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AFRICA
SUSTAINABLE
LIVESTOCK
2050



Country Brief
KENYA



Republic of Kenya



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**ASL
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Growing economy, population and increasing urbanization

Kenya will face unprecedented growth in the demand for food in the next 30-40 years. In 2050 the population of the country will reach about 96 million, up from 46 million today; 41 million people will live in urban areas vis-a-vis 12 million today¹; and consumers will be better off, with GDP per-capita projected to be USD 6 500 in 2050, over five times its current level². This growth will lead to new and different interactions between people and natural resources locally, regionally and globally, resulting in both predictable and unpredictable changes in all sectors of society.

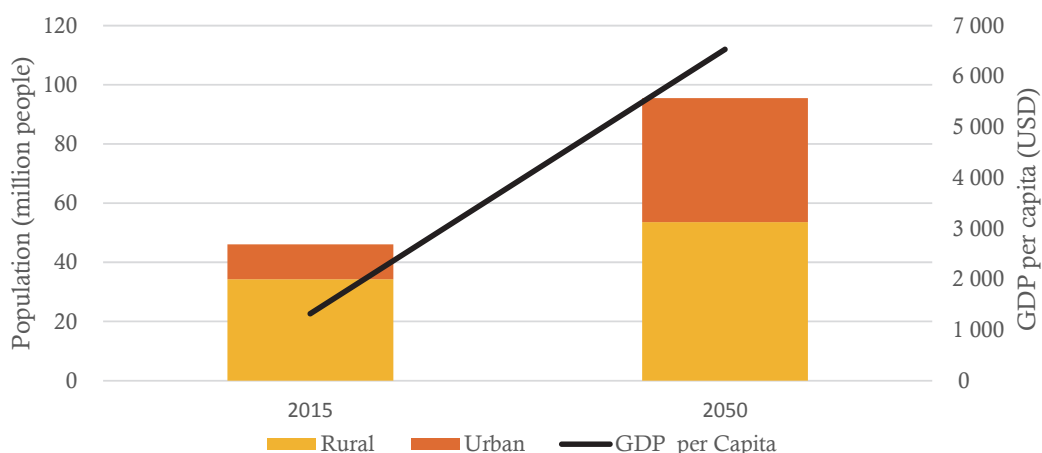


Figure 1. Human population and income growth projections for Kenya, Source: KNBS Projections

Increasing demand for animal source food

The growing, increasingly affluent and urbanized Kenyan population will consume more high value food products, in particular animal source foods such as meat, milk and eggs. Figure 2 shows that higher earning Kenyans spent more on dairy, meat and eggs which can be attributed to both high grade expensive products and high quantities³. We can expect this preference to continue to be adopted as income increases across the population in the long term. In aggregate, consumption of beef and milk will increase by over 170% between 2010 and 2050 – by 0.81 and 8.5 million tonnes respectively (table 1)⁴.

Currently per capita consumption of meat is low, averaging no more than 10 kg for any type of meat. The expected increase in consumption will improve nutrition, without any envisaged negative impact on human health due to over consumption.

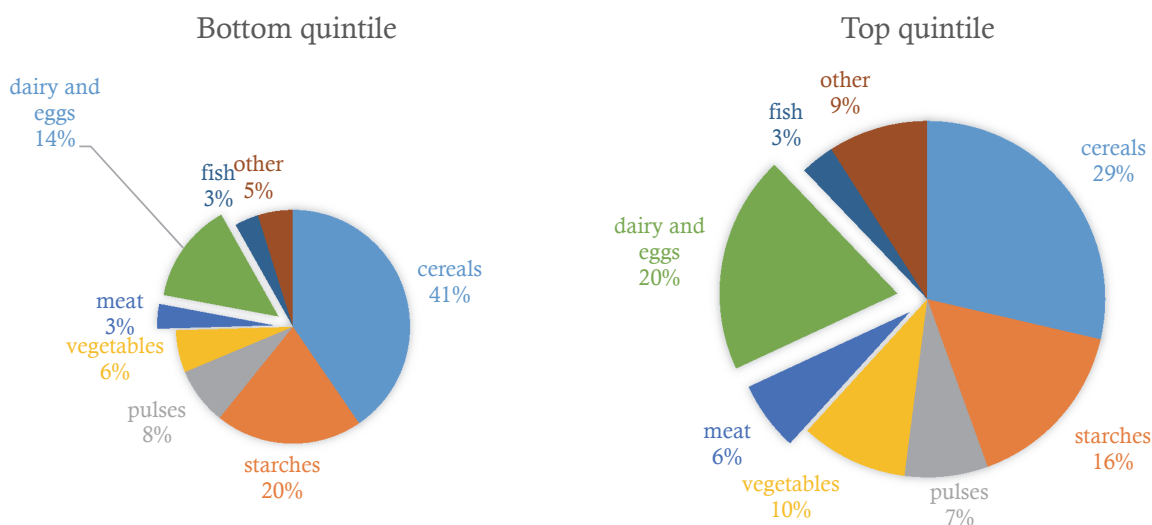


Figure 2. Weekly per capita food consumption, in percentage. Source: Kenya IHBS 2005/2006

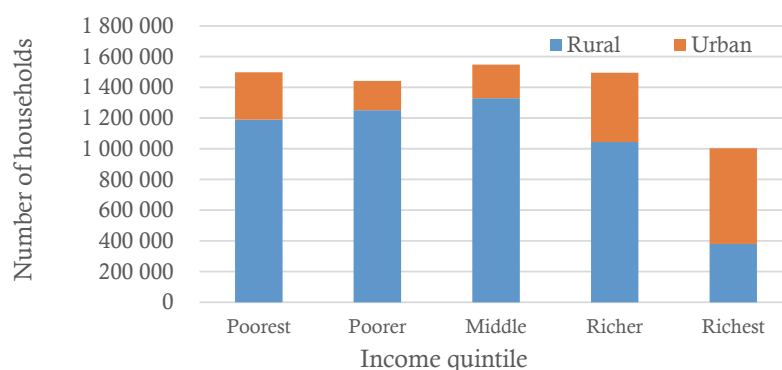


Figure 3. Number of households keeping livestock in Kenya 2015
Source: Kenya 2015 DHS survey

Commodity	Thousand tonnes			% change
	2010	2030	2050	2010-2050
Beef	467	734	1 277	173%
Milk	4 839	7 513	13 298	175%
Poultry	26	48	71	174%
Egg	89	238	537	503%
Mutton & Chevron	87	103	127	46%
Pork	13	29	48	268%

Table 1. Livestock demand and supply projections. Source: FAO projections, Acosta and Felis (2016)

Unprecedented pressures on livestock systems

Main livestock species in Kenya include cattle (18 million), sheep (18 million), goats (28 million), camels (3 million) pigs (334,689) and poultry (31 million)⁵. Currently, about 60% of total households keep livestock, or about 7 million households, mostly keeping few livestock (figure 3)⁶. The majority (75%) of livestock keepers are rural and among the less-well off in the population (poorer, poor and middle wealth quintiles, Figure 3)⁶. As a response to the growing demand for animal source foods, livestock keeping households as well as private commercial livestock enterprises, will expand their livestock assets and adopt productivity-enhancing practices. For some, livestock will represent a vehicle out of poverty.

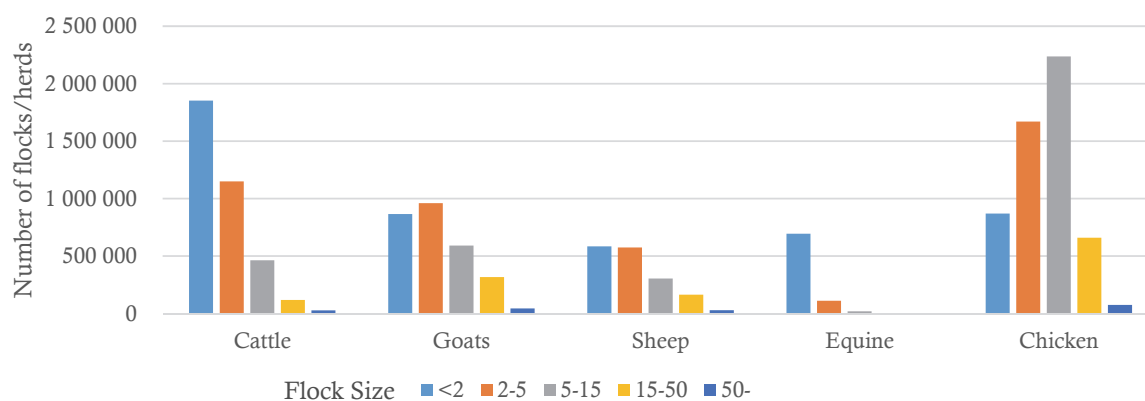


Figure 4. Number of livestock kept by households in Kenya 2015. Source: Kenya 2015 DHS survey

As a consequence the livestock sector, which currently accounts for 13.4% of agricultural value added, or USD 3.1 billion excluding draft power and contributing to 27% of agricultural and manufacturing labour force⁷, is anticipated to become the largest contributor to agriculture, as in industrialized economies.

The demand-driven transformation of livestock agriculture provides unprecedented opportunities for sustainable development of the Kenyan economy. Livestock owners could improve their livelihoods and the development of the sector could generate major socio-economic benefits, such as job creation in both rural and urban areas and increased availability of affordably-priced animal source foods. However, the transformation of the livestock sector will result in novel interactions between people, productive resources, including livestock and land, and the environment that could represent major threats for the entire development trajectory of the country.

Impact of rapidly changing livestock systems impact on society

Evidence points to major public health, livelihood and environmental threats associated with unregulated growth of livestock; for instance the Asian livestock sector growth in the late 20th and early 21st century had negative consequences such as biodiversity loss, surface water eutrophication, groundwater contamination, reduced soil fertility, emerging infectious diseases, antimicrobial resistance, and rural impoverishment. Unregulated growth of livestock in Kenya could thus be catastrophic in the impoverished soils and weak health systems of sub-Saharan Africa. For example:

- The current 1.8 million urban and peri-urban households currently keeping livestock (dairy, pigs and poultry) are known not to adopt adequate bio-security and waste management practices. This number is expected to increase to over 6 million households in 2050, exponentially increasing public health and environmental threats. At the same time agricultural greenhouse gas emissions are likely to increase from 32 MtCO_{2e} in 2010 to 39 MtCO_{2e} in 2030, largely driven by livestock methane emissions and land use change⁸.
- Increased Livestock production will also add additional pressures on water systems. As of today, the livestock sector is estimated to use 255 million litres of water per year. Extrapolation suggests that nearly 650 million litres of water will be used by livestock systems in 2050⁹. Bearing in mind that Kenya has a water deficit, serious actions would need to be taken to meet the rising water demand.
- Increased livestock production, if not regulated, could generate major negative effects on public health. For example, between 2012 and 2016, there were 255 000 confirmed human infections of brucellosis (and this figure is possibly an underestimate due to underreporting)¹⁰. The 2006/07 outbreak of Rift Valley Fever caused over 120 human deaths and 411 reported cases, and led to the death of over 900 000 heads of livestock (cattle, sheep, goats and camels). Vaccination coverage in the country is low; in 2007 only 11% of cattle, 1.2% of camels, 4.8% of sheep and 5.9% of goats were vaccinated against RVF¹¹. If access to preventive services does not significantly improve, the increase in livestock production may ultimately generate more damages than benefits for Kenya.

Arriving at sustainable livestock sector development in the coming decades

In this setting, articulating long-term scenarios that explore plausible livestock development trajectories is essential to anticipate emerging challenges and design policies that are more resilient to the future. The Kenyan government is already implementing a series of policies and strategies to support the inclusive and efficient development of the livestock sector, and that attempt to address many of the above challenges. In particular *Kenya Vision 2030* provides a road map to making Kenya a middle income country and includes strategies to enhance value addition of livestock products, particularly with a focus on export markets. The *National Livestock Policy-2008*, the *Veterinary Policy-2016*, the *National Environment Policy-2013*, the *Policy for Arid and Semi-arid Areas-2012*, the *Antimicrobial Resistance Policy/Action Plan*, the *Agriculture Growth and Transformation Plan* and the *Kenya Vision 2030 third MTP (2018-2022)* currently being formulated and the recently launched *Kenya Climate Smart Agriculture 2017-2030* all aim to support improvements in the efficiency and inclusiveness of the different livestock systems.

Notably, the majority of these initiatives are primarily short term, addressing current or more immediate challenges. Moreover, they have different perspectives on the livestock sector and only some of them have a forward looking approach. Given the anticipated changes in livestock systems, different visions and time frames could make it difficult for Kenya to ensure smooth and sustainable livestock sector development in the coming decades.

Africa Sustainable Livestock 2050, a forward looking policy initiative

Africa Sustainable Livestock 2050 (ASL2050) aims to engage stakeholders to develop agreed scenarios of livestock in 2050 which will provide guidance to refine, if need be, the different policies currently affecting the livestock sector and make them consistent and coherent. Long term scenarios will assist in prioritizing actions to effectively address emerging livestock-environment and livestock-public health challenges. In particular, ASL2050 will:

- Systematically describe priority livestock production systems, as of today, and their impact on society including, in particular, public health and the environment.
- Formulate alternative long-term livestock development scenarios and assess their likely impact on livelihoods, public health and the environment in 2050, with the objective to identify major challenges Kenya will have to address to ensure a sustainable trajectory for the sector.
- Identify actions to take now for promoting sustainable livestock in 2050, which will support and complement current livestock sector policy by injecting a forward-looking and long-term approach into the policy debate. This is essential for building policies that are resilient to a dynamic future, which is to a large extent unpredictable.

1. UN Population Fund data & projections <http://www.unfpa.org/world-population-trends>
2. SSP Public Database, OECD Env. Model, SSP2
3. Kenya IHBS 2005/2006. Weekly per capita food consumption
4. AGAL projections, Acosta and Felis (2016)
5. KNBS, 2009. National population and housing census 2009
6. Kenya 2015 DHS survey
7. Kenya economic survey (2017)
8. NEMA- Government of Kenya (2015) <http://unfccc.int/resource/docs/natc/kennc2es.pdf>
9. http://www.fao.org/nr/water/aquastat/countries_regions/KEN/
10. MOH, District Health Information system
11. Kimani, et al. (2016) Public Health Benefits from Livestock Rift Valley Fever Control: A Simulation of Two Epidemics in Kenya No Title. Ecohealth, 13, pp.729–742

Annex 1: Livestock Statistics for Kenya

Macroeconomic statistics and long-term projections

Population	Value	Year	2050 Projections
Total population	46 050 302	2015	95 504 636
Urban / rural	25.6 % / 74.4 %	2015	43.9 % / 56.1 %
Employment in agriculture	15.7%	2016	
HDI ¹	0.56	2015	
Poverty rate	36.0%	2013	
GDP	Value	Year	2050 Projections ²
Gdp (million)	USD 55 241	2013	USD 509 871
Gdp per capita	USD 1 322	2013	USD 6 532
% Agriculture	26.27%	2012(2011-2013)	
% Livestock	2.01%	2012(2011-2013)	
Net Trade (EX -IM) (2012)	Value (EX - IM) (1000 USD)	Traded items	Value (EX - IM) (1000 USD)
Agricultural products	678 655	Live animals	1 009
Livestock products	- 8 003	Feed	- 13

Current consumption of animal food and long term projections

Commodity Demand	Thousand tonnes			% Change			Annual growth rate		
	2010	2030	2050	2010-2030	2030-2050	2010-2050	2010-2030	2030-2050	2010-2050
Beef	467	734	1 277	57%	74%	173%	2.28%	2.81%	2.55%
Milk	4 839	7 513	13 298	55%	77%	175%	2.22%	2.90%	2.56%
Poultry	26	48	71	85%	48%	174%	3.12%	1.99%	2.55%
Egg	89	238	537	167%	126%	503%	5.04%	4.15%	4.59%
Mutton&Goat	87	103	127	19%	23%	46%	0.89%	1.02%	0.95%
Pork	13	29	48	125%	64%	268%	4.14%	2.49%	3.31%

Livestock population

Number of animal heads by species			
Species	Heads	Year	Source
Donkeys	1 813 213	2009	Kenya National Bureau of Statistics
Camels	2 970 911	2009	Kenya National Bureau of Statistics
Cattle	17 465 774	2009	Kenya National Bureau of Statistics
Chickens	31 827 529	2009	Kenya National Bureau of Statistics
Dairy	4 316 153	2014	Ministry of Agriculture, Livestock and Fisheries
Ducks	138 460	2014	Ministry of Agriculture, Livestock and Fisheries
Goats	27 740 153	2009	Kenya National Bureau of Statistics
Horses	n.a.	n.a.	n.a.
Pigs	334 669	2009	Kenya National Bureau of Statistics
Sheep	17 129 606	2009	Kenya National Bureau of Statistics

¹ HDI (Human development index) is a measure of economic performances and welfare, combining Life Expectancy Index, Education Index and Income Index (GNI at PPP), thus proving important information on country development.

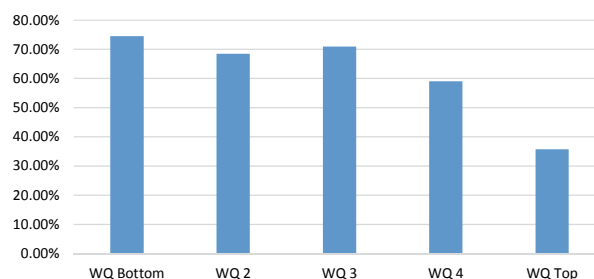
² 2050 Projections are in PPP 2005 USD.

Households' ownership of livestock

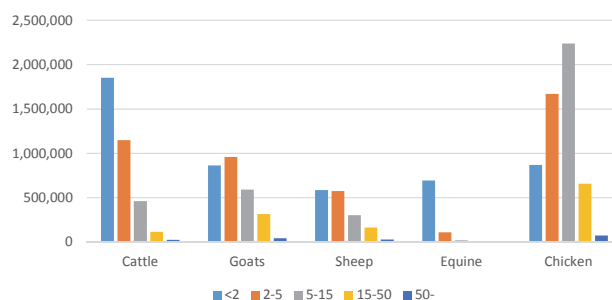
Total number of households: 11.63 million	Number of HHs keeping animal	% of total number of households	% of livestock keeping households
Livestock keeping households	6 985 359	60%	
<i>Cattle</i>	3 610 839	31%	52%
<i>Goats</i>	2 776 171	24%	40%
<i>Sheep</i>	1 659 964	14%	24%
<i>Equine</i>	826 572	7%	12%
<i>Chicken</i>	5 511 901	47%	79%

Herd/flock size	<2	2-5	5-15	15-50	50-	Total
Cattle	51%	32%	13%	3%	1%	100%
Goats	31%	35%	21%	11%	2%	100%
Sheep	35%	35%	18%	10%	2%	100%
Equine	84%	13%	2%	0%	0%	100%
Chicken	16%	30%	41%	12%	1%	100%

% Livestock keepers by wealth quintiles (WQ),
Kenya 2015



Herd/flock size, Kenya 2015



Animal health and human health statistics

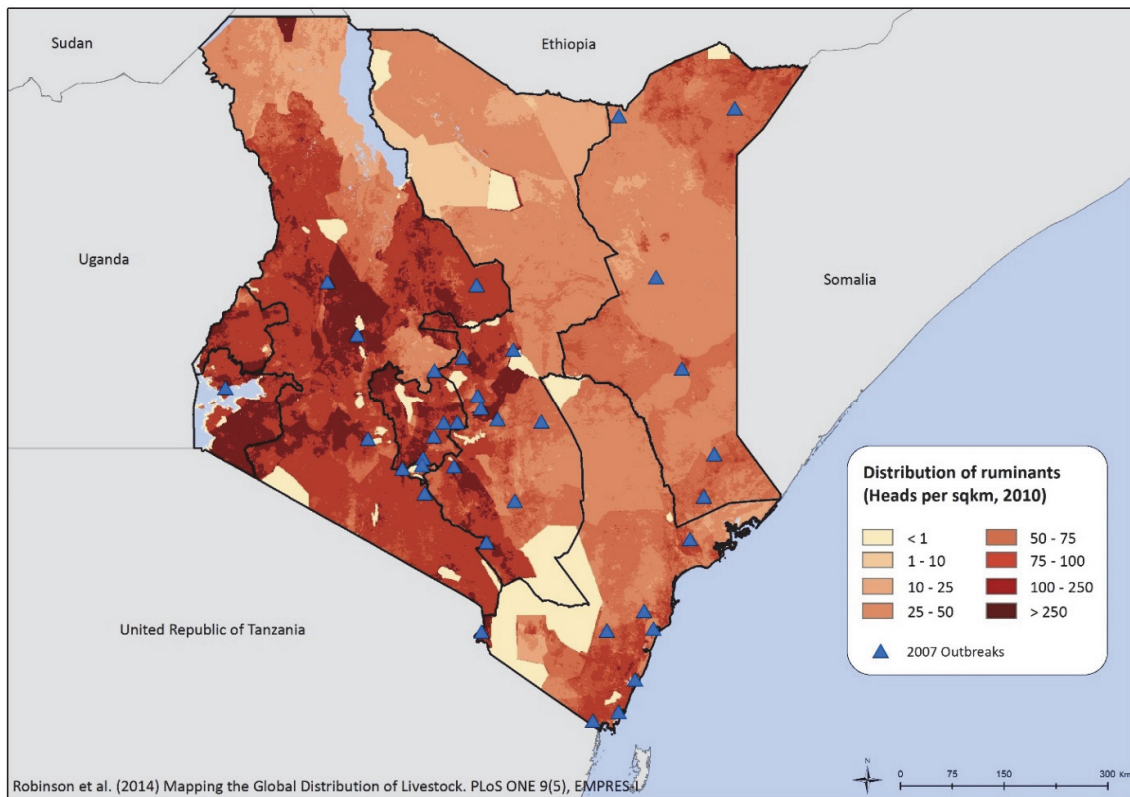
DALYs/100,000 people (2012)	Total	%
All causes	48 603	100.0%
<u>Nutr. deficiencies</u>		
<i>Protein-energy malnutrition</i>	1 033	2.1%
<i>Iron deficiency anemia</i>	1 463	3.0%
<u>Zoonoses</u>		
<i>GID (40% zoonotic)</i>	1 831	3.8%
<i>TB (2.8% zoonotic)</i>	20	0.0%
<i>Cysticercosis</i>	12	0.0%
<i>Rabies</i>	31	0.1%

Number of outbreaks of zoonotic diseases 1998 - 2007

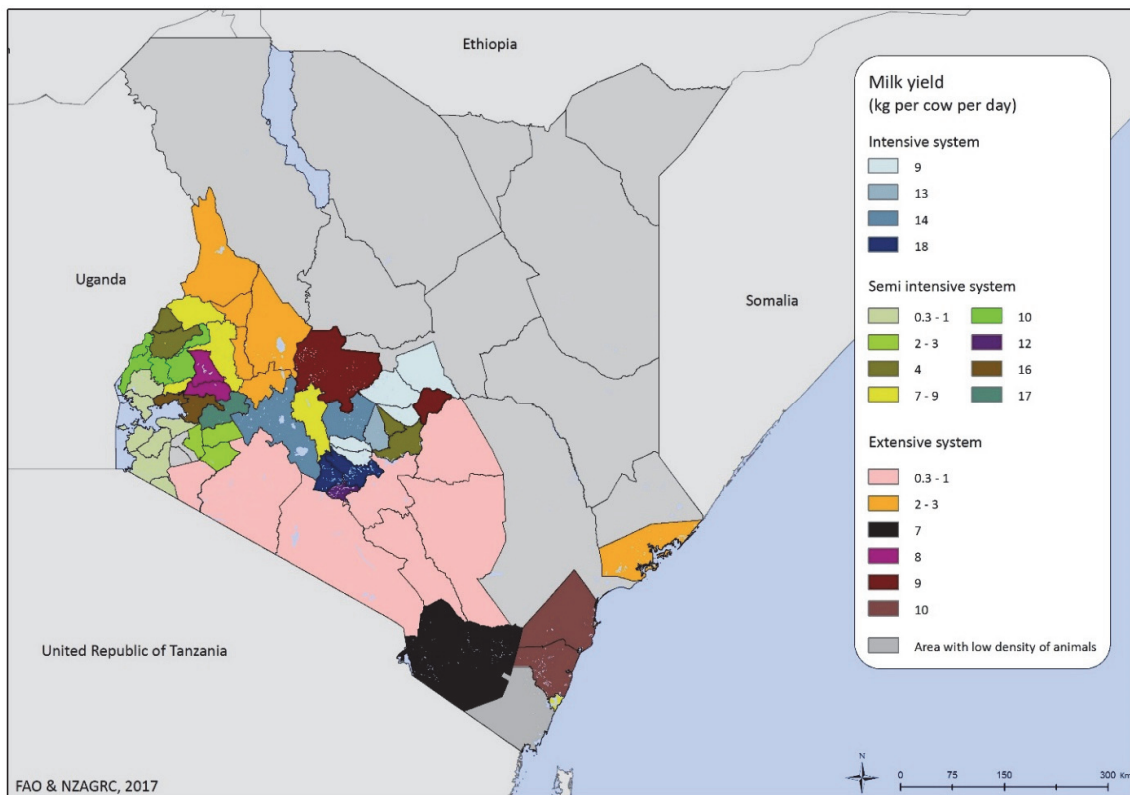
- **Empres-i:** from 1998 to 2007, 8 426 animal cases of RVF have been reported
- **WTO:** As of 30 January 2007, 411 suspected human cases of RVF, including 121 deaths (case-fatality rate, 29%) have been reported in the country.

Livestock maps

Map I. Livestock units with RVF outbreak



Map II. Milk yield per cow



Data sources

- **Macroeconomic statistics projections:** National accounts, UN Population Fund, UNDP data, FAOSTAT and OECD. Conversions done using World Bank annual data on currency conversion factors. Trade elaboration on FAOSTAT.
Projections by Acosta and Felis (2016) AGAL projections and FAOSTAT.
- **Household level statistics:** Elaboration on the Demographic and Health Surveys (USAID): publicly available at <http://dhsprogram.com/>
- **Livestock Statistics:** National accounts, Gridded Livestock of the World.
- **Animal and human health statistics:** Empres-i, OIE, WHO, AU-IBAR. DALYs statistics elaborated on Institute for Health Metrics and Evaluation (2015) and Müller *et al.* 2013
- **Maps:** Gridded Livestock of the World: FAO, Université Libre de Bruxelles and Environmental Research Group Oxford, International Livestock Research Institute: publicly available at <http://www.fao.org/ag/againfo/resources/en/glw/home.html>;
Global Livestock Environmental Assessment Model: FAO: publicly available at <http://www.fao.org/gleam/en/>; FAO & New Zealand Agricultural Greenhouse Gas Research Centre: publicly available at: <http://www.fao.org/in-action/enteric-methane/en/>

