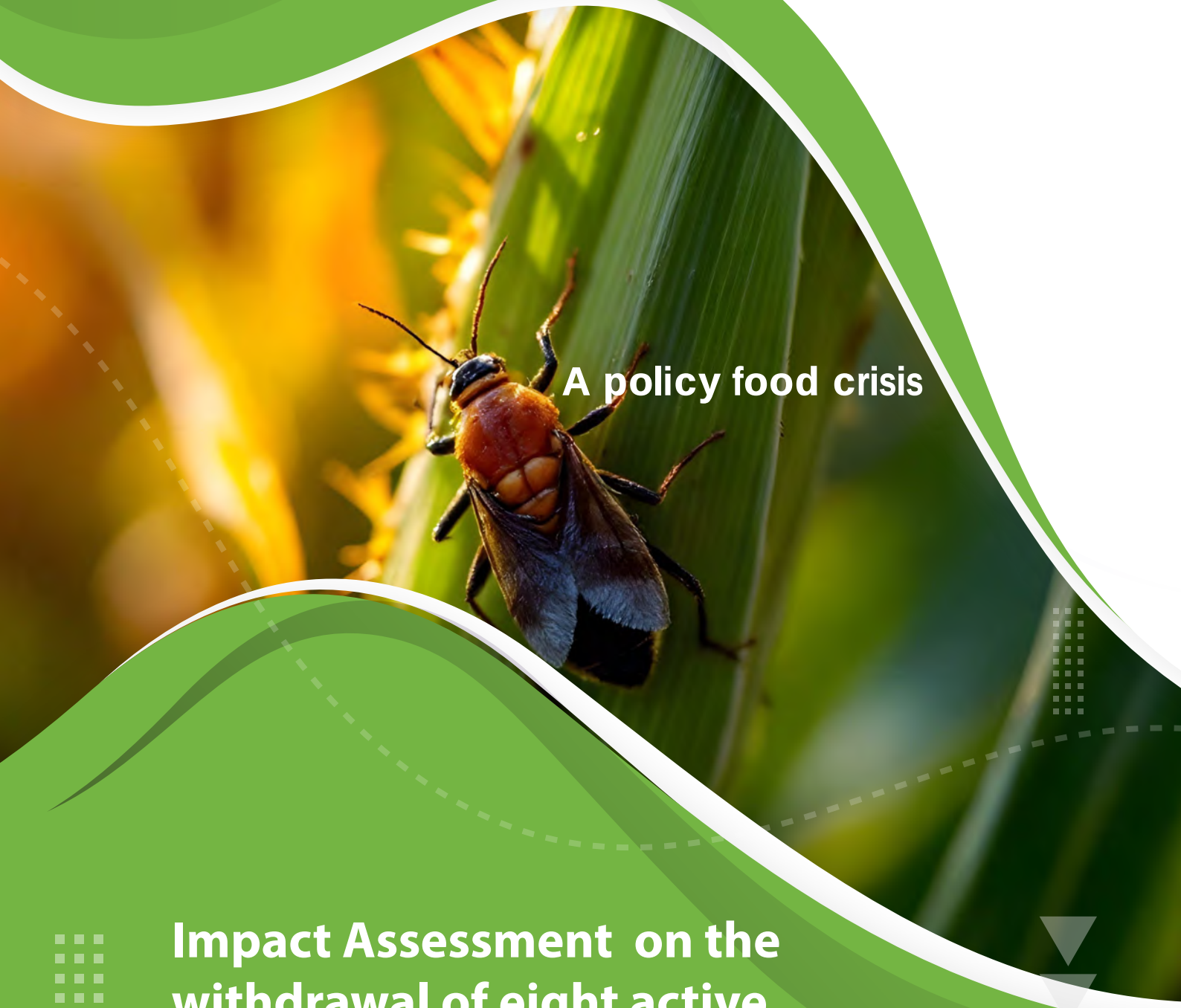


A policy food crisis

Impact Assessment on the withdrawal of eight active ingredients and associated pest control products in Kenya

Executive Summary

01

In over 142 pest control products

8 Active Ingredients withdrawn or restricted from use

This impact analysis has been conducted to estimate the likely effects and the consequent policy issues arising from the **withdrawal of 8 active ingredients contained in more than 142 pest control products** that was announced in Kenya in 2023 driven by differing safety, environmental and trade concerns

02

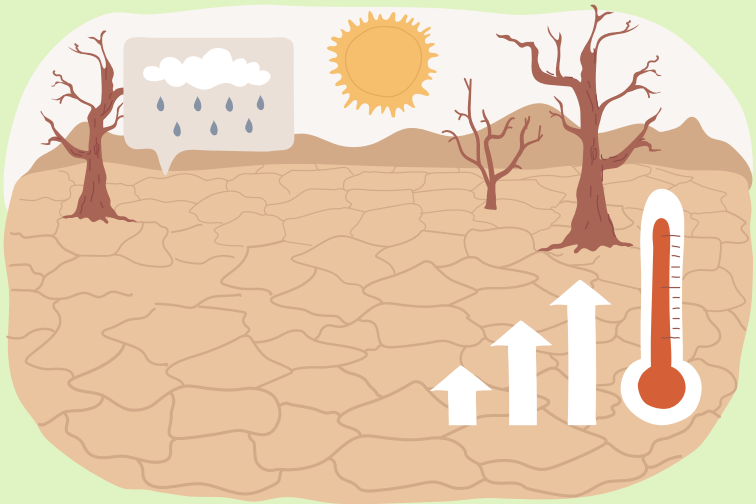
Research surveying 155 Smallholders

Research surveying 67 Agricultural experts, exporters, and specialist farmers

The study is based on primary and secondary research, conducting literature reviews on damage done to crops by the pests affected their prevalence in Kenya, their development of resistance, and the availability, efficacy and adoption rates of alternative crop protection tools.

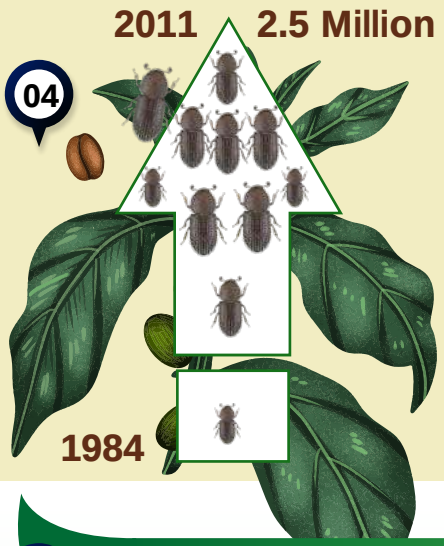
03

The starting point for this analysis is the level of damage done to crops in Kenya by pests. Kenya and her neighbours suffer more extremely than many parts of the world due to its heat and weather patterns, which accelerate pest growth and proliferation.



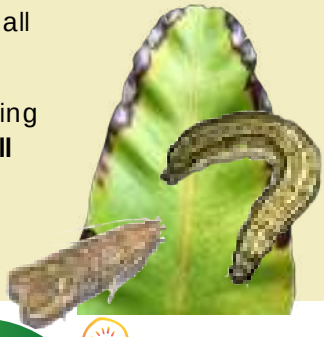
90% crop losses without pest control

This has been made worse by climate change, with current data revealing **2°C temperature rises** taking **crop losses without pest control** to an estimated **90% of all crops grown**.



The rate of expansion of pests has leapt, for instance for coffee berry borer, **it increased 2.5 million-fold between 1984 and 2011**, even as the **pest climbed to altitudes 300 metres higher each decade**, to now reach almost all Kenya's coffee crops.

The country's ideal pest conditions are also attracting alien species, such as **Tuta absoluta in 2013 and Fall Armyworm in 2017**, that are inflicting massive crop losses as their life cycles shorten by half and egg volumes rise.



05 The surge in insects has driven up viral infections

More than **600** infections spread by insects

increased the number of emerging plant diseases

such as Maize Lethal Necrosis Disease (MLND) in 2011, which **destroys up to 95% of a crop.**

Spread of Fungal diseases. A 2022 survey of farms across Kenya finding **fungal infections in every Sorghum crop.**

Invasive weeds have also gained momentum, from striga weed, through mesquite, to parthenium, destroying crops, pastoral land, and biodiversity.

06

In the face of this increase in pests,

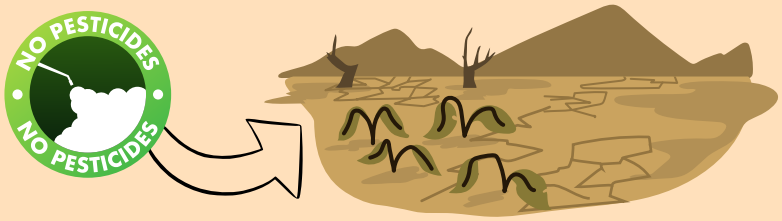
57.5% of the farmers surveyed said they were losing income to pests every year or most years

50.6% of the farmers surveyed said that they were losing food every year or most years.

97.4% were using pesticides

Nearly 47% reported that if they could not get pesticides, it would decrease income from their crops by more than three-quarters,

While 58.9% said stopping pesticide use would increase their food losses to over half their crop.



07

- Pymetrozine
- Thiacloprid
- Diuron
- Chlorothalonil
- Propineb
- Chlorpyrifos
- 2.4-D
- Acepthate

Against this backdrop, the Kenyan government in 2023 announced the **withdrawal from the market of eight pest control products**, for differing reasons across human safety, environmental impact, and trade concerns.

The international basis of pest control regulation is risk assessment, which considers **any poisonous element**, **the dose that makes it poisonous** and the **volume of the product reaching humans, animals and the environment.**

Kenya is strongly committed to risk- based assessments, and is in disputes at the WTO with the EU, which now implements a hazard based assessment and precautionary principle where there is no evidence of risk.

08

Our analysis examined the risk assessments and hazard assessments for each of the **eight active ingredients withdrawn** and found that most of the Kenyan withdrawals were, in fact, precautionary.

More than half of the active ingredients withdrawn have no established 'risks of concern' for humans, animals or the environment.

09

Having examined the withdrawals, our study mapped the previously registered uses for all **eight withdrawn active ingredients** and associated pest control products by pest and crop,

finding the withdrawals affected the control of

more than 105 Pests

on at least 31 Crops

These included all the country's staple foods, all its leading agricultural exports, and all the most-consumed vegetables in the country.

Crops affected accounting for 75% (74.8569%) of the volume of crop and vegetal output in Kenya.

10

We undertook **literature reviews of peer-reviewed studies** to map the crop damage done in the absence of crop protection in each pest pathway, and the prevalence in Kenya.

We **calculated the net loss without crop protection** as the average damage multiplied by the prevalence.

However, for many of the crops, this created a sum of damage adding up to more than 100 per cent.

It is not possible to lose more than all of a crop, for which reason this raised a critical modelling challenge.

11

In fact, pests do not inflict damage in a linear sequence, one adding to the next. We, therefore, made a critical modelling assumption that if we took the most destructive and prevalent pest, all other damage would be subsumed beneath that percentage.

Example:

8 Active Ingredients withdrawn

affects pest control for **12** pests that affect flowers

thrips, aphids, hids & whiteflies, mealybugs, spider mites, caterpillars, powdery mildew, downy mildew, botrytis, black spots, and false codling moth.

3% to **47%**

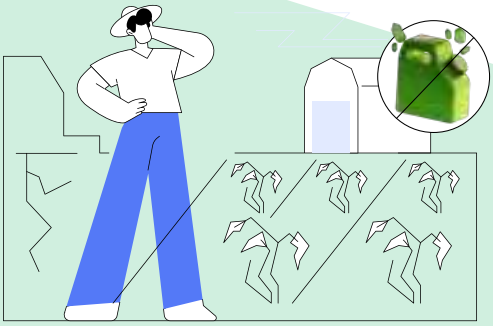
Average crop losses caused by damage by these pests together with their prevalence in Kenya without pest control

Adding these average unprotected damage percentages together for all 12 pests equals **total damage of 246.84%**.

For the modelling, we modelled the impact of **botrytis**, which, at **49%** was the most damaging pest if uncontrolled, and assumed that all of the damage done by aphids, hids & whiteflies, mealybugs, spider mites, caterpillars, powdery mildew, downy mildew, botrytis, black spots, and false codling moth, would be encompassed within that 49%, and/or not add any further crop losses.

12

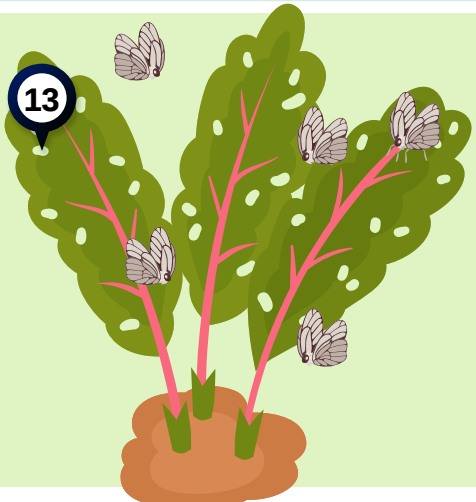
It is worth emphasising that this constitutes a very conservative assumption and is likely to mean that all the model outcomes are underestimates of the actual impact ahead.



However, on the basis of this selection,

the losses to the **31** crops without protection

amounted to **42.8%** of their 2022 production levels



13

We then mapped all alternative pest controls.
For registered chemical control products, which were mapped from the PCPB database by pest and crop, we assumed their equivalent efficacy to the withdrawn product as a baseline.

The only differential applied to that baseline was the level of resistance already being reported for any of the alternative controls in relevant peer-reviewed studies.

This was not an evaluation of pest sensitivity, but where, for instance, studies were reporting 35 per cent to 65 per centresistance to a product, we applied that resistance factor as a reduction in its equivalent efficacy.

14 We also derived from literature reviews the pace that a pest was developing resistance and applied that as a resistance factor reducing the control provided by synthetic alternatives in each successive year, as that expanding resistance removed more protection.

15 For IPM alternatives, such as hand weeding, the use of GMOs, parasites, pheromone traps, and suchlike, we carried out global literature reviews on every pest 'pathway' (being the pest on that specific crop) to identify all alternative means of control.

We found that for many of the pest pathways no cultural or biocide controls existed, or where they did, their efficacy was very partial or minimal, and sometimes untested.

However, for all IPM alternatives that offered significant pest control, we mapped their efficacy and degree of uptake. The pest control provided by IPM alternatives at the start was calculated as their efficacy multiplied by their uptake. For instance, GMO cotton gives strong bollworm resistance, but has enjoyed very poor uptake because of its vulnerability to drought.
A factor of increased IPM uptake was then built into future years.

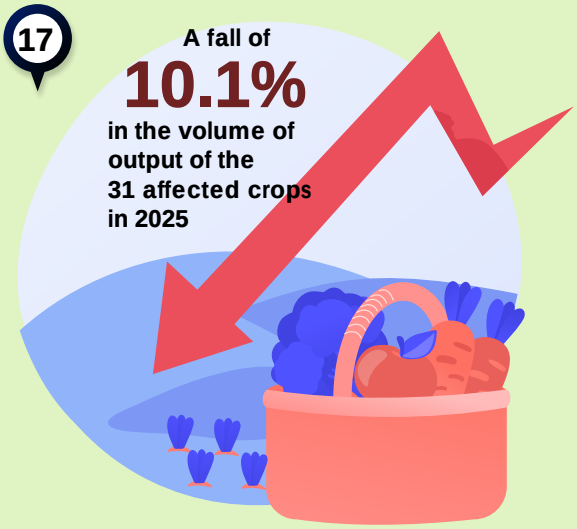
16 These calculations and findings were modelled to calculate the net impact of the withdrawals on crop yields.

For 13 of the pathways, the withdrawals removed all pest control.

For a further 20, the withdrawals will leave only one crop protection option

These include crops such as wheat, where there were only two fungicides available for leaf rust, which develops resistance to same-use fungicides within two to three seasons, and where Kenya only now has one,meaning there will be no control for the pest within two years.

17



For all crops, based on the use of alternatives and levels of resistance, our model forecast **a fall of 10.1 per cent in the volume of output of the 31 affected crops in 2025.**

Of the 27 crops affected, 16 will not have restored output to 2024 levels by 2034. All the country's staple crops will be seriously affected, and most of its leading agricultural exports.

Within the country's staple crops, our model reported a recovery to 2024 levels only in rice production. However, this was because the impact of the now aggressively expanding apple snail was not included in our model - since our model considered the present status quo plus the impact of the withdrawals, and not other extraneous changes, such as new and uncontrolled pests.

18

None of maize, wheat, potatoes, cut flowers, or coffee will return to their 2024 output level in the 10 years analysed.

19

A fall by more than **30%** in 2025

(cucumbers, cabbages and kales, and French beans)

A fall by more than
10%

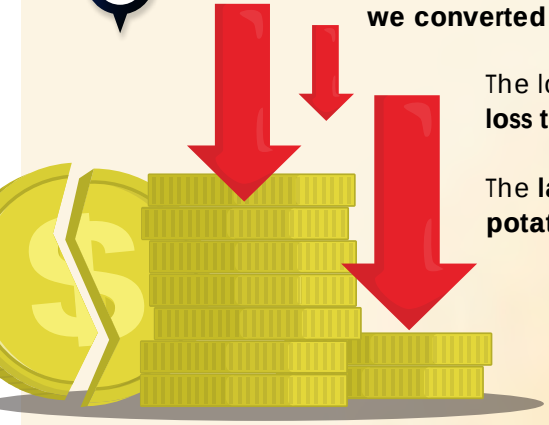
(Cotton, pineapples, courgettes, maize and coffee)

A fall by more than **20%**

(tomatoes, egg plants, kerala, cut flowers, snow peas, squashes, tea, potatoes, barley and sorghum)

20

In forecasting the impact on farmers' incomes, **we converted all crop volumes into value at their 2022 prices.**

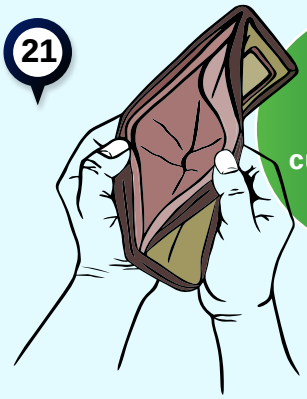


The losses were concentrated in higher-value crops, meaning the **loss to agricultural producers' incomes will be 17.6 per cent in 2025.**

The **largest total income losses in 2025** were for **cut flower, maize, tea and potato growers**, ranging from **Sh15bn to Sh37bn per crop**, at 2022 prices.

For 18 of the 27 crops analysed, farmers incomes failed to recover to 2024 levels in the decade ahead, generating total income losses, at 2022 prices, of **Sh 124.6bn in 2025 and Sh 487.78 billion by 2034**

21



48% of families curenty living in poverty

The impact is set to be far more severe, however.

22

Kenya's smallholders sell

on average, only **26%** of the crops they produce

Our survey into the pest control strategies they use for crops produced for sale and the strategies used for crops produced for home consumption found farmers using almost the same pest control strategies for both end-uses.

23

Our data revealed some end-use switching on yield losses, with **farmers reducing crops for sale to prop up their own food supplies for home food consumption.**

But, whether swapped out from income, or bought as replacement food, the same farmers will be **replacing a net 13% cut in their home food supplies (76% retained x 17.6% reduction).**

24

On this basis, we calculated the replacement costs for home food supplies by excluding
crops such as cut flowers, tea, coffee, and cotton.

We assumed farmers could replace foods at a price broadly equivalent to farmgate prices, versus the normal spread from farmgate to **consumer prices of 80%.**

This was a further deeply conservative assumption. On this basis, farmers will gain additional food replacement costs of **Sh183bn in 2025, at 2022 prices.**

25

Over the next decade, the impact on farmers of **both lost sales income** and **new food replacement costs** is set to reach **at least Sh1 trillion shillings**, while the double impact of a reduced volume of foods for sale and reduced home-grown foods is set to trigger a spike in food insecurity, as consumers seek to secure 30 per cent more food than was available for sale domestically in 2024, prior to the production falls.

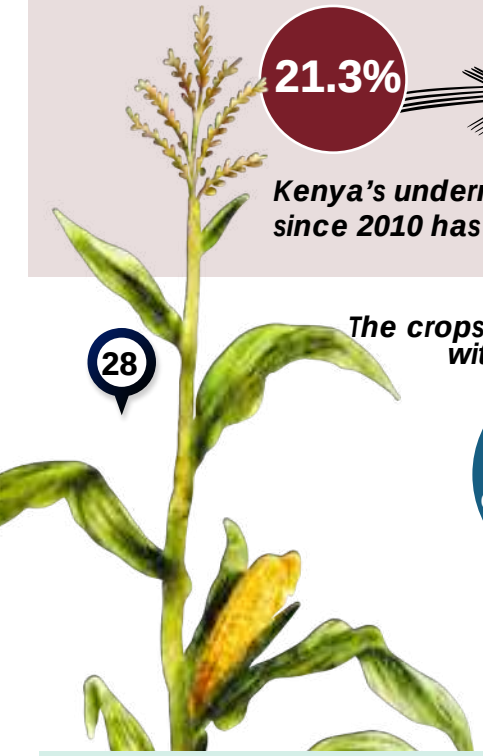
26

This report has not estimated the rise in food prices this will generate, but it will be considerable as a result of import substitution, undermining the trade balance and exchange rate, combined with an excess of local demand and shortages.

27

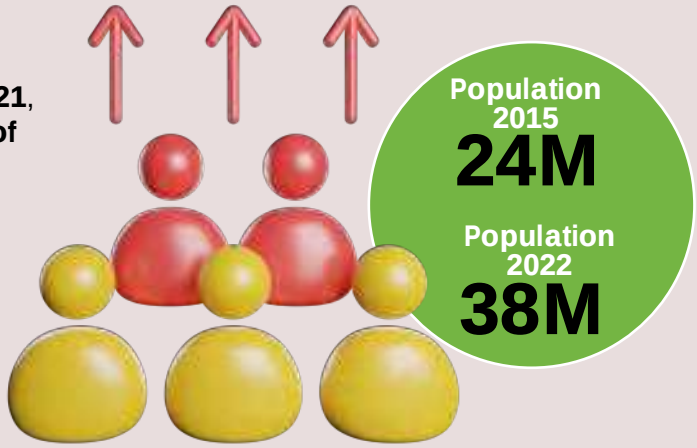
Kenya is already suffering from high food insecurity, primarily because of the long-term failure of cereal crops to expand at a sufficient rate to keep pace with population growth.

As a result Kenyans were getting an average **2,218 calories a day by 2021**, **13.8%** below the **average in Africa of 2,573.**



21.3% → **27.8%**

Kenya's undernourishment rate since 2010 has steadily risen.



28

The crops affected by the pest control withdrawals account for

63%
of calories consumed by Kenyans

Without import replacement, the yield drops forecast in this report will further reduce the calories per head to **1,872 per day,** assuming the consumption of unaffected foods can continue at the same rate as previously, and to **1,767 by 2034,** moving Kenya to the lowest national calorie count in the world.

29

Studies show that the **long-term consumption of 1,800 calories per day** moves consumers into **'semi-starvation neurosis',** while **severe calorie deficits drive up cancer cases by as much as 89%**, and **diabetes by 55% to over 75%.**

Evidence from Kenya's anaemia data additionally shows **climbing micronutrient deficiencies since 2011, from 39% of children to 43% by 2019.**

30

In modelling the nutrient content of just onions, kale and tomatoes and the impact of their yield drops

this impact analysis found a further **7%** drop in iron availability

this impact analysis found more than **1/2** in the average availability of vitamin A

with Kenya's 2011 Micronutirient Survey citing WHO figures reporting that **vitamin A deficiencies** cause a **23 per cent in all cause mortalities.**

31

The **further increase in micronutrient deficiencies** will also have other long-term impacts, reducing productivity, and introducing permanent developmental impacts, through l**ower IQs, reduced concentration and earning power, and reduced kidney and lung development.**

We have not included these impacts in the analysis on the economic impact of the withdrawals

32

Based solely on the yield cuts, and the consequent losses across the agricultural value chain, the reduction in Gross National Income will be a reduction of at least 6 per cent in 2025.

Import substitution in 2017, **when maize crops were decimated by Fall Armyworm**, equated to the **reduction in sold maize and did not also cover the home-retained losses**, **leading to a parallel 41.7 per cent increase in local maize prices**.

We have assumed imports to substitute for the gaps in the country's four staple cereals will also cover only the sold portion, however the pressure to arrest domestic price rises will be severe, with maize prices already at long-term highs.

On this basis we estimate the shortfalls will generate additional imports of **$211m, or Sh27.43 bn**.

33

At the same time, **the output of 4 out of Kenya's 5 largest exports will be affected by the pest control withdrawals (tea, flowers, coffee, and tropical fruits)**

the fall in output is forecast to cut their export earnings by **$492.7m** in 2025

19.3% or of their estimated 2024 earnings of **$2.552bn**

and by **$1.77bn** or **$230bn** in the decade to 2034

34

However, many of the pests for which controls have been removed are also quarantine pests in the European Union, which is Kenya's leading export destination.

A series of crops, including coffee, snow peas, egg plants, cucumbers and chillies, are unlikely to be able to navigate the quarantine bans on the basis of the controls that have been removed.

This won't affect export levels in 2025, but **over the decade ahead is likely to lead to lost export income of approximately $11bn or Sh1.43 trillion.**

35

Based on our most conservative assumptions, we estimate the **pest control withdrawals** will reduce **Kenyan GDP by 7.28 per cent in 2025.**

36

In terms of policy considerations, the withdrawals appear to have been driven by export market needs and not the previous regulatory framework that was based on risk assessment and necessary mitigation measures

At least **6 of the 8 withdrawals** raise no risks of concern, across human and environmental risks, but instead represent the application of the European Union's precautionary principle of withdrawing on un-evidenced concerns, following from trade restrictions and trade pressures.

This is despite Kenya's active participation in WTO disputes rejecting the validity of the EU's pest control registration regime.

37

The withdrawals, however, extend beyond the adoption by Kenya of the EU's contested regulatory methodology, and in the case of 2-4-D, set aside all regulatory regimes in an ad hoc override, on a globally approved pest control product, prompted by a small number of MRL-breach notifications.

This implies the transition of pest control registration away from any regime dedicated to the health and welfare of Kenyans to an unpredictable tool of trade support over which Kenya no longer has sovereignty, and which might better be addressed through the enhanced facilitation of MRL observance.

38

The enormous impact of these withdrawals raises further policy issues around the need to promote and accelerate alternative pest control tools, prior to withdrawing existing tools, or in some other way manage the transition in such a way as to prevent a surge in Kenyan mortalities.

39

We recommend, based on this report's findings that:

- **A consistent and transparent methodology and criteria be adopted and promulgated for pest control product approvals**
- **This methodology and criteria be aligned with national priorities, national commitments and national security in incorporating considerations of food security and public health impacts.**
- **The government initiate an urgent public information campaign informing farmers of the pest control withdrawals and the alternative protection they can deploy.**
- **The government review the trade impact and national security impact of the announced withdrawals and take all necessary measures to mitigate the negative impacts at a pace sufficiently timely to prevent the consequent surge in mortalities, morbidities and mass financial distress.**

P.O. Box 13809, 00800, Nairobi
Mashiara Park Formerly Cooper Centre,
Kaptagat Road, Off Waiyaki Way, Kangemi

Phone: 0202464811/12
Mobile: 0734 447 777 | 0710 447 777
Email: info@aakgrow.com

aak-GROW/CropLife Kenya

aak-GROW/CropLife Kenya

aak-GROW_CropLife Kenya

aak-GROW/CropLife Kenya

aakgrow.croplifekenya

www.aakgrow.com