

Background information: Following food surges, prices of most staple food commodities in most developing countries mirrored the surges suggesting global price transmission. Consequently, price volatility act as disincentive for producers' investment and consumers purchasing decisions affecting sustainable agricultural productivity. In food policy, economic theory affirms that markets allocate scarce resources from surplus to deficit regions absorbing demand and supply shocks arising from uncertainties and risks. The study gives useful insights for production and consumption investment decisions.

Objective: To investigate spatial market integration and price transmission of selected supply and demand markets.

Problem statement: Despite maize being major staple food commodity and the most traded in Kenya its demand outweighs domestic supply owing to erratic rains and increasing demand contributing to food insecurity and poverty. Moreover, major maize producing areas are spatially separated from major consuming areas leading to high transaction costs which make maize rather expensive food commodity in deficit areas. In this regard, Kenya being net importer of grain maize in East Africa necessitates investigation of market integration and price transmission on supply and demand markets.

Hypothesis: White grain maize markets are not integrated and no price transmission between selected supply and demand markets.

Methodology and data : The study investigated spatial market integration and price transmission for grain white maize in eight selected markets of East Africa mainly Kenya, United Republic of Tanzania and Uganda. Time series monthly wholesale price data, CPI and exchange rates from 2006 to 2014 were used. Consumer Price Index (CPI 2005= 100 as base year) was used to deflate the data. Bivariate Johansen co-integration and threshold autoregressive error correction (TAR) model to account for transaction costs was used.

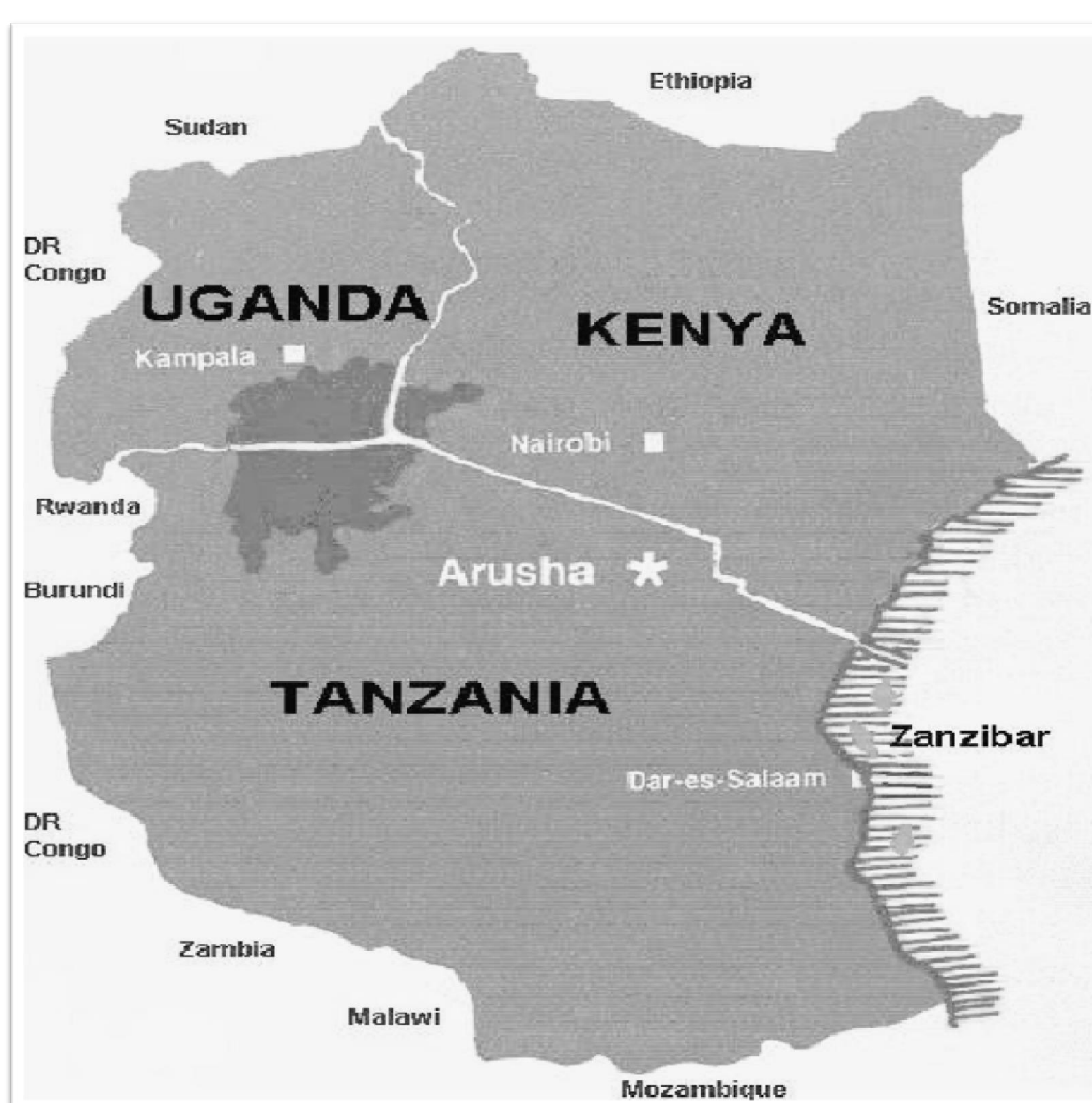


Figure 1: Map of Kenya, Uganda and Tanzania



Figure 3: Grain white maize is the most traded grain cereal in East Africa



Figure 4: Maize from Tanzania being sold in Makueni Kenya during drought period.

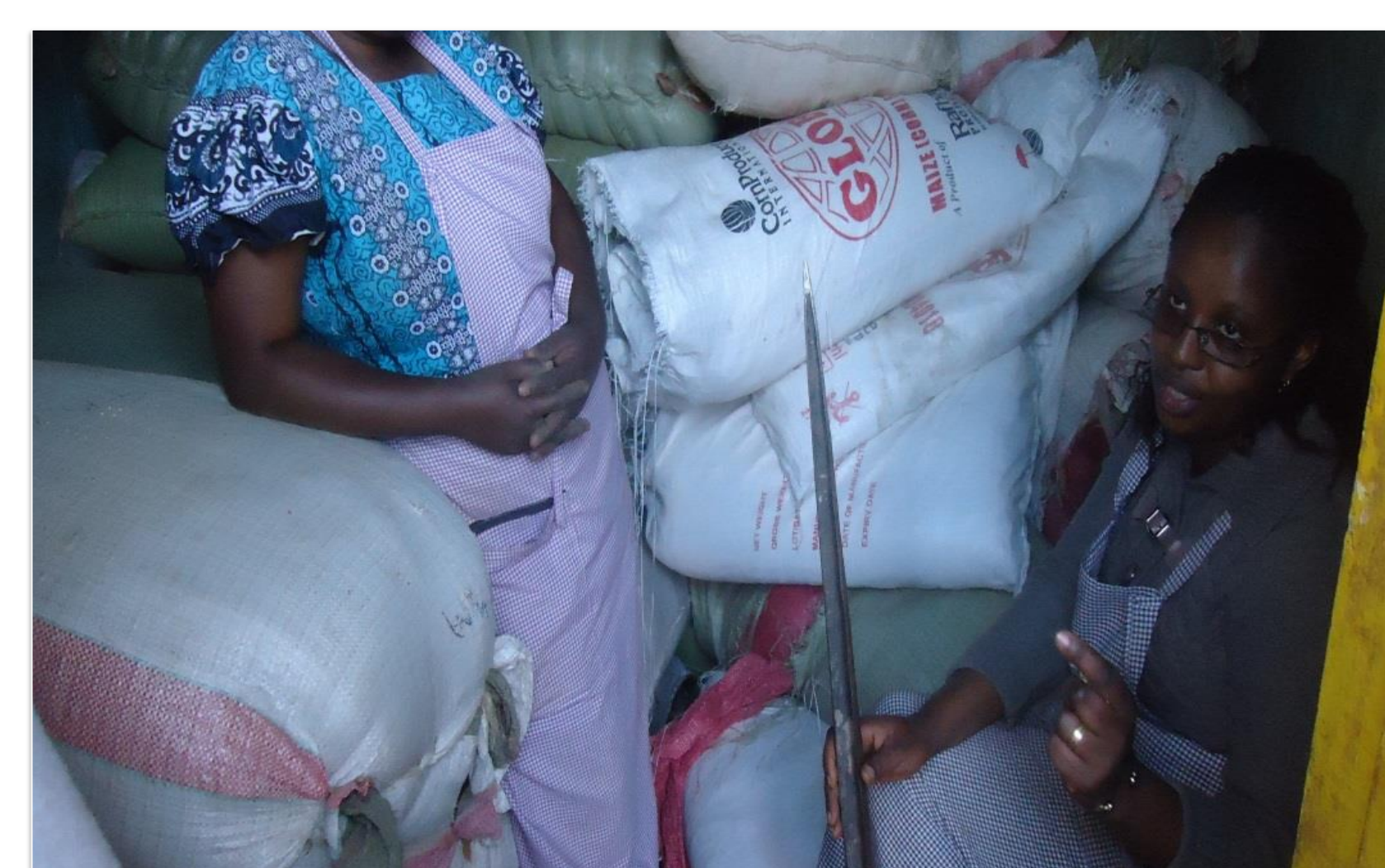


Figure 5: Maize from Uganda through Busia border being sold in Meru North Kenya.

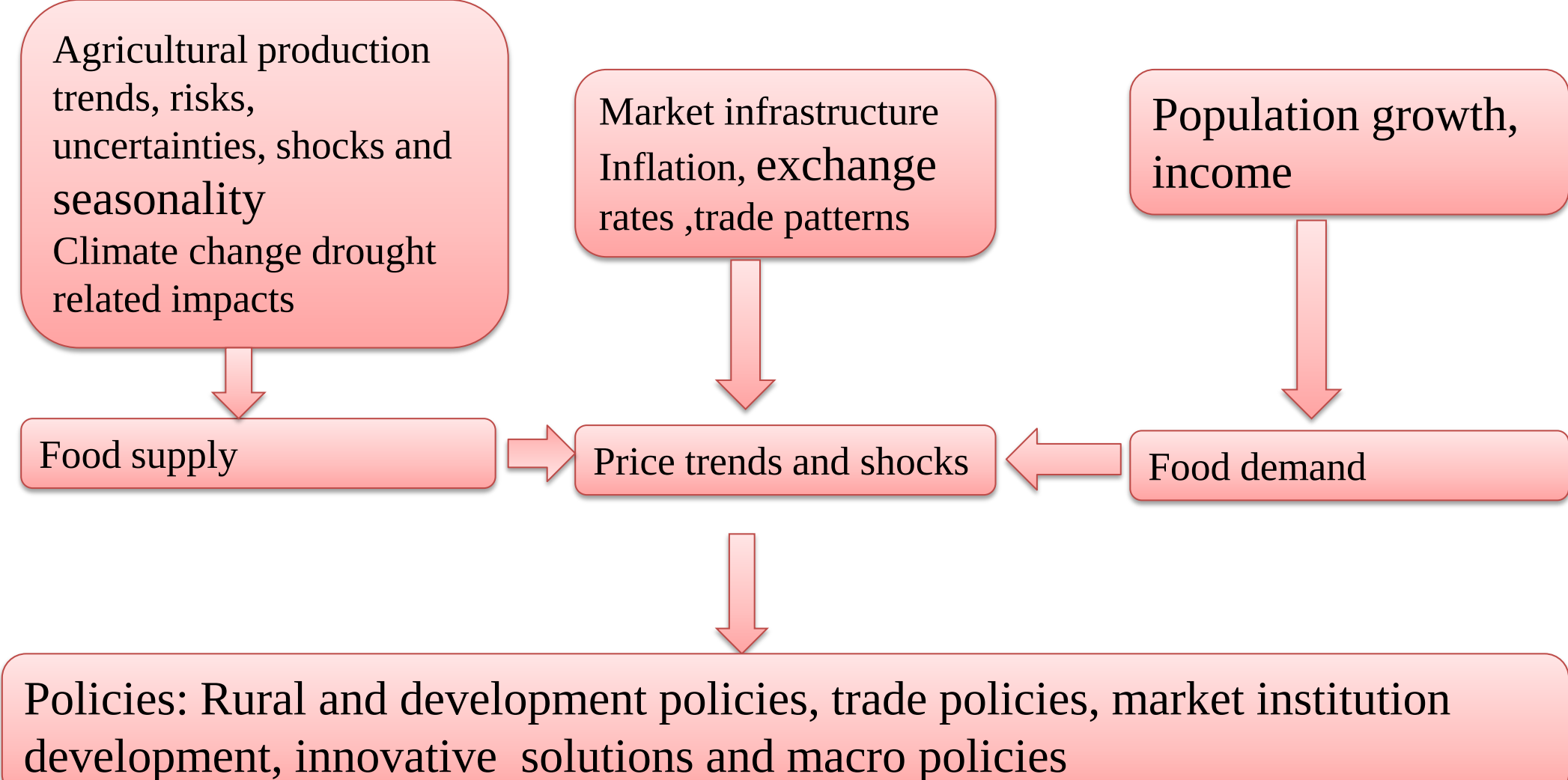


Figure 2: Conceptual framework of market integration in supply and demand markets

Results: Though, maize markets in East Africa were found to be integrated, they exhibited price volatility with selected Kenyan markets having highest wholesale prices compared to Uganda and Tanzania. Price shock adjustments took long ranging between 2 to 11 months. However, speed of price adjustment was found to be high in case of negative deviations inimical to net food buyers in absence of price stabilization mechanisms.



Figure 6: Farm in arid area of Kenya during dry period showing no sign of crop life

Paradox of scarce in a world of plenty



Figure 7: Grain white maize for sale in Eldoret Kenya

Table 1: Bidirectional price adjustment TAEEM estimates of selected pair of maize markets for the period between 2006 and 2014

Market pair(I/J)	Distance (Km)	α (Adjustment factor) (SE)	$\theta(i)$	Half life in months (adjustment time)
Makueni-Nakuru	294	-0.061(0.012)	6.08	11.03
Makueni-Eldoret	454	-0.310(0.022)	41.27	1.87
Makueni- Nairobi	187	-0.180(0.015)	45.16	3.49
Makueni- Mombasa	330	-0.098(0.013)	20.07	6.71
Makueni - Dares Salaam	587	-0.084(0.011)	7.30	7.92
Makueni -kampala	608	-0.119(0.014)	8.42	5.43

SE : denotes Standard error; : adjustment coefficient on the lagged price difference (i.e. percentage of mean price in the two markets , threshold i.e. percentage of mean price between the two markets; Half life: measured in months :TAEEM denotes threshold autoregressive error correction model

Source: Author's computation from time series data

Conclusion: Selected markets were found to be co-integrated suggesting they do not drift far apart exhibiting long-run steady linear equilibrium relationship. Conclusions can be made that transactions costs in short and long term equilibrium price adjustment should be accounted for in price transmission analysis.

Policy recommendations: Specifically for Kenya, in the short term there is need for social protection interventions mainly properly designed and funded Hunger Social Safety Net Programme to help households build their assets. However, in the medium term there is need to enhance maize buffer stocks to cushion households against abrupt shocks, risks and uncertainties. In the long term, for sustainability investment in infrastructure mainly road network, markets and information systems is deemed necessary. Additionally, there is need for proactive rather than reactive interventions and adequate policies especially irrigation technology especially in arid and semi areas for improved productivity and enhanced household resilience in agriculture and rural development.