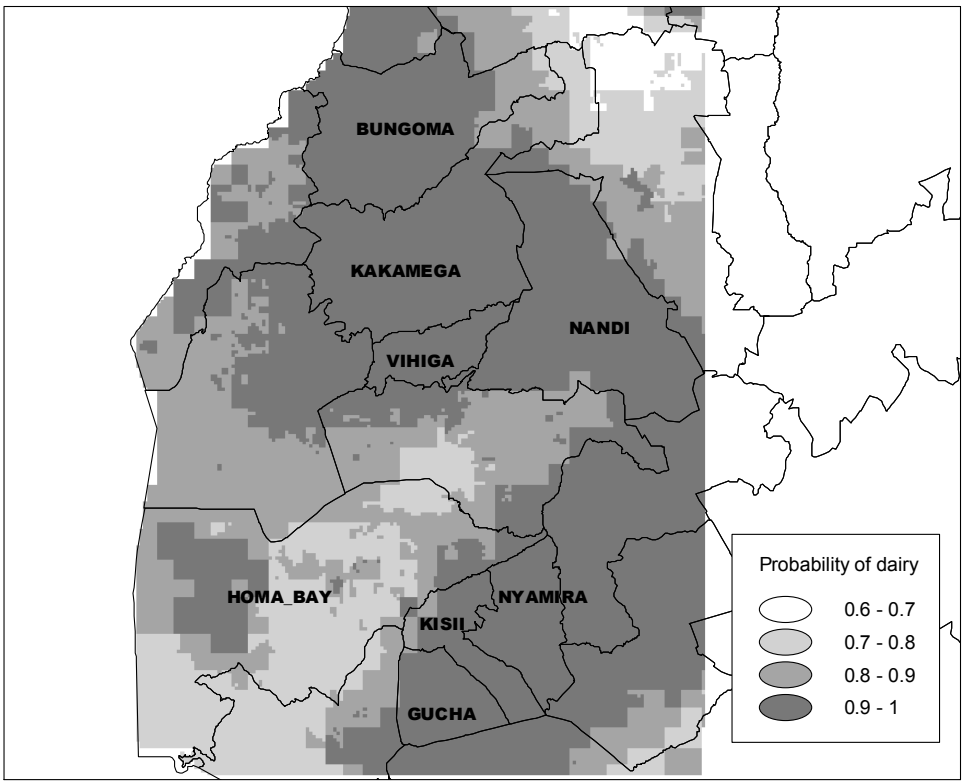
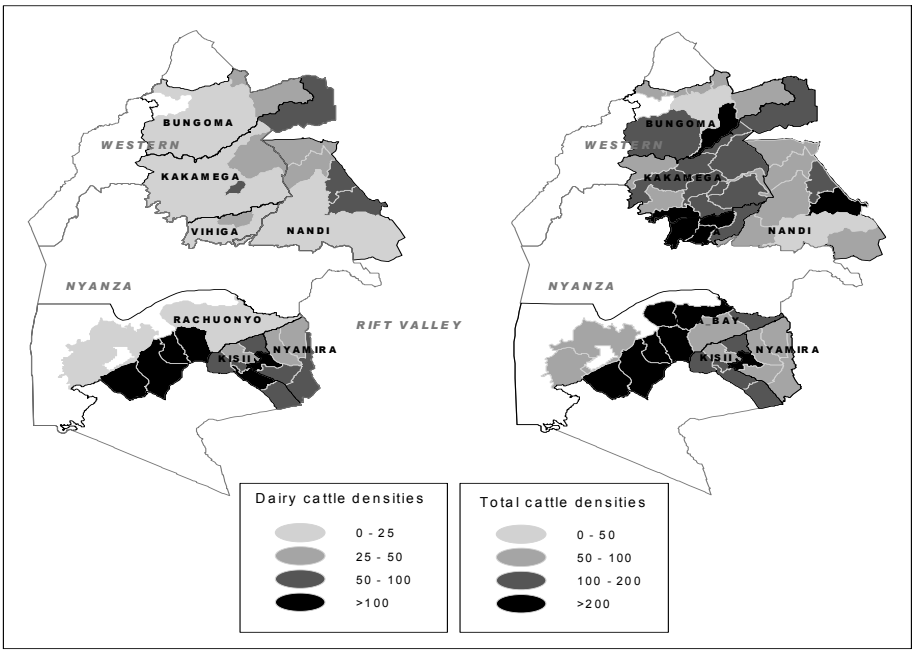
Figure 2.1 Dairy probability predicted for Western Kenya



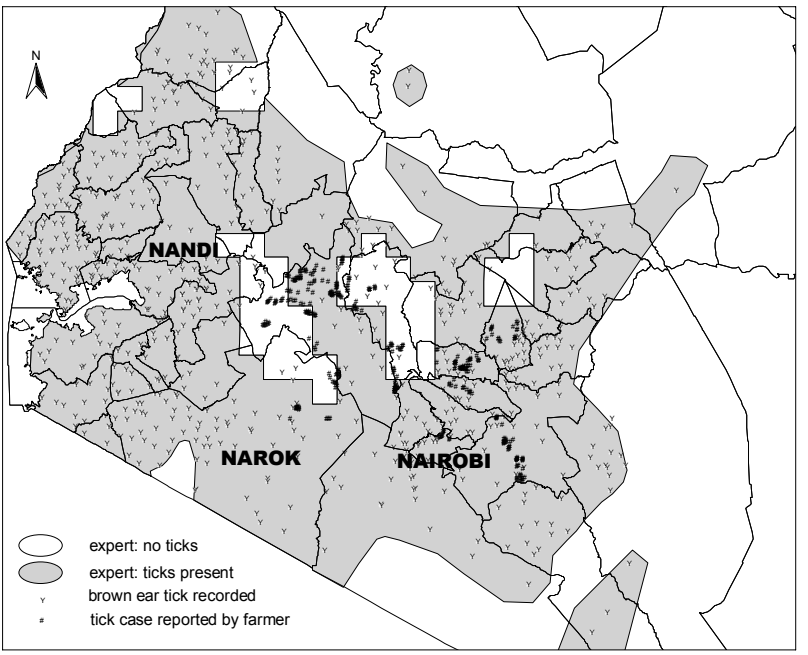
Source: ILRI 1999, Baltenweck & de Wolff

Figure 2.2 Cattle distribution in Western and Nyanza Provinces



To check the consistency of the available tick data, an overlay was made of all tick distribution layers and point data. Data assembled included layers on reported ECF, expert opinions on the spread of ticks and point data on the reported presence of the brown ear tick, compiled by Lessard, et. al. (1990) In addition, household point data on perceived animal health problems and actual reported cases of illness or death were extracted from the other district surveys. The resulting overlay of all available data presented a consistent pattern of expected and reported distribution of tick borne diseases in a broad sense. A vast area in southern Kenya seems to be tick infested. However, no differentiation was possible within the area, which, if improved on, should result in some marked variation between the research areas.

Figure 2.3 Distribution of tick (borne diseases) throughout Kenya

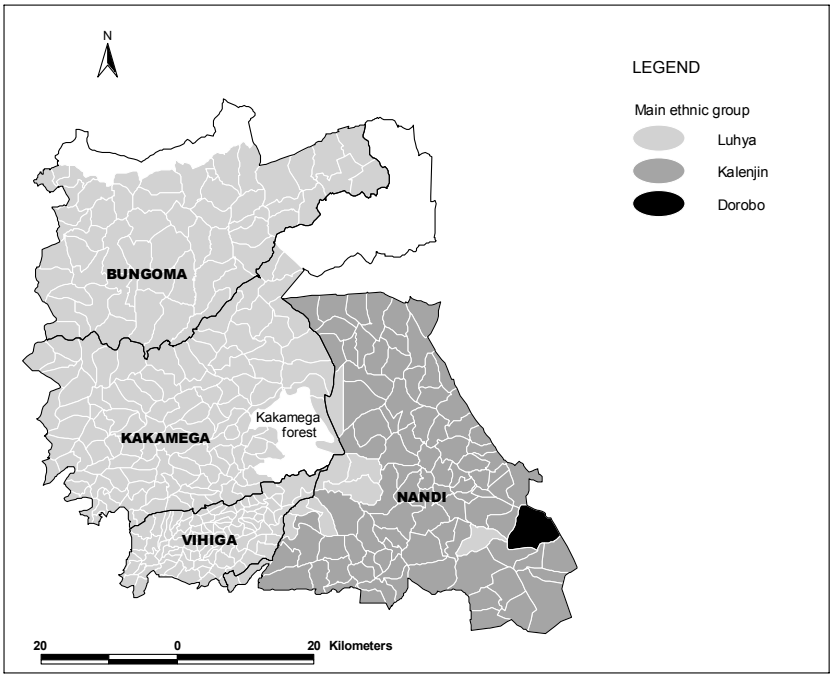


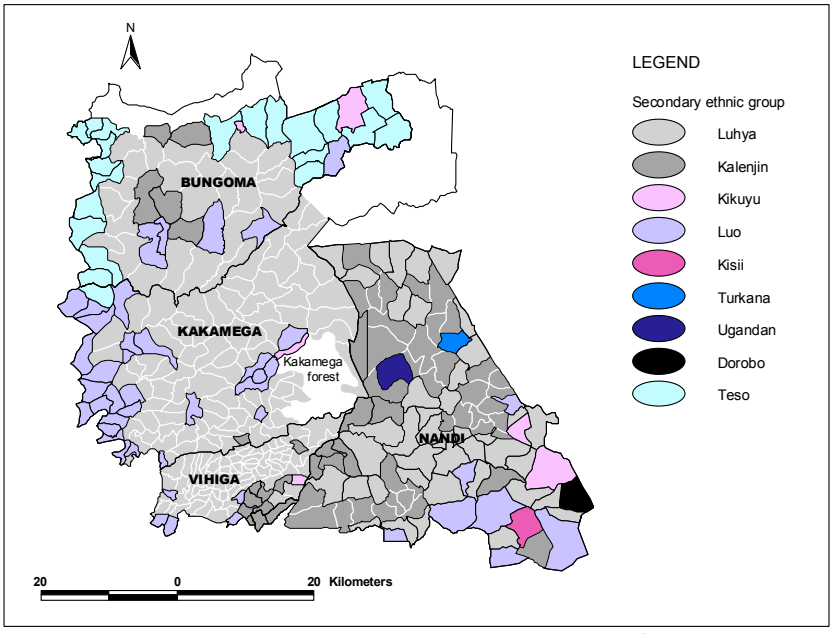
2.5 Ethnicity

As far as ethnicity is concerned, some very useful datasets were made available by the central bureau of statistics (CBS). They were initially used to portray primary and secondary ethnic groups in each sub-location. For all sub-locations with only one predominant ethnic group (being greater than 95% of the total inhabitants) no secondary ethnic group was recorded. Most areas proved to be quite consistent especially in the southern Districts Kisii and Nyamira. In areas with less than 95% consistency, secondary ethnic groups were recorded, the best example of ethnic mixture being Nandi, which harbours a number of other ethnicities apart from the predominant Kalenjin (Figure 2.4 and Figure 2.).

In future modelling procedures, based on analysis of household data from the Western Kenya survey, these data will provide a very useful supplement for further spatial extrapolation and prediction.

Figure 2.4 Distribution of main and secondary ethnic groups in western Kenya





Source: ILRI 2000, de Wolff

Figure 2.5 Distribution of main and secondary ethnic groups in Nyanza Province

3 SURVEY DESIGN AND IMPLEMENTATION

3.1 Targeting the study areas

To focus the selection of research sites within the seven districts (Bungoma, Kakamega, Vihiga, Nandi, Rachuonyo, Kisii and Nyamira), cluster analysis was used as a means of spatial stratification. Instead of simply sampling from the entire subset of sub-locations in these districts, clusters of relatively homogeneous areas were created, to serve as a sampling base.

When running a cluster procedure a number of things can be customized to user preferences. One of was choosing the number of clusters to be created. In the first run, SAS software was used to generate six groups of sub-locations, similar in terms of population densities, market access and climatic potential. Of these six, two clusters were small to display as they contained only one and 15 sub-locations respectively. The four remaining larger clusters were useful with variation between sub-locations ranging from those with high access, climatic potential and high household densities to the more remote and less populated areas (Table 3.1).

Table 3.1 Clusters means

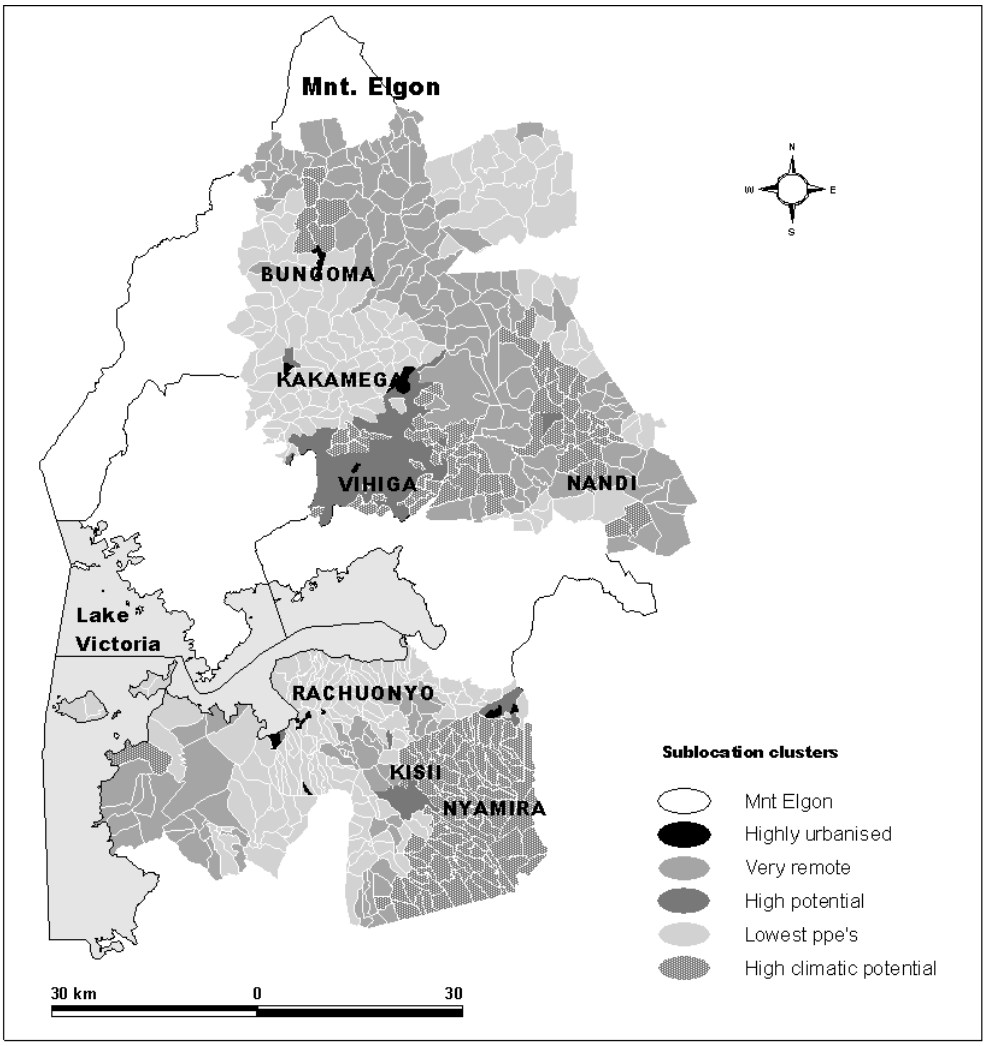
Cluster No.	Number of sub-locations	Mean household density	Mean access	Mean PPE
1	1	0 (low)	5 hrs (poor)	1.07 (high)
2	15	497 (high)	0.2 hrs (high)	0.91 (reasonable)
3	155	53 (low)	2 hrs (poor)	0.95 (reasonable)
4	106	174 (medium)	0.6 hrs (good)	1.07 (high)
5	238	61 (low)	0.8 hrs (reasonable)	0.85 (lower)
6	154	75 (low)	1hr (reasonable)	1.15 (high)

Table 3.2 Cluster description

Cluster	Description
1	Mt Elgon
2	Highly urbanised sub-locations (municipalities)
3	Remote, sparsely populated areas
4	High potential areas (not too many households, good access and climatic potential)
5	Lower density areas with good access but lower climatic potential
6	Similar to 5 but with very high climatic potential

In a second run, the number of clusters was enhanced to nine, in an attempt to pull apart the rather big clusters generated by the first run (155, 106, 238 and 154 respectively, Table 3.1). This resulted in five more equally sized groups, with more distinct characteristics. However, though the second run provided more detailed information, the first run generated a workable number of clusters as well as a distinct spatial pattern, which proved to be most useful for mapping and targeting purposes (Figure 3.1).

Figure 3.1 Clusters of similar sub-locations in Western and Nyanza Provinces



Source: produced at ILRI , Jan 2000

A final outcome of this clustering procedure was a list of almost homogenous divisions (as far as dairy related issues were concerned) from which two contrasting divisions could be selected in each district to serve as the sampling frame for the survey (Table A1.1).

3.2 The questionnaire

The current survey followed a sequential process that started with studies in coastal Kenya, central Kenya, and within western Kenya, sub-regional reviews (Owango et al, 2000, Mudavadi, et al 2001, and Ojowi, et al, 2001), GIS analysis and rapid appraisals (Waithaka et al, 2000). The information collected during these stages, especially the PRAs was used to refine the characterization questionnaire to fit circumstances found in western Kenya. The questionnaire, was developed to fit with the previous work and with an aim of guiding other successive studies in the region (Mullins et al, 1994; Jabbar et al, 1997; Rey et al, 1999) and was designed to be effective in collecting household level data and information encompassing the entire continuum from dairy production, marketing, processing and consumption. The questionnaire was