6.13 General Conclusions from Case Studies

The three commodities evaluated in these studies were milk from smallholder dairy operations in East Africa and sorghum and peanuts in West Africa. The more detailed studies were done in Kenya and Mali and approximations were made for the use of technology developed in these countries for adjacent countries.

Generally, the results obtained were consistent with both the predicted and measured historical results of the introduction and use of agricultural technology in both developed and developing countries. Consumers were the major and continuing beneficiaries of the introduction of new technology. Producers who were the early users of new innovations benefited both in terms of what was sold in the market and what was consumed in the household. In steady state, after adoption peaked, the models estimated that increased quantities of the commodity in question would result in lowered prices which would reduce producer welfare—assuming that demand remained relatively constant. However, when population predictions for the year 2015 were included in the analysis, the increase in demand accommodated the increase in production, prices were less depressed and both consumers and producers found substantial benefits from the introduction of new technology. When risk avoidance was incorporated in the models, the behavior of risk-avoiding individual producers tended to reduce consumer benefits because less quantities of commodity would be produced. Assessment of the behavior of individual “firm-level” operations was not necessarily the same as assessment of behavior of the commodity in the aggregate at the national level with regard to risk aversion. The particular technology packages used as test platforms for development of these methods were not associated with substantial negative environmental consequences, as measured by IMPACT. In fact, positive benefits were predicted for the sorghum production system introduced into Mali because of the use of ridge tilling as a means of conserving water and preventing erosion.

These studies were neither ex ante nor ex poste in the formal sense of the definition. In all cases, there was experimental data and producer experience to provide quantitative information on how the technology package performed under experimental conditions. The ultimate utility of the technology and its result will not be known until there is substantially more experience over time. Thus, these studies, as is often the case in technology assessment, predict future impact of new technology based on experimental results obtained at specific sites. The ability to objectively assess the geographic extent to which these technologies may be used provides an emerging new capacity for estimating the broader utility of technology and the broader impact of policy options involving agriculture and natural resources.