# CHAPTER 9B

# COMMENTS ON "LARGE-SCALE MOVEMENTS OF LARGE HERBIVORES: LIVESTOCK FOLLOWING CHANGES IN SEASONAL FORAGE SUPPLY"

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Mobility is indeed a perfect tool to optimise exploitation through tracking changing resources, as shown in Boone et al. (Chapter 9) by the example of transhumance systems in various parts of the world. Fragmentation and private access can limit mobility of herds so that key resources can no longer be used, decreasing the overall productivity of these livestock systems. The chapter recommends therefore the re-instalments of mobility wherever possible, and indicates the risks associated with a reduced mobility of herds.

A pivotal question is whether key resources really exist. What are key resources (see also Scholte and Brouwer, Chapter 10)? How large does the landscape heterogeneity have to be in order to affect overall pastoral-productivity levels? Intuitively, the idea makes sense, but it would be good to identify the thresholds that produce significant effects on herd production.

Assuming that these heterogeneous key resources exist, the question remains whether an increased mobility or return to former transhumant systems is feasible. An important threat for transhumance is the privatising of lands. Privatisation can have an autocatalytic effect. Once a small group of pastoralists starts to privatise certain areas, others feel urged to do so as well. Conversion from privatised lands into communal lands, enabling transhumance is a difficult, if not impossible road with few examples. Fragmentation and privatisation are not easily stopped.



*Herbert H.T. Prins, Frank van Langevelde (eds.), Resource Ecology: Spatial and Temporal Dynamics of Foraging*, 207-210.

Factors that hamper the re-instalment of transhumance are the increase in the human-population size, public services that are more accustomed to sedentary lifestyles, economic constraints or social changes. One of the problems is a rapid deterioration of vegetation due to overstocking on private grounds. So, not only access to pastures has changed but also pasture quality. An additional problem is that it is profitable to subdiverse land for future sales. Furthermore, banks do not provide loans without a clear ownership. Unfenced land with free-ranging cattle will not be accepted for loans. Therefore, the re-installation of transhumance often fails.

The realism of re-installation of transhumance is therefore low. A first lesson to be learned though is that if transhumance in an area still exists, and access is open to different herd owners, one should try to avoid fragmentation, privatisation, or other processes that lead to a reduced access to key resources. Secondly, a more important issue to be solved is: what is the best mobility strategy in a fragmented landscape? How can herd mobility, but also stocking rates or other aspects of the pastoral production system contribute to improved herd productivity in a privately owned, smaller fragment?

Moreover, fragmentation leads to a reduced overall productivity, and thereby results in increased prices. This reduces the overall gain but locally the gains are variable: some win, some lose. Fragmentation and privatisation of a heterogeneous landscape create owners possessing high-quality pastures or other key resources. The profits for those privileged owners are probably larger than the ones generated by a communal system, lowering the maximal profits per herd. Some capitalist herd owners might therefore see new opportunities, stimulating privatisation and limiting common access.

The chapter focuses on the negative effects of fragmentation on livestock production, but numerous positive effects have also been documented. Restricted access can provide stimuli for investments, improving resource quality through pasture management, decreasing the chance of overgrazing, or improving water availability. Small-scale investments of smallholders are often only possible when land can be used as security for the financier. In fact, the graphs presented in the chapter indicate that with relatively stable livestock numbers, and an increasing human population, livestock production efficiency could have gone up, apparently able to sustain a higher number of people. This brings us to an important question that is not addressed by the paper: what are the underlying causal mechanisms responsible for the decrease in livestock numbers or herd productivity with increasing fragmentation? The understanding of the mechanisms is instrumental when one wants to initiate mitigating measurements.

Another topic that needs urgent attention is the goal function of the herd owners. How important are risk minimisation strategies in shaping herd mobility? Owen-Smith's paper (Chapter 8) used Jensen's inequality principle to illustrate differences in foraging behaviour. This principle certainly also applies to transhumant livestock owners. Do owners minimise deficits, or maximise profits? How do pastoralists accommodate for uncertainty in their decision-making? A different goal function would influence herd productivity, change benefits, and therefore change mobility patterns in relation to the fragmentation level. The relationship between herd

productivity and landscape fragmentation, as proposed by Boone et al., must be able to incorporate these different strategies in order to increase realism, thereby leaving the focus on maximum herd productivity. Studies that tried to optimise pastoral production have received, rightly so, a lot of criticism, as risk minimisation, social status, herd diversification, dowry and other factors all determine production decisions. It is therefore a scientific challenge to try to model these different factors, and compare the different scenarios, starting with risk minimisation strategies. The approach of Boone et al. is a very important first step, but in order to be able to use their modelling results, we need a more realistic goal function.

Transhumance was in the past a good system to maximise productivity. Herd mobility through agricultural areas is sometimes only possible for wealthy herd owners (e.g., in Mongolia) who can use trucks for the transportation of their cattle to seasonal pastures. The costs for livestock transport in other areas are sometimes very low (Africa). Return to transhumance is therefore no longer attractive, as herd owners sometimes use modern transport facilities to track fluctuating resources.

A possible solution seems to be the formation of grazing associations or cooperations. An option to overcome most problems may be to try to convince private landholders not to fence their private lands, thereby enabling transhumance in fragmented landscapes. However, this is probably only feasible where there is a (social or economic) compensation for opening key resources for others to use. Grazing associations seem to be able to supply a framework for this. The new government in Kenya froze the transfer of land. The trend towards fragmentation can be rolled back, not so much in ownership, but by not having the areas fenced. Individual contracts in this sense already occur (Chapter 9).

Another option discussed to solve the problem of overstocking and losing transhumance in systems was the option to create game farms (Prins et al. 2000). However, in some countries, legislation prevents this. For instance game and trophy hunting is not allowed any more by Kenyan law, so a reduction in cattle and increase in game is not feasible. However, ecotourism is occurring and this also sometimes leads to a reduction of fragmentation, as landowners join larger management units in order to optimise management with neighbouring owners who share similar interests, such as happened in and around the Klaserie area near the Kruger National Park.

Social fragmentation was not included in the paper, and might also have effects on land degradation and transhumance. Fragmentation could also have positive effects on ecosystems, e.g., when manure is collected from the corals where animals are kept during the night. Moreover, the link of transhumant pastoralists with sedentary agriculturalist is fundamental in their production strategy. Fertilisation of agricultural fields, guarantees food supplies in the form of millet or maize. How do we value these future benefits?

In general, the paper clearly illustrated that movement of a consumer is instrumental in optimising fluctuating resources in time and space. Resource access (e.g., through territories or ownership) has large implications for the overall benefits derived from these resources, so social organisation and access cannot be neglected when studying resource exploitation.

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