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Structural changes in the poultry sector: will there be smallholder poultry development in 2030?

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The major structural changes that have occurred in poultry production and marketing in recent decades have been driven by the growing consumer demand for cheap animal protein. As a result, a strong and internationally integrated poultry industry has evolved that utilizes economies of scale and advanced technology. In developing countries, however, the majority of poultry are still kept by smallholders in less intensive systems. For these households, poultry has served as both a safety net and a means to acquire assets and move out of poverty.

However, increasing external pressures on the poultry sector arising from social, economic and environmental factors are strengthening the trend towards intensification. It seems likely that poultry production will continue to serve two needs: supporting livelihoods of poor rural households and as a source of lean meat for growing populations in non-agricultural areas. It is less clear where and for how long small scale commercial poultry systems will serve as a tool for poverty reduction. This paper examines the evidence and proposes conditions that may support or discourage smallholder poultry development.

Keywords: poultry; sector structure; policy; smallholder development

Introduction

The poultry sector is possibly the fastest growing and most flexible of all livestock sectors. Over the past decade or so it has expanded, consolidated and globalised, driven primarily by very strong demand. However, the sector faces considerable and multiple challenges from scarce or more expensive natural resources and public health concerns that will require entrepreneurship and flexibility from the players in the sector if they are to continue to participate in this dynamic market. A conference in Bangkok at

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the end of 2007 (http://www.fao.org/AG/againfo/home/events/bangkok2007/en/index.html) concluded that very small family flocks raised for subsistence consumption and local sale are unlikely to be pushed out of production as long as they serve a function as a safety net for the families who own them. Small commercial units, however, particularly those that supply market chains to urban populations, will increasingly be subject to competition. This paper examines the demands that will be made on these small scale poultry producers and the services that supply them and poses the question: for how long and under what conditions can small scale poultry continue to provide a route out of poverty and towards capital accumulation?

Forces that have shaped the poultry sector

Since the 1990s, the poultry sector has been part of the 'livestock revolution'. Demand has grown, driven by urbanisation, population growth, trade and high expenditure elasticities for livestock products such as chicken (Narrod *et al.,* 2008; Steinfeld and Chilonda, 2006). Supply has been able to match demand, thanks to technology developments in breeding and nutrition (Upton, 2008) supported by relatively inexpensive sources of feed. Demand and supply have shifted from OECD countries towards developing and emerging economies, where poultry meat and eggs have seen a huge expansion in both consumption and production (Steinfeld and Chilonda, 2006). Consumption of poultry products in these economies is growing more rapidly than for all other meats, with China being a net importer of poultry products (Upton, 2008) while the small group of exporting countries supplying most of the international trade in poultry products includes Brazil and Thailand.

The poultry sector has been quick to take advantage of economies of scale and has rapidly become consolidated and integrated. This change has been especially rapid in countries that trade internationally. The ownership of global breeding chains is concentrated in a very small number of companies, and while asset ownership for birds producing meat and table eggs is more dispersed, in the USA, eastern China, part of Brazil and Thailand poultry value chains have consolidated around fewer, larger production and processing units (Binsheng and Yijun, 2008, NaRanong, 2008). There has also been some spatial concentration, influenced by the advantages of being close to the point of final sale and the need for heating or cooling of poultry houses in certain climates. In countries that do not export but have large poultry populations, like Indonesia, Pakistan and Egypt, similar trends are evident.

Concentration of the sector, together with increasing requirements to meet animal health, food safety and quality standards, have raised the barriers for smallholder producers and small scale processors to participate in growing markets (Binsheng and Yijun, 2008, Mehta and Nambiar, 2008). Nonetheless, small and medium scale commercial production has been able to expand very fast to meet demand gaps in newly growing economies such as Vietnam, and in the areas immediately surrounding many large cities of the developing world, but faces rising pressure as markets develop and value chains become more organised. However, in the countries where supply has grown fastest, it has not been matched by an expansion of safety and quality regulation in livestock food chains. Neither has much attention been paid to disposal of waste or other types of environmental contamination created by livestock (Gerber *et al.*, 2008).

In parallel with the commercialisation of the sector, small scale production for home consumption and local sale continues to flourish in many parts of the world, providing an important family income source, a supply of products, the means to fulfil social obligations, and a source of livelihood for women (Sonaiya, 2008).

Today's poultry sector, therefore, is dynamic and diverse. It has responded quickly to the opportunities, but neglected to pay sufficient attention to animal health and food safety systems. Poultry can be seen as a success story and also provide an indicator of underlying problems of unregulated growth of livestock systems leading to human health and environment risk.

New directions

The demand drivers that fuelled the livestock revolution are still in evidence, namely growing incomes and urbanisation in developing and emerging economies (Upton, 2008). However, the impact of these drivers is lessening. Demand is already stagnating in OECD countries, where higher incomes are no longer increasing total consumption of livestock products. Marketing of food, rather than focussing on increasing quantities, is instead concentrated on adding value through processing, packaging and presentation. This is much less the case in Asia where total demand for poultry products can be expected to rise for several years, or in Africa, which is belatedly experiencing a livestock revolution, but in these regions it can be expected that demand will eventually level out or fall.

Set against the drivers for growth, a series of trends and shocks are pushing up the cost of producing livestock. One set of trends is associated with environmental problems and our adjustment to them. At the time of writing, the price of food was a major topic of discussion. Concerns about fossil fuels, leading to a considerable investment in biofuel production from cereal crops and oilseeds, have intensified competition for these crops with animal feed and human food producers. The use of cereals for non-food purposes grew at treble the rate of their use for food purposes between 2000 and 2007 (von Braun, 2007, citing FAO Food Outlook reports). At the same time there have been droughts in major cereal producing countries, reducing the ability of suppliers to respond. World stocks of cereals are currently very low and prices have risen by roughly 50% since 2000 (von Braun, 2007). Higher costs of feed translate to lower margins for livestock producers and elevated food prices for consumers. Poultry are very efficient feed converters and feed research is exploring many avenues, including ways to exploit alternative energy sources and ways of unlocking nutrients (Chadd, 2008).

While it is too soon to assess long term trends (for example, fertilised maize as a source of biofuel is not particularly carbon efficient and may be replaced by other sources), cereal prices are likely to increase by a further 10 to 15 percent by 2015 (von Braun, 2007) with consequent impacts on poultry product prices. The impact on demand is likely to vary in different income quintiles. If prices of poultry products rise relative to other animal or fish products, wealthier families switch between sources of animal protein, so that the impact of high feed and food prices on their poultry consumption is affected more by the relative than the absolute cost of poultry products. Less wealthy families, faced with reduced purchasing power, respond by switching from animal to vegetable proteins (Geerlings *et al.*, 2007).

A smaller but important trend relates to concerns for animal welfare and the effect of livestock on the environment, particularly evident in the OECD countries and notably in the EU. Some consumers, concerned for human health, the environment and welfare, have reduced animal protein in their diets. Poultry provide lean meat with limited pollution from manure compared to other livestock, but when they are farmed intensively they score poorly on welfare grounds and contribute to production of nitrous oxide as a result of the fossil fuels and fertiliser used in their production.

Problems that affect poultry sales are mainly associated with disease, consumer

reactions to disease, and the measures taken to control it. The poultry sector is not alone, as other livestock have suffered badly from outbreaks of FMD and BSE in recent years, as well as more localised impacts of other diseases, but the impacts of HPAI have been very great. Global markets were turbulent during 2004 and 2005 (Morgan, 2006) and local markets in newly infected countries have continued to experience reductions in sales. Response to HPAI has affected the structure and production pattern of the global poultry sector, shifting sources of production (*e.g.* from Thailand towards Latin America) and accelerating changes in the pattern of exports (*e.g.* towards processed products rather than chilled meat from Asia). It has also pushed national poultry value chains in some countries towards concentration and intensification at a much faster rate than might otherwise have occurred, and is creating a long-overdue interest in biosecurity and market hygiene (Sims, 2008). The extent and speed of further changes resulting from HPAI will be highly country-dependent; for example, in Thailand new management practises may already be in place (Sirimongkolkasem, 2008).

The sector is showing itself to be responsive: in spite of the difficulties caused by disease outbreaks, total production and the volume of international trade in poultry products have continued to grow, but there has been an accelerated shift towards processed products and a growing interest in creating compartments. Both of these represent attempts by the private sector to reduce the uncertainties and costs associated with disease. However, there have been losers, most notably poor families that have lost birds that provided them with income, allowed them to fulfil social obligations and added to their sense of wellbeing (McLeod, 2008). These families are now living with heightened uncertainty about the future.

There is growing pressure on all parts of the economy to internalize the externalities they create. The poultry sector has a strong potential to adapt and thrive. But an important question remains: what will the necessary adjustments mean for small scale producers?

The future for smallholder poultry

What will the future be for smallholder poultry? They will certainly survive, but in which form? The meeting in Bangkok (2007) debated hard over this question and produced many interesting ideas but no clear-cut conclusions.

In very broad terms, the sector is divided between three types of poultry flock, each with a different function.

1. The first type we will call ‘industrialised’: a medium or large sized flock, either intensively reared or kept extensively under strictly regulated conditions, kept purely as a commercial venture by a firm that can provide all necessary inputs and technology.
2. The second is the ‘safety net’ and this is an example of smallholder poultry. Safety net flocks are small, low-input flocks of indigenous breeds or hardy crossbreds, kept by a large number of poor families for eggs and meats, or to be sold, bartered or given away as required. They make an important contribution to livelihoods and social dynamics although their contribution to income is usually small.
3. The third type, again classed as smallholder poultry, is the ‘asset builder’. These are small to medium sized flocks kept by a family as a means of acquiring assets as a route out of poverty. These flocks may be enclosed (typically hybrid chickens) or extensive (*e.g.* herded ducks). They represent quite a large proportion of the total assets and income of their owners, and are often financed from loans. Because of the fast turnover, a successful asset building flock is an attractive way of making money, but it is also highly risky and relies on good market connections.

In Europe in the early 20th century, there were large numbers of safety net and asset builder flocks. The large majority moved indoors to meet the demands of urban markets and to take advantage of technology and retail systems favoured intensive large scale production. Towards the end of the century some flocks moved outdoors again in response to a demand for free range and organic birds, but most are still kept in well regulated conditions. Small numbers of backyard flocks still exist, but are now kept for interest ('hobby farms') more often than as safety nets. In some countries small scale poultry producers serve a niche market. Changes in production patterns have been reflected by changes in patterns of ownership; the people keeping extensive poultry today are not the sons and daughters of those who once kept small scale flocks.

Will the same trends be seen in developing countries? Developing and emerging economies are important players in the global poultry sector. Four patterns can be seen in the poultry sectors. One, typified by Turkey and parts of Brazil, shows a strong trend towards industrialised flocks (particularly chickens) with safety net flocks still common, but predominantly supplying local rural markets. A similar pattern can be seen in eastern China and Thailand, where most of the flocks are very small and have a safety net function, but the great majority of chicken production is from industrialised flocks. Duck production, however, is mainly in extensive asset-building flocks. In both of the preceding patterns, the role of asset building flocks is arguably diminishing. A third pattern is typified by Indonesia, India, Egypt, Nigeria and Ghana, where all three types of flock are found in large numbers, and asset building flocks supplying largely unregulated market chains are important to meet urban demand. Finally, there is the pattern seen in Cambodia, Lao PDR and Burkina Faso among others, where safety net flocks are the mainstay of rural production, small numbers of asset building and industrialised flocks supply the towns, and the system is changing slowly if at all.

THE FUTURE FOR SAFETY NET FLOCKS

It is both likely and desirable that safety net flocks in rural areas will continue to exist as long as there are poor families that need them. Their owners should not be particularly vulnerable to the changes described above, since they rely on low inputs for home consumption or they supply markets where they will meet limited competition, and live in places that will be least affected by regulations to protect animal and human health.

Those kept in large towns have a more uncertain future as concerns about human health and HPAI may lead to them being banned. There has not yet been a comprehensive risk assessment to differentiate between different types of safety net flocks in towns. Free roaming flocks that scavenge on urban rubbish dumps are an obvious risk whereas those kept on rooftops and handled only by their owners may not be.

THE FUTURE FOR ASSET BUILDING FLOCKS

Asset building flocks have been the mainstay of many livestock development programmes, based on several different models, some more successful than others. The precise requirements for success varies with local conditions, but common features can be identified, some internal to the enterprise and others part of the external environment.

Internal success factors include the ability to meet market requirements, a good business model, access to support services, a reliable source of finance, and a reliable source of labour. Market requirements include price, reliability, safety and quality. This applies in all markets and to both contracted farmers and independent suppliers. Some poultry development projects have failed to be sustainable because they have not made

realistic provision for the demands of markets (Sonaiya, 2008). Small scale flocks that try to directly compete in a market well supplied by industrial flocks have a large chance of failure because they will not be able to exploit economies of scale or wield bargaining power.

A good business model needs to be realistic about the market and make allowance for slow start-up and occasional failures. The most effective poultry development projects include some business and financial training.

All asset building flocks need access to support services and technology, such as day-old chicks, feed, vaccines and drugs and information on good husbandry. There are several success stories in which the support package has been provided by an NGO or by a commercial supplier of day-old-chicks, as well as less successful examples of unsustainable systems.

A sustainable source of finance that allows for occasional losses is essential, whether this comes from family loans, external credit or another family-owned enterprise. Small flocks need pre-financing to pay for birds and inputs, particularly in the first few production cycles, when the birds are vulnerable to disease and there may be temporary market fluctuations. A reliable supply of competitively priced labour is also essential. Family labour is ideal provided that it can be sustained and the poultry unit is not too far from the house, and small commercial poultry flocks kept near the home can be attractive to women because they are family-friendly in their demands on time.

Poultry development projects, understandably, have focussed on the internal factors that they can influence, and in the short to medium term this may be sufficient, but the external factors will have a major influence on long term sustainability. External factors likely to be favourable to asset building flocks include having suitable markets, support policies for establishment of the flock, favourable land use and land tenure regulations, sources of credit, and promotion of business models such as co-operatives and joint ventures.

Suitable markets for poultry products produced by individual farms should ideally be 'niche' sector. In other words, markets must be small enough to discourage competition from large companies, perhaps demanding specialised products that can be produced on a small scale and command a high prices, or perhaps favouring 'localness'. There is a strong urban myth that local and specialised livestock products, such as indigenous poultry and their eggs, command premium prices and are a suitable niche market for commercial smallholders to target. In some cases thriving markets have been developed with birds designed to meet this need, such as the Baladi in Egypt and the kuroiler in India, and extensive ducks in Vietnam and China, although the latter are problematic for countries that have suffered from HPAI and have reduced in number in Thailand. In other places, commercial smallholders have adopted the hybrid broilers and layers, putting them into direct competition with industrial flocks. Suitable markets for asset building flocks arguably have a limited life. In countries where domestic demand is still growing, such as in Egypt, they still have opportunities. However, when the demand for a premium product grows and a modern retail system develops, as in Thailand and Turkey and for free range eggs in Europe, the market is captured by large firms. Consumer demands change over time. In Vietnam, for example, the preference in pig meat is reported to be shifting from fat pork, derived from indigenous breeds, towards lean meat.

Government support policies can directly subsidise the costs for small firms of establishing themselves in a market, or encourage NGOs or large companies to support smaller operators. Subsidy may be needed for infrastructure, for training and for certification, since in the interests of food safety, it may be deemed necessary to exclude all but certified producers from some markets (Slingenbergh and Gilbert, 2008). Policies supporting the establishment of asset building flocks are justified in places where

poultry are the only viable development option for some social groups. However, policies that subsidise the recurrent costs of production (*e.g.* subsidised feed) will not be sustainable because they encourage inefficient management.

Land use and land tenure systems that promote 'safe' and environmentally friendly poultry production may involve zoning of production and processing. If zoning regulations are put into place to force the sector to restructure, small firms will be at a disadvantage in competing for land on which to site their production units and markets (Thieme and Hinrichs, 2007).

Asset building flocks are often financed from credit at least for the first few production cycles. Poultry are perceived as risky and banks may be reluctant to lend, require high collateral or charge high interest. However micro-credit schemes can provide access for people with few assets.

Economic and political conditions favouring co-operatives and farmer associations may assist small farms to group together to exploit economies of scale. The history of such models for livestock production has been chequered, and they seem to have been more successful in Latin America than elsewhere.

Governments may, through their policies, be able to create a more even balance between small and large firms, but it is unrealistic to expect that they will tip the balance in favour of small scale development.

Conclusions

The answer to the question posed by the title of this paper: 'will there still be smallholder poultry in 2030' is yes, but with qualification. Rural safety net flocks will certainly exist, particularly in Africa and parts of Asia, wherever there are poor rural families. Current projections do not suggest that rural poverty will be eradicated by 2030, although it should be diminishing. We can expect some countries still to show a pattern of poultry production that is dominated by rural safety net flocks.

For safety net flocks in cities, the question is still open, and this is important in many countries that currently have the highly mixed pattern of production. With sensible biosecurity regulations and reasonable compliance, small enclosed urban flocks could still exist at minimal risk to their owners in 2030, but this would require a more moderate approach to regulation than has so far been applied. For human health reasons, however, free range poultry flocks in cities should be, and probably will be, removed.

It is a rather obvious statement that asset building flocks will exist in 2030 in places where they can meet the demands of the market. Assuming that the poultry sector continues to scale up in countries whose economies are growing – and there is no strong evidence to suggest that it will follow any other path – the asset building flocks in 2030 are likely to be much fewer in number than they are now, more geographically concentrated, and many will be kept by highly entrepreneurial owners with a clear plan for acquiring assets from poultry as a route to some other forms of business. Some will target niche markets while others exploit temporary business opportunities provided by changes in human demography (such as development or new settlement in rural areas). There will probably be a range of business models, with some farmers acting independently, some in collectives or joint ventures and some, but fewer than today, contracted to large companies. There is currently an interest in compartmentalisation among large scale producers even when their immediate target is not the export market (*e.g.* in Indonesia), as a way of stabilizing their domestic market. Without strong government incentives, it is not evident how small scale asset building flocks could be part of a compartment.

Ideally, policymakers will aim to provide an environment for economic growth while at the same time offering protection to the most vulnerable, but the protection of the vulnerable will not always mean enabling them to continue producing poultry. Other livelihoods options will in some cases be more viable and more sustainable, and in this case the challenge for policy will be to promote a seamless transition.

References

BINSHENG, K. and YIJUN, H. (2008) Poultry sector in China: Structural changes in the past decade and future trend. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5-7 November 2007, Bangkok, Thailand.

CHADD, S. (2008) Future trends and developments in poultry nutrition *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5-7 November 2007, Bangkok, Thailand.

GEERLINGS, E., ALBRECHTSEN, L. and RUSHTON, J. in collaboration with Zahra Ahmed, Ferial Abd El-Kader Ahmed, Soad Ahmed Eldawy, Aida Saied, Hanaa Mohamed, Mervat Khalil, Emel Ramzi, Afaf Said, Nawal Abd El-Menem, Abeer Mohamed, Amira Salah, Ahlam Hazan, Mohamed Abd El-Aziz, Mona Mohamed, Mostafa, Shaakem and Hazan Omar & Sahar El-Helaly (2007) Highly pathogenic avian influenza: a rapid assessment of the socio-economic impact on vulnerable households in Egypt. Unpublished Report.

GERBER, P. OPIO, C. and STEINFELD, H. (2008) Poultry production and the environment – a review. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

MCLEOD, A. (2008) Social impacts of structural change in the poultry sector. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

MORGAN, N. (2006) Meating the market: outlook and issues. Presentation made to the International Poultry Council at the seminar on global trends in meat production and the impact of animal diseases, VIV Europe, 16-18 May, Utrecht.

MEHTA, R. and NAMBIAR, R.G. (2008) Poultry Industry in India. Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond, held 5–7 November 2007, Bangkok, Thailand.

NARANONG, V. (2008) Structural Changes in Thailand's Poultry Sector and its Social Implications. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

NARROD, C., MARITES TIONGCO, M. and COSTALES, A. (2008) Global Poultry Sector Trends and External Drivers for Structural Change. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

SIMS, L.D. (2008) Risks associated with poultry production systems. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

SIRIMONGKOLKASEM, A. (2008) Response of the Thai poultry industry to HPAI. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond*, held 5–7 November 2007, Bangkok, Thailand.

SLINGENBERGH, J. and GILBERT, M. (2008) Do old and new forms of poultry go together? *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

SONAIYA, F. (2008) Smallholder family poultry as a tool to initiate rural development *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

STEINFELD, H. and CHILONDA, P. (2006) Old players, new players, in: MCLEOD, A., CROOK, J., FORLANO, N. & CIARLANTINI, C. (Eds) *Livestock Report 2006* (Food and Agriculture Organization, Rome, Italy).

THIEME, O. and HINRICHS, J. (2007) Poultry sector restructuring options and impacts *Proceedings of an FAO workshop: Future of poultry farmers in Vietnam after HPAI*, 8-9 March 2007, Hanoi, Vietnam, 87-90.

UPTON, M. (2008) Scale and structures of the poultry sector and factors inducing change: intercountry differences and expected trends. *Proceedings of the International Conference Poultry in the Twenty-first Century: avian influenza and beyond,* held 5–7 November 2007, Bangkok, Thailand.

VON BRAUN, J. (2007) The World Food Situation. New Driving Forces and Required Actions. IFPRI Food Policy Report No. 18. Washington DC. http://www.ifpri.org/pubs/fpr/pr18all.asp#dl.