

THE INFLUENCE OF MODERN AGRICULTURAL PRACTICE ON GLOBAL WARMING

INTRODUCTION

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Most research in transport animals has concentrated on health, welfare, performance and their interactions, and this symposium takes welcome and timely steps towards deepening our understanding of the context in which transport animals work.

Transport animals are not just required for cultivation and on-farm transport. They are also vital for marketing produce, taking grain to the grinding mill and similar activities. They play a vital part in assuring food security and in integrating food systems.

It is fascinating and often very rewarding to study or attempt to refine components of the system, for example by finding better ways of assuring welfare; of reducing parasite burdens; of improving vehicles and implements. Yet the basis of effective dissemination of knowledge and of the fruits of research, is a clear understanding of what the system is intended to achieve and of the constraints within which it operates.

Cattle or donkeys for work in Zimbabwe

For example, in Zimbabwe there is much interest in the economic development of the agriculturally marginal areas outside the fertile lands which have historically been the preserve of what is called the commercial sector. I was involved in a DFID-funded project (Hall, 1998; Hall and Blench, 1998) in one such place in the north-east of the country in an economically disadvantaged area which has poor and unpredictable rainfall (450-600 mm annually with complete failure in some years). Here, the logical land use would be as a wildlife reserve but given that there is cultivation, the logical animal for draught work would be the donkey and there are some to be seen in the area, but the main work animals are Mashona cattle. During drought years there can be heavy mortality of these cattle, but they remain favoured for draught work which is seen as their primary function. In May 1997, oxen were worth about £140 each (Zimbabwe dollars 2400) and donkeys £18 (Z\$300), on the face of it a surprising differential given that farmers there say that a donkey is as strong as an ox, even though it cannot work for so long at a stretch.

However, cattle carry the cultural cachet! They have a respected place in local awareness. Here are three examples of this. In the area where I was working, bride price is expressed in cows not donkeys. In May 1997 the current rate was between 4 and 12 cows. Secondly, though primary schooling is free, secondary education is expensive and all farmers know that 2 or 3 cattle need to be sold for one child to be educated to O-level standard. Thirdly, Government involvement with livestock is directed solely towards cattle. This involvement comprises tsetse control and the provision of dip tanks with compulsory dipping. The dip tank staff are the major source of local veterinary advice. The

Government has also long had a role in marketing, the parastatal Cold Storage Commission being a reliable purchaser of slaughter cattle.

Biologically, therefore, the donkey might be the sensible choice as a work animal but the livestock system is slanted towards cattle, which will always find a buyer whether conditions are good or bad.

Adoption of cattle traction in Ghana

Another study site of this project was in north-east Ghana (annual rainfall 1000-1300 mm) where, in contrast to the Zimbabwe study area, there was an extremely high human population density with consequent environmental degradation. Here, both cattle and donkeys are used for work. Donkeys are bought as required from dealers who bring them by lorry from Burkina Faso, the neighbouring country to the north. In north-east Ghana, the cattle are the local humpless Ghana Shorthorn breed, which are smaller than, and quite different from the Ghana Sanga cattle found only about 145 km further south in much less heavily populated areas. The former are kept in confined conditions while the latter are pastured extensively and it is possible that each genotype is specifically adapted to the livestock system in which it is found.

The adoption of cattle as work animals in northern Ghana was studied by Panin (1988) in the early 1980's. It was found that cattle traction made excellent economic sense and Panin predicted that it would spread. Recently, Johan Hesse (Hesse, unpublished) repeated Panin's work, revisiting the households that had been interviewed ten years previously. Hesse found that the area ploughed by cattle had in fact increased but the number of households owning work cattle had decreased. Those which had kept their work cattle tended to have higher resource endowments and they had access to more land, more livestock, and the family groups comprised more and older people. The households that had given up cattle traction were those which got a higher proportion of their income from off-farm activities and they had switched to hiring work cattle.

Hesse drew three main conclusions. Firstly, that adoption of cattle traction does not necessitate ownership, secondly that the potential of the rental market for draught animals has not been considered by those responsible for research or extension, and finally that ownership of work cattle may be associated with particular stages in what he termed household life cycle. Clearly, then, there is a whole new set of considerations relating to family dynamics and structure that are likely to influence traction animal practice.

The environment of traction animals

A complete description of the environment in which transport animals work must be holistic, taking account not only of biological and physical factors, but also of economic and cultural aspects. This total environment does not remain static. Indeed, it is worth remembering that agricultural systems based on transport animals have a flexibility which more heavily capitalised systems may not have and it behoves everyone to help to maintain this flexibility. One way of doing this is to ensure the conservation of local breeds of

transport animal to preserve future options. We must also devote thought to predicting what new constraints and opportunities may arise as a consequence of environmental perturbations, and what we can do to reduce this threat. What could disturb the environment more than global warming? One's instant reaction is to think that transport animals must be less harmful to the environment than tractors, but it would be interesting to see a calculation comparing the effect on global warming of the carbon dioxide produced by a tractor ploughing a field, with that of the methane emanating from oxen doing the same thing. Such calculations are interesting but are probably unlikely to influence policy. Maybe a more profitable approach would be to examine the changes that animal traction must make in a world where the consequences of global warming are a reality. This is the aim of our symposium today and I am sure we shall have a most informative and stimulating day.

References

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