2.2 Technologies Contributing to Improvement in Productivity

As demand for milk has increased and markets improved over the last 20 years, there has been an evolution of dairying in Kenya. Dairy breeds have been introduced and used as cross or pure breeds, and improved forage varieties have been introduced. Several management and marketing practices have been made available including improved animal health and the use of fertilizers to enhance forage production. However, the evolution of dairying has not been uniform across the country but has tended to emerge first in peri-urban areas of higher populations. National research and extension programs in KARI and the Ministry of Agriculture, in collaboration with ILRI, have contributed to the development and adoption of improved technology. The following is a partial list of the technologies which have been adopted to varying levels depending on size of operation, location, and market demand:

- Improved animal genetics by introducing dairy breeds, principally Friesan and Aryshire, and crossbreeding them with local zebu cattle, primarily East African Zebu.

- Improved forages, including Napier grass, with multiple fertilizer levels. Application of up to 50 kg N/ha has been recommended.

- Use of feedstuff/minerals, primarily corn bran, and commercial concentrate feeds and mineral sources, primarily phosphorus.

- Improved animal health programs especially for the introduced dairy breeds to minimize the impact of external and internal parasites and disease such as East Coast Fever, through spraying and vaccination.

- Intensification of production system through part time confinement of the animals (semi-zero grazing) or complete confinement (zero-based grazing) with adoption of various stall management technologies (shedding, floor construction, bedding techniques, composting, manure/urine management, etc).

- Rearing of male calves up to 24 months of age for sale, primarily in extensive dairying situations.

2.3 Dairy (Meat and Milk) Production Systems Evaluated in this Assessment

Drawing in these technologies for smallholder dairy production, national experts defined four milk production systems (Table 2.3.1) and two growing animal rearing systems that generate milk and meat within the dairy industry. These systems are described by Stotz (1983) and include:

1. Zebu cattle - Grazing Only: Grazing-only environments supporting zebu cattle of improved and unimproved breeding for milk production supported by native forages, introduced species growing on roadsides, and grasses/weeds available in adjacent plantations or woodland clearings. Little or no inputs are made in these systems in terms of supplement, disease control, or fertilizer.