

Costs of aflatoxins in the Kenyan dairy value chain

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Introduction

Kenya's dairy industry contributes to 14% of agricultural GDP and 3.5% of the total GDP.

Aspergillus fungi contaminate crops before harvest or postharvest and produce aflatoxins. Aflatoxin contaminated food/feed cause direct economic losses (when the food/feed is unfit for consumption) and indirect economic losses due to acute and chronic aflatoxicosis in humans and dairy cattle.

Several studies have reported a high prevalence of aflatoxins in maize, dairy feeds and milk in Kenya. The overall goal of the present study is to assess the economic costs of aflatoxins in Kenyan dairy value chain.

Methodology

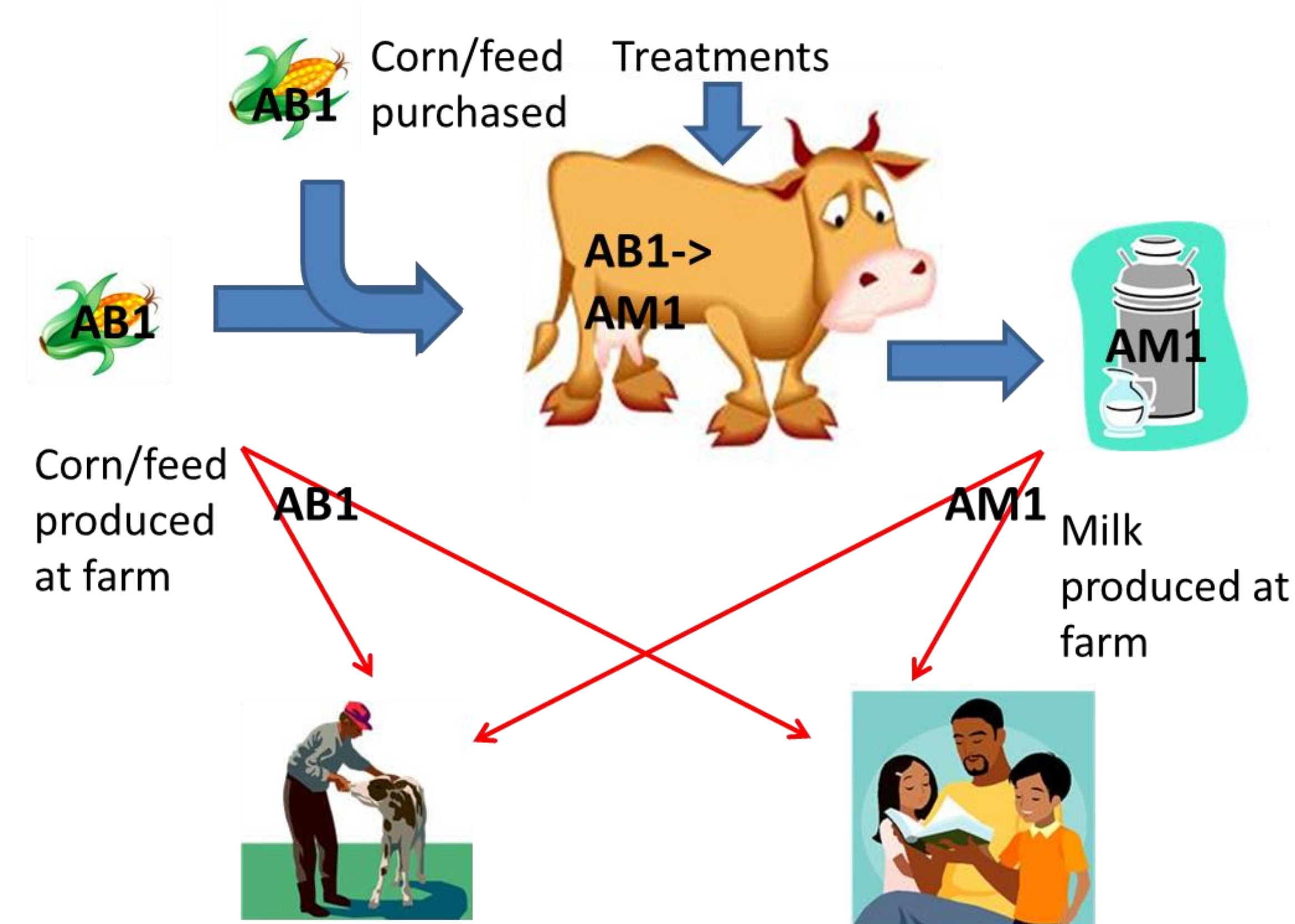


Figure 1. Aflatoxin contamination pathway (source: authors)

Site selection

Five study sites were selected from four agro-ecological zones: Kwale County (sub-humid), Isiolo County (semi-arid), Tharaka Nithi (humid), Kisii (temperate), and Bungoma (temperate). A questionnaire was administered to dairy farmers, milk traders, milk consumers, feed traders, and feed manufacturers. Samples of milk, foods and feeds were collected. The samples are being analysed for aflatoxins M1, B1, and total aflatoxin using ELISA and HPLC. The total aflatoxin exposure per day in humans and dairy cattle will be used to calculate aflatoxin costs. The aflatoxin human health costs will be calculated using the formula of Rico-Sole (2012).

Conclusion

There is need to assess the costs of aflatoxins in the Kenyan dairy value chain and suggest economically viable and socially acceptable mitigation strategies that could be followed to reduce aflatoxin contamination of foods and feeds.

The results could help policymakers and the Kenya Dairy Board to implement strategies that allow the control of aflatoxin contamination in milk.

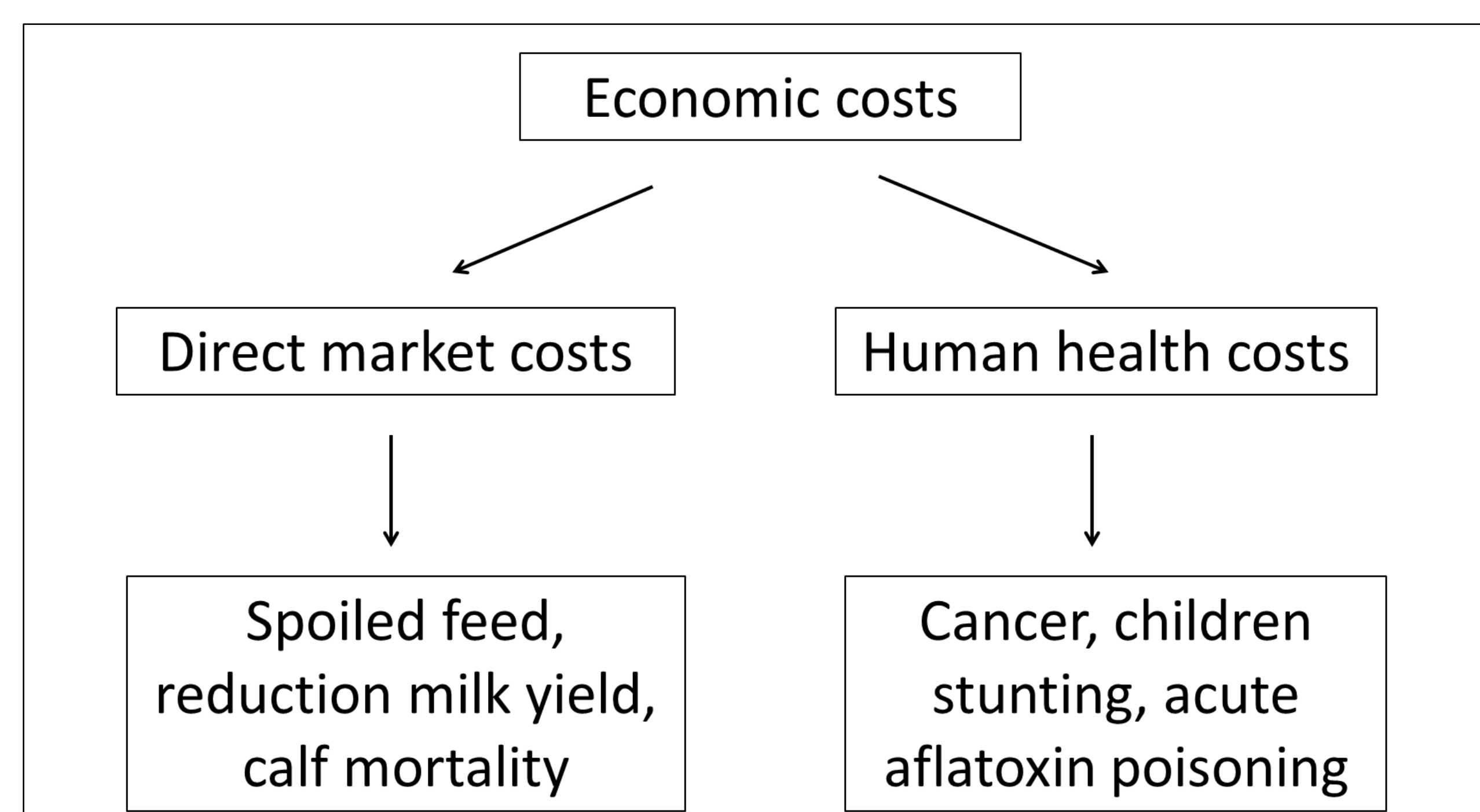


Figure 2. Economic costs of aflatoxins (source: Khlangwiset and Wu, 2010)

Human health costs could be assessed through questionnaire directed to sampled consumers and using the following equation (Rico-Sole, 2012):

$$Aflatoxin\ health\ costs_i = H \cdot E \sum_{i=1}^n x_i \cdot w_i \cdot z_i$$

H: number of exposed habitants

E: health expenditure per capita

i: risk factor

x_i : fraction in DALY's implication in this population of risk factor i

w_i : estimated fraction of implication of aflatoxin in risk factor i

z_i : estimated fraction of implication of milk consumption in aflatoxin in risk factor i

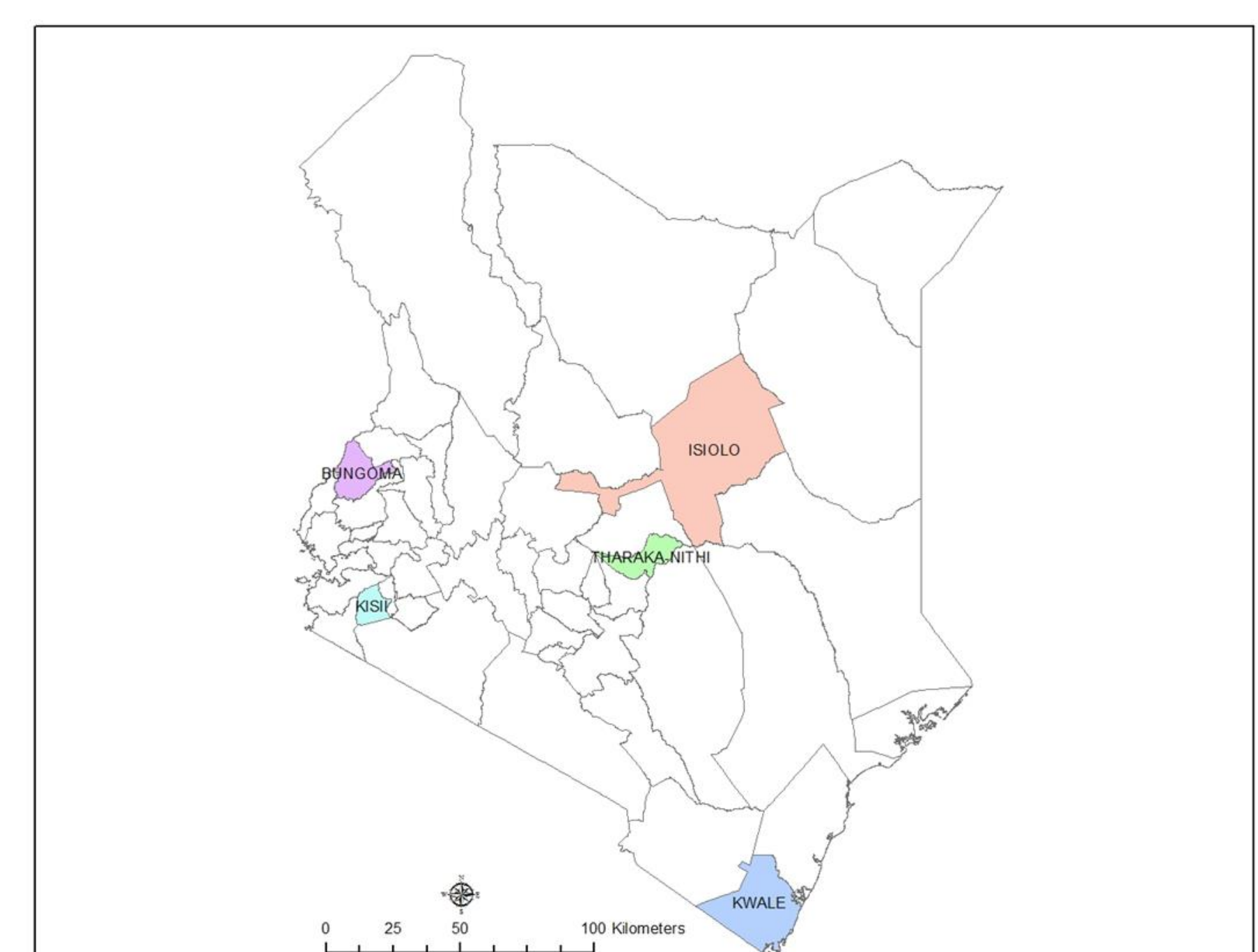


Figure 3. Study area (source: authors)