Pathways out of poverty: a novel typology of animal diseases and their impacts

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Summary
This paper describes the development of a typology of animal diseases that is based on the impacts they have on the poor in the developing world, and advocates the use of this typology in identifying poverty-reducing disease control research and development opportunities.

Introduction
Due to the multiplicity of key roles that livestock play in the lives of the poor in most regions of the developing world, animal diseases are a significant constraint to poverty reduction, exerting their influence in a variety of different ways. Their impact depends on the importance of the different species affected in the livelihoods of poor societies, in the form of security, financial and social capital, as machines for cultivation, as fertiliser, and of course as nourishment. An accepted clustering of animal diseases has been into the four general groups of the endemic, the epidemic (or transboundary), the zoonotic and the food-borne (Perry et al., 2001), but these are not sufficiently specific to the effects of diseases on poor people to be of value in targeting poverty-reducing disease control research and development. In this paper, we propose a novel typology of disease impacts on the poor, and in an accompanying poster (Perry et al., 2003) demonstrate the application of this typology to identifying research and development options for poverty reduction.

ANIMAL DISEASE IMPACTS

Animal diseases generate a wide range of biophysical and socio-economic impacts that may be both direct and indirect, and may vary from localised to global problems. A particularly useful distinction can be made between those impacts associated with overt clinical and sub-clinical disease and those associated with disease risk. While exposed to a wide array of risks related to animal disease, the poor have a particularly limited capacity to cope with such risks. Existing close to the survival threshold, the poor tend to be more risk averse, and so less likely to “take a chance” on preventive disease technologies. More importantly, low incomes and few assets mean that the poor have few options available for managing crises, are less resilient to shocks and slower to recover. Livestock disease is particularly damaging as it threatens one of the few assets that the poor keep for dealing with other shocks.

The impacts of animal diseases on the poor are complex, involving direct and indirect effects, multiple pathways, operating at a variety of levels, depending on the particular disease or syndrome. The livelihoods approach (DFID, 2000) offers a valuable framework for handling these dimensions. The vulnerability context (left box in Figure 1) represents the environment in which the poor live, particularly as it translates into the various types of risk they face. Within the livelihoods framework, the impact of animal diseases can be described by the various ways they affect the

poor household's asset base represented by the pentagon. Animal disease can threaten each of the five types of household assets.

- financial capital (mortality and morbidity reduce the financial investment value of livestock assets, and the income flows derived from them);
- human capital (zoonoses and food-borne diseases can temporarily or permanently impair an individual's ability to work, depriving a household of income generation);
- social capital (in many societies livestock serve as a mechanism for establishing relationships of trust within social networks; disease lowers the number and quality of animals available for this)
- natural capital (in mixed crop-livestock systems, manure often plays a critical role in maintaining soil fertility, and disease can reduce its availability)
- physical capital (livestock can be considered as farm tools, for example in ploughing, and disease can affect their quality and availability).

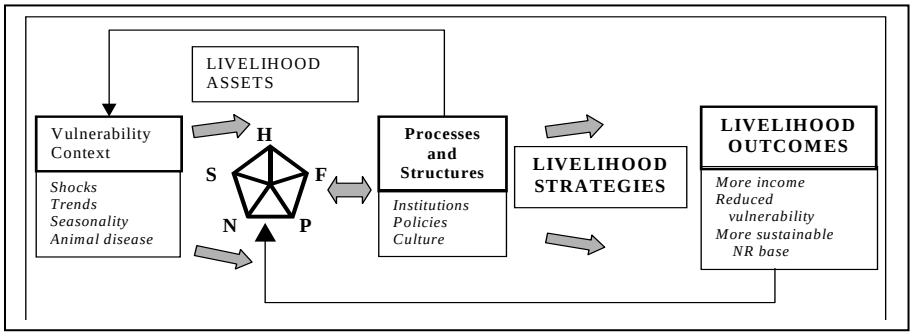

FIGURE 1: SUSTAINABLE LIVELIHOODS FRAMEWORK (H=Human capital; F=Financial capital; N=Natural capital; S=Social capital; P=Physical capital). Source: DFID, 2000.

The same type of analysis can be applied to poor households that do not keep livestock. For the poor who earn wages from working in off-farm livestock or marketing enterprises, animal disease can put at risk one of their important sources of income (financial capital). Also most poor, rural and urban, are consumers of animal products, and often can only afford low-quality products sold in informal markets. They face a higher chance of contracting zoonotic and food-borne diseases, putting at risk their key human capital (illness) and financial capital (wage losses and medical expenditures) assets. Poor consumers may also be affected by epidemic animal diseases when outbreaks disrupt markets, create product shortages, raising prices.

A NOVEL TYPOLOGY OF DISEASE IMPACTS ON THE POOR

By looking at the impacts of animal disease through a poverty lens with the help of the livelihoods approach, a new way of grouping the impacts of diseases emerges. Three general categories are proposed. The boundaries between these are certainly not distinct, and there is an inevitable degree of overlap. They provide a useful conceptual framework for evaluating research and development initiatives.

- **Diseases that exacerbate asset insecurity**

The first set of diseases includes those that threaten and degrade the asset base of the poor household under current conditions of livestock use within the household.

Whether the household keeps livestock for consumption or market, earns wages from off-farm livestock activities, or simply consumes livestock products, the focus here is on the impact of animal diseases in eroding the household's assets through various pathways. These include many of the endemic diseases and poor productivity syndromes, as well as the common zoonoses. Through the continued high exposure to the risks associated with animal disease and the lack of access to appropriate means to manage these risks, poor households are forced to adopt risk-averse livelihood strategies that do not allow them to accumulate assets or invest in better technologies. Securing these assets offers a first possible pathway out of poverty.

- **Diseases that limit market opportunities**

The second set of diseases refers to those that restrict the poor from exploiting market opportunities for their livestock and livestock products. Market opportunities are changing rapidly for the poor. Local demand for livestock products is expected to increase dramatically in developing countries as population sizes and income levels increase in what has been termed the Livestock Revolution (Delgado et al., 1999). With appropriate policies, the response to increased demand could also be harnessed as a mechanism for reducing poverty, by paying particular attention to the role of poor livestock keepers in responding to this demand for livestock products at the community, national and international levels. From this perspective, many of the zoonoses and epidemic and food-borne diseases limit access to markets for livestock products from the poor. This reduces their ability to reap full income value from their livestock activities by restricting them to informal markets and their lower prices, and excluding them from participating in new market opportunities as they develop under globalization, so excluding them from a second pathway out of poverty.

- **Diseases that limit livestock-based intensification of farming systems**

The third category of diseases turns the focus to those livestock activities that would require a specific effort and investment by the poor because they involve upgrading an existing activity through a more productive management technique or adopting a new, more productive livestock activity. Increasing productivity is the classic pathway for intensification of farming systems by which households increase the value of output for their inputs, and is thus key to escaping poverty. Moving up the "livestock ladder" is a common form of intensification. But, as emphasized above, the poor tend to be risk-averse, and so are reluctant to invest in a new activity that may threaten their vulnerability and already constrained asset base. Some diseases have had a major impact by discouraging certain livestock activities. A well-known example is that of trypanosomosis, which has been responsible for the under-utilization of livestock across the tsetse belt of sub-Saharan Africa.

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