

# Urban farming and animal production, a synthesis

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## 1. Animal production in and around cities: some background

Livestock keeping has been part and parcel of human settlements since the start of civilisation but the variety of form is staggering. A brief outline of the variation and method / level of analysis is given here before proceeding to a review of the information listed in the different literature categories of this bibliography.

Animals have served in rites for sacrificial purposes, they can help to upgrade food waste from kitchens and/or agro-industry, they are a form of informal saving and a status-symbol, and last but not least, they serve for the production of different forms of food.

Over the ages, however, human settlements have become larger and the association with animals remained but the nature of the interactions changed. The story goes that one of the Medici queens forbade the trading of animal products on the main bridge in Florence because she did not like the smell (A. Scappini, pers. comm., 2000). That bridge is now the centre of trade in gold and jewellery. The German economist Von Thunen showed some 150 years ago how the dairy and vegetables were produced in or near the city, how cropping was done at a somewhat greater distance and how extensive animal production took place at a much larger distance. That model still seems to be quite useful and it is generally observed in many tropical countries, even when it does not explain all local differences, partly because more roads and other market structures make distances smaller.

Other factors of change are that certain functions of animals disappear: for example, animal draught in cities due to increased availability of oil. Increased use of oil is also related to the fact that the scale of operation increases and Phelan reports that the dairy cattle were expelled from Copenhagen at the end of the 19th century. Prior to that they had been largely fed on spent brewery grains from the beer manufacture but the proximity of people and factory combined with different life expectations to make animal production in the city unpopular.

Similar expulsions of livestock production took place recently in Singapore, even to some extent in densely populated in countries like the Netherlands, and over the past half century in so-called dairy colonies such as the Aarey milk colony near Bombay some 50 years ago, or in the Kuku milk colony near Khartoum.

At present there are plans to move pig production out of places such as Ho Chi Minh City and one possible evolution of pig production in the Netherlands is the move to industrial parks. However, to date, there are still many cities where animals are part of urban life and urban agriculture. The question is not whether they should leave or not, but why and how they should continue (or leave). The gist of this review is not a yes –an approach that focuses on local solutions to local problems.

## 2. Complexity in urban livestock systems: perception and scale

The variety of ways and purposes of keeping animals is almost endless: one only needs to look at the titles in the bibliography. The variation is even larger when one starts to notice the different perceptions that one can have to establish the usefulness and problems of these different forms. One report talks about the income raised by a small single-parent family in a slum through urban livestock, another thinks in terms of large enterprises with tens of thousands of chickens owned by a rich investor.

Such diversity can easily lead to misunderstanding and unnecessary arguments because different people have different things and conditions in mind when they talk or write about urban livestock. This is a typical case of what are nowadays called issues of “complexity”, i.e., of problems that are highly interconnected and where different people have different perceptions regarding the definitions and (side)-effects of such a system. One way to cope with such a variation is to simplify the issues, which partly depends on the question one has in mind.

A useful simplification of the discussion regarding the variety of periurban livestock systems looks at major groups of stakeholders (who are involved); what are their perceptions about problems and opportunities of urban livestock (dung is a problem unless it can be used in a garden or for biogas generation); what are the types of urban context (what sort of city are we talking about); and what is the level of analysis in space and time (do we talk about problems and changes that occur at my home this week, or do we discuss changes that take place over several years and over the whole region).

Hardly any of the reports makes an explicit attempt at describing the level of analysis and the stakeholders, even though the approach that they take is rather obvious from taking a first look at the report. From what we have read one can notice a large variation: without trying to be comprehensive one could suggest the following patterns and scales of analysis:

- Stakeholders are consumers (ranging from home consumption to purchases from supermarkets), producers (backyard / semi-commercial / commercial), neighbours and neighbouring communities, administrators (veterinarians, public health servants, slum-kings and urban government);
- Levels of analysis in space range from family and animal to city level, to regional and even (inter)national level (backyard chickens are produced locally and commercial broilers have to be flown in);
- Levels of analysis in time range from time-spans of a day (how to survive tomorrow), a year (how to overcome the next dry season), to 10 or more years (how to supply the city with sufficient animal protein in 2020);
- Linear and non-linear approaches are exemplified by “either – or” *versus* “and – and”; as well as “direct” *versus* “indirect” production (the animal is useful or not *versus* the animal is useful in one aspect and not in another; if the animal produces no protein for the local population she is useless in view of the dung problem *versus* even if she produces no protein she can still be essential; the contribution of animals to food production is only small on a city basis *versus* small changes in one place can have dramatic effects elsewhere);

Perceptions about functions of animals range from rather linear ones, animals as pets, animals as saving account or money-spinner, to animals as producers of meat and eggs, to the rather broad and non-linear ones such as the function of animals in local resilience of the neighbourhood, and emancipation of women’s groups. The idea that matter and mind is separate is also apparent in this approach. This idea is to be redrafted, because it should be clear that mental quiet can only be achieved when the minimal physical requirements are met (and vice versa);

Professional background in which generally reductionist-trained experts will tend to split the problem into disciplinary problems without looking at the whole (e.g., low production of an individual animal is not so problematic to a farmer if that implies a high income; biological performance of an animal is all that counts).

The following sections summarise the conclusions from the different categories of literature. Essentially they reorganise the information that was summed up in this paragraph.

### **3. Five categories of reports on livestock in urban conditions**

It is necessary to simplify and categorise information if one wants to be able to separate the forest from the trees. The type of classification determines, however, the result of the analysis. Therefore, readers should use their own judgement in reading all this: it is just a convenient way to organise the otherwise so variable literature.

#### ***Category I: Anecdotal information from family and animal level***

This category of reports basically focuses on case studies and anecdotal stories of how a particular family or small community copes with the keeping of animals, how it is happy and or unhappy with its rabbits, backyard chickens, guinea pigs, an occasionally with a goat or a cow. It is the kind of information that is essential to keep policy makers and people from categorising, to help them keep their feet on the ground, to understand local variation and to appreciate the wealth of indigenous technical information that is available in local communities. It also depicts the degree of interconnectedness of systems at that level even though some of this literature might do better on that aspect.

A typical example of physical interconnectedness is given in the study of urban livestock in Mexico City. Women take the day-old tortillas to sell them as animal feed at the farm where they buy their milk. And the dung of the cows goes to other people that have small vegetable plots. More socio-economic aspects examples are that women can (re)gain status and independence by having a few animals, while for certain religions it is simply impossible to

think that one could live without animals, whether cows in India, pigs in South India or goats and sheep in the Id festival of the Moslems.

Only participatory approaches and a preparedness to be open for other perceptions of reality can help academics and policy makers to start understanding these intricacies. These will make them more careful about intervening and it should make them realise the value of local participation in setting agendas for sometimes important changes (e.g. due to serious dung effluent problems, issues of local resilience). A serious drawback present in the literature on case studies is that they discuss only one condition, i.e. one remains unaware of the contextdependency of the anecdotal evidence. One remains blind, therefore, to the fact that what works in one place might not be useful somewhere else and one can remain stuck in a objectivist mode of thought (see category V).

### ***Category II: publications on how to keep animals in urban conditions***

A large collection of quite useful materials exists that explain how one can keep animals. Whether this is in urban conditions or not is of no concern to these authors. They tend to focus on small-scale methods of animal husbandry that also apply to cities. The same objectivist approach underlies these publications and if the recommendations do not fit local conditions one can either dump the book or even better: use local insight to see how and whether the book solution should be modified. Many such books are available, ranging from manuals on rabbit rearing, to the small-scale processing and marketing of animal produce, to the production of duckweed in fishponds and practical hints on how to install and use biogas pits to make more intensive use of dung and excreta. These are very valuable materials full of ideas and practical approaches, but they need to be screened for local suitability.

### ***Category III: city level view of animal production specialists and administrators***

Reports in this category address issues at the level of the suburb, but more often at the level of the whole city and/or even nation. By their very nature they have to part from individual cases and they are supposed to generalise. However, by doing so, they tend to be moulded into ways of thought that may not always fit local conditions. It is strange that health officials of the Middle East use health standards from California while conditions and local preferences differ considerably, to say the least.

Moreover, many of these reports are written based on a reductionist academic approach that subdivides the world of animal production into issues of nutrition, breeding, and health while reality may not work along these lines. Farmers' reality is more likely to operate along the lines of local status, short-term income, complaints or praise from a neighbour, love for an animal etc. In other words, many of these reports talk about (virtual) animals and/or their (virtual) owners / keepers. They address legitimate issues that affect whole neighbourhoods or cities but which have little bearing on day-to-day life of individuals. A measure to control average dung-effluent problems punishes the big guilty fellows who dump large amounts perhaps less than the smaller fellows who live almost in the animal shed and who take meticulous care that the place stays clean.

General measures kill and de-motivate local initiatives if they are not by and large in line with local reality. Clear examples are available from world literature where a measure to increase urban health was counter-effective because it did not fit local reality. That is the concern about objectivism in the anecdotal reports from which positive experiences should be translated only with proper consideration of other conditions. The reports in category III refer, however, to a number of serious issues: public health, hygiene, food-safety, excreta effluents, and animal health.

One would have to be cautious to decide on these grounds that livestock is to be banned from the city because collateral damage would be done to social stability, equity. Also, one would have to devise new ways of using and/or recycling the feeds and other resources that are now used for animal production. In particular one would have to look at ways to remedy the problem without throwing the baby with the bathwater. In addition, one might also attempt solutions to the problems outside veterinary medicine, for example a discussion with city planners and social workers, or based on discussions with local stakeholders.

### ***Category IV: city level views of architects and social workers (to name a few)***

The category looks at issues of urban agriculture in general, mostly in proceedings of conferences and workshops such as UNDP and Bakker et al. It tends to provide an outsider look by architects, planners and/or local large NGOs themselves. The more recent publications are influenced by concepts of habitat, or of ecological approaches to urban

planning. They essentially have a positive approach to urban agriculture in general and they do not mind that animals are part of that picture.

These publications provide the balance and overall picture that animal specialists will need to get their feet back to the ground, although they lack the experience that animal production specialists can provide. Statements such as “animals can provide free meat” were not encountered in the literature resources as such, but they might stem from people who are ignorant about what an animal is or can be to them. Major functions of animals for draught power and large-scale cleaning of waste from agro-industry in cities are on the wane, but why not include some of those in the design of eco-cities and industrial parks.

#### ***Category V: the “overview and insight” of academics and visionaries***

A number of papers have attempted either in-depth analysis of particular cases, notably the work such as by Sumberg et al., Mexico, Salvador, Quito. They focus on insight and they illustrate and document very well the large variation in issues, and stakeholders also to some extent as they change over time. Apart from the rather superficial but useful overviews such as in the previous category (IV) there is a more integrative paper by Ann Waters Bayer that needs to be mentioned. It finds a balance between social and biophysical aspects of animal production at several levels of urban systems. It is supplemented by a recent report of the FAO /AGA division that summarises and synthesises the information of case studies mainly from category III. There is still little reported on the analysis of ecological aspects of urban livestock. This would address issues such as:

- Different patterns along which cities will develop /or crash over the next decade or two;
- How can one avoid that a large-scale system inherently results in eutrophication and pollution, a problem that is basically the same for animal and industrial production?
- Which mixes of crops, animals and people (include businesses) are stable, resilient and practical for promotion (in analogy with the approach to business parks)?
- How should societies handle the issue of public perception regarding consumption patterns?
- To what extent should public funds and/or tax rebates be used to stimulate industrial forms of livestock production to satisfy some virtual demand?
- Do politicians have the courage to popularise the idea that sustainable development includes ecological consumption patterns that adjust demand to “what is on offer”?

#### **4. Concluding comments**

The reports on urban livestock keeping illustrate quite clearly the range of forms and contexts in which livestock plays a role. Very few of the reports attempt a synthesis and one major suggestion from this brief review is therefore to go for integration rather than for detail at this point. Another suggestion is to arrange the discussion according to the level and the perceptions of the stakeholders, their time and space scales, and the professional background of the authors. Last but not least there is a suggestion to achieve synthesis through the application of some system theory in the larger picture of the emergence of mega-cities and market change that is to be expected, against the background of a few questions regarding the directions of change for sustainable development.