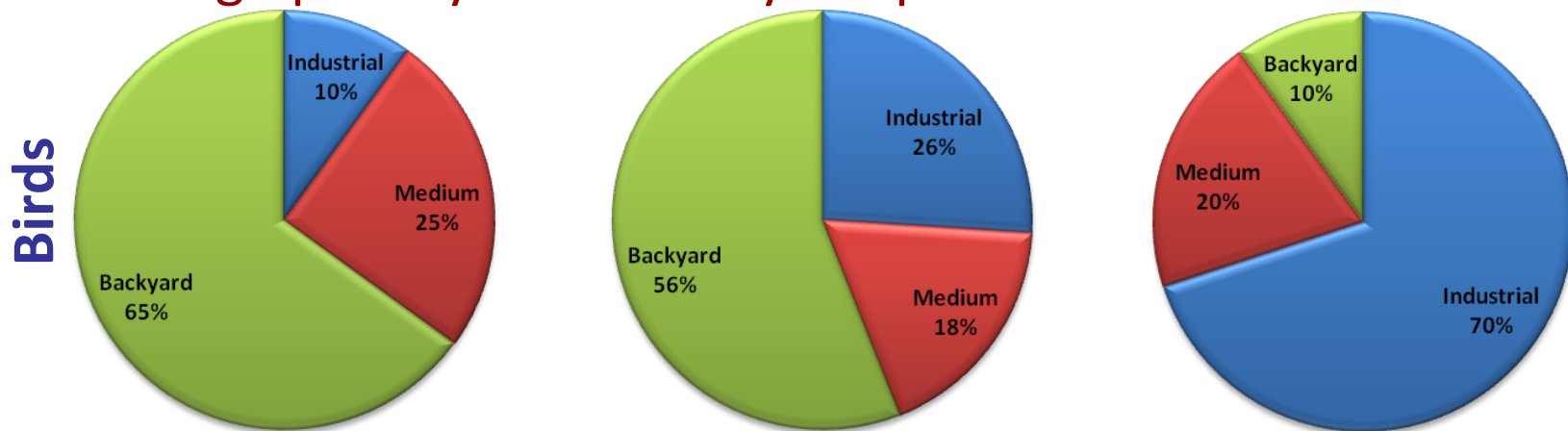
1.3 Household poultry keeping and marketing

1. Nearly all rural households in the GMS keep poultry for both sustenance and income, specializing in traditional bird varieties raised in low-input systems.
2. Though small in absolute terms, the relative returns to selling poultry products are very high.
3. In addition to nutrition and income, poultry offer rural households a complex array of services, including pest control, fertilization, security, and entertainment, and birds and bird products serve a variety of cultural functions.
4. The majority of small scale producers face credit constraints.

Backyard Chickens are Ubiquitous



although poultry sectors may be quite diverse...



Backyard Chickens are Profitable

(Vietnamese evidence)



Average Return per Hen and Year
(Monetary Values in 1,000 VND)

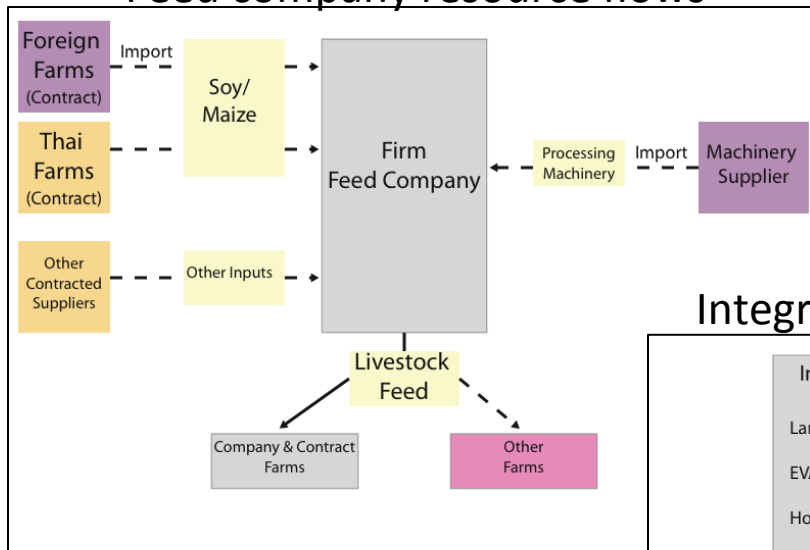
Item	
Eggs consumed/sold (nr)	35.0
Birds consumed/sold (nr)	6.7
Value of eggs consumed/sold	49.0
Value of birds consumed/sold	244.7
Depreciation of hen	6.3
Gross revenue/hen	287.4
Investment/hen	50.0
Return on investment (%)	575.0

3.3 Livelihoods and economic impacts of HPAI & HPAI control

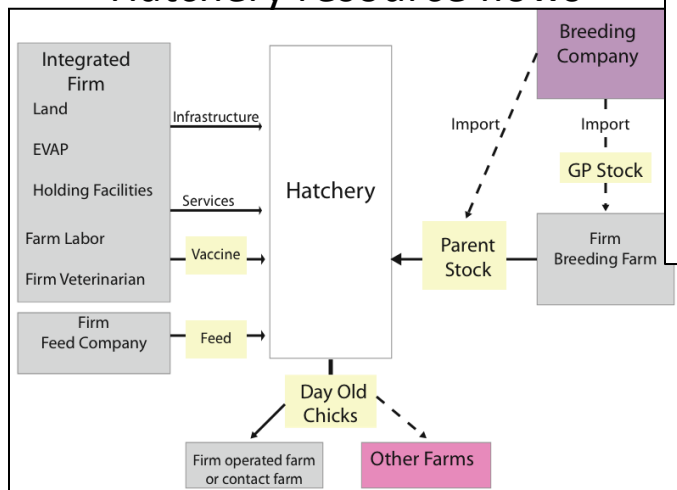
- 1. HPAI causes economic losses through a complex mixture of impacts acting through direct and indirect pathways.**
- 2. Drastic disease control measures and consumer reactions to HPAI have severe impacts on all actors in poultry supply chains irrespective of the specific infection status of their flocks.**
- 3. Smallholder poultry producer households have well-developed strategies to cope with one-time losses of their poultry.**
- 4. Poultry production and processing standards promoted by the industrial / corporate sector are reducing the prospects for smallholder poultry development.**
- 5. Changing market environments in response to HPAI pose more serious threats to smallholder poultry producer livelihoods than HPAI itself.**
- 6. Low-income urban consumers are neglected stakeholders in HPAI control.**
- 7. Consumers have re-evaluated the risk posed by poultry and adjusted their consumption habits.**
- 8. Poultry producers who bore the largest cumulative economic burden of HPAI differ from those whose livelihoods are most severely affected by the disease.**

Supply Chain Audits

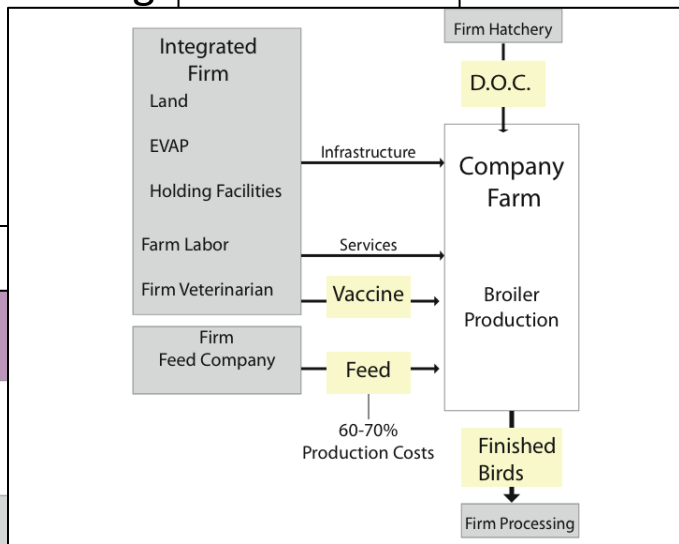
Feed company resource flows



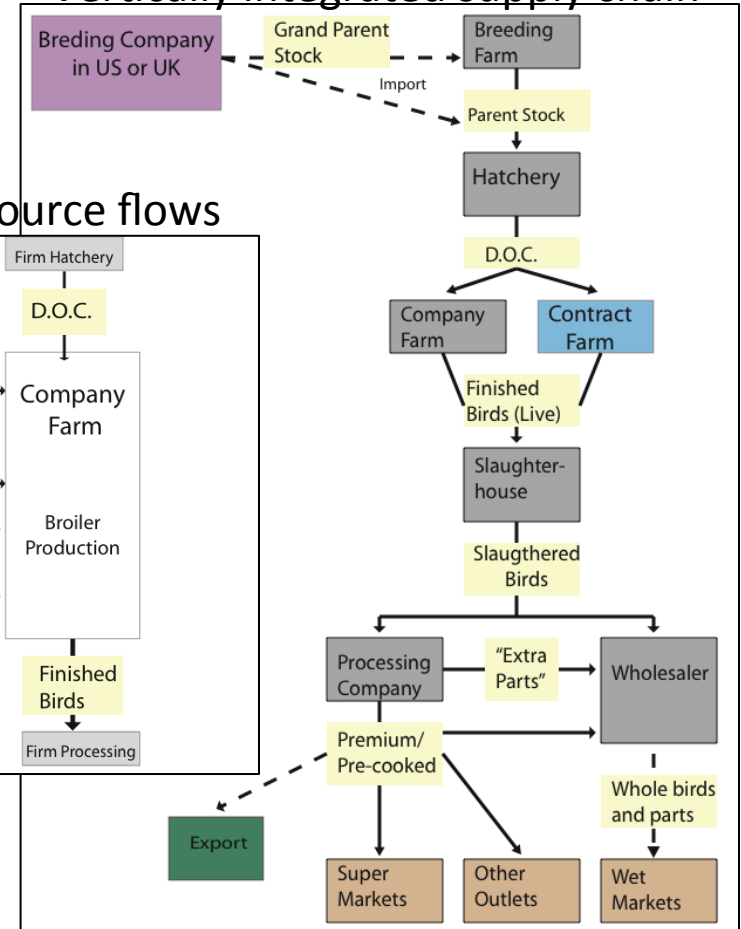
Hatchery resource flows



Integrated farm resource flows



Vertically integrated supply chain



4.1 Alternative approaches to HPAI control

1. Any attempt to formalize markets without maintaining low transactions costs will displace low income participants.
2. Diffusion of coping mechanisms along food supply chains, supported by incentive-compatible policies, can enhance social effectiveness of public and private HPAI risk management programmes.
3. Consumers continue to exhibit a preference for local poultry breeds and are willing to pay significant premia for this preference, which can be used to finance self-sustaining and credible supply chains for healthier, higher quality poultry.
4. The need for improved disease surveillance is global, willingness to pay at each location may be small, but gains may be substantial.

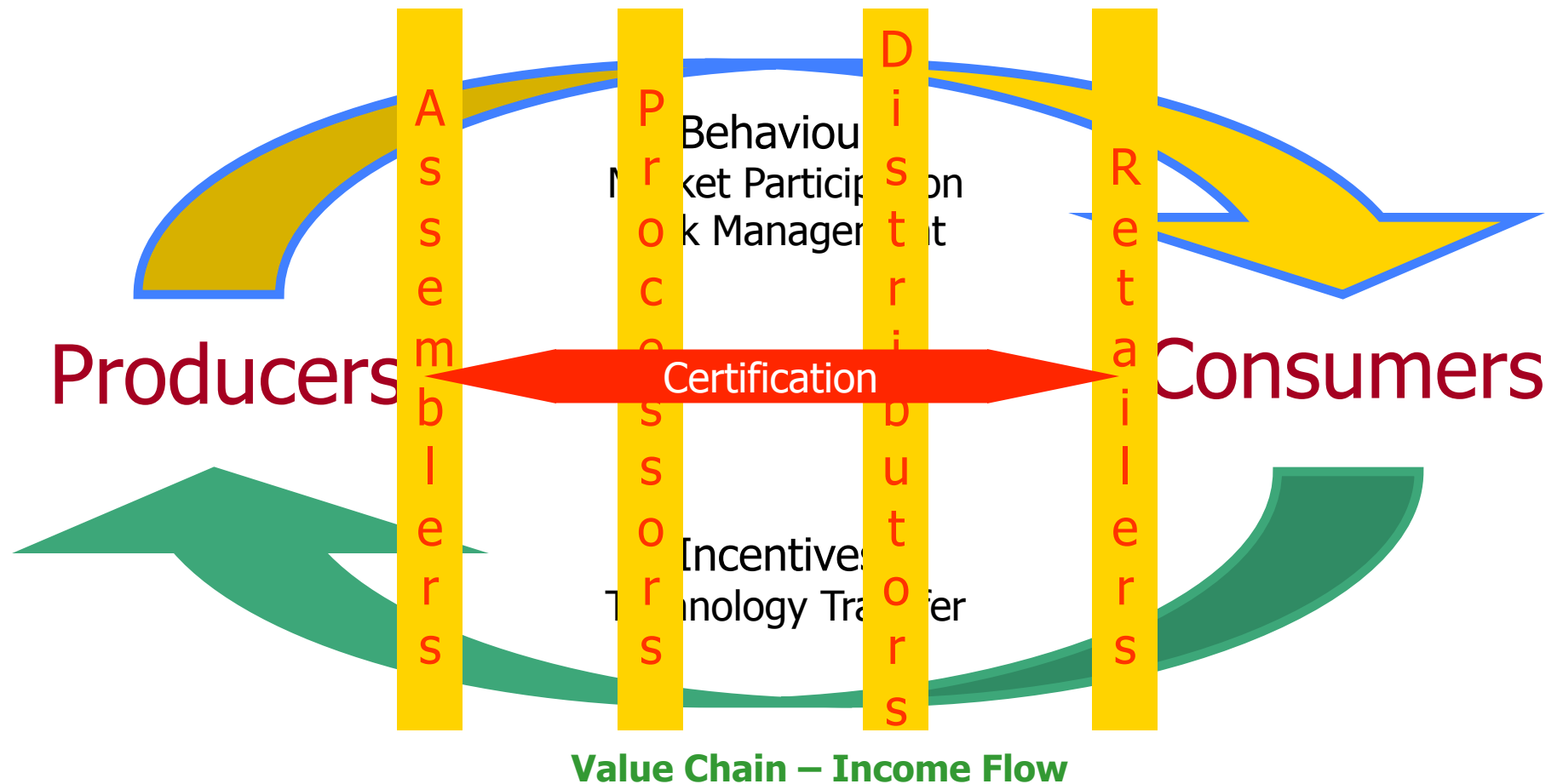
Supply Chain Interventions

- Certification
- Contracting
- Cooperatives
- eTrading



Certification to Reduce Market Uncertainty

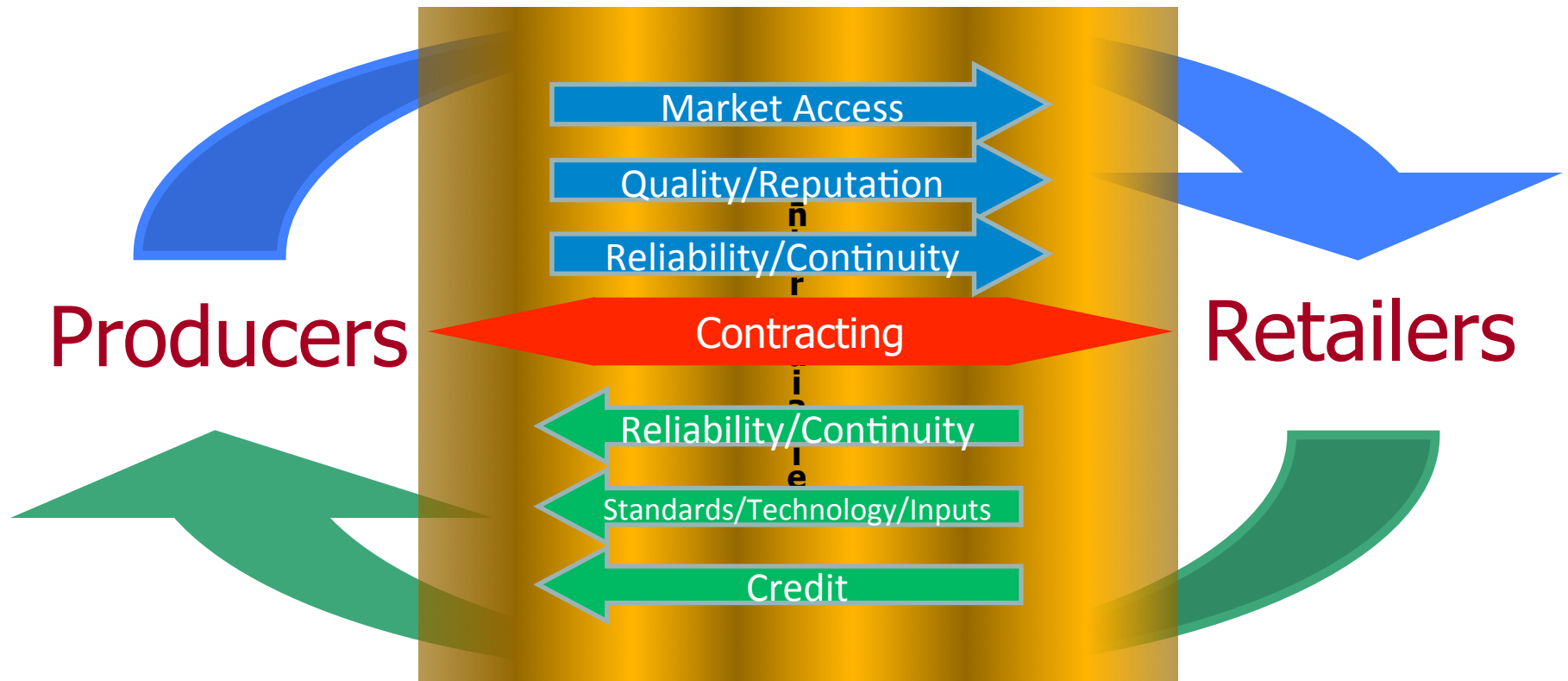
Supply Chain – Resource Flow



See HPAI Research Brief No. 4

Contracting to Facilitate Value Creation

Supply Chain – Resource Flow



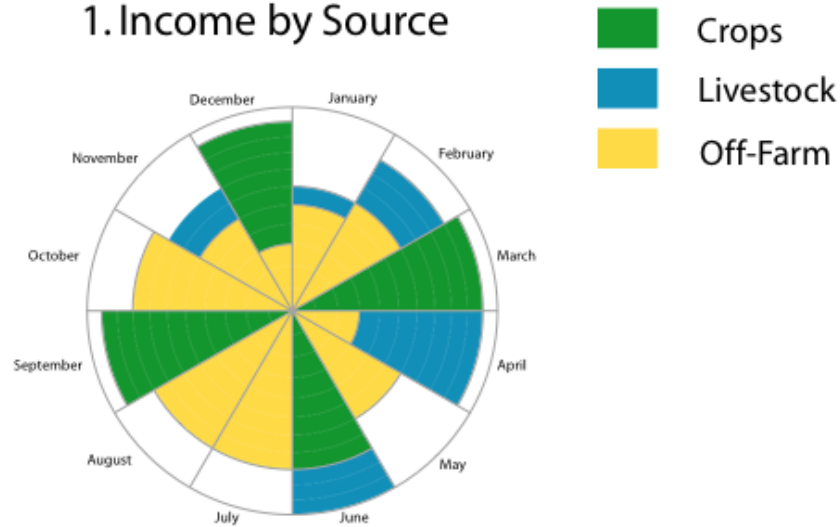
Value Chain – Income Flow

eBird – An SMS based poultry trading system

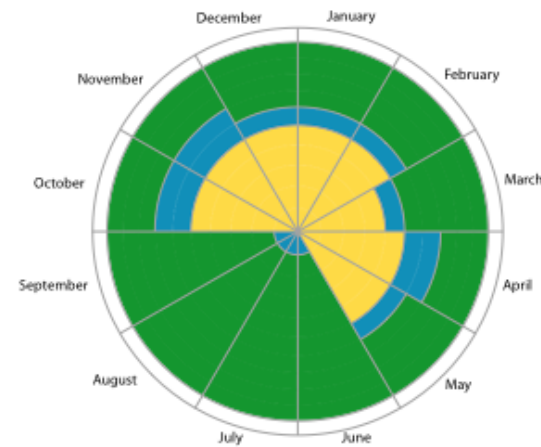
- Objective: Create a clearinghouse for poultry meat transactions that uses Short Message Service (SMS) text messaging as the means for connecting individual buyers and sellers across low income agrofood supply networks.
- The purpose of the system is to facilitate producer-consumer information exchange and improve producer incentives to invest in quality improvements by providing the opportunity to build reputation.
- Such improvements, including nutritional values and animal health status, will increase value added and improve livelihoods across low income supply chains extending from smallholder farmers to independent urban food vendors.

Seasonality in Smallholder Activity/Income

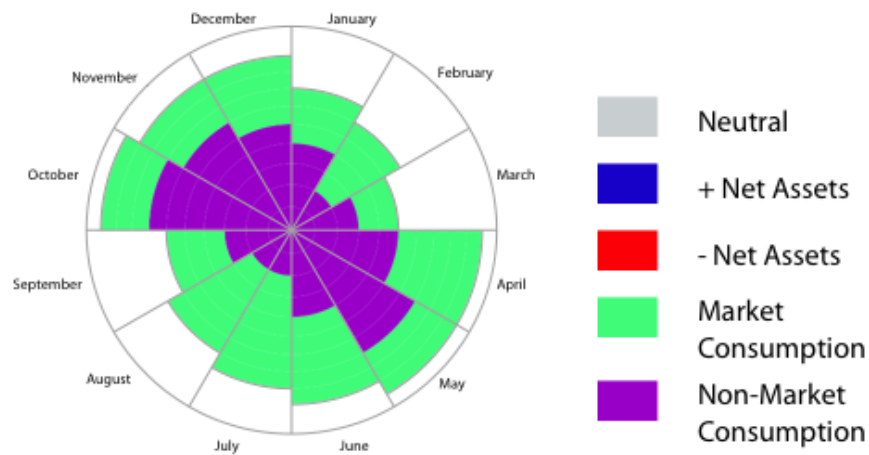
1. Income by Source



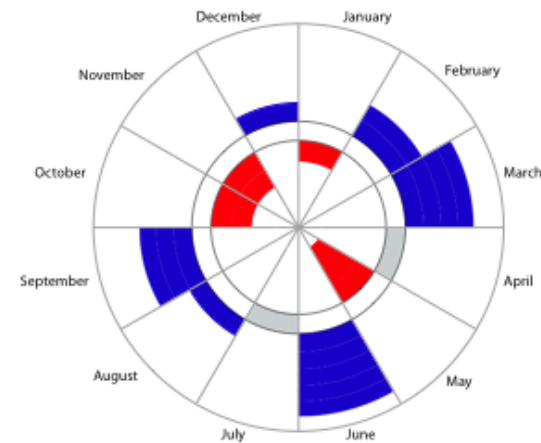
2. Labor Allocation



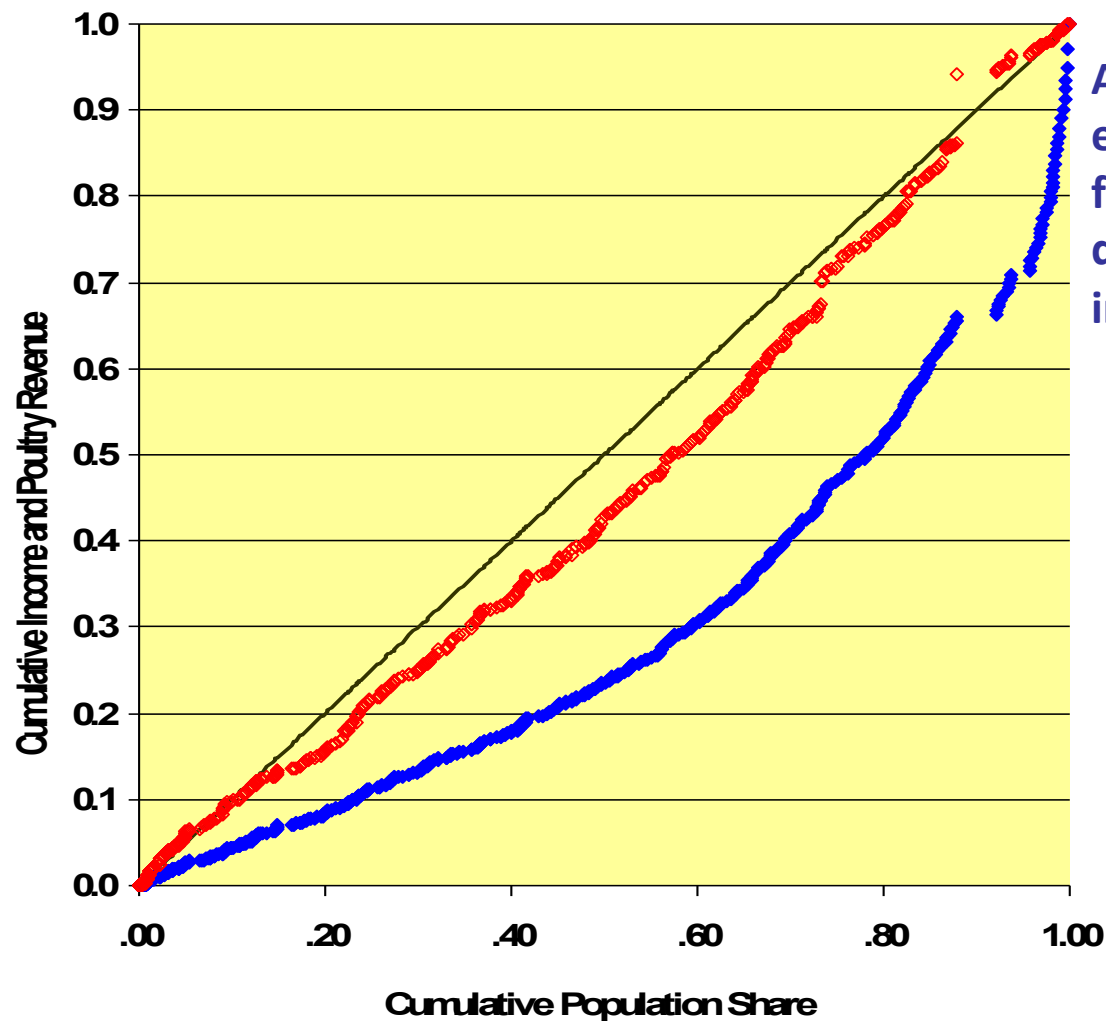
3. Consumption



4. Net Cash Assets



Poultry Income is Pro-poor



Across the Viet Nam national economy, poultry income is far more equitably distributed than total income !

Top Livelihoods Findings

- Publicly funded blanket vaccination campaigns are costly and appear to be ineffective against HPAI in areas with a high prevalence of small-scale poultry keepers raising birds in 'traditional' ways mainly for home consumption. Targeted vaccination of specific high-risk groups can achieve comparable risk reduction at a fraction of the cost.
- Radial approaches to culling birds and destruction of smallholder poultry infrastructure, which are very costly to communities, appear to contribute little to risk reduction and deter broad-based cooperation in HPAI control programmes. Culling should be limited to infected flocks and high risk contacts. Infrastructure can be disinfected, but should not be destroyed.
- Although they comprise the vast majority of poultry keepers in the GMS, smallholders do not presently have a voice in the design of short- and long-term HPAI policies. Omitting this stakeholder group is a mistake that compromises policy effectiveness and legitimacy.
- It is essential to recognize the smallholder poultry producers as part of a solution (effective disease defense) rather than a problem (infection risk), enlisting them with socially effective policies that recognize and reward their contribution to the national and global commons of disease resistance.
- Market-oriented policies offer vital opportunities for private cost sharing and self-directed poverty reduction (e.g. certification, contracting, cooperatives).

Institutions

1.2 Poultry sector dynamics and consumer preferences

1.3 Household poultry keeping and marketing

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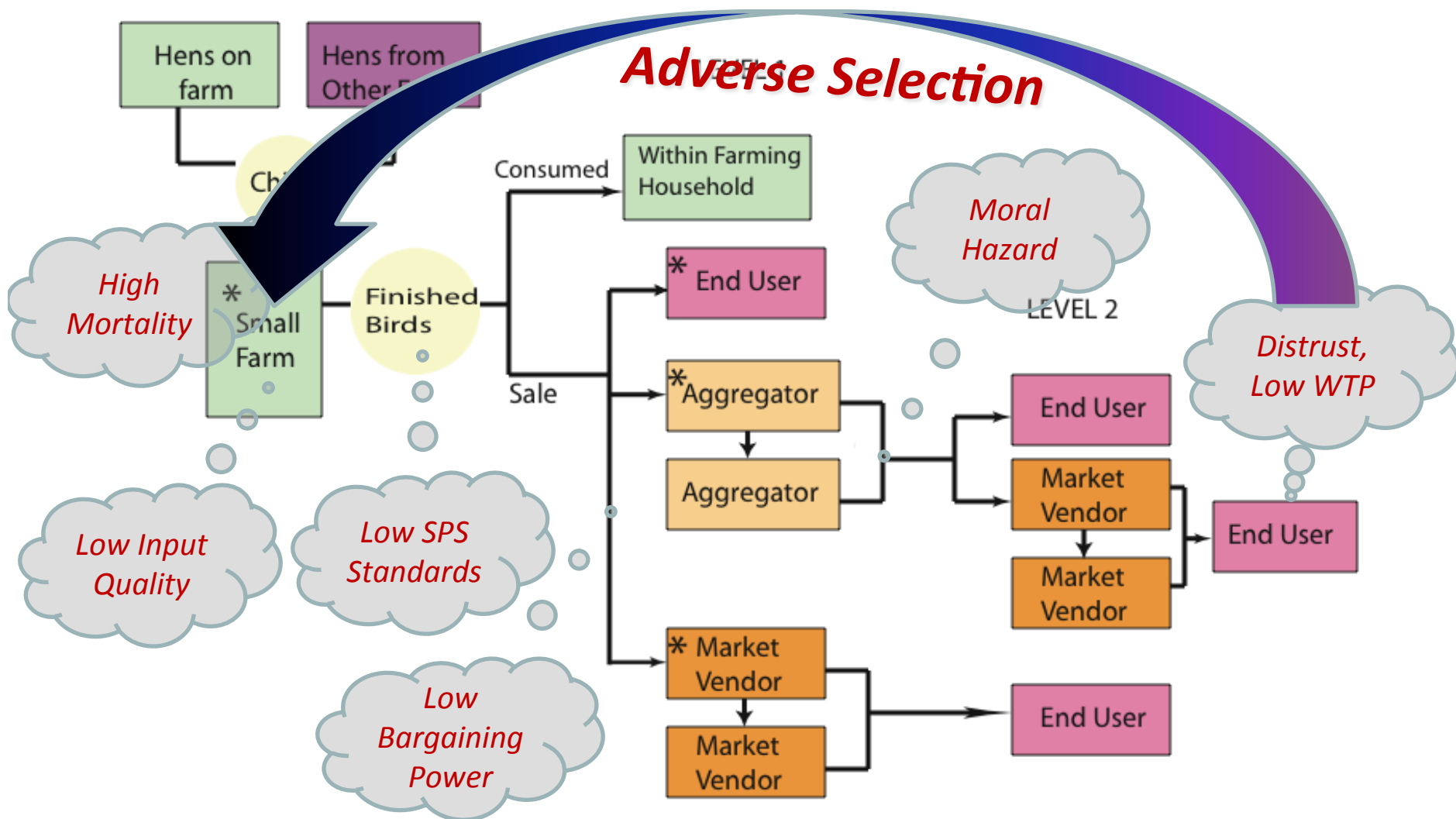
1.2 Poultry sector dynamics and consumer preferences

1. Regional poultry production systems are extremely diverse, in terms of species, production methods, and marketing channels, but traditional smallholder production is ubiquitous.
2. A distinctive production system in the GMS entails keeping mobile duck flocks that travel extensively to provide pest control and fertilization services in exchange for forage.
3. Industrial systems are the fastest growing category of total bird production, but market-oriented smallholder systems far outnumber industrial production units.

1.3 Household poultry keeping and marketing

1. The semi-industrial, market-oriented poultry producers are implicated in networks of small enterprise agrofood marketing systems.
5. Most smallholders market their poultry at the farm gate, selling to aggregators who move their birds downstream to Live Bird Markets (LBM). These relationships often undermine value added and increase disease risk.
6. Adoption of biosecurity measures depends upon the scale of household poultry production.
8. Informal transboundary trade flourishes throughout the region, posing a significant challenge to national disease control policies.

LDC Poultry Markets have Many Imperfections



* May be the party that slaughters the bird

Transboundary Risk - Regional Coordination

Best practices from this project can help individual nations manage disease risk with a combination of local and external resources, but

Without regional coordination, transboundary interactions (“wild birds”) will undermine these efforts and limit the effectiveness of funding

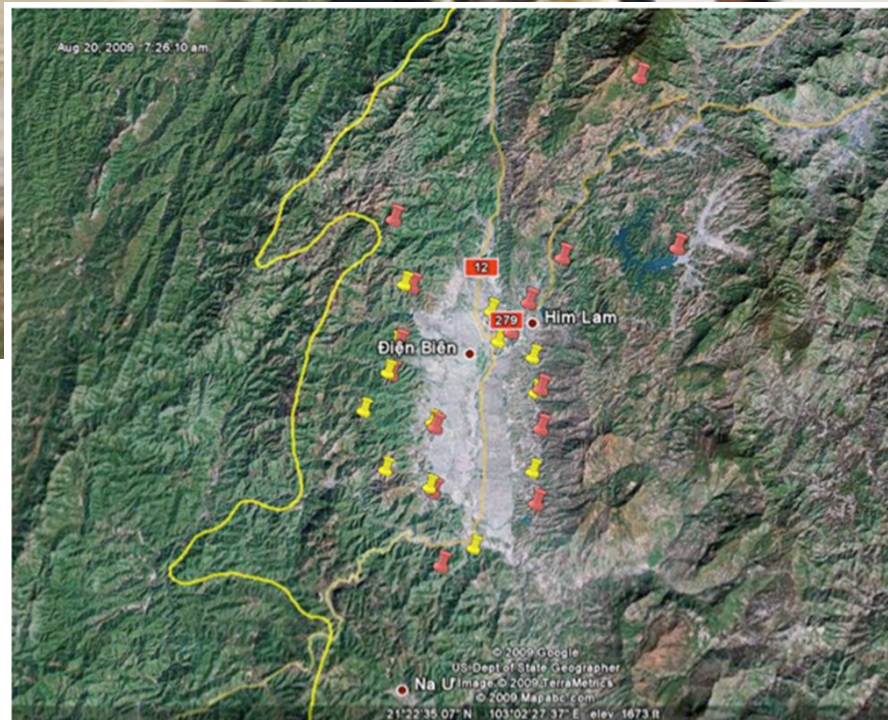
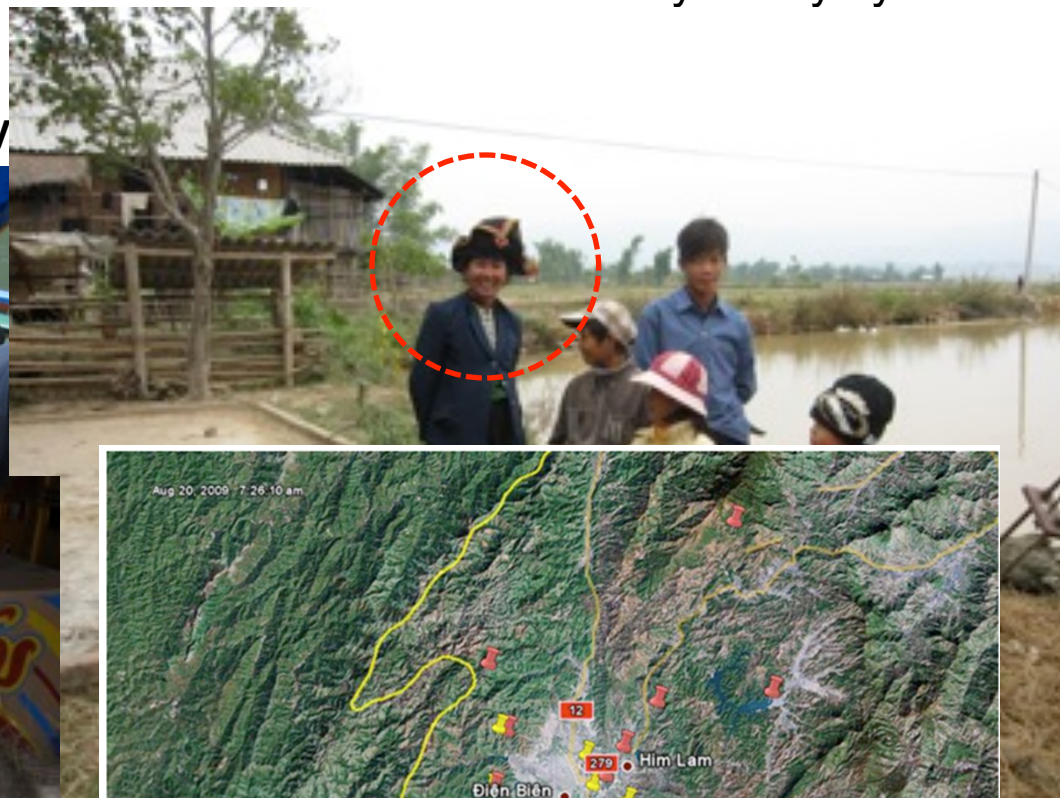
Just as with human pandemic, the transboundary disease externality can only be addressed effectively by explicit recognition and concerted policy response

This approach will make more effective use of HAPI control resources by limiting the risk of recurrent outbreaks via re-infection

Northern Lao PDR

Hill tribes with transboundary family systems.

Chicken on a bus: Oudomxay-Phongsaly



Chinese eggs in Phongsaly (Lao vendor)

Reported outbreaks, Dien Bien Phu

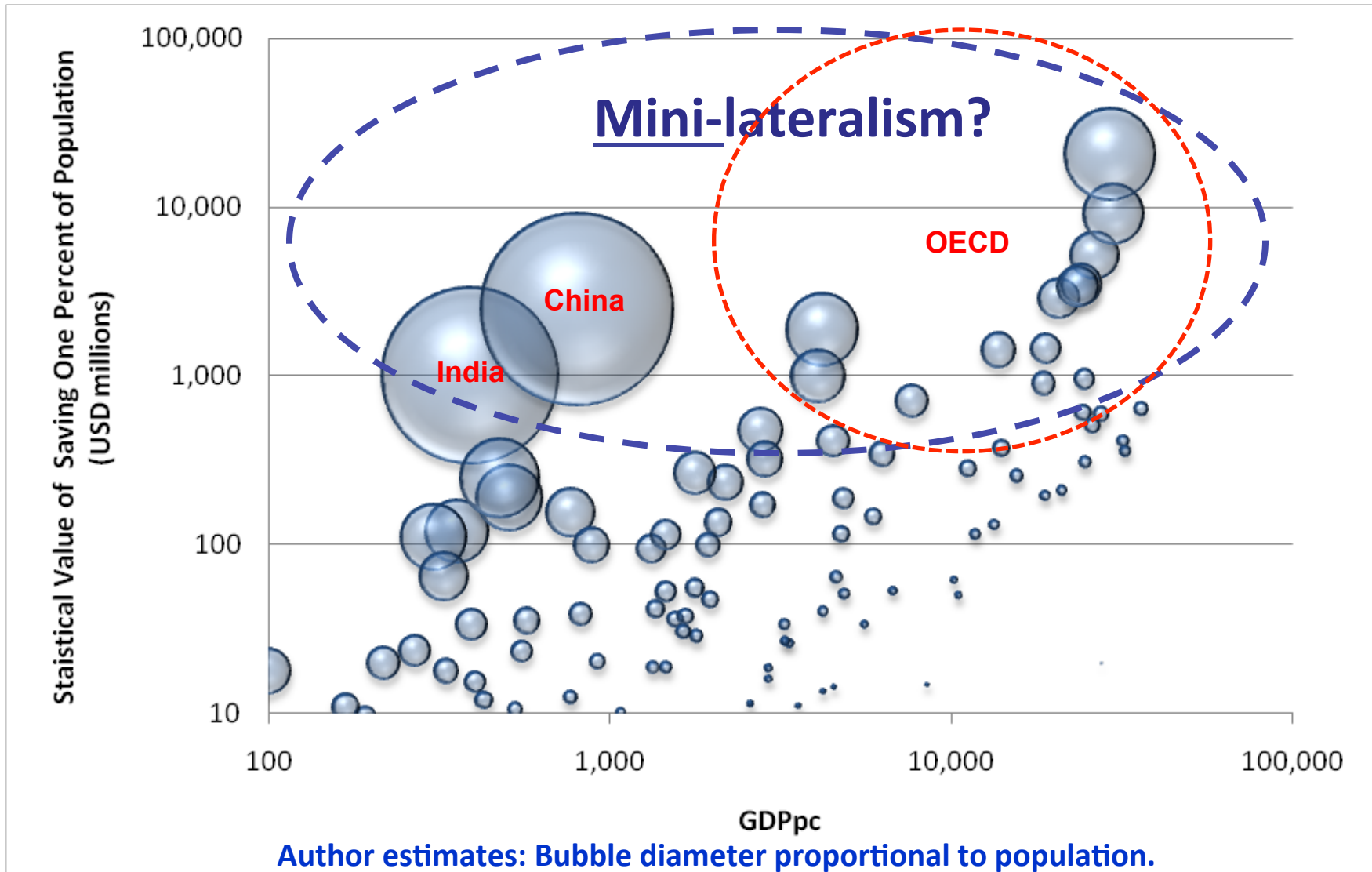
3.1 Driving forces of HPAI control – Diverse interests/influences across countries

1. Economies with the highest potential economic damage from HPAI, including the OECD, China, and India, are seriously underinvesting in risk reduction at home and abroad.
2. In Thailand, concerns of the export-oriented industrial poultry sector were influential determinants of the country's HPAI responses.
3. In Viet Nam, despite assertive central government participation in HPAI policy and expenditure, fragmentation of vertical and horizontal authority within the structure of government constrained HPAI responses.
4. In Cambodia and Lao PDR, institutional weaknesses are exacerbated by strong patronage politics and weak border control.
5. Smallholder farmers were generally blamed for the disease and became the targets for HPAI control.
6. Donor coordination has been sub-optimal and has contributed to distortions in the HPAI response in some countries.

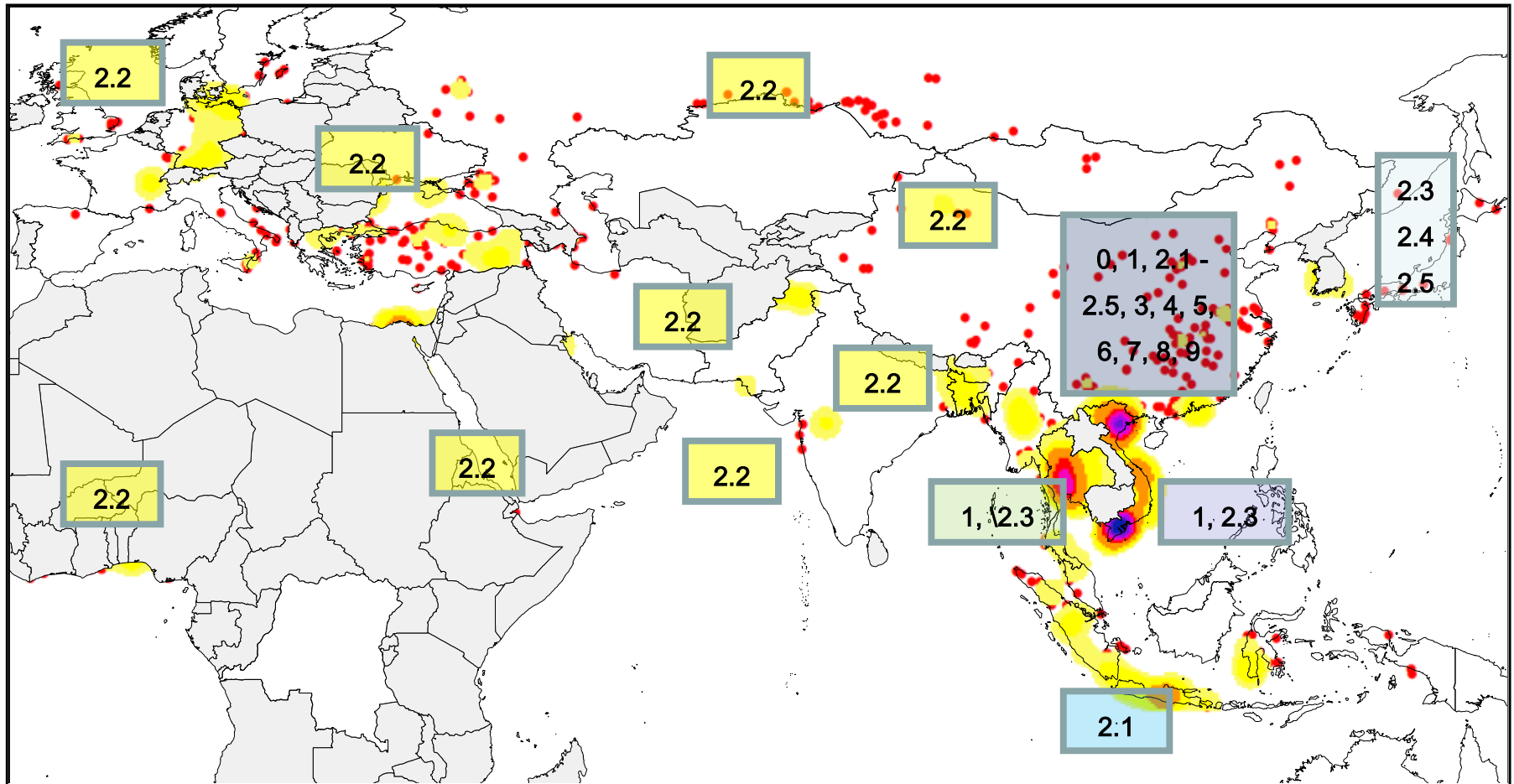
Global Coordination: Funding for HPAI Prevention and Control

- Resistance to contagious disease is a global commons, and it should be sustained financially by governments in proportion to estimated national gains from investment in risk reduction.
- A practical rule for such cost sharing would equate national commitments with the expected economic value of lives saved, to be invested by activity/location according to effectiveness of overall risk reduction.
- Because of geographic disparities in both economic risk and disease origination risk, such a rule will entail significant multilateral transfers.
- This approach will also require sustainable coordinating institutions for funding, monitoring, research, and cooperative extension.

Value of Population Defense



Epicenters: HPAI Viral Clades



3.2 Applied control measures and their efficacy – diverse responses

1. Thailand focused its HPAI control on enhanced detection through geographically extensive surveillance and culling, without permitting the use of vaccination.
2. Viet Nam opted for a control program consisting of surveillance, vaccination and extensive radial culling.
3. Cambodia's control program is less extensive than either Thailand's or Viet Nam's, and did not involve public vaccination campaigns.
4. A comparison between the approaches chosen particularly in Thailand and Viet Nam suggests that large-scale vaccination represents a significant challenge when attempting to achieve the necessary vaccination coverage to produce extinction of infection.
5. Gains in detection would have had a large impact upon the scale and duration of both the 2007 wave and any that may occur in the future supporting the notion that more targeted surveillance may be necessary for effective control.
6. Smallholder's risk perceptions limit their economic interest in biosecurity investments, and these must be changed with incentives that recognize their contribution to larger social objectives.

3.4 Alternative approaches to HPAI control

1. Given the structure of current market incentives, smallholder poultry keepers are unlikely to adopt compulsory bio-security measures.
4. Control measures can undermine safety.
5. Control measures can undermine value creation.
6. Development of incentive-compatible policies critically depends on information technologies.
7. In the absence of 'perfect' information, systems of 'carrots and sticks' need to be introduced.

Control measures can undermine safety

Adverse incentives in control measures can lead to a variety of unintended and undesirable outcomes:

- **Producers** loss aversion may lead them to circumvent health standards, sell illegally, hide or swap stocks, etc.
- **Traders** may actually profit in these circumstances by purchasing animals known to be sub-standard and reselling them without this information.
- **Buyers** with low levels of risk aversion can also facilitate trade in sub-standard animals by ignoring minimum sanitary requirements to save money (this includes households, restaurants and butchers).

At all three levels, incentives exist for behaviour that will increase surveillance costs, undermine animal health standards, and transfer disease risk down the supply chain.

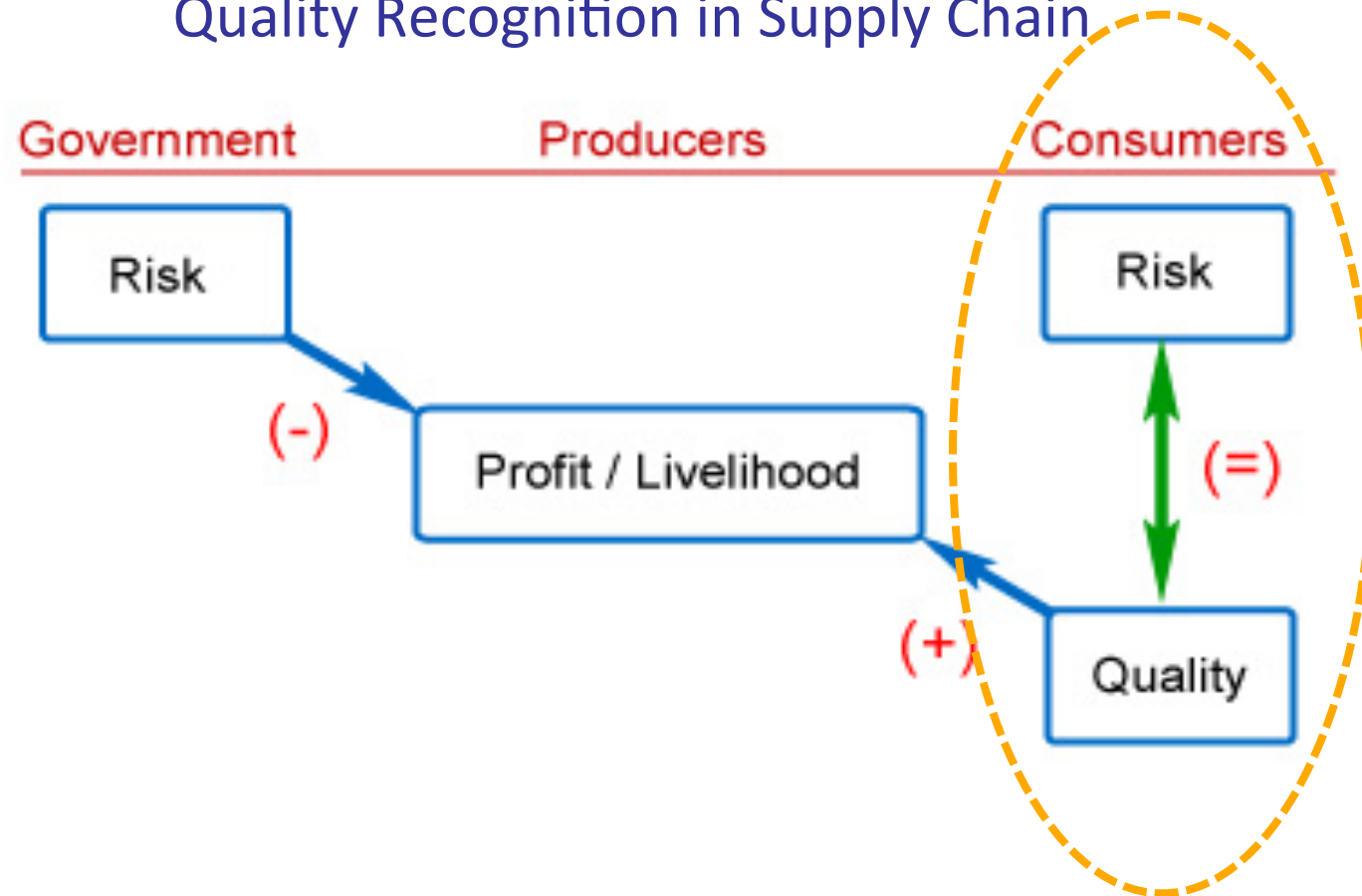
Control measures can undermine value

By blending animals without adequate regard for safety, traders contribute to biocontainment problems and undermine value in three ways:

1. **Spillover** of disease risk – blending promotes contagion within and between species
2. **Adverse selection** – masking producer sources reduces incentives to invest in quality, increasing risk and reducing producer incomes
3. **Perception** of these uncertainties undermines consumer willingness to pay (program credibility, perceived safety standards)

Control Measures from a Smallholder Perspective

Quality Recognition in Supply Chain



Coping Strategies for Smallholders

Endogenous

- Gains through price increases of substitute products
- Intensification of other farming activities (e.g. pig production)
- Engagement in 'new' farming activities (e.g. fruit)
- 'Release' family labor for off-farm employment or migration
- Draw in savings and social networks

Exogenous

- Compensation
 - partial (20% of value of culled bird)
 - late (several months delay is not uncommon)
 - none for revenue foregone
- Restocking assistance
 - delayed
 - inappropriate
- Product certification, traceability, and other value chain programs and incentives

Challenge: Smallholders and Risk Perception

Independent smallholders exhibit less commitment to HPAI risk management than might be socially optimal. Potential reasons include:

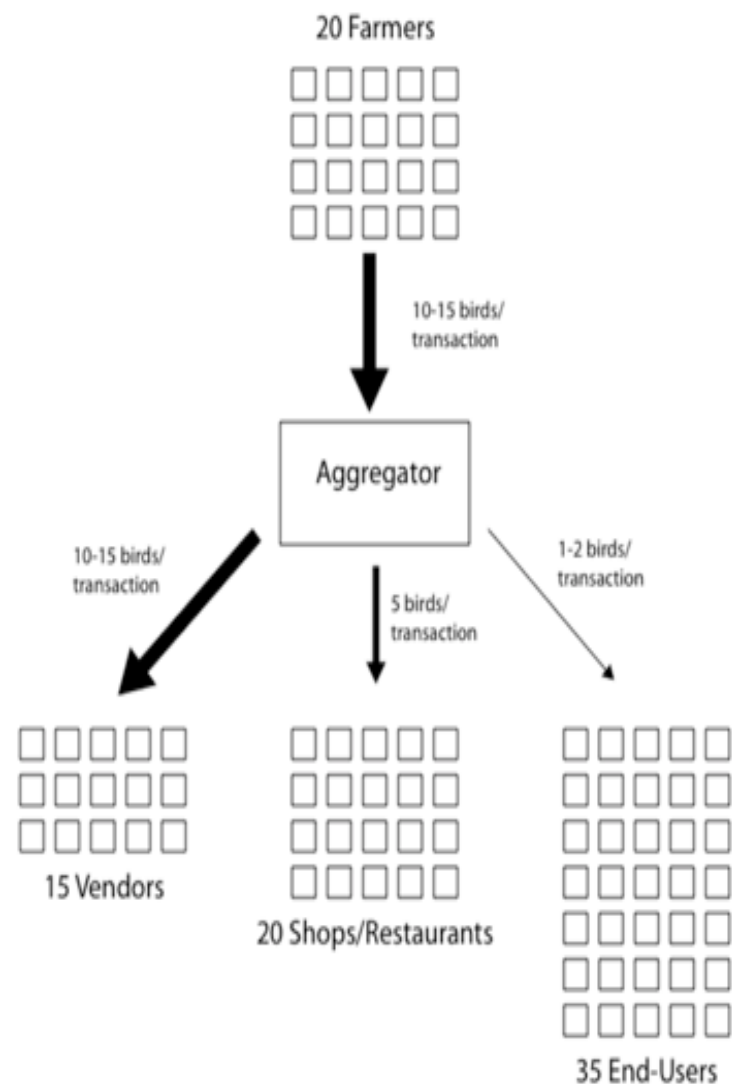
1. Lack of information on individual health risk
2. Low relative individual health risk
3. Failure to internalize the public health externality
4. Low perceived risk to native birds
5. Low opportunity cost of birds
6. Higher relative cost of conformity

Aggregators

- By nature of their business, aggregators potentially play an important role as disease transporters
 - 20 purchasing transactions/month
 - 70 sales transactions/month



Monthly Trading Volume



Top Institutional Findings

- **OECD economies have given primary global policy and financial impetus to risk reduction at HPAI sources. However, empirical evidence on actual and potential domestic damages suggests that the OECD, as well as China and India, should still make much larger investments in risk reduction in current and potential AI epicenters.**
- **HPAI risk in the GMS arises in diverse poultry production systems and species, where millions of households raise poultry for food, abundant small-scale poultry enterprises linked to consumers through complex market chains, and the covert transboundary trade that pervades the region.**
- **HPAIV H5N1 now appears to be endemic in parts of Greater Mekong Sub-region (GMS). We anticipate that it will be difficult to obtain the level of domestic and (especially) external public resources needed to sustain commitments to national risk reduction and coordinated regional control efforts need to be substantially strengthened.**
- **Domestically, effective public and animal health policy must arise from and be sustained by sound institutions, with adequate capacity and coordination at the national, regional, and local levels. Governmental institutions in the GMS are very diverse in all these aspects, and HPAI risk management has in some cases been seriously compromised by institutional weakness.**
- **Attempting to improve the bio-security of millions of backyard producers is an ineffective use of scarce resources in the GMS countries, especially public funds in countries with many high priority development objectives. Interventions targeting participants in the main poultry market a supply channel are likely to be more cost-effective.**

Thank you