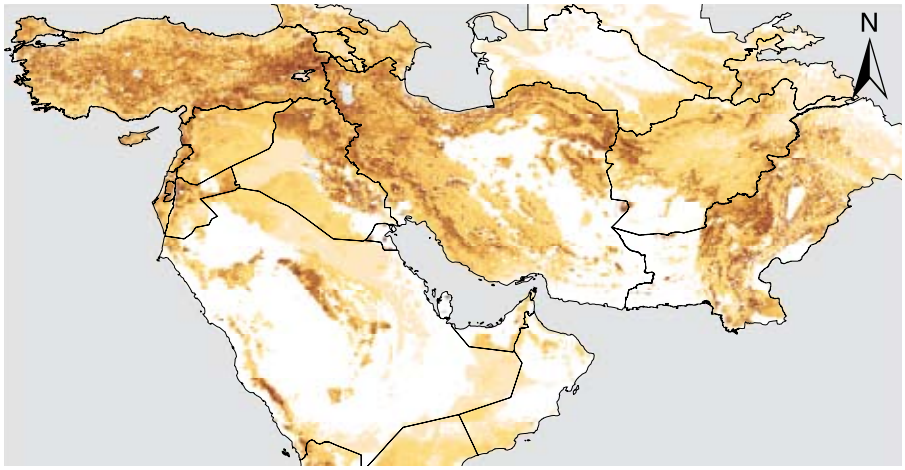
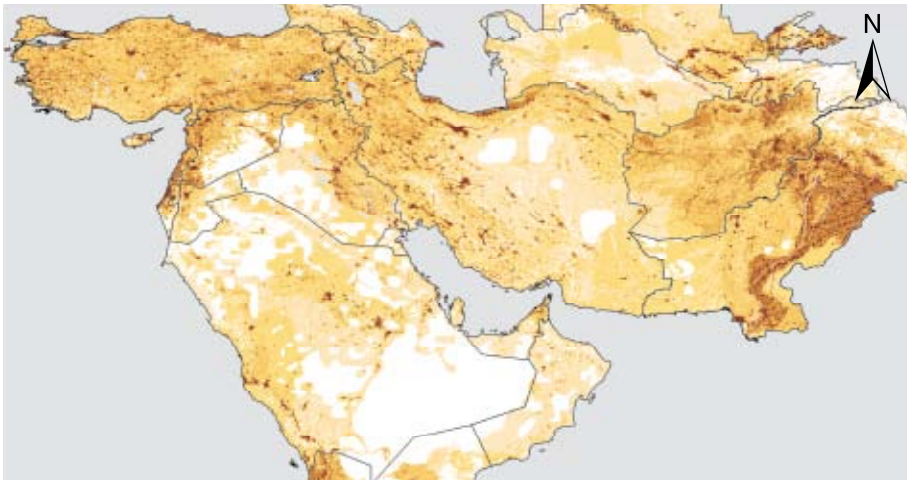
7.14 MODELLED SHEEP DENSITIES IN THE MIDDLE EAST



Number per square km

<1	10–20	100–250	International boundary
1–5	20–50	>250	Water
5–10	50–100		Unsuitable for ruminant

7.15 HUMAN POPULATION DISTRIBUTION IN THE MIDDLE EAST

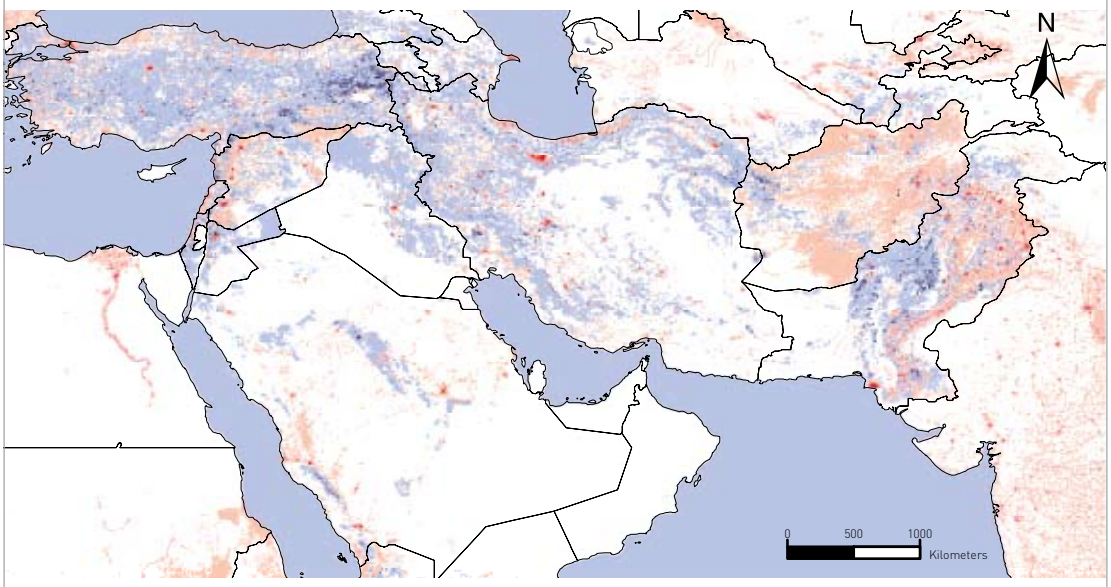


Number per square km

<1	10–20	100–250	International boundary
1–5	20–50	>250	Water
5–10	50–100		Unsuitable for ruminant

Source: Reproduced from LandScan population figures (www.ornl.gov/sci/gist/projects/LandScan).

7.16 PRODUCTION SURPLUS FOR SHEEP MEAT IN THE NEAR EAST (Estimates from the year 2000)



Source: Derived from Wint and Slingenbergh, 2004.

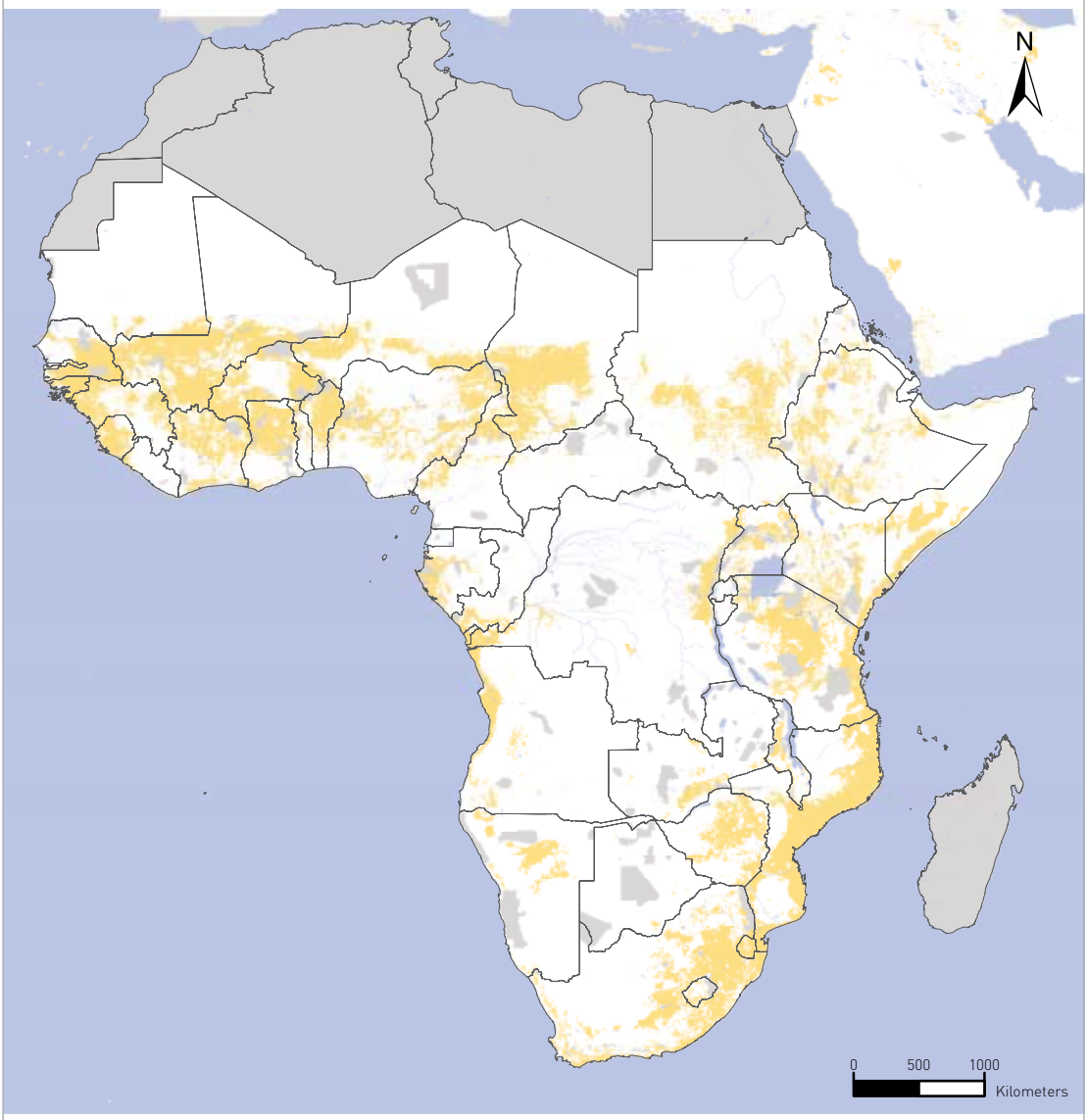
nation has exported livestock products, and from which countries it has imported them. However, available data are not exhaustive and focus more on products than live animals, many of which are moved across borders without official knowledge or permission – so-called 'informal' trade.

A modelling approach to estimating movements of livestock and livestock products is shown here (Wint and Slingenbergh, 2004). This is based on the assumption that national levels of animal production, expressed as kilograms of product per animal and calculated from figures given in FAO, 2003, can be applied to subnational resolution animal distributions to estimate the distribution of animal production per species. An index of the demand for livestock products can be produced by multiplying the calculated country-level demand per person, also provided in FAO, 2003, by subnational resolution human population data (derived from the LandScan coverages[46]).

These estimates are illustrated in Figures 7.12 to 7.15, which give the components of a production/consumption balance approach to estimating movements of livestock and livestock products in the Near East. Figure 7.12 shows estimates of sheep production per animal (from FAO, 2003) and Figure 7.13 the GLW sheep distribution; combining these gives an estimate of production. Similarly, Figure 7.14 estimates the per capita rate of consumption of sheep meat (from FAO, 2003) and Figure 7.15 shows the LandScan distribution of people; combining these data gives the 'demand' side of the equation. (Obviously, in each case, production and consumption are assumed to be

[46] http://www.ornl.gov/sci/gist/projects/LandScan

7.17 FARMING SYSTEMS IN SUB-SAHARAN AFRICA MOST LIKELY TO SUPPORT SIGNIFICANT CATTLE MOVEMENTS

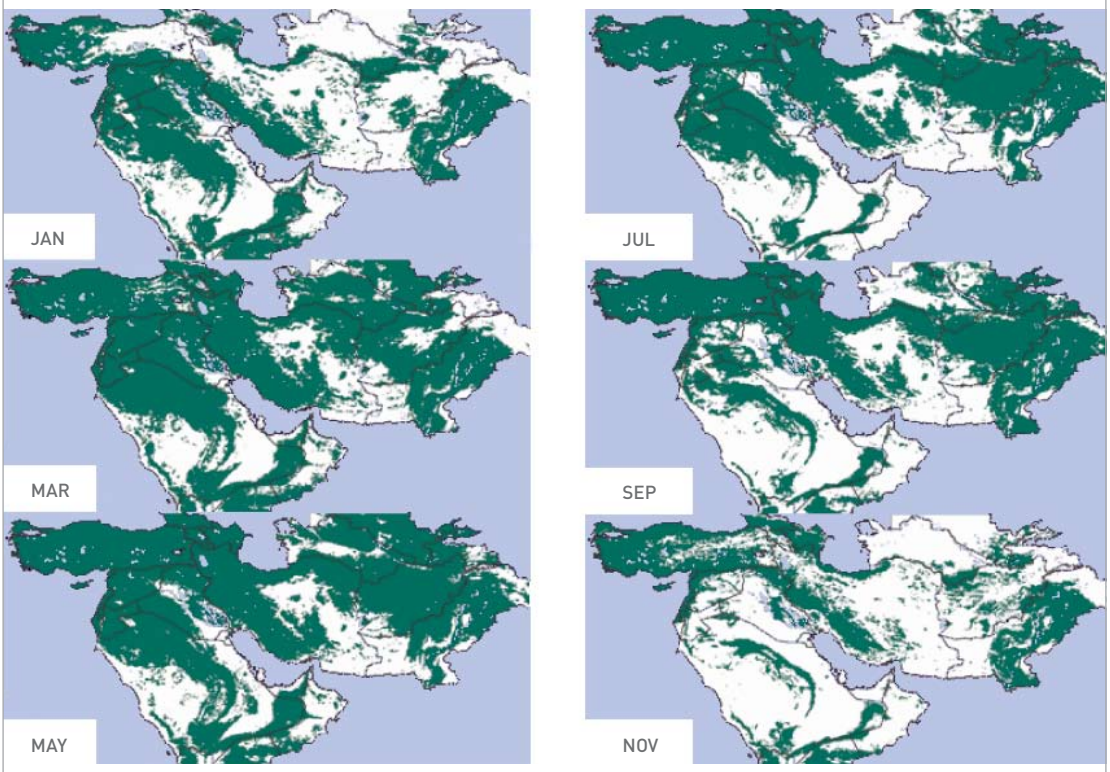


Source: Derived from Wint and Sumption, 2005.
Note: Protected areas and countries outside the analysis are masked in grey.

equal across each country: a limitation caused by the detail of the available figures.)

Combining these production and demand indices, as illustrated in Figure 7.16, produces a production balance map. Not surprisingly, this demonstrates a general surplus in rural areas and a deficit in heavily populated areas in and close to cities. However, it also highlights larger areas where a general surplus is indicated and those where a general deficit is indicated, suggesting movements

7.18 MONTHLY PASTURE AVAILABILITY IN THE NEAR EAST FOR THE YEAR 2002



Source: Adapted from Wint, 2003.

of livestock and livestock products from the surplus to the deficit areas. These modelled estimates need to be validated against trade statistics.

LIVESTOCK MOVEMENT

A feature of many forms of animal agriculture is the movement of livestock, either to take advantage of seasonally available resources or for trade, both within and among countries.

As discussed in the previous section, livestock trade statistics are notoriously unreliable in many parts of the world. While some countries have begun to maintain detailed databases of internal livestock movements, such as the Cattle Tracing System in the United Kingdom, they must be seen as the exception. Because a reliable database of global livestock movements has yet to be established, any tentative assessment must perforce rely on the use of indices, proxies or indicators.

In this context, the production balances described in the previous section may be used as indicators of trade-related movements of livestock or livestock products from areas of production surplus to areas where demand exceeds supply. These trade indicators are most likely to be associated with animal movements where there are substantial areas of demand and production surplus adjacent to one another, or where production surpluses are very high. Other proxies of animal movements may be implied from predominant husbandry systems. For example, areas with significant cattle densities but relatively few people and/or little cultivation,