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Policy Briefing

Projected Impact of climate change on household diets in Kenya Insights from Busia County, Kenya

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Summary

By 2050, climate change is expected to reduce maize yields in Kenya, threatening food and nutrition security. **Analysis** of possible **2050 national food production scenarios** – based on the current market-oriented agricultural policy and an alternative crop diversification approach – **shows persistent nutrient gaps** (iron, zinc and calcium) and rising diet costs, making even basic **calorie-adequate diets unaffordable for poor families**.

There is a need to prioritise addressing persistent nutrient gaps (particularly iron and zinc for infants) and raising diet costs through affordable foods. **Policy must urgently shift** from maize dependency **towards climate-resilient staples** and **nutrient-dense crops**, while expanding **support for child nutrition and household affordability** to ensure food systems meet future nutrition and health needs for the population.

Context: 2050 climate scenarios

Climate change is expected to reduce the productivity of key staple crops – especially maize, the current staple food in Kenya – by 2050.

The current analysis uses Cost of the Diet[i] and iFEED tools[ii] to assess two possible 2050 national climate, food production and trade scenarios (market-oriented policy and an alternative crop diversification approach) versus a supply unconstrained scenario:

- **Market-oriented**: reflects Kenya's current agricultural focus, prioritising high-yield staples (maize, wheat, potatoes) and export crops.[iii]
- **Alternative crop diversification**: promotes crop diversification and traditional crops (identified by Kenya Seed Savers Network) for local consumption, encouraging community-led food systems.[iv]
- **Unconstrained supply**: models the most affordable healthy diet based on national recommendations[v] and food preferences in Busia, assuming all foods are available in 2050.[vi]

Key findings

Projected dietary shifts

In both 2050 scenarios, per capita maize supply declines significantly, prompting greater reliance on available alternatives to meet calorie needs.

Sorghum, supported by wheat and millet, or rice and maize, offers **a promising, affordable way to meet calorie needs** but there is **not enough grown** in both market-oriented and diversified scenarios.

Soybeans, dark-green leafy vegetables, sesame seeds, beans and offal are promising affordable sources of protein, fat and micronutrients for families with young children – but projected national supply is insufficient to meet population needs.

Future nutrient gaps (Table 1)

Across the three 2050 scenarios, there are projected iron and zinc deficits for infants aged 6–8 months, including in household diets aligned with the 2017 national guidelines, underscoring the need for targeted support during complementary feeding.

- Overall, **iron, zinc and calcium are likely to remain a problem** for young children, adolescents, and pregnant and lactating women in all three 2050 scenarios.
- **Diets based on roots and tubers may fail to meet energy** needs for vulnerable groups, due to high bulk density.
- **Diets based on sorghum, soybean, sesame and offal can close nutrient gaps**, except iron for young children.

Family & individuals	FUTURE SCENARIOS (2050)		
	Market-oriented	**Alternative diversification**	**Unconstrained food supply**
Entire family	Energy (99.1%)	Iron (94.1%)	**Iron** (100.2%)
Child, 6–8 months	Iron (74.9%), zinc (100%)	Iron (71.5%), zinc (100%)	Iron (72.6%), zinc (100%), calcium (100%)
Child, 2–3 years	Fat (100%)	Iron (100%), calcium (100%)	Calcium (100%), vit A (100%), fat (100%)
Child, 14–15 years	Iron (97.7%), fat (100%)	Iron (93.0%)	Iron (100%), fat (100%)
Man, 30–59 yrs	None	Iron (100%), calcium (100%)	Calcium (100%), vit A (100%), fat (100%)
Woman, 30–50 yrs, Lactating	Energy (96.9%)	Iron (98.6%)	Iron (100%), fat (100%)

Table 1: *2050 projected nutrient gaps and percentages met for entire family and individual members. Nutrients with less than 100 per cent met (red font) are the most difficult and costly to meet.*

Future diet affordability (Figure 1)

Affordability analysis based on 2050 projected food supply reveals significant gaps for typical families:

- To acquire **the cheapest nutritious diet** using June 2023 monetary value, families will need annual food budgets over **USD 4,431** under the **market-oriented scenario** or **USD 3,930** under the **alternative diversification scenario**.

Poor households are **unlikely to afford even energy-only diets** in both scenarios.

Diets based on **sorghum, soybean, sesame and offal** can reduce diet costs, narrowing affordability gaps significantly for poor households.

- **Even so, only households with annual food budgets above USD 2,155** – close to the poverty line for lower middle-income countries (USD 3.65 adult equivalent/day) – **are likely to afford the cheapest healthy diets**, aligned with 2017 national recommendations.
- Considering 2022 national average income and adult consumption expenditure for urban areas, **these hypothetical future diets are currently unaffordable** for typical households in Busia.

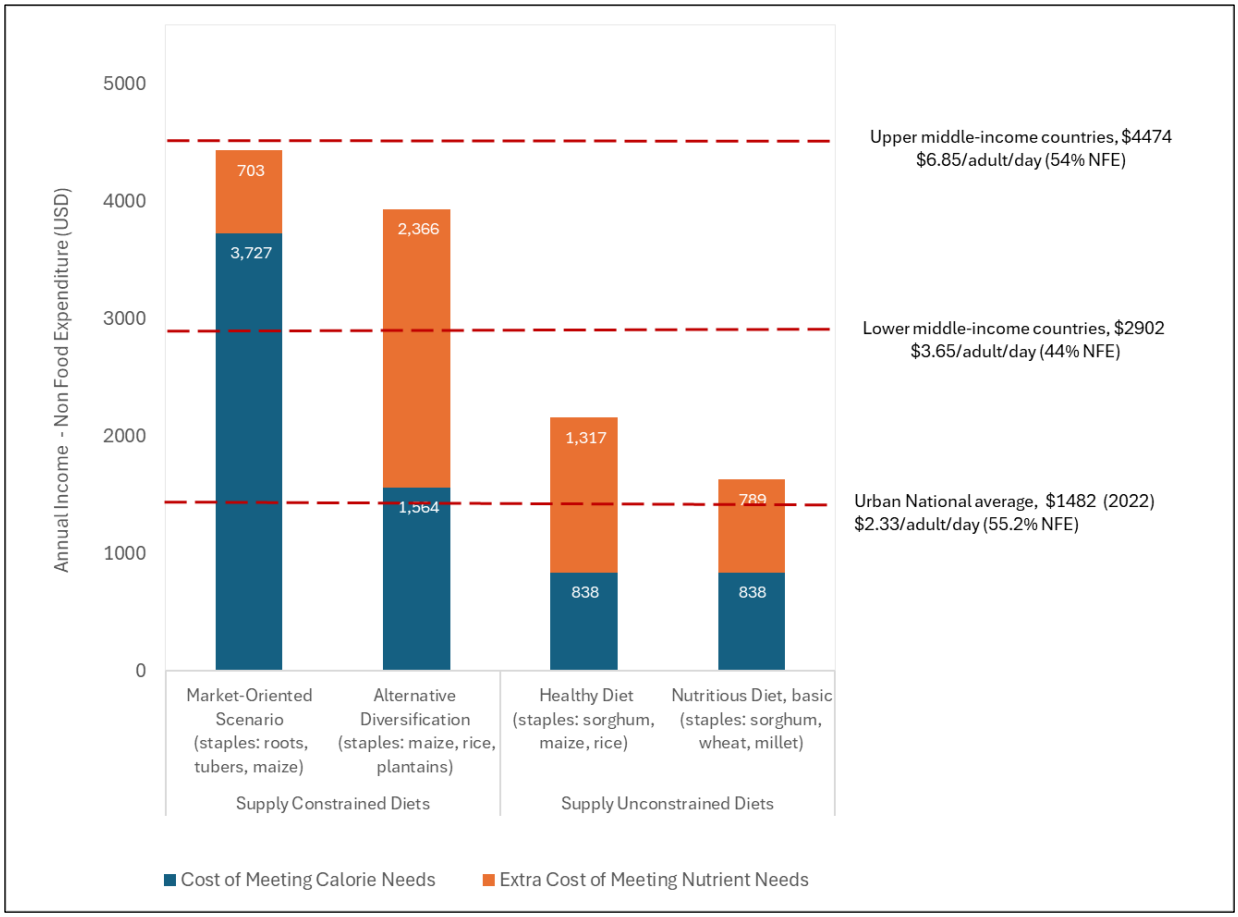

Figure 1: *Projected cost and affordability of least-cost future supply-constrained diets under market-oriented and alternative crop diversification scenarios versus supply unconstrained healthy (aligned with national recommendations) and basic nutritious diets (for a typical household in Busia Town). NFE = Non-food expenditure estimated for the poverty lines. $ or USD = US Dollars.*

Policy recommendations

1. *Enhance household incomes through employment and social protection*

Create employment opportunities and consider income-enhancing measures such as universal child benefits and food vouchers, as a safety net for low-income households. These strategies are essential to close diet affordability gaps, especially as future diet costs for a typical family are projected to exceed USD 4,431, requiring annual incomes close to the international poverty lines for upper middle-income countries (USD 6.85/adult equivalent/day), based on June 2023 monetary value.

2. *Transition from maize dependency to climate-resilient staples*

Shift agricultural and food policy away from maize dependency towards more climate-resilient, nutrient-dense staples – such as sorghum and millets (through the national flour blending policy) – and legumes, dark-green leafy vegetables and animal source foods high in iron and calcium. Incorporating these foods in household diets can reduce projected diet costs by up to 78 per cent and close nutrient gaps.

3. *Strengthen infant and young child nutrition*

Prioritising targeted interventions during the complementary feeding period to address persistent iron and zinc gaps for infants. Expanding support for micronutrient supplementation, food fortification and biofortification, and affordable, age-appropriate and family nutritious foods.

4. *Strengthen retail environments to promote healthier choices*

Partner with small retailers and markets to promote fortified products via point-of-sale materials and demos. Regulate advertising of unhealthy foods targeted at children, promoting responsible marketing aligned with World Health Organization guidelines. Support informal vendors with training on hygiene, safe food preparation and planning nutritious family meals.

5. *Adapting the County Nutrition Action Plan (CNAP) and County Agri-Nutrition Implementation Strategy (CANIS)* to start building sustainable food systems that can support access to nutritious, safe and affordable healthy diets for all in the contexts of ongoing urbanisation and climate change.

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