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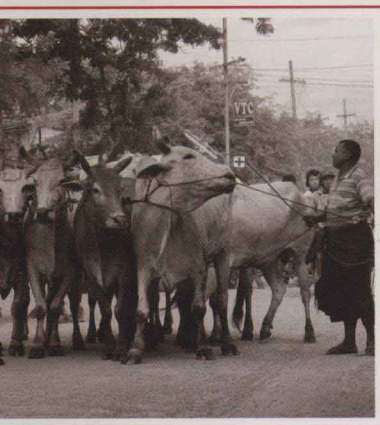

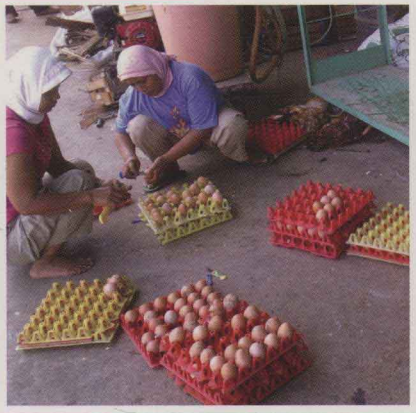

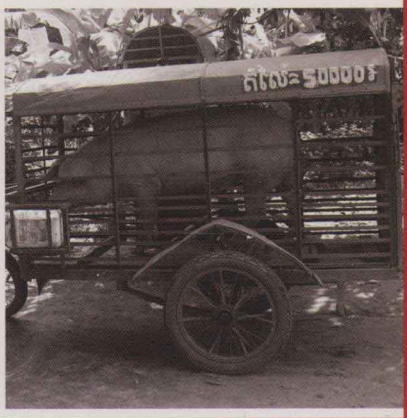

guidelines

DESIGNING AND IMPLEMENTING LIVESTOCK VALUE CHAIN STUDIES

A practical aid for
Highly Pathogenic and Emerging Disease (HPED) control

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Several of the workshop participants made particular contributions in the chapter "Some examples of successful application of tools described in this document". These people are named within the headings of the sections they contributed.

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Contents

Purpose of the document

Several production system and market chain studies have been conducted to support disease control interventions in South East Asia. These value chain studies have been very useful to enhance understanding about the production system dynamics, product flows and the disease transmission impact of different actors' incentive structures and behaviours. However, it is felt that more explicit integration of the value chain approach into epidemiologic risk assessments would be beneficial to support animal health decision makers in identifying efficient and equitable disease control interventions.

Some of the early, exploratory field applications of value chain approaches to understanding disease epidemiology and risk assessment, with a focus on H5N1 HPAI, were used as a basis for the development of a FAO guidelines document (FAO, 2011[3] – hereafter referred to as "the FAO guidelines document"). The FAO guidelines document provides technical foundations of the value chain approach to management of disease risk and describes a practical approach for the incorporation of risk analysis with descriptive value chain mapping. Suggestions of field techniques are included.

This document is based on a consultative workshop on "The integration of livestock market chain analysis in the control of HPEDs in South and South East Asia", held from 26 to 27 April 2011 in Bangkok, Thailand (for convenience this will be referred to as "the Bangkok workshop"). Based on the collective experience of the participants in the workshop, this document sets out to prioritise the set of required data to be collected and to identify effective data collection and analysis techniques. After a brief overview to set the context of value chain studies in animal health decision support, the main body of the document consists of:

- A chapter covering the practical aspects of value chain study design, implementation and analysis. This chapter presents an overview of available data collection and analytical tools (a 'toolbox') with discussion of the appropriate use of the tools.
- A chapter describing some current regional experiences with value chain study approaches, containing brief examples of the successful application of different tools.

It is intended that as an adjunct to the FAO guidelines document this document will provide further practical advice that will encourage more effective use of value chain studies in South and South East Asia as part of animal health decision support.

The target audience for this document includes:

- International and national organizations contracting national institutes to conduct value chain studies and/or organizing capacity building in this subject.
- Research institutes in ASEAN and SAARC countries conducting livestock sector value chain studies.

[3] FAO. 2011. A value chain approach to animal diseases risk management – Technical foundations and practical framework for field application. Animal Production and Health Guidelines. No. 4. Rome. ISBN 978-92-5-106861-8.

Wider audiences include:

- in Africa AU-IBAR is actively seeking support for Value Chain approaches that will allow design of better, more standardised surveillance systems;
- there is private sector interest in data and analysis that is whole-chain or Critical Control Point focussed in nature.

This document, along with the more extensive FAO guidelines document, should be helpful as a reference document in the process of commissioning value chain studies for the purpose of supporting design of animal health strategies.

Overview: context of value chain studies

HOW VALUE CHAIN STUDIES FIT WITHIN THE WIDER CONTEXT OF DESIGNING DISEASE SURVEILLANCE AND CONTROL STRATEGIES

Disease prevention, surveillance and control, whether at national or farm level, state or private resourced, must be planned and implemented in proportion to the risk associated with animal disease. It is unrealistic to implement a very costly programme against a disease hazard that has low risk. In current parlance, planning for disease prevention and control should be *'risk-based'* and prevention and control measures should be *'proportionate to the risk assessed'*. Furthermore, it is recognised that in livestock production and marketing systems there are many stakeholders (people, groups and organisations) with different perceptions of the same risk, that may affect, and be affected by, disease hazards in different ways, and may face and accept different levels of risk. Different stakeholders may also be affected by prevention and control measures in different ways. Ideally, prevention and control measures should be *'proportionate to the risk'* faced (and perceived) by each stakeholder, otherwise compensatory mechanisms may be needed to assure compliance and equity.

To achieve this goal requires that two technical issues are addressed together.

1. Understanding the livestock production systems (including marketing and input supply) and the decisions stakeholders make within the livestock production systems in question.
2. Evaluation of disease risks within the livestock production systems in question and of measures to reduce risk.

The first issue falls within what in economics is called 'value chain analysis'; the second falls within what in veterinary epidemiology is called 'risk analysis'.

Value chain analysis provides a practical framework for disease risk assessment and animal disease management. It is a tool that can be used to identify key constraints and opportunities within a livestock production system, including possible risk for disease transmission within a value chain and the people involved along the value chain. In turn where the risks are deemed to be high enough and the reduction of these risks is thought to create large impacts on society in general (externalities) public interventions may be appropriate.

Value chain analysis can be a useful tool in such planning insofar as it directs and identifies people and organizations who need to be involved in order for an intervention to succeed. Used in a participatory way, for example, as part of a stakeholder consultation, value chain mapping acts as a focus for communicating knowledge, and can play a very important role in risk communication, thus leading to more transparent decision-making on animal disease management.

It is important to remember that value chain analysis complements other tools and information:

- Epidemiological information is essential – key activities in generating good epidemiological information are surveillance and outbreak investigation;
- Characterisation of pathogens and analysis of distribution – sample collection from outbreaks and as part of designed surveys with diagnostic testing and detailed characterisation of pathogens (e.g. molecular epidemiology) are important in this respect;
- Known risk factors should form part of the 'knowledge base' informing risk analysis in value chains – e.g. it is known that RNA viruses are more likely to emerge as new threats.

DEFINITION OF VALUE CHAIN AND VALUE CHAIN STUDY

For brief definitions of technical terms related to value chains and risk analysis, see Annex 1.

Value chains

Value chains are the linked groups of people and processes by which a specific commodity is supplied to the final consumer. These chains have inputs that are used to produce and transport a commodity towards a consumer; this is the supply chain. The value chain encompasses more than the production process; value chain as a term implies a flow of information and incentives between the people involved. Money is sent from the consumer to the different people in the chains to complete the value chain. Understanding the flow of materials through a value chain is important in understanding how risk of disease spread may be engendered in the chain, while understanding the flow and distribution of incentives is key to understanding how to manage those risks.

It is important to note that value chains may involve several products, including waste and by-products.

Value chain studies

Description

Value chain studies should firstly describe the processes through which livestock and other inputs pass during the production process[4] together with the resulting variety of products at the end of the chain. The results often include a ***flow chart*** or ***process map*** for ***specific products***. Value chain studies must also describe the places where each process occurs and the people involved, and therefore often include ***annotated maps***.

Value chain descriptions provide a good starting point for risk analysis and can be used as part of a stakeholder consultation process to create useful discussions about risk issues and therefore promote good risk communication.

The first output of a value chain study is usually one or several diagrammatic value chain "maps" consisting of boxes representing different people, groups or organizations and/or production/marketing sites in the chain with lines or arrows between these boxes indicating flows of livestock and animal products. Information on seasonal patterns and longer-term

[4] See *A value chain approach to animal diseases risk management* (FAO Animal Production and Health Guidelines 4) pages 25 to 30.

trends, product volumes and values, as well as numbers of enterprises or livelihoods supported at each point in the chain, can be presented as ***seasonal calendars***, linked to the charts and maps.

Analysis

Value chain analysis adds to the value chain description by analysing the internal and external environment of the chain or chains.

A complete value chain analysis would include information on the following:

- Identification of the products/by-products of interest;
  - Note that commercial interests focus on one or two products, while for animal and public health purposes it is necessary to look at the full spectrum of products, including low-value ones such as waste products, cull animals, etc.;
- who is involved in the value chain;
- physical location of activities and of the people in the chain;
- seasonality of supply and demand;
- appropriate analysis of profitability[5] for different people at different points, including transaction costs between people and points;
  - It is important to have the units correct: per ton, per animal, etc. This in turn requires that costs and revenues are, in fact, (i) able to be attributed and, (ii) able to be disaggregated into variable and fixed costs. The same goes for animal health costs and benefits.
  - Note that public goods and dynamics are important: costs of disease prevention and control have long term benefits and these may be public in nature. Costs incurred in the value chain are private and pay short term dividends.
- who sets regulations or conditions (pressures) for participation in the chain, who applies the rules and ensures compliance with them and/or provides assistance in meeting the conditions, i.e. who governs these chains;
  - public legislation that impacts on the functioning of the chain; this could include regulations not directly related to animal health, such as tax regulations favouring different scales of operation;
  - contractual arrangements (formal or informal);
  - private sector regulations;
- who and what factors are driving developments or changes in a value chain; this implies a temporal factor for the analysis;
- a complete value chain analysis will allow an assessment of the equity (e.g. market power) across the chain and its efficiency to convert inputs into products demanded by consumers;
  - equity can be skewed by governance and poor distribution of information across chains; for example, traders may have and retain better knowledge of consumer demands than producers so that traders can take advantage of premium markets without passing on benefits to producers;
  - presence of disease in the chains will reduce efficiency of the chain.

[5] i.e. gross margin analysis or enterprise budget.

In the practical application there need to be trade-offs between precise detail and requirements of the users of the study for timely decision making. For the specific purposes of animal disease management and health planning it is important to focus on identifying how people influence risk and react to it in the chain. It is particularly important to describe how chains actually work, not how they ideally work; for example, it is common to find abuse of procedures both by people directly involved in market chains and by those in authority, and this leads to enterprises operating outside regulations. These defects in market chains can often cause serious animal and public health risks. In such cases it is useful to ask: "Where is the leverage to deliver compliance with measures necessary to reduce risk?"

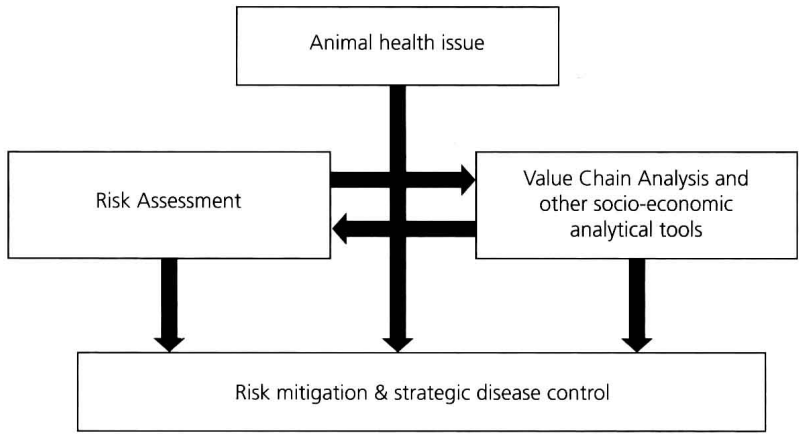
AN OVERVIEW OF THE PRACTICAL APPROACH

During the Bangkok workshop it was recognised that value chain analysis and other forms of socio-economic analysis are tools which can be used to support and inform disease control and risk analysis. The different components are linked as shown in Figure 1 below.

A critical issue is to determine where the entry points lie[6]. Establishing a clear disease control problem or question is an essential starting point and then value chain studies, analysis and other approaches can be selected and re-selected based on an ongoing analysis and prioritisation of requirements.

The FAO guidelines document describes a suggested stepwise approach to applying the combination of value chain and risk analysis to an animal health issue. Three steps are summarised as:

FIGURE 1
Inter-linkage of disease control, risk assessment, value-chain and socio-economic analysis



[6] This has been approached by ICRISAT, ILRI and others by "Innovation Platforms" which are 'talking shops' for people involved in value chains who engage in a cycle of communication using value chain analysis as a framework to refine problem and opportunity definitions, and help identify the entry points.

Step 1. Situation analysis and preliminary risk analysis

- descriptive epidemiology of the situation regarding the disease(s) of concern
- description of livestock value chains and identification of people and organizations involved in those chains
- identification and characterization of the risk issues[7] and risk hotspots in value chains

Step 2. Detailed risk and value chain analysis leading to planning of risk management options

- development of risk pathways and identification of potential risk mitigation measures
- development of options for inclusion in a risk management strategy

Step 3. Option appraisal and decision-making

- analysis of impacts on different stakeholders

Livestock value chain studies and the information they generate are needed at all three steps. Different specifications of study may be needed at different stages in the process – 'quick and dirty' at step (1) and more detailed, rigorous studies in the following steps.

The overall approach merges classical veterinary disease investigation and control measures with a range of socio-economic tools and includes participatory approaches to epidemiological analysis.

Particularly in the second and third steps, the different components of the approach are linked through a dynamic and iterative process, in that value chain analysis will identify priority areas for deeper risk analysis and risk analysis will in turn identify priority questions to be answered by value chain studies.

It was recognised that through the iterative approach some tools could be applied rapidly and give urgent information back to decision makers (e.g. focus group discussions). That information would be of variable quality but would permit timely feedback. Where initial data quality was of concern and/or the significance of the decision being based on the data was high then several tools could be utilized or implemented in greater detail (e.g. value chain analysis could be conducted rapidly to map and identify key stakeholders or could be done in great detail to provide more depth and higher quality of analysis).

[7] Here it is only animal disease risk that is referred to. It is of interest to note that the concept of risk in value chains may also be applied to risks of other kinds of hazard faced by people in value chains. Some are related to disease risk (the weather) some are not (non-payment) and some have complex feedbacks (efficacy of surveillance systems and the associated information transfer, and the responses of people to it). Essentially, this issue places a probability on the profitability assessed.

Designing and implementing value chain studies

DECIDE OBJECTIVE AND OUTPUTS

During the Bangkok workshop it was recognised that the first requirement in setting up a successful value chain study is to establish a clear understanding of the ***questions to be addressed by the study***. Clearly stated questions in turn allow the expected value chain study results to be anticipated and specified.

In general, the combination of value chain mapping and economic analysis with epidemiological risk analysis is useful in Animal Health Planning to:

1. assess the epidemiological and socio-economic justification for different disease control strategies;
2. inform the stakeholders involved in the different disease control strategies;
3. evaluate the socio-economic impact of contagious diseases and the socio-economic sustainability of different control strategies on the different stakeholders affected;
4. plan adjustments to control strategies based on both the epidemiological and socio-economic assessments.

In support of animal health planning, some of the key questions that may be addressed using these techniques include:

- **Which processes within different production and marketing systems carry risk for disease spread, and what are their relative contributions to overall risk?**
  - Understanding role of movements of animals (+ products + inputs) in spread of disease - implications for disease control?
  - In case of outbreaks... which markets should be closed etc.?
- **What are the structural, institutional and governance issues which underlie higher risk situations?**
  - Infrastructure constraints and limitations on value chain operation (e.g. availability of specialised transport, existence of slaughter facilities... etc. etc. ...).
  - Distribution of incentives in the chains.
  - Rules and agreements (state and local / written and unwritten) that dictate behaviour of people in the chains.
- **Overall, which production systems carry more risk and therefore justify more regulation/intervention?** [risk assessment in value chains]
  - For example, with respect to H5N1 HPAI, should the priority be to deal with backyard poultry or do some other commercial systems require urgent attention?
  - And, how do people within these systems influence the level of risk through their behaviour? – which people have more influence than others?

- **Who are affected by risky processes/points, and how much?**
  - Who could be affected by any disease hazards (and how)... [impact assessment and risk assessment in value chains]?
- **Who has most to gain or lose through risk mitigation interventions?**
  - Who could be affected by any proposed control measures (and how)... and what are the alternatives [impact assessment and risk assessment in value chains]?
- **How can the state and/or other stakeholders including the private sector, agribusiness and civil society, act to promote less risky operating environments for livestock production?**
  - What are the possible impacts / consequences of major re-structuring plans [disease risk changes; stakeholder socio-economic impacts]?
  - How can (disease free / controlled) compartments be defined / established?
  - What are the options for controlling / managing cross-border disease risk?
- **Where in a country are the 'risk hotspots' (for example, locations where there is higher risk of disease emergence and/or spread)?**
- **When in the year are the high risk times?**
- **Where and when should control measures be targeted (in other words, identification of critical control points)?**
- **Where and when should surveillance be targeted?**

Outputs required from value chain studies

When commissioning or designing value chain studies to support animal health planning it must be remembered that, whereas the original focus of value chain analysis is on improving market efficiency, the focus for this purpose needs to be on risks of disease transmission in the production and market chain. Value chain studies can yield a mixture of quantitative and qualitative data:

- Quantitative data on: animal origin areas, location and volume of movement corridors, congregation points, processing points and consumption areas; price differentials and margins.
- Qualitative data on: practices of actors in the chain; governance, regulation and control of the chains; regulation, linkages and trust; knowledge, skills, technology and support service options for risk reduction.

Step1. Outputs from situation analysis and preliminary risk analysis

The first step of a value chain study focused on disease risk must result in the following outputs:

- Identified people, groups and organizations in the livestock value chain from the input supplier to the producer, trader, processor, retailer and through to the final consumer.
- Mapped routes to markets for specified livestock and livestock products, which could be what currently exists and what potentially is available or could be developed.
- Identified opportunities for disease transmission (the big 'risk issues') and hotspots.