Food production in urban and peri-urban areas certainly has a role to play in contributing to the welfare of some proportion of citizens living in cities and towns in developing countries. However, the fact of urban food production should not be confused with the access and entitlement to food of the urban poor. Patterns of farming observed in contemporary African cities and towns reflect pressures and responses arising, *inter alia*, from structural adjustment, including transitional states of resource and output markets that may not persist in the future. The significance of food production in and around towns for the overall quality of life in developing countries should not be exaggerated, and nor, too, should its claims for scarce development resources.

## CONCLUSIONS AND RECOMMENDATIONS

### *Conclusions*

This research set out to describe livestock production activities in and around three cities in Tanzania. The overall objective was to determine if and how improved strategies might be developed for these intensive livestock systems. An implicit objective was to determine if the category 'peri-urban interface system' added anything to the description or the analysis of these activities. Is there any real advantage to the peri-urban category as opposed to, for example, a category such as 'commercial' livestock production systems? In other words, how important is the fact that these activities take place in the vicinity of urban areas in terms of policy, research or extension?

In each study site production activities centred around milk and poultry were both widespread and dynamic, with most producers being very small-scale. Total output, however, was dominated by a small number of larger-scale operations. It was also clear that livestock products produced in and around these urban areas compete with products produced in other areas, be they regional, national or international. This reinforces the point that livestock (and more generally food) production in and around urban areas must *necessarily* be seen as one part, and in some cases a relatively minor part, of a larger urban food supply system. This point has important implications when research and policy concerns, and potential development interventions, are being evaluated and prioritised.

Both the milk and poultry examples clearly illustrate the impacts of the government's structural adjustment programme on the types and levels of output, and the productivity and efficiency of livestock production in and around cities. There seems to be little doubt that the dramatic growth in urban dairy and poultry production relates to declining purchasing power of civil servants. At the same time, the fact that the government has not yet been able to re-establish itself in a monitoring or regulatory role, as envisioned under structural adjustment, has important implications for producers and consumers alike. For example, poultry producers feel forced to supplement expensive compounded feeds, almost at random, because they have little faith in the nutritional composition of these feeds as purchased. Analysis of a small sample of feeds indicates that this scepticism is warranted, but the actions taken to correct it are costly and inefficient. These costs are borne by

producers and consumers alike. In terms of milk, while liberalisation has opened opportunities for producers, little if any of the fresh milk sold in Dar es Salaam is now inspected, which potentially leaves public health at considerable risk. The fact that a rudimentary milk inspection system still functions in the smaller cities of Mwanza and Shinyanga is perhaps an important comment on the necessity to understand the influence of scale when analysing livestock production in and around urban areas.

Thus, a major conclusion of this research is that the technical and economic efficiency of commercially-oriented livestock production systems in and around urban areas depend on the existence of a regulatory framework that guarantees the quality of the inputs offered to producers, as well as the quality of the end-products offered to consumers. At the present time no such functional framework for quality control exists. Poultry producers add a few handfuls of fish meal to compounded poultry feed, 'just in case', while in Mwanza individual consumers commonly purchase their own lactometers to check for adulteration before accepting delivery of milk. Personal contact and trust still play extremely important roles in these situations, and are used by producers and consumers alike to try to reduce the uncertainly inherent in a largely unregulated environment. It may well be that the costs associated with an adequate regulatory framework would actually take much of the current dynamism out these systems, and it is not being suggested here that this would be an appropriate course of action. However, further consideration of the role and importance of quality control mechanisms for commercial livestock production in adjusting economies is certainly warranted.

Successful milk and poultry production in these commercially-oriented systems depend on the availability of an array of inputs and institutions, from (in addition to the basics such as water and fodder) compounded feed and veterinary services and products, to functional markets. It is clear from the case studies that under these conditions there are many complimentarities between, for example, large-scale and small-scale producers. One obvious case is highlighted in the poultry study: in and around Dar es Salaam, one large integrated poultry company is providing extension services to small-scale producers who use its products. Perhaps it would be easier to argue that this is a win-win situation if that firm did not also effectively dominate both the day-old chick and compounded feed markets, but in the other hand, it is still early days.

The study of milk supplies to Mwanza and Shinyanga illustrates another central complimentarity: that between production in an urban area, and production in hinterland areas beyond the bounds of anything that could usefully be considered peri-urban. If the hypothesis arising from the study is correct, than the rapid development of the population of urban dairy cattle over the last decade may have increased total milk supply, which resulted in expanded consumption and greater demand for hinterland milk. In order to build on this positive linkage, and the dynamic marketing and transportation mechanism that it has spawned, much more research attention should now be focused on these hinterland milk producers. Are they simply selling surplus milk in an opportunistic way, or have they begun to introduce management measures aimed at increasing, stabilising, or seasonally modifying the amount of milk they have to sell? At what point will it become attractive for them to invest in technology such as cultivated fodder, grade cattle, or concentrate feed? While there questions have a clear technical dimension, there is

absolutely no doubt that the responses of hinterland producers will depend in large part on the future development (or demise) of the urban dairy cattle population.

It is interesting to note that this kind hinterland milk does not at present make a significant contribution to the Dar es Salaam milk supply. One constraint is obviously related to scale, in that the sheer size of the Dar es Salaam urban area essentially eliminates the possibility of bicycle transportation from hinterland production areas. Perhaps the movement of milk from the Chalinzi Masai into Dar es Salaam is the most appropriate analogy, and the outcome of current efforts to foster the development of this linkage will be of considerable interest. However, in the light of the magnitude of the Dar es Salaam milk market, the long history of unmet demand, and the significant growth seen in urban dairy cattle, one is forced again to confront the question of whether commercial milk production without the benefit of direct marketing will ever be a viable undertaking given the agro-ecology around Dar es Salaam.

The relatively high capital costs of dairy and poultry production in urban and peri-urban areas means that many producers have considerable formal education and links to a variety of organisations and institutions which can provide technical advice and other services as needed. Indeed, many producers have direct links either to government technical ministries or the agro-industrial companies. These facts appear to argue against any fundamental shift toward urban and peri-urban producers of the limited livestock research and extension resources which are currently available.

Given the dynamic and responsive nature of these systems, which, if nothing else, this research has highlighted, there would also appear to be little justification for targeting specific public-sector or NGO development interventions on urban and peri-urban livestock production. Both dairy and poultry production have relatively high capital requirements, and therefore carry a significant level of risk. In the light of the largely self-financed expansion of these activities in and around urban areas, it is appropriate to seriously question interventions which seek, for example, to distribute dairy cattle to low income families.[9] On the other hand, measures to reduce the level of mortality and increase egg productivity of poultry may make these activities profitable for a greater percentage of producers, and one might expect that these would become priorities for the emerging private extension initiatives.

An analysis of the policy implication of food production in and around urban areas led the research team to the conclusion that there is little justification for a re-introduction of sectoral policies to specifically support urban and/or peri-urban agriculture. In effect, much of the present very active promotion of urban agriculture as a response to urban poverty and food insecurity is probably misguided. Caution should also be exercised in not going too far with the notion of urban agriculture, including livestock production, as a central component of 'sustainable cities'. Rather, the approach must be to see food production in and around urban areas in a food

[9] Several organisations are presently interested in expanding heifer-in-trust schemes to the peri-urban areas of Tanzanian cities. The success of these schemes in Tanzania is a matter of considerable debate (Kinsey 1994; Rutama et al. 1994; Houterman et al 1993).

systems perspective, which takes account of, *inter alia*, wider economic forces and agro-ecological potential.

There is no question that some limited resource urban food producers would benefit from changes in, for example, urban bye-laws and land access arrangements, but there seems to be little justification for a significant shift of resources to support food production in urban and/or peri-urban areas. Another area of concern relates to the real or potential environmental impacts of agriculture and livestock activities in urban environments, and this definitely deserves some attention. Nevertheless, it is possible the phenomenal growth in the populations of urban cattle, which is at heart if much of this concern, may actually be a transitory phase, particularly if structural adjustment programmes eventually have their desired effects.

The production activities described in this report are commercially oriented and they are located either in or around urban areas. One central conclusion is that it is the commercial nature of these activities that is overriding, and that from an analytical point of view little is gained in describing them first in terms of their spatial relationship to an urban area.

***Recommendations***

Several possible areas for further research can therefore be identified. These research areas assume a shift from either a strictly spatial (i.e. peri-urban) or agro-ecological (i.e. high potential) point of departure, such that the defining interest is in *commercially-oriented livestock production* (but make no assumptions about the scale of these activities). Thus, research might focus on:

1. The role, importance and implications of alternative quality control frameworks and mechanisms governing the inputs and outputs of commercial livestock production in adjusting economies.

2. The implications of segmented markets for the future develop of different production systems (i.e. urban and hinterland milk). Specifically, under what conditions will these markets continue (or cease) to be segmented, and which producers or production systems will be best placed to take advantage of these developments?

3. The conditions under which the interaction of urban and peri-urban livestock production systems on the one hand, and hinterland systems on the other, result in positive (or negative) outcomes for consumers and for producers in the different areas.

4. The changes or factors that will motivate (or have already motivated) hinterland cattle owners to manage their herds more specifically for the production of milk for urban markets.

5. The significance of the issues and trends identified through this study of Tanzania for other countries and regions in Africa.

Some of these questions could be addressed effectively by building directly upon the base of data and understanding that this research project has already yielded.

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# APPENDICES

*Milk Systems of Smaller African Cities: Two Examples from Tanzania (Nyamrunda & Sumberg)*

*Food Production, Urban Areas and Agricultural Policy (Ellis & Sumberg)*

*Food Production In And Around Urban Areas: A Bibliography With Particular Reference to Livestock, Tanzania, and Sub-Saharan Africa*