

# LINKS BETWEEN LIVESTOCK, ENVIRONMENT AND FOOD SECURITY

by Frands Dolberg\*\*\*

Our present day pre-occupation with the environment and food security is not new. This can be illustrated by the following extract from a letter written by Danish farmers in 1672 to their queen:

***"We poor men have to burn fodder, which our cattle and beasts should eat" (1)***

The first Danish census in 1769 showed a human population of 798 000, while it is now more than 5 million.

This example from Denmark is provided with the purpose to illustrate that degradation of the natural environment need not mean that there is no room for improvement so that in the future more people and animals can be sustained. Apart from feeding a much bigger human population than in 1672, Denmark today is a big exporter of dairy products and bacon.

However, as shown in the quote it was common at that time to use straw as fuel and frequently cattle dung was dried and burned as well. Both features are clear indicators of environmental degradation and can be seen in many countries today.

## LIVESTOCK AND THE ENVIRONMENT

### South Australia

In his "Report on Rainfed Cereal and Livestock Production in West Asia and North Africa" Brian Chatterton uses data from South Australia to prove some of the points he wants to convey to his readers.

In one example he shows how wheat yields in South Australia in the decade 1890 - 1900 were below 0.5 ton per hectare, but the introduction of super phosphate, fallows and new wheat varieties gave a slow improvement till about 1950, when the introduction of ley farming with legumes improves yields and in 1970 wheat yields had risen to 1.2 ton per hectare. However, the legumes in the system not only provide for greater wheat yields, they allow many more sheep to be kept and wool and mutton yields go up as well. Table 1 illustrates the point.

An important feature of the evolutions that took place in Denmark as well as in South Australia was the introduction of management and cropping practices that led to improved soils and increased yields. It was a common feature that more nitrogen was introduced into the agricultural systems. In Denmark red and white clovers played an important role, while it was medicago in the ley farming system in South Australia.

Table 1. Wool and wheat yields at South Australia's Turretfield Research Centre for the period 1928 – 1972.

Period	Wool yields	Wheat yields
	Tonnes	Tonnes/hectare
1928-32	3.25	1.20
1933-37	5.00	1.50
1938-42	6.30	1.50
1943-47	5.50	1.50
1948-52	4.87	1.87
1953-57	6.00	1.95
1958-62	10.00	2.70
1963-67	14.37	2.30
1968-72	17.30	3.74

*Source:* Brian Chatterton (1979).

### Sub-Saharan Africa

Recently Dr. Pedro A. Sanchez - former Director General of the International Centre for Research in Agroforestry (ICRAF) - was awarded the World Food Prize for this year (2002). One of his main contributions has been to demonstrate how trees and bushes, fertilized with native rock phosphate and planted alongside rows of crops, pull nitrogen from the air and thereby help fertilize the crops. Yield increases of 200 to 400 percent are reported and now ICRAF has plans (2) to help African farmers plant 5.5 billion more trees, which - according to the website of the World Food Prize Foundation - is the equivalent of another tropical rainforest.

Why mention this here? The answer is that Dr. Sanchez's work has similarities to the lessons from Denmark and South Australia, where general improvements of plant production led to a greater surplus of plant material that could be fed to livestock.

### Links between livestock and food security

Food security tends to be a problem for the poor and much less for the better off households and type of livestock kept by a household may therefore be used as an indirect indicator of food security.

In many countries, scavenging poultry is one of the few assets owned by poor households and almost as a rule, it is the women who decide over income from poultry. In one study in Bangladesh, which the author was involved in, it was found that no less than 80% of the bullocks were on holdings with more than 1 acre while more than 50% of the total number of goats and chickens were kept by households with less than 0.5 acre of land or no land at all. In an example from Africa it was found that in Swazi rural households backyard poultry keeping is much more widespread than of cattle, goats and pigs and the most assetless and thereby food insecure households were those with only poultry or no animals at all. The conclusion is that one link between livestock and food security is that the type of livestock kept in a household may be taken as an indicator of food security.



Photo by Jens Christian Riise; the Network for Smallholder Poultry Development

### Nutrition effect of livestock

Malnutrition is not only a problem for the people who suffer from it, but society at large as it leads to the birth of many children with low birth weight, setting them off to a life marked by retarded growth, which may lead to higher susceptibility to diseases, reduced school and work performances and - as adults and even with improved nutrition - delivery of small children, who will tend to suffer the same problems (3).

Apart from containing important amino acids, food of animal origin contains major micronutrients like iron, zinc and vitamins B12 and A. Consumption of some meat helps prevent anaemia, which many women suffer. A very interesting recent study from Kenya has shown that children who get some animal source foods have better cognition and activity levels in school than children who did not receive such food (4) and - interestingly, the children getting meat did better than the children getting milk. The results of this study deserve follow up and replication in other countries.

Studies have shown that income from the sale of eggs, milk and meat, apart from being used to improve the diet, was used to educate children and - where this was possible - to begin a process of asset accumulation and households with more assets tend to be more food secure. The lesson is that the contribution from animals to food security is not so much from the increased domestic consumption of animal products by the producing household as it was from the income generated by sales and to get to the real food insecure households higher priority should be given to small animals such as small semi-scavenging poultry flocks.

Space does not allow elaboration on the main point underlying this short article that degraded soils and malnourished people are the result of bad political leadership, poor administration and inappropriate farming systems. At its root it has very little to do with a particular crop or animal per se. Some consumption of food of animal origin is important for young children, pregnant and lactating women as they require food of high nutrient density with essential amino acids (5) and the production of eggs and milk can provide opportunities for daily income and meeting daily expenses that crops are less suited for as they tend to be sold in lumps after harvest. There are many good reasons to have animals on as many small farms as possible.

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(1) Thorkild Kjaergaard (1994). The Danish Revolution 1500 - 1800. An Ecohistorical Interpretation. Cambridge University Press, p. 23.

(2) <http://www.worldfoodprize.org/2002Laureate/laureatestorypg4.htm>

(3) Mercedes de Onis, Edward A. Frongillo and Monika Blossner (2000). Is malnutrition declining? An analysis of changes in levels of child malnutrition since 1980. Bulletin of the World Health

Organization, 2000, 78 (10): <http://www.who.int/nutgrowthdb/00-0688.pdf>



(4) Charlotte Heumann and Diane M. Harris (1999). Contribution of animal source foods in improving diet quality for children in the developing world. University of California. Paper prepared for the World

Bank. [http://glcrsp.ucdavis.edu/project\\_subpages/CNP\\_folder/CNPWB.pdf](http://glcrsp.ucdavis.edu/project_subpages/CNP_folder/CNPWB.pdf)



(5) See <http://www.healthy.net/library/books/haas/amino/essential.asp> for an explanation

Pastoralist livestock production, which is based upon large-scale migrations of people and animals along grazing corridors, is increasingly threatened and indeed, these people may be one of the sources of political unrest now so prevalent in the northern Sahelian dry lands and Saharan desert. This little vignette illustrates the complex interfaces between climate change, food production and resource tenure. While climate change is expected to facilitate increases in agricultural productivity in a limited number of regions, climate change models predict that other regions will experience a decrease. There is a close relationship between the food security agenda and strategies for poverty reduction and sustainable regional and national development. It is essential to tackle poverty in order to provide households with the means to access food. Local trade of basic agricultural products, agricultural production and employment, and adequate use of food are important components of food security. Both cooperation programmes are still under examination. 3.4. Livestock, environment and development. Livestock is a particularly important asset for the rural poor because they provide income and food, as well as draught power and fertiliser. Demand for livestock products is growing rapidly in the developing world as a result of rising incomes and urbanisation. African Livestock Futures. Realizing the potential of livestock for food security, poverty reduction and the environment in Sub-Saharan Africa. Report. United Nations. This report is produced by the office of the Special Representative of the UN Secretary General for Food Security and Nutrition and UN System Influenza Coordinator (UNSIC). @UNSIC 2014. Recommended citation: Herrero, M., Havlik, P., McIntire, J., Palazzo, A. and Valin, H. 2014. African Livestock Futures: Realizing the Potential of Livestock for Food Security, Poverty Reduction and the Environment in Sub-Saharan Africa. Office of