



Pro-Poor
Livestock
Policy
Initiative

Socio-Economic Impact Assessment of Selected Control Strategies for Avian Influenza in Viet Nam and Thailand

Bangkok, 29 June 2005

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Background

Influenza virus affecting Southeast Asian poultry represents a significant global human and animal health risk and its emergence may necessitate significant restructuring of poultry (chicken and duck) production, especially in Thailand and Viet Nam where the highest incidence of avian and human cases have been reported. In both these countries, poultry production is an essential economic activity for the rural poor, and their livelihoods could be adversely affected by control strategies implemented to mitigate disease risks. To better understand linkages between different strategies for the control of avian flu and the impacts on rural poor majorities as well as on other stakeholders in these two countries, a concept note outlining an investigative approach aimed at achieving a comprehensive and systematic assessment of the socio-economic impacts of selected control strategies for avian influenza in Viet Nam and Thailand was prepared by the FAO-Pro-Poor Livestock Policy Facility. The proposal intends to foster research partnerships between national research institutions and international expertise in the fields of epidemiology, economics and spatial data analysis, build on past and on-going work, and strengthen regional cooperation by clearly identifying mutual interests and concerns (Concept Note in Annex 1)

Purpose of the meeting

The aim of the meeting was to provide more detailed information about the research proposal and prior work that has been carried out in the Mekong region on socio-economic impact assessment of policy decisions, the epidemiology of avian influenza, and on spatial data processing and analysis to researchers and decision makers concerned with human as well as animal health management both from Thailand and Viet Nam (List of Participants in Annex 2) and to ascertain whether the proposed approach was perceived as desirable and 'adding value' to on-going research, and if so, to decide on the immediate next steps that need to be taken to move the proposal forward both in Thailand and Viet Nam.

Meeting agenda and discussions

The meeting followed the agenda presented in Annex 3. Mr J. Otte, co-ordinator of FAO's Pro-Poor Livestock Facility (PPLPF) presented a brief overview of the PPLPF, the reason for its proposed engagement in the assessment of the impacts of AI control and the general thrust of the research proposal. Subsequently Prof. D. Pfeiffer, Head of the Epidemiology Division of Royal Veterinary College presented the results of epidemiological analyses of the 2003/4 and 2004/5 AI epidemics in Viet Nam, which he had conducted jointly with staff from FAO's Animal Health Service. Finally, Prof. D. Roland-Holst, Director of the Rural Development Research Consortium at Berkeley, University of California, described the analytical approach developed for the micro-economic assessment of the impacts of policy changes based on micro-macro modelling, its application in Viet Nam and potential expansion to disease control policies and concluded with an overview of the stage of economic data development for Thailand. Presentations were followed by brief discussions specific to the presentation while a general discussion on the proposal as a whole concluded the meeting. (Presentations in Annex 4)

There was overall agreement that the general thrust and the holistic approach of the research proposal was desirable and potentially very useful in providing policy

guidance to decision-makers concerned with the control of avian influenza both in humans and livestock. Representatives from institutions dealing with the human health aspects of avian influenza in Thailand rightly pointed out that the proposal did not contain an explicit component addressing the linkage between human and livestock health nor that it covered the economics of different human health scenarios. They would however be very interested in collaboration should these aspects become part of the study. Dr Van Nam, representing the Vietnamese Ministry of Agriculture and Rural Development (MARD), was in favour of its application in Viet Nam but pointed out that high level endorsement both from MARD and the Ministry of Public Health should be sought at an early stage. Thai representatives engaged in livestock-related research and animal disease control emphasized that the research effort needs to build on past work, should be coordinated with on-going activities and should have a capacity building element. Provided these conditions are met, however, the Thai Research Fund (TRF) would be willing to provide financial support for the Thai component.

Next steps

The following next steps were agreed:

- Refinement of the 'umbrella' concept note and expansion to explicitly include a human health component. Action: J. Otte, D. Pfeiffer, D. Roland-Holst. Timing: Mid-July
- Letter to MARD and MoPH Viet Nam by FAO to explain undertaking and obtain high-level endorsement. Action: J. Otte. Timing: End July
- Development of a Research Proposal for the Thai component of the study for presentation to TRF. Action: W. Kalpravidh supported by Thai researchers and international research coordinators. Timing: End-August
- Letter by FAO to Thai Department of Livestock Development requesting their participation in the study. Action FAO RAP or HQ. Timing: September
- 'Inception' meeting in Hanoi with policy makers and potential research partners in Viet Nam (similar to this Bangkok meeting) to define approach to take in Viet Nam. Action: J. Otte and F. Friscia. Timing: End October/early November
- First 'technical' meeting to discuss details of scenarios to be developed for the Thailand case. Action: Thai lead researcher. Timing: End October/early November

Acknowledgements

We would once again like to thank the participants of the meeting for making available their time at short notice, for their constructive interventions and the interest shown in the proposal. Furthermore we would like to express our gratitude to staff at the FAO office in Bangkok for their helpfulness and professional organization of the meeting.

Annex 1: Concept Note *Socio-Economic Impact Assessment of Selected Control Strategies for Avian Influenza in Vietnam and Thailand*

Objective

Influenza virus affecting Southeast Asian poultry represents a significant global human and animal health risk and its emergence may necessitate significant restructuring of poultry (chicken and duck) production, especially in Thailand and Vietnam where the highest incidence of avian and human cases have been reported. In both these countries, poultry production is an essential economic activity for the rural poor, and their livelihoods could be adversely affected by control strategies implemented to mitigate disease risks. To better understand linkages between different strategies for the control of avian flu and the impacts on rural poor majorities and other stakeholders in these two countries, a preliminary assessment will be undertaken that integrates epidemiological and economic modelling. The proposed project intends to build on, synthesize and complement on-going research whilst avoiding duplication.

Methodology

Existing village level and other survey data (eg LSMS, Agricultural Census, etc) will be used to ascertain and map out disease emergence scenarios and likely effectiveness of selected control responses through epidemiological modelling. The economic impacts of these control responses will then be assessed with economic models at micro-, meso-, and macro- levels, estimating direct and indirect costs associated with the selected control strategies. This kind of integrated approach to health risk and economic impact analysis will support more informed and better targeted policies, both as regards to precautionary actions as well those taken in response to outbreaks.

The proposed approach will take explicit account of empirical and potential health risks, using a variety of metrics for expected morbidity and mortality, as well as a broad spectrum of economic welfare measures at the local, regional, and national level. Particular emphasis will be placed on evaluating policy responses that can limit adjustment costs for the poor, provide alternative measures to mitigate adverse impacts on them, and promote opportunities for rural diversification.

Ownership

To assure its relevance and the effectiveness of its policy recommendations, it is essential that this project be based on strong collaborative commitments from national and local authorities. The first task of the project will be a reconnaissance mission to the region to enlist local official partnership.

Management

Overall management responsibility for the project will be shared between the coordinator of FAO's Pro-Poor Livestock Policy Facility and the Animal Health Officer for Infectious Disease Emergencies of FAO's Animal Health Service.

Principal Research Coordinating Institutes

Experts will be recruited in economics, animal health epidemiology, and digital data analysis/mapping. The core team of research coordinators will consist of:

1. Professor David Roland-Holst, University of California, Berkeley, economics
2. Professor Dirk Pfeiffer, Royal Veterinary College, epidemiology
3. Michael Epprecht, IFPRI, Hanoi, digital data analysis

Collaborators

Contacts will be established at four levels:

1. Health and agriculture ministries in both countries
2. Research institutions in both countries
3. Local representatives of leading multilateral and other interested institutions (CDC, WHO, AVSF Vietnam, etc.)
4. AGAH, AGAL, AGAP, local and regional offices of FAO

Tentative Schedule for Principal Activities

- | | | |
|---|---|---------------------------------|
| 1 | <u>Regional reconnaissance and local consultations</u>
Venue - Bangkok
Duration - 2 weeks | <i>2nd half June</i> |
| 2 | <u>Workshop on Policy Priorities, Data Resources, and Methodology</u>
Venue - Bangkok
Duration - 1 week | <i>Mid-July</i> |
| 3 | <u>Assessment</u>
Venues - Rome, London, and Berkeley
Duration - 3 months | <i>July to October</i> |
| 4 | <u>Dissemination Seminars</u>
Venues - Hanoi and Bangkok
Duration - 2 weeks | <i>November</i> |
| 5 | <u>Reporting and recommendations</u>
Potential extensions - locally or to Cambodia, Lao PDR, etc. | <i>January</i> |

Funding

Financial resource requirements are roughly estimated to be in the order of USD 100,000 to 120,000. PPLPF is offering to cover the costs of the core team of experts while funding for workshops and dissemination seminars needs to be mobilized from other sources.

Annexes

1. Economic analysis and modelling

Economic analysis will build on the 'integrated poverty assessment of livestock promotion' (IPALP) approach developed by Prof. D. Roland-Holst and expanded to include issues related to household health and disease risk. IPALP currently covers four component areas of economic assessment as follows:

- **Analysis of initial macro-economic conditions**

This component surveys the recent history of aggregate indicators to set the stage for examination of the more detailed determinants of household welfare.

- **Micro-economic analysis of initial conditions**

This component provides a systematic survey of existing patterns of household production, employment, asset holding, expenditure and other conditions. The micro results are further divided into three parts:

- a) Summary statistics and tables extracted from Living Standards Measurement Survey (LSMS) samples and other detailed data.
- b) A synoptic atlas of digital maps presenting selected micro-economic results.
- c) Models of household-level production systems, labour supply, and consumption geared to better understand the behavioural basis of household economic activity.

- **Dynamic simulation of policies and external economic conditions**

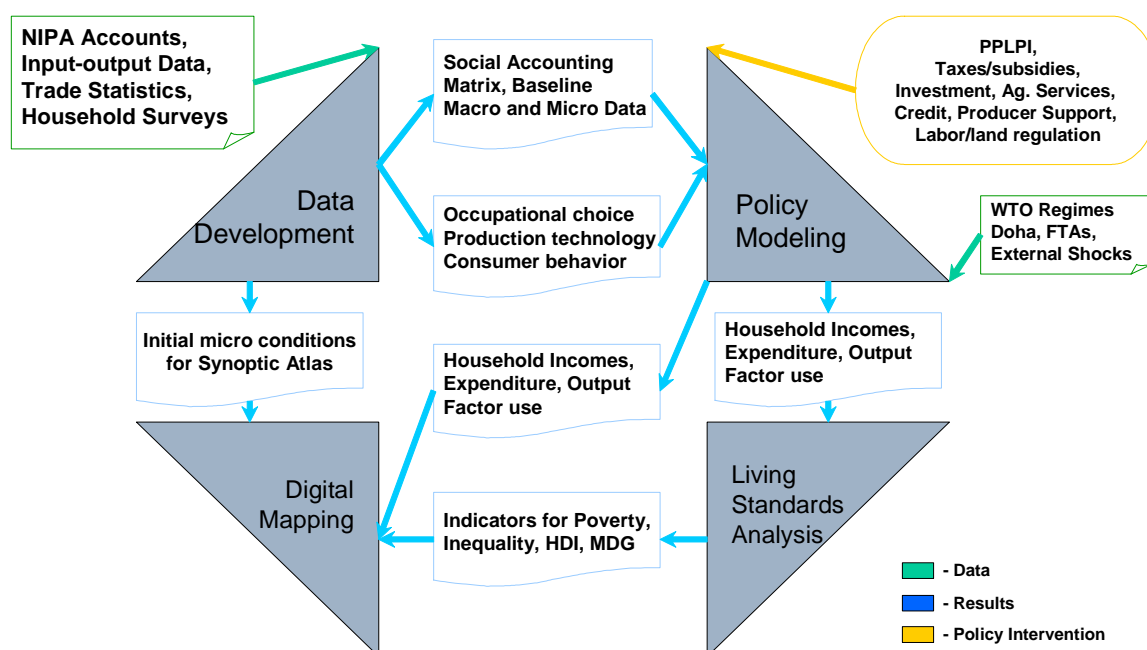
These include, but are not be limited to, pro-poor livestock policy interventions, development strategies, trade policy, WTO accession (Vietnam), market reform, tax policies, etc. Emphasis is on the estimation of the local impacts of these policies.

- **Microeconomic assessment of pro-poor livestock and related policies**

This components assesses various aspects of the above policies, in concert with national and international policies and market forces, to more clearly identify patterns local economic adjustment and, in particular, their implications for poverty alleviation. In this component, a broad spectrum of poverty assessment tools are be implemented.

A brief overview of the components of IPALP is presented below.

Figure 1: Flowchart for economic analysis



2. Epidemiological analysis and modelling

Outbreak information from Thailand and Vietnam will be used to develop stochastic simulation models specific to the epidemiological situations in countries for which disease data is available. The model structure and parameters will be derived from a combination of expert knowledge and epidemiological analyses of outbreak data. Risk maps based on GIS analysis of outbreak data and agro-ecological variables will be developed for Thailand and Vietnam, which will inform simulation models with respect to the spatial distribution of important environmental and other relevant risk factors. The models will be implemented using the @Risk simulation add-in software for Microsoft Excel.

The model will be tested using sensitivity analyses, and basic validation against subsets of outbreak data will be performed. If the model performance is considered satisfactory in terms of predicted infection dynamics, the likely impact of different control options will be simulated by using the model outputs as inputs for IPALP.

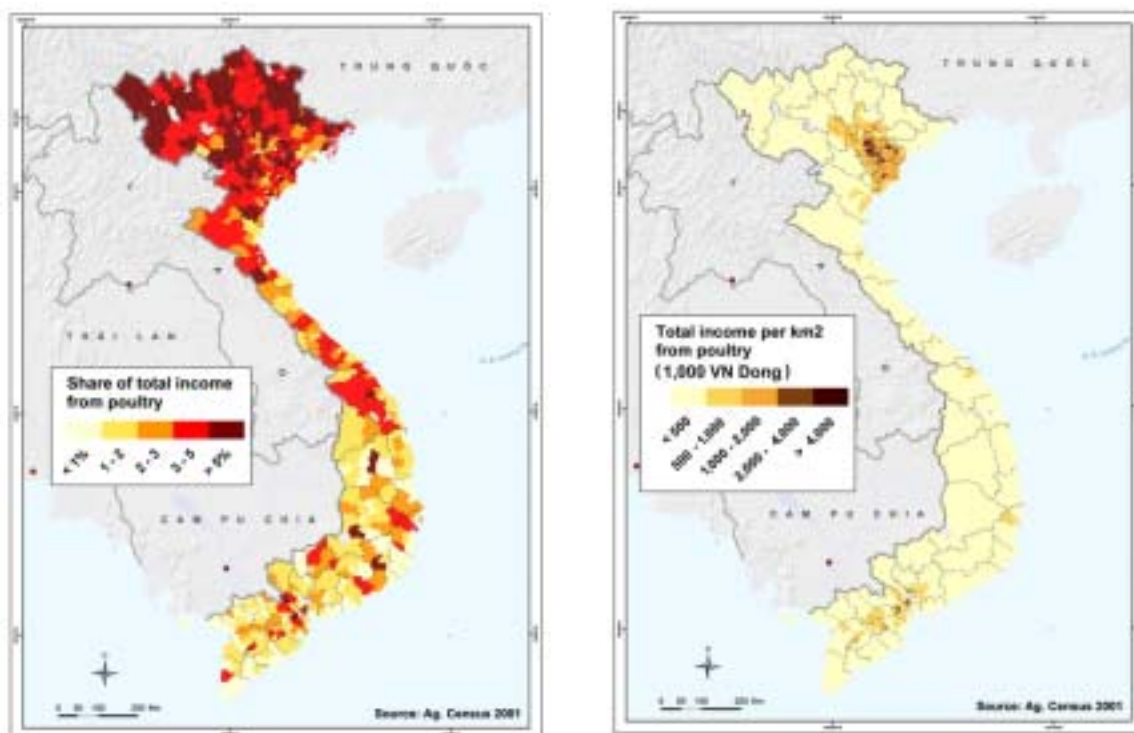
3. Results mapping

Mapping of results could range from simple 'traffic light' (green, yellow, red) risk maps to contagion patterns and control cost contours.

4. Data sources and availability

4.1 Economic data

Vietnam: Extensive macro and micro data, including a nationally representative survey of 75,000 households detailing most economic and many health characteristics is available. Examples of derived maps are given below.



Thailand: As with Vietnam, most of the macro data has been assembled and micro data are plentiful, including several national surveys and many detailed village surveys.

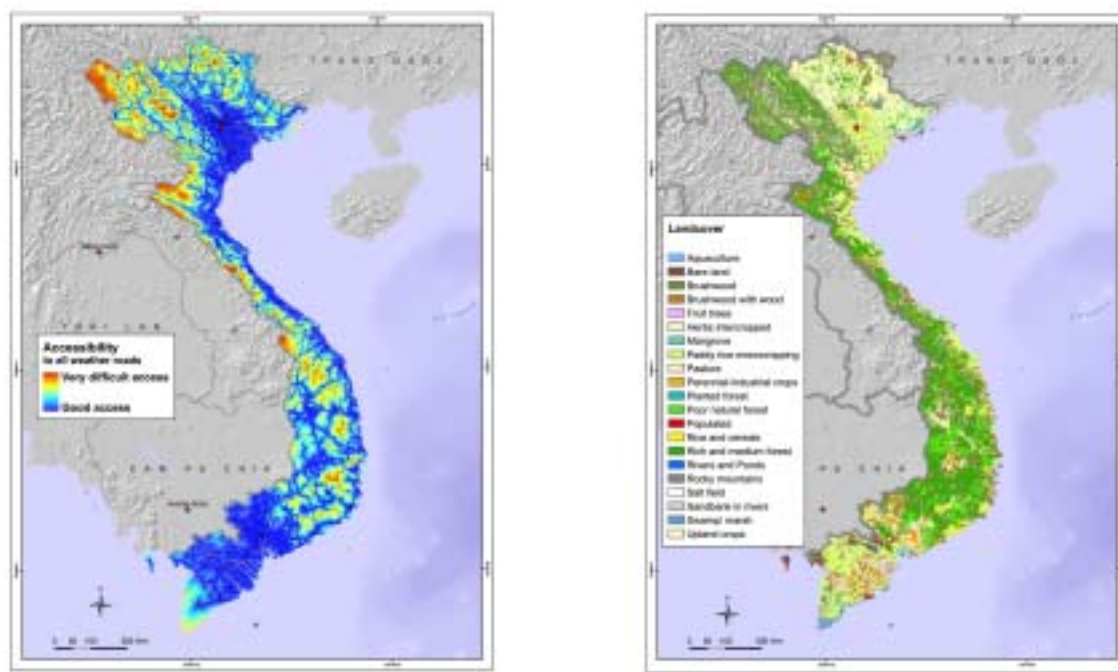
4.2 Animal health data

Vietnam: Commune level outbreak data for the 2003/4 and the 2004/5 poultry epidemics (Source: Department of Animal Health [DAH] Hanoi).

Thailand: Detailed outbreak data on disease incidence in poultry is available through DLD.

4.3 Agro-ecological data

Vietnam: Digital elevation, water bodies, transportation system, commune-level land use (area under annual and perennial crops, irrigation etc), infrastructure, water surface for aquaculture. Examples of derived maps are given below.



Thailand: Thailand GIS data at 1:250,000 scale is available from Thailand Environment Institute

5. Contacts

For further information and / or comments please contact: Joachim.Otte@fao.org, Juan.Lubroth@fao.org, dwrh@rdrc.net; pfeiffer@rvc.ac.uk and / or Michael@eprecht.org

Annex 2: List of Participants

Name	Institution	Position	e-mail
Benigno, Carolyn, Ms	FAO Regional Office Asia and Pacific	Animal Health Officer	carolyn.benigno@fao.org
Chaitaweesulo, Prasit, Mr	Department for Livestock Development		
Chansiripornchai, Niwat, Mr	Chulalongkorn University, Dpt of Medicine, Faculty of Vet. Science	Assistant Professor	cniwat@chula.ac.th
Chunsuttiwat, Supamit, Mr	Ministry of Public Health, Dpt. of Disease Control	Senior Expert	schunsu@health.moph.go.th
Coldren, Rodney, Mr	USAMC-AFRIMS	GEIS Program Director	rodney.coldren@afirms.org
Frischia, Fabio, Mr	FAO Rep Viet Nam	Program Officer	fabio@fao.org.vn
Hall, David, Mr	FAO Regional Office Asia and Pacific	Consultant, Livestock Policy	david.hall@fao.org
Kalpravidh, Wantanee, Ms	FAO Regional Office Asia and Pacific	Consultant, Animal Health	wantanee.kalpravidh@fao.org
Otte, Joachim, Mr	FAO Animal Production and Health Division, Rome	Coordinator Pro-Poor Livestock Policy Facility	joachim.otte@fao.org
Peerapakorn, Somchai, Mr	WHO, SE Asia	National Professional Officer	somchai@whothai.org
Pfeiffer, Dirk, Mr	Royal Veterinary College	Head Epidemiology Division	pfeiffer@rvc.ac.uk
Prempracha, Decha, Mr	Department for Livestock Development		
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Supakankunti, Siripen, Ms	Chulalongkorn University, Centre for Health Economics	Director	ssiripen@chula.ac.th
Van Nam, Hoang, Mr	Department of Animal Health, Viet Nam	Deputy Director	hvnamdah@yahoo.com
Wagner, Hans, Mr	FAO Regional Office Asia and Pacific	Senior Officer Animal Production & Health	hans.wagner@fao.org

Annex 3: Meeting Agenda

Informal Meeting on Study Proposal entitled Socio-Economic Impact Assessment of Selected Control Strategies for Avian Influenza in Vietnam and Thailand



Venue: NOVOTEL Bangkok, SIAM SQUARE

Date: 29 June 2005

Welcome and opening	J. Otte - FAO Rome, PPLPF	09:00 - 09:15	15'
Background and objective of the proposed study	J. Otte - FAO Rome, PPLPF	09:15 - 09:30	15'
Epidemiological component: methodology, data availability and work so far	D. Pfeiffer - Royal Veterinary College	09:30 - 10:15	45'
Tea/coffee break		10:15 - 10:45	30'
Economic component: methodology, data availability and work so far	D. Roland-Holst - University of California, Berkeley	10:45 - 11:30	45'
Discussion: Technical issues	J. Otte	11:30 - 12:00	30'
Lunch		12:00 - 13:30	90'
Discussion: Organizational issues	J. Otte	13:30 - 15:00	90'

Annex 4: Presentations

Socio-economic Assessment of Selected Control Strategies for Avian Influenza in Viet Nam and Thailand *Joachim Otte FAO, PPLPI*

<p style="text-align: center;">Socio-economic Assessment of Selected Control Strategies for Avian Influenza in Viet Nam and Thailand</p> <p style="text-align: center;">Informal 'Inception' Meeting Bangkok, 29 June 2005</p> <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>	<p>Outline</p> <ul style="list-style-type: none"> • What is the Pro-Poor Livestock Policy Initiative • Why do we want to get involved in AI • What is the purpose of this meeting • What do we propose  <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>
<p>Pro-Poor Livestock Policy Initiative</p> <ul style="list-style-type: none"> • DFID-funded project in the Animal Health & Production Division of FAO since 2001 • Overall goal: Poverty Reduction • Entry point: Livestock • Mechanism: Policies and Institutions • A Central Facility at HQ (PPLPF) • 'Field' work in Focus Regions & Countries <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>	<p>Focus Regions & Countries</p>  <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>
<p>PPLPF's Interest in AI</p>  <ul style="list-style-type: none"> • Prior engagement in the Mekong region, particularly Viet Nam • Poultry contributes to the livelihoods of a large proportion of rural households • AI directly and indirectly has negative impacts on these rural households • Human health dimension <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>	<p>Poultry is most important for the poorest</p>  <p style="text-align: center;"><i>A Living from Livestock</i> Pro-Poor Livestock Policy Initiative</p>

Meeting Purpose

- Assess the extent of 'buy-in' into the proposed study, ie is it perceived as 'adding value' ?
- If so, identify partners and develop 'modus operandi' and 'road map'



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The Study Proposal

- **Purpose:** Assess the socio-economic **impact** of different **control** strategies (very different from assessing disease impact!)
- **Research Questions:**
 - What control strategies are being implemented / considered for implementation,
 - How effective are the different measures (alone or in combination) likely to be, and what are the consequences both for animal and human health
 - How will the different control measures affect various actors in the poultry business and consumers



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Study Components

Epidemiology

- Risk factors for AI outbreaks in poultry
- Transmission routes between flocks
- Transmission routes to humans
- Cumulative risk reduction through control measures

Economics

- Impacts at household level
- Impacts at sub-sectoral level
- Impacts at national (and international) level
- **Spatially explicit**

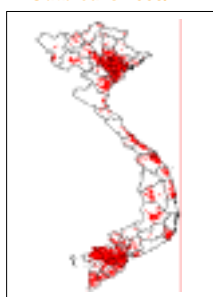


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AI Incidence and Economic Impact

Outbreaks 2003/4



Poultry Income



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Suggested Research Co-ordinators

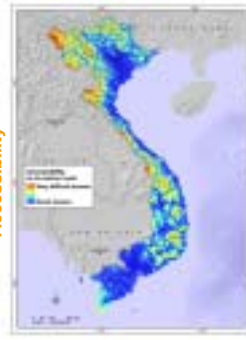
- Prof. David Roland-Holst, University of California, Berkeley, Economics
- Prof. Dirk Pfeiffer, University of London, Royal Veterinary College, Epidemiology
- Dr Michael Epprecht, IFPRI Viet Nam, spatial analysis and digital mapping



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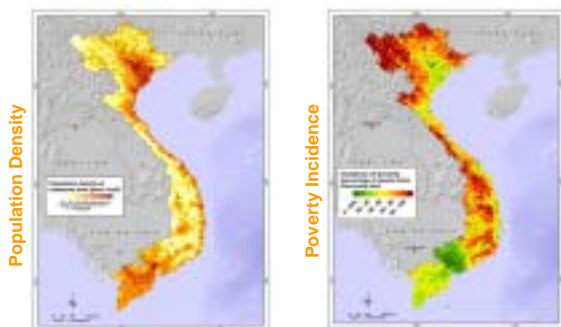
Agro-ecology and Infrastructure.....



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Demography and Socio-economics....



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Guiding Principles

- **Open**, ie everybody can become a research partner provided they contribute in one form or another
- **Transparent**, ie partners have access to all primary and secondary information
- **Accountable**, ie processes and contributions well documented
- **Results-oriented**, ie leading to policy guidance and not research for the sake of research



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Avian Influenza in Viet Nam *Dirk U. Pfeiffer Royal Veterinary College University of London*

Avian Influenza in Viet Nam

Dirk U. Pfeiffer
Royal Veterinary College
University of London



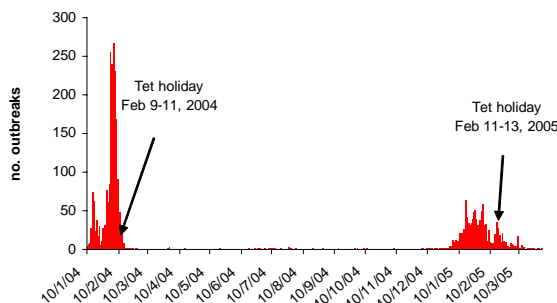
AI Data

- source -> DAH's Epidemiology Division
- two HPAI epidemics
 - December 2003 to end February 2004
 - commune level spatial resolution, but without temporal reference.
 - temporal data is available without spatial reference
 - from 10/1/2004 until 29/2/2004
 - December 2004 and beginning of March 2005
 - every reported outbreak at commune level spatial resolution and day of reporting temporal resolution
 - from 29/3/2004 to 12/3/2005

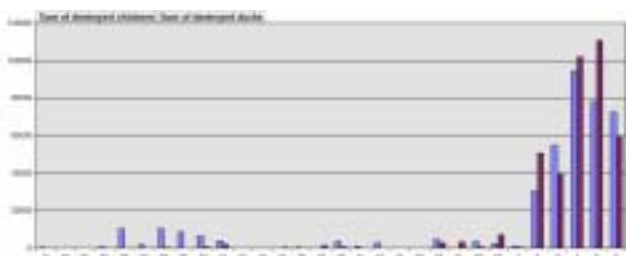
Other Data

- source
 - FAO
 - Viet Nam's Government Statistical Office (<http://www.gso.gov.vn>)
- data has different spatial resolutions and levels of aggregation
 - NDVI (averages for period 1998-2004 covering each year, May – Oct, Nov – Apr; source: FAO GIEWS – SPOT-4 Satellite images South-East Asia, resolution: 1km)
 - Land cover (source: FAO GeoNetwork - ORNL Land cover of South Asia; resolution: 30 arc seconds, date: 2002)
 - Elevation (source: FAO GeoNetwork – Elevation in South Asia; resolution: 1km, date: 1996)
 - Incidence of poverty (source: Minot et al (2003), resolution: commune level, date: 2002)
 - Census data about poultry farms (source: Ministry of Agriculture and Rural Development; resolution: province level; date: 2003)

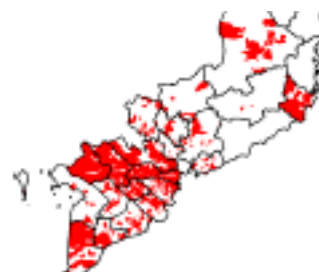
Temporal Pattern of 2003/4 and 2004/5 AI Epidemics



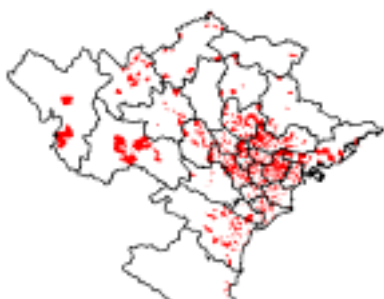
Temporal Culling Pattern during 2004/5 AI Epidemic



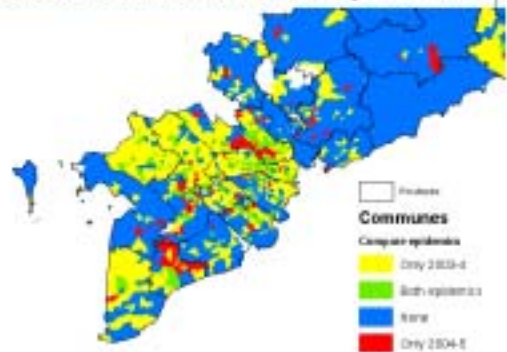
Affected Communes in Southern Viet Nam (2003/4 Epidemic)



Affected Communes in Northern Viet Nam (2003/4 Epidemic)



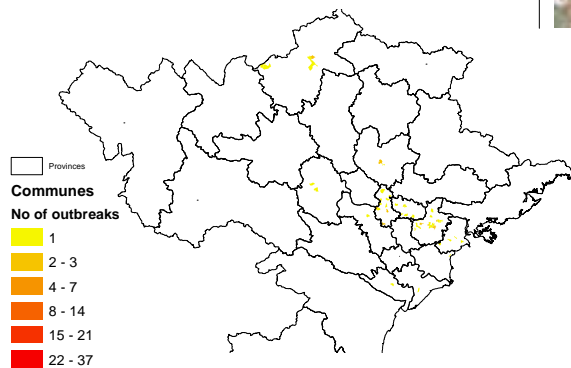
Comparing Affected Communes in Southern Viet Nam between Epidemics



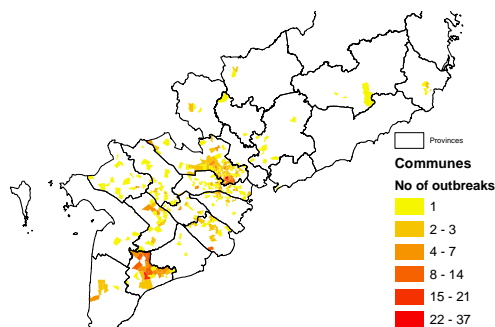
Comparing Affected Communes in Northern Viet Nam between Epidemics



2004/5 AI Epidemic in Northern Viet Nam



2004/5 AI Epidemic in Southern Viet Nam

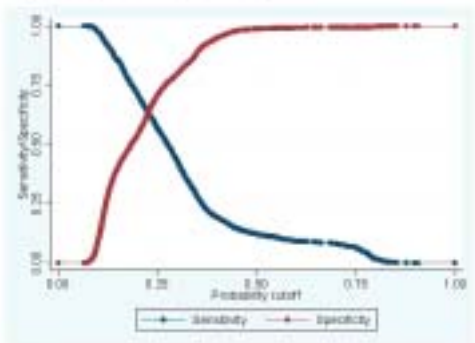


Logistic Regression Model for 2003/4 AI Epidemic

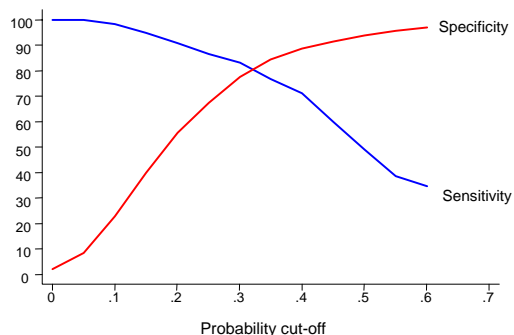
- outcome variable
 - commune infection status
- independent variables
 - odds increase with
 - commune level variables
 - reducing long-term NDVI average May-Oct
 - increasing percent surface water or irrigated land
 - province level variables
 - increasing paddy yield
 - increasing sweet potato yield

district was included as a random effect to take account of dependence (intra-cluster correlation 0.58)

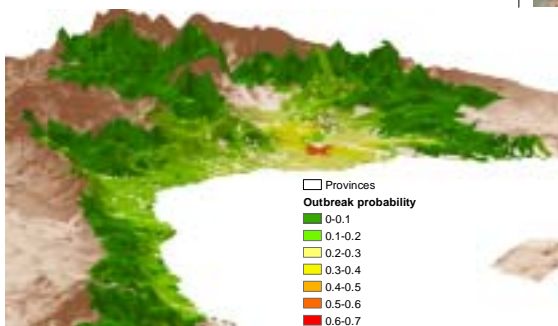
Model Fit for 2003/4



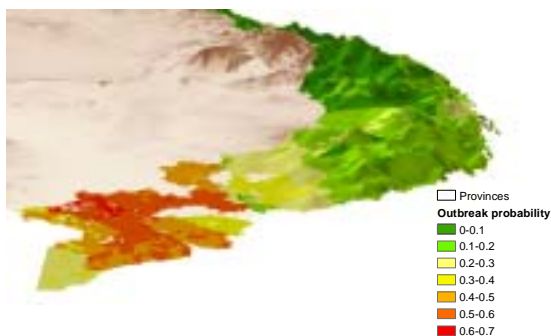
Model Validation against 2004/5 Outbreak Data



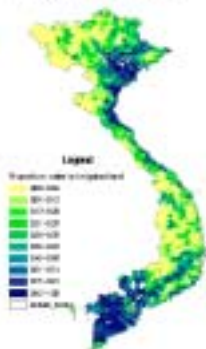
Probability of Outbreaks in Northern Viet Nam based on Logistic Regression Model for 2003/4 AI Epidemic



Probability of Outbreaks in Southern Viet Nam based on Logistic Regression Model for 2003/4 AI Epidemic



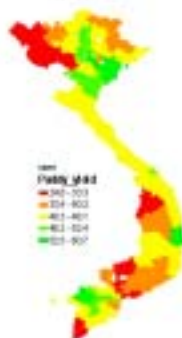
Percentage Surface Water or Irrigated Land



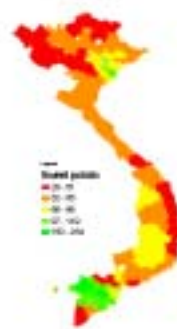
Average Long-term NDVI May-Oct

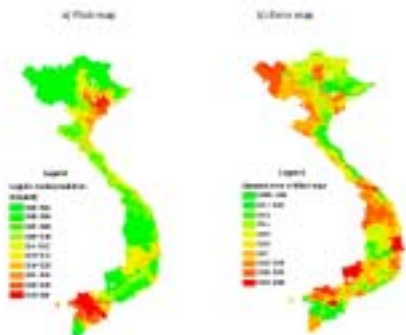


Paddy yield (2003)

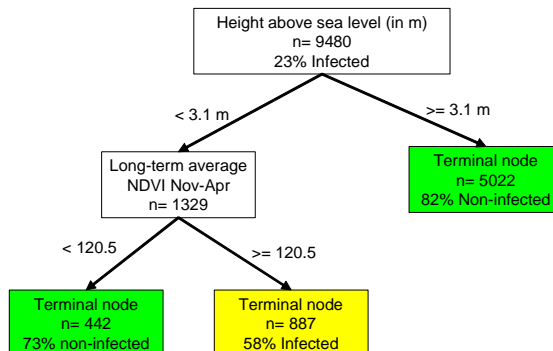


Sweet potato yield (2003)

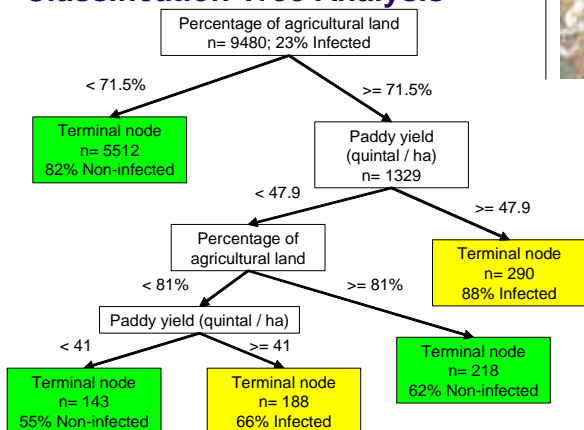




Classification Tree Analysis



Classification Tree Analysis



Conclusion

- currently fairly crude model
- potential to be used for targeting surveillance
- need to explore different variables
- need to have higher spatial resolution for production statistics

Economic Assessment for HPAI Control: Application to Thailand and Vietnam David Roland-Holst (UC Berkeley)

Economic Assessment for HPAI Control: Application to Thailand and Vietnam

Joachim Otte and David Roland-Holst, FAO and UC Berkeley

Informal Meeting on the Socio-Economic Impact Assessment of Selected Control Strategies for Avian Influenza in Vietnam and Thailand

Venue: NOVOTEL Bangkok, Siam Square
Date: 29 June 2005

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Introduction

Highly Pathogenic Avian Influenza (HPAI) has potentially momentous consequences for human society.

Even in the absence of a pandemic, the economic costs of increasing HPAI biosecurity are already substantial, and their ultimate incidence is still not well understood.

Policy makers need better visibility about the direct and indirect effects of alternative approaches to biosecurity.

This will permit them to identify stakes and stakeholders, recruit beneficiaries to support more effective policy, and anticipate adjustment needs for others.

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HPAI Stakeholders

1. Rural Producers
 - Direct and indirect livestock benefits
2. Enterprise Producers
 - Income, employment
3. Food Processing Industry
 - Costs, income, employment
4. Consumers
 - Biosecurity, purchasing power
5. Government
 - Biosecurity, economic and social stability, fiscal
6. Rest of World
 - Biosecurity, Poverty/Development, R&D

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Elements of Control Strategies

- stamping out
- surveillance
- quarantine
- movement control
- screening
- zoning
- vaccination
- compensation

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Introduction to IPALP

To support the larger agenda of its Pro-Poor Livestock Promotion Initiative (PPLPI), FAO has developed a research facility to evaluate economic effects of livestock and policies related to them.

Integrated Poverty Assessment for Livestock Promotion (IPALP) is a suite of analytical methods that elucidate local incidence of national and regional policies toward the livestock sector.

Among the livestock policies to which IPALP will be addressed is animal health and disease control strategies, including HPAI.

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IPALP Perspectives

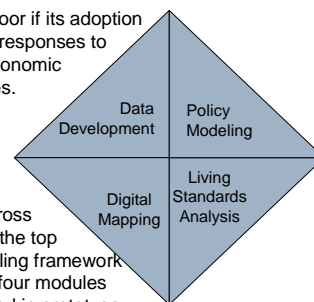
IPALP synthesizes four perspectives:

- Analysis of initial macroeconomic conditions
- Microeconomic analysis of initial conditions
- Dynamic simulation of policies and external economic conditions
- Microeconomic assessment of Livestock Related Policies

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Overview of IPALP

Livestock will help the poor if its adoption is compatible with local responses to regional and national economic conditions and incentives.



To capture linkages across the economy and from the top down, a four-fold modeling framework is used. Each of these four modules has now been developed in prototype form.

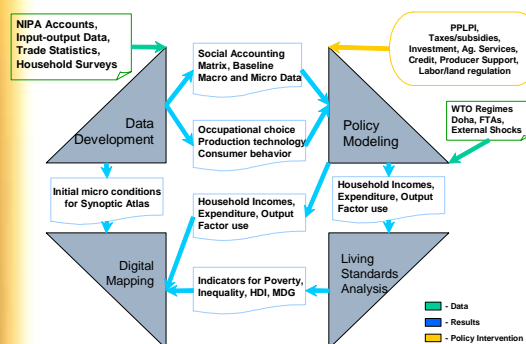
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Fourfold Structure of IPALP Methodology

- 1. Data development**
– A comprehensive inventory of data related to the overall economy, including macro and micro information, with particular reference to rural conditions and the livestock sector.
- 2. Policy Modelling**
– With a highly disaggregated dynamic CGE forecasting model, a baseline scenario for growth is compared to a variety of national policy scenarios, including PPLPI, generic development strategies, trade policy, WTO accession, market reform, tax policies, etc.
- 3. Living Standards Assessment**
– Using the microeconomic results obtained from the previous two components, we will apply state of the art assessment tools to evaluate the effects of PPLPI and other policies on poverty, inequality, and other living standard and human development indicators.
- 4. Digital Mapping**
– GIS mapping is applied to data on initial conditions and results of policy simulations. This synoptic economic atlas provides a transparent set of assessments that can be widely disseminated and compared across case studies.

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Detailed Methodology



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FAO Rationale for Economic Analysis

- **Determine whether a proposed strategy is viable in economic terms.**
 - Do the expected benefits exceed the expected costs?
- **Identify from what sources it might be financed.**
 - Those who benefit most might reasonably be expected to contribute most. However, the method of contribution (e.g. payment at point of service, direct or indirect taxation) needs to be designed to make financing efficient.
- **Identify potential risks of non compliance.**
 - Those who do not expect to benefit or find it hard to pay for new biosecurity measures may be less inclined to comply with regulations.

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Economic Benefits of HPAI Control

- **Increased income and food security**
- **Reduced costs of dealing with disease outbreaks**
- **Reduced costs of dealing with human disease cases**

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Economic Costs of Control Strategies

Estimates must take into account:

- The total cost of a policy.
 - This is the cost of the extra resources used to implement it plus the total loss in output value that it creates.
- The costs incurred by each major stakeholder.
 - Some of these will be actual costs (new resources used) and some will be transfer costs. For example, compensation does not represent a real cost – no resources are used up – but finances are transferred from the government to farmers to the reduced the impact of their loss.

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Direct Costs

- Investment needed to achieve and maintain a heightened state of biosecurity.
 - strengthening of veterinary services infrastructure and capacity
 - improved or new farm buildings and infrastructure, equipment, staff and training
 - improved facilities at markets
 - in extreme cases, complete relocation of farms or markets
- Recurrent costs of preventing outbreaks.
 - surveillance and diagnosis costs
 - movement control
 - administrative costs of enforcing regulations
 - on-farm biosecurity measures
 - on-farm traceability measures
 - in some cases vaccination

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Other Costs

- Indirect costs
 - These are the costs resulting from reduced levels or values of production because of temporary or permanent changes to management systems or markets. In practice, when calculations are made with simulation models, the indirect costs are usually captured for in the estimation of benefits.
- Transfer costs
 - costs transferred from one stakeholder to another
- Compensation
 - To encourage compliance with culling regulations.
 - To avert a livelihoods crisis.

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Incidence – Macro

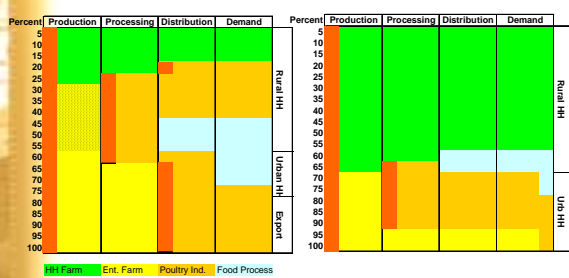
Estimates of the impact of HPAI in affected countries vary greatly, depending on the structure of the poultry sector, the speed of outbreak control and the method used to estimate the impact.

- World Bank estimates earlier this year suggested that the costs of the current outbreaks in Vietnam might have approached 1.8% of GDP.
- Estimates for Thailand suggest that the rate of growth of agricultural GDP may have halved during the outbreak year.
- The total cost of the 1997 outbreak in Hong Kong is said to have been hundreds of millions of dollars when the costs to international trade and tourism are included.

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Incidence – Meso

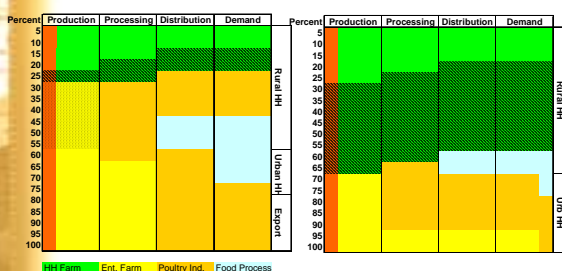
Poultry Sector Resource Flow
Thailand Vietnam



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Incidence – Meso Example

Stamping Out and Displacement
Thailand Vietnam



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Incidence – Micro

Producers - detailed analysis of production systems, at both the enterprise and household level.

- Impact and Adjustment -Producers will face two alternatives with different policy implications:
 1. Cull and restock - Direct compensation/credit
 2. Exit and diversify - Adjustment assistance
- Incentives, reporting, adverse selection, and other behavioral issues

Consumers – about health and prices

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Discussion

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