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TEGEMEO INSTITUTE OF AGRICULTURAL POLICY AND DEVELOPMENT

A Rapid Assessment of the Effects of the General Fertiliser Subsidy on Private Sector Fertiliser Markets

Technical Report

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Abbreviations

BETA	Bottom-up Economic Transformation Agenda
CAN	Calcium Ammonium Nitrate
CIF	Cost Insurance & Freight
DAP	Diammonium Phosphate
ETG	Export Trading Group
FAK	Fertiliser Association of Kenya
FAO	Food and Agriculture Organization of the United Nations
KALRO	Kenya Agricultural and Livestock Research Organization
KCEP-CRAL	Kenya Cereal Enhancement Programme Climate Resilient Agricultural Livelihood Window
KIAMIS	Kenya Integrated Agricultural Management Information System
KNTC	Kenya National Trading Corporation
Ksh	Kenya Shillings
MoALD	Ministry of Agriculture and Livestock Development
MT	Metric Tons
NAAIAP	National Accelerated Agricultural Inputs Access Programme
NCPB	National Cereals and Produce Board
NFSP	National Fertiliser Subsidy Programme
NPK	Nitrogen Phosphorus & Potassium
NVSP	National Value Chain Support Programme
USD	US Dollars

Executive Summary

The government re-introduced the National Fertiliser Subsidy Programme (NFSP) in September 2022 in response to rapidly rising global fertiliser prices, and as one of several steps to lower the cost of agricultural production. The NFSP is one of the flagship programmes designed to achieve the Bottom-up Economic Transformation Agenda (BETA), which identifies bringing down the cost of living, eradicating hunger, creating jobs, and uplifting the livelihoods of those at the bottom of the pyramid, as some of the government's key governance priorities.

The current NFSP improves upon its predecessor that ran from 2008-2018 by reducing the transaction costs in terms of the time farmers take to access fertiliser. This was done through an exercise in which 3,228,412 farmers were registered in 2022. The NFSP issued 3,628,512 vouchers by the end of the 2023 long rain season, but only 553,479 vouchers (15%) had been redeemed by the end of the 2023 main season. The underlying causes for this low uptake can be attributed to programme inefficiencies, especially on aspects similar the previous programme.

Tegemeo Institute conducted a rapid assessment to establish the effect of the NFSP on the private sector markets and to draw lessons for improving the efficiency and effectiveness of the programme. Tegemeo used qualitative approaches, including key informant interviews with stakeholders involved in or impacted by the NFSP, a rapid assessment of fertiliser distributors and stockists in key fertiliser markets, and reviewed available literature relating to the earlier programme to draw comparisons and lessons.

Key Findings:

The NFSP was and remains an appropriate intervention to cushion farmers against the current skyrocketing fertiliser prices. However, the implementation framework has weakened the private sector by crowding out their investments out in the fertiliser market. By not leveraging the private sector's existing value chain infrastructure, the government lost an opportunity to enhance the subsidy outcomes.

Specifically:

i. The subsidy programme made fertiliser affordable for farmers but excluded over 30,000 small and medium enterprises (SMEs) and agro-dealers who provide or have invested in well-developed last-mile farm input distribution network.
ii. The government and the private sector achieved roughly the same last-mile distribution costs. After factoring in the handling and distribution costs, the average landing cost for a 50kg bag of the subsidised fertiliser to the distribution centres was Ksh 5,405 for the government and between Ksh 5,352 and Ksh 5,597 for last-mile agro-dealers.
iii. Exclusion affects will continue to impact micro, small, and medium-scale fertiliser enterprises negatively. The fertiliser volumes handled by last-mile agro-dealers were reduced by between 77% and 88%, so continued exclusion will significantly weaken the private sector, including through divestment. Not involving the last-mile agro-

dealers in the NFSP will diminish services provided to farmers, as agro-dealers provide other services to farmers in addition to selling fertilisers .

iv. Despite the programme's broad coverage, the distribution is skewed towards major maize-growing areas of the country (79% of the distributed subsidised fertiliser in the 2023 long rains season went to 12 counties).

v. There was low overall redemption of the E-vouchers issued, possibly due to late delivery of fertiliser that went well into the cropping season in some regions; the long distances from farms to National Cereals and Produce Boards (NCPB) depots; and a mismatch between the fertiliser types that farmers wanted vis-a-vis the type they were offered in the programme.

vi. The subsidy programme disrupted the marketing plans of private-sector fertiliser traders. The subsidy was announced when most businesses had stocked fertilisers for the season, causing traders to hold large stocks of unsold fertiliser.

Recommendations:

i. **Inclusive subsidy programmes** have a higher chance of producing stronger outcomes. It is in the best interest of farmers and the agricultural sector to implement the input subsidy programme by fully leveraging the private sector's well-developed procurement, manufacturing, handling, and distribution capacities and capabilities. For instance, the government would benefit from revitalising and delivering the subsidy through the **National Value Chain Support Programme**, of which the private sector is part.

ii. There is a need for **prior sensitisation** and information regarding the fertiliser types and preferred applications to increase the redemption and uptake of subsidised fertilisers.

iii. The government should **publish the fertiliser quantities** it intends to subsidise before the start of the main cropping season to allow the private sector to adjust its marketing model.

1.0. Introduction

The Kenya Government reintroduced the NFSP in the 2022 short-rains season in response to the skyrocketing fertiliser prices. Domestic fertiliser prices started to rise in the 2021 short rain season following the supply chain shocks triggered by the COVID-19 pandemic. Additionally, the price hikes were exacerbated by the Russian war in Ukraine at the onset of the long rains in 2022. The new government administration took over in August 2022 and immediately reinstated the NFSP, a programme that had ended in 2018. The NFSP is a key intervention in the Bottom-up Economic Transformation Agenda (BETA). It identifies bringing down the cost of living, eradicating hunger, creating jobs, and uplifting the livelihoods of those at the bottom of the pyramid as some of the top priorities.

- To implement the NFSP-2, the government utilised a modified version of the previous model of procuring and distributing fertiliser through state agencies. This time, the government used the Kenya National Trading Corporation (KNTC) to procure the fertiliser (previously done by the Ministry of Agriculture) but maintained the distribution system of the National Cereals and Produce Board (NCPB). Among the improvements that were instituted in the modified model was that farmers needed to register to be eligible for the subsidy. Local chiefs and their assistants conducted the registration.
- The farmer registration exercise was widely publicised, and 12 counties were initially prioritised to pilot the registration. During the registration process, farmers were required to declare the size of the land cultivated. The declared cultivated land size would then determine the quantity of subsidised fertiliser a farmer would be eligible to purchase.
- An electronic voucher (E-voucher) in the form of a phone SMS was sent to the farmer indicating the number of 50 kg bags of fertiliser a farmer had been allocated and where (depot) to collect the fertiliser from, at the subsidised price. These adjustments improved the previous practice where farmers collected forms at NCPB, processed them at the agriculture extension offices, submitted forms back to the NCPB depot, and then made arrangements to collect the allocated subsidised fertiliser. The implementation of the general fertiliser subsidy began in the short season of 2022.

The efficiency and effectiveness of smart input subsidies are pegged on their full utilisation. For example, Makau et al. (2016) found that the general fertiliser subsidy model used between 2008 and 2018 was skewed geographically and favoured maize-growing regions. The general subsidy programme also displaced fertiliser sold through private-sector retail markets. As also shown in the Zambian fertilizer subsidy case landholding size seemed to positively affect uptake while distances from distribution and/or roads had a negative effect, and that generally subsidised fertililser was disproportionately allocated to better-off households (Mason et al., 2013). Therefore, an evaluation of the effect of this fertiliser subsidy program on the performance of the domestic private sector fertiliser markets would be important.

1.1. Objectives of the study

The overarching goal of this study is to inform policy decisions on input subsidy programmes to ensure that they can deliver appropriate, affordable, and adequate fertilisers to farmers on time. The study achieves this by:

1. Assessing the impacts of the general fertiliser subsidy programme implemented in the short rains of 2022 and long rains of 2023 on the domestic fertiliser private markets, including manufacturers, importers, distributors, and retailers.
2. Evaluating the effectiveness and efficiency of the general fertiliser subsidy model to propose delivery mechanisms that could produce better outcomes for the fertiliser supply chain actors, including farmers.
3. Estimating the last-mile delivery costs of the general fertiliser subsidy model and comparing that with the costs associated with last-mile delivery by the private sector.
4. Making recommendations to improve the effectiveness and efficiency of delivering subsided fertilisers to farmers.

1.2.Methodology

1. *Qualitative approaches:*
    a. Primary data were collected by interviewing officials from the Ministry of Agriculture and Livestock Development (MoALD), NCPB, KNTC, and the Fertiliser Association of Kenya (FAK) members.
    b. In addition, we conducted a rapid assessment of fertiliser distributors and stockists in key fertiliser markets using a checklist designed to identify data on different fertiliser types, quantities, and delivery costs to different markets. Data on sales, closing stock, costs and prices for different fertiliser types were also collected.
    c. The views and experiences of agro-dealers, some of whom participated in the National Value Chain Support Programme (NVSP), were collected through qualitative interviews.
2. *Quantitative approaches:* We calculated two indicators to estimate the impact of the subsidy programme on private-sector fertiliser markets:
    a. The estimated volumes sold during the subsidy period and compared that to the period before the subsidy. To account for the pandemic and supply-chain shocks, we went back five years to 2019, a year after the last subsidy programme ended.
    b. The margins for distributors and agro-dealers to estimate agro-dealer losses.
3. *Secondary data analysis:* We analysed the primary and quantitative data from secondary sources to establish the implications of the fertiliser subsidy on private-sector markets and the agricultural sector.

2.0. Evolution of fertiliser subsidy programmes in Kenya in the past two decades

At the turn of the 21st century, input subsidy programmes started to make a comeback after their discontinuation during the structural adjustment programmes (SAPs) era of the 1980s through to early 2000s. The oil price shock in 2008 catalysed the full implementation of these programmes following the rapid fertiliser price increases. Although the price settled to the pre-shock prices by 2009, subsequent governments continued implementing subsidy programmes. We highlight the key subsidy programmes that involve fertiliser.

Kenya, like many countries in the region, abolished inputs subsidy programmes during the structural adjustment programme. However, low fertiliser use continued to account for low productivity. To promote enhaced fertiliser use (especially among smallholder farmers), Kenya implemented the National Accelerated Agricultural Inputs Access Programme (NAAIAP) in 2007. NAAIAP was a 'smart' subsidy programme to improve access to seeds and fertiliser and increase the affordability of these key inputs to smallholder farmers – those who farm on less than one hectare of land.

In 2008, fertiliser prices tripled due to a sharp rise in global oil prices. The oil price shock resulted in a fertiliser price shock and caused food prices to increase. The price of popular fertiliser products such as Di-Ammonium Phosphate (DAP) rose from Ksh 2,000 per 50 kg bag in 2007 to Ksh 6,000 in 2008. The government responded by reintroducing the fertiliser subsidy programme, dubbed the Fertiliser Price Stabilization Plan, and later renamed the National Fertiliser Subsidy Programme (NFSP).

The Ministry of Agriculture implemented the NFSP through the National Cereals and Produce Board (NCPB). Initially, the NCPB imported fertiliser and then settled the import claims with the Ministry of Agriculture; subsequently, the ministry contracted suppliers who delivered directly to NCPB depots. Farmers then accessed the subsidised fertiliser through the NCPB depots (refer to the access process outlined in Section 1).

Initially, fertiliser procured through the NFSP was meant to cover 10% of the total demand. Later, the government committed to increasing the coverage to about 40%, with 60% supplied through the private sector. Data on annual fertiliser subsidy coverage (including other subsidy programmes) shows that the closest the government got to its quota was about 39% in 2015 (Annex 3)[1]. The subsidy programme faced challenges, including procurement delays due to budgetary constraints, long distances from household locations to depots, tedious access processes, and major disruptions to private-sector distribution plans.

In response to feedback about the inefficiencies of the NFSP, the Government piloted the electronic voucher (E-voucher) system in 2014/2015. The E-voucher subsidy programme involved agro-dealers, often geographically closer to farmers than the NCPB depots, and targeted farmers in specific geographies who satisfied the recruitment criteria. This programme allowed the private sector dealers to operate without the prior disruptions caused by NFSP.

Concurrently, NAAIAP, which targeted vulnerable households was also introduced. Other subsidy programmes that were implemented during the same period include the County

[1]More information can be found at https://vifaakenya.org/#/kenya/policy

government's fertiliser subsidy programmes in specific counties and the Kenya Cereal Enhancement Programme Climate Resilient Agricultural Livelihoods Window (KCEP-CRAL).

In 2018, the government discontinued the **NFSP** and replaced it with the National Value Chain Support Programme, commonly called the E-voucher programme.

2.1. National Value Chain Support Programme (NVSP, or E-voucher programme)

The NVSP, commonly known as the E-voucher programme, was piloted in 12 counties in 2020. It used electronic vouchers to manage the distribution of subsidised bundle of inputs, including seed, fertiliser, and agrochemicals. The NVSP differed in many aspects from the NSFP:

1. The NVSP leveraged mobile phone penetration across the country,
2. The NVSP required the registration of both farmers and agro-dealers, with agro-dealers assigned to specific catchment areas,
3. Agro-dealers under the programme sold inputs at subsidised prices, and
4. Commercial banks participated as fund managers to settle the subsidy amount immediately an input sale was made by an agro-dealer to farmers.

The programme was seen to be efficient as farmers got vouchers they could redeem at agro-dealer outlets within their localities in real-time. Voucher validity was two weeks; a farmer would pay 60% of the cost of a bundle of inputs, while the government paid of 40% of the input cost to the agro-dealers through the contracted commercial banks in the first year. The subsidy would be reduced to 30% in the second year and 10% in the third year. The farmer would then be expected to continue to purchasing inputs at market prices after the third year, presumably after realising the importance of using the bundle of inputs during the subsidy period. The programme worked with agricultural staff at the county level, who also participated in farmer registration exercises and could be leveraged to provide extension services to farmers.

The pilot phase of the NVSP covered four value chains, i.e. coffee, rice, maize, and Irish potatoes. After the first year, two more value chains, sorghum and green grams, were added, and the number of counties participating in the programme increased to 28. An additional nine counties that were targeted in the second phase rollout did not participate owing to low response from agro-dealers. The programme also revised the targeting criteria of farmers from those with one acre to those with five acres or less. As expected, the bundle of inputs varied by value chain.

Development partners like the Food and Agriculture Organisation (FAO) supported the programme by developing the Kenya Integrated Agricultural Management Information System (KIAMIS) to replace the then-existing information platform. The core of the success of the NVSP was the comprehensive farmer registration exercise to guide the selection of qualifying farmers. The programme also roped in county governments and the private sector to aid its implementation.

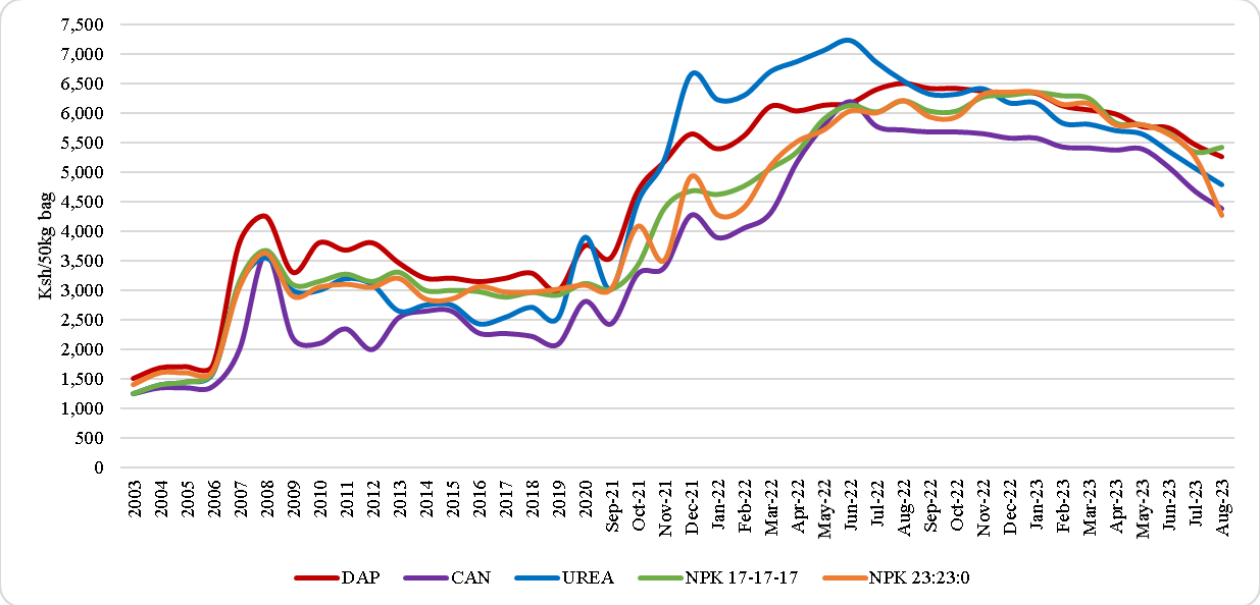
Despite the initial success, the programme was not scaled up further. In 2021, fertiliser prices started to rise due to the supply chain constraints from the COVID pandemic period. The price hike escalated exponentially again in early 2022 following Russia's invasion of Ukraine. As shown in Figure 2, the crisis in 2022 closely resembled the price shock in 2008 in terms of magnitude.

A new government came into power in August 2022. A key promise to voters during elections was reinstating the general fertiliser subsidy to cushion farmers from the price hike. As such, the NVSP funding was significantly reduced from Ksh 2 billion to Ksh 500 million in the 2023/24 financial year. The reason for this policy change was that the government would rather prioritise the general fertiliser subsidy over the NVSP.

2.2.National Fertiliser Subsidy Programme Phase 2 (NFSP-2) – 2022/2023

The government re-introduced the NFSP-2 in the short rains season of 2022 due to high fertiliser prices. *Figure 1* shows the trends in average fertiliser prices between 2004 and 2023: the average prices more than doubled from an average retail figure of Ksh 3,300 to about Ksh 7,000 for a 50 kg bag of fertiliser – this escalation was reminiscent of the 2008 fertiliser price shock. The surge in fertiliser prices was attributed to the effects of the pandemic on global supply chains, and the Russia-Ukraine crisis in 2022, as already mentioned, that caused further disruptions to the global fertiliser industry.

Figure 1: Fertiliser retail prices



Source: VIFAA, KENYA, 2023.

The decision to subsidise fertiliser was also informed by the Kenya Kwanza Manifesto, which had committed to providing 10 million bags of affordable fertiliser. It was also in line with the BETA, the current government's blueprint to turn around the economy and facilitate inclusive growth through a value-chain approach. BETA, as already mentioned, identifies bringing down

the cost of living, eradicating hunger, creating jobs, and uplifting the lives and livelihoods of those at the bottom of the pyramid as key government priorities.

The decision to use the NFSP-2 to subsidise fertiliser instead of the NVSP was because the government felt the programme had low publicity despite the successful pilot and roll-out. The government also felt it could not use the NVSP infrastructure to supply fertiliser nationally since it had few farmers and was not designed to manage smallholder farmers nationally – just those targeted under the NVSP. The government also did rope in the private sector because it would be too expensive to do so – this also addressed concerns about the role of a private sector that is often perceived as exploitative and cartel-like.

The implementation of NFSP-2 was similar to the original programme, with some modifications to enhance efficiency:

1. Instead of requiring farmers to register as with the old programme, the government developed a digital database to register about 3.2 million[2] farmers across the country, which was complete by the start of the long rains for 2023.
2. Registered and verified farmers received their vouchers through SMS (E-vouchers), which cut down costs associated with registering into the NFSP. Registered farmers verified by Ministry officials received E-vouchers to access fertiliser at the nearest NCPB depot within their county. The quantity of fertiliser allocated was determined by the farmer's declared cropland, the crop type(s) to be cultivated, calculated per the recommended application rate by the Kenya Agricultural and Livestock Research Organization (KALRO). For the short rains of 2022 and long rains of 2023, farmers bought fertiliser at a subsidised maximum price of Ksh 3,500 per 50kg bag.
3. The government purchased fertiliser through KNTC, which, in turn, was supplied to NCPB for last-mile distribution at its depots. This means that the NCPB would now charges for storage and distribution costs. The government has since lowered the prices farmers will pay for the 2023 short rains season to Ksh 2,500.
4. Finally, the fertiliser types on offer under NFSP-2 were varied. The fertiliser types that are supplied under the current programme are NPK (17:17:17 and 23:23:0), Calcium Ammonium Nitrate (CAN), and blends that are produced locally. DAP is not included in the subsidy.

2.2.1. Issues with NFSP-2

Stakeholders in the agriculture sector have raised several issues concerning the design of NFSP-2:

1. The average distance to the nearest NCPB depots is about 25 km (Karanu, 2015); this means a high delivery cost for farmers, making the scheme unlikely to benefit farmers who require small amounts of fertiliser.

[2] Fertiliser Subsidy Programme Updates, July 2023

2. Timely delivery is still challenging. Under the current programme, farmers were supplied way into the season in some areas for both short rains in 2022 and long rains in 2023.
3. There was insufficient sensitisation about the types of fertiliser that would be supplied under the programme, which affected demand.
4. As with NFSP-1, the choice of NCPB for distribution confirmed that the fertiliser would be biased towards maize-growing areas, where NCPB depots are primarily based. This led to a misconception that the programme only targeted maize farmers.
5. At a macro level, the model threatened to displace private sector traders and agro-dealers, especially since the subsidy price was, on average, about 50% of the prevailing retail price.
    a. In addition, the subsidy was announced quite late after most distributors/retailers had already stocked.
    b. Furthermore, the lack of information about the volumes to be supplied through the subsidy programme meant that the risk of not selling was higher for the private-sector traders, leaving them to reduce supply as the only risk-mitigation strategy available – and at significant financial opportunity cost. Under the NSFP-2, two suppliers were contracted to supply the subsidised fertiliser. The subsidy programme inadvertently led to a crowding out of private sector retail fertiliser - more than 16 registered importers/manufacturers, over 150 distributors, and about 30,000 agro-dealers risked going out of business.

2.2.2. Effects of NFSP-2 on NVSP

With the introduction of NFSP-2, the Ministry reviewed beneficiary qualifications of those that farmed a maximum of five acres to two acres, greatly reducing the number of qualifying farmers. The change also saw the Ministry's budgetary allocation towards the NVSP reduced and the surplus reallocated to the NFSP-2.

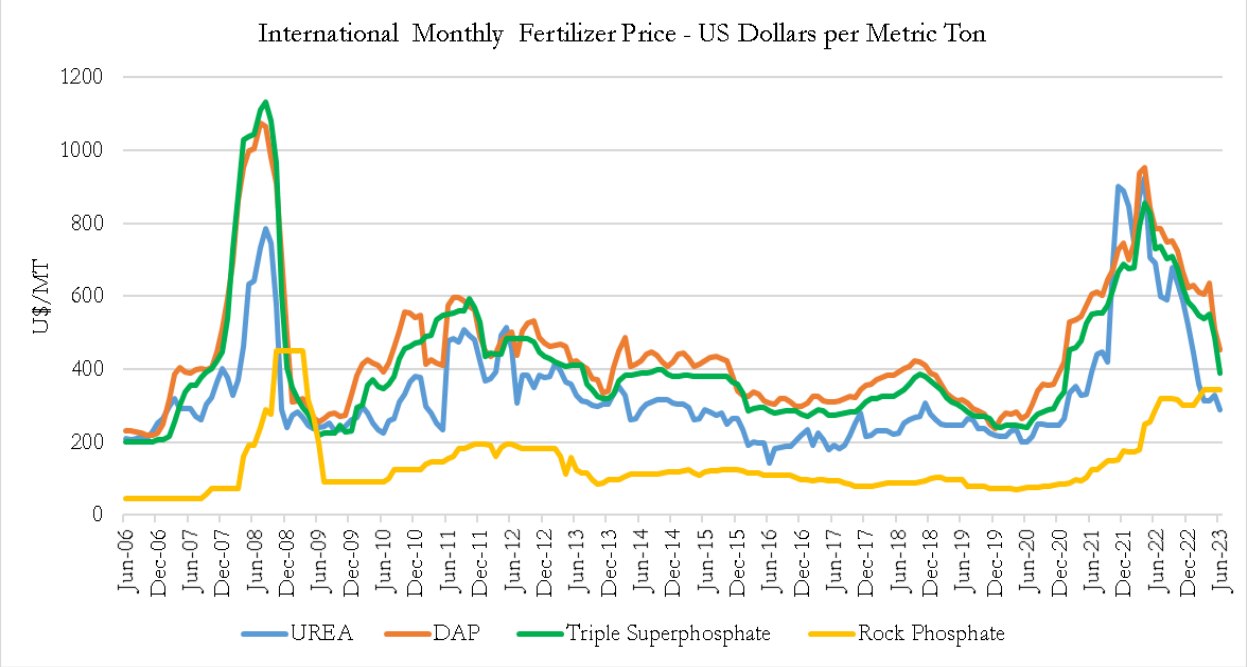
With these changes, agro-dealers who had stocked in anticipation of the continuation of the NVSP were caught flatfooted and left with higher-than-anticipated closing balances. This is because agro-dealers had projected higher demand with more beneficiaries but saw depressed demand due to the lower number of participating/qualifying farmers. With fertiliser prices in the parallel free market steadily rising, demand remained low, and those purchasing fertilisers went for the cheaper government option. It is worthwhile to note that agro-dealers had also invested in electronic gadgets to use when farmers redeemed their vouchers in the NVSP model. With the introduction of the NFSP-2, these gadgets became a sunk cost to the agro-dealers.

3.0. Findings of the rapid assessment

3.1.Trends in fertiliser prices

Figure 2 shows the trends in international average monthly prices of fertilisers between 2006 and 2023. The prevailing price shock in 2022-23 is similar in magnitude to the one in 2008 – when the price of DAP rose from $512 to $1079 per metric tonne, for example. The influence of raw material prices also contributed to the price surge. For instance, the prices of phosphate rock, sulphur, and ammonia used to produce DAP and other fertilisers increased from the beginning of 2007 to early 2008. Rising energy prices also increased the production and delivery costs. The price of natural gas, which is used to produce ammonia – the main input in all nitrogen fertilisers – rose by more than 65 percent between June 2007 and June 2008, significantly affecting production costs for nitrogen fertilisers. During the latter months of 2008, the international market experienced a general reversal in price trends, including fertiliser, with the decline in monthly average prices, particularly for nitrogen fertiliser, attributed to softening global fertiliser demand in reaction to the fertiliser price surge and declining crop prices.

Figure 2: International monthly fertiliser prices



Source: World Bank Data, 2023

In 2021, the fertiliser cost increased sharply, reaching peak levels not seen since the 2008 crisis – other commodities also experienced price volatility similar to fertiliser. For instance, global food prices rose steeply in the middle of 2021. The monthly average fertiliser prices also increased due to China's suspension of fertiliser exports until June 2022 to satisfy domestic demand and Russia's restrictions on nitrogen exports. The Russia-Ukraine conflict and the imposition of a trade embargo by the United States on Russian products also affected the global

commodity supply chain. While fertiliser prices have started to decline in 2023, they remain above pre-pandemic levels.

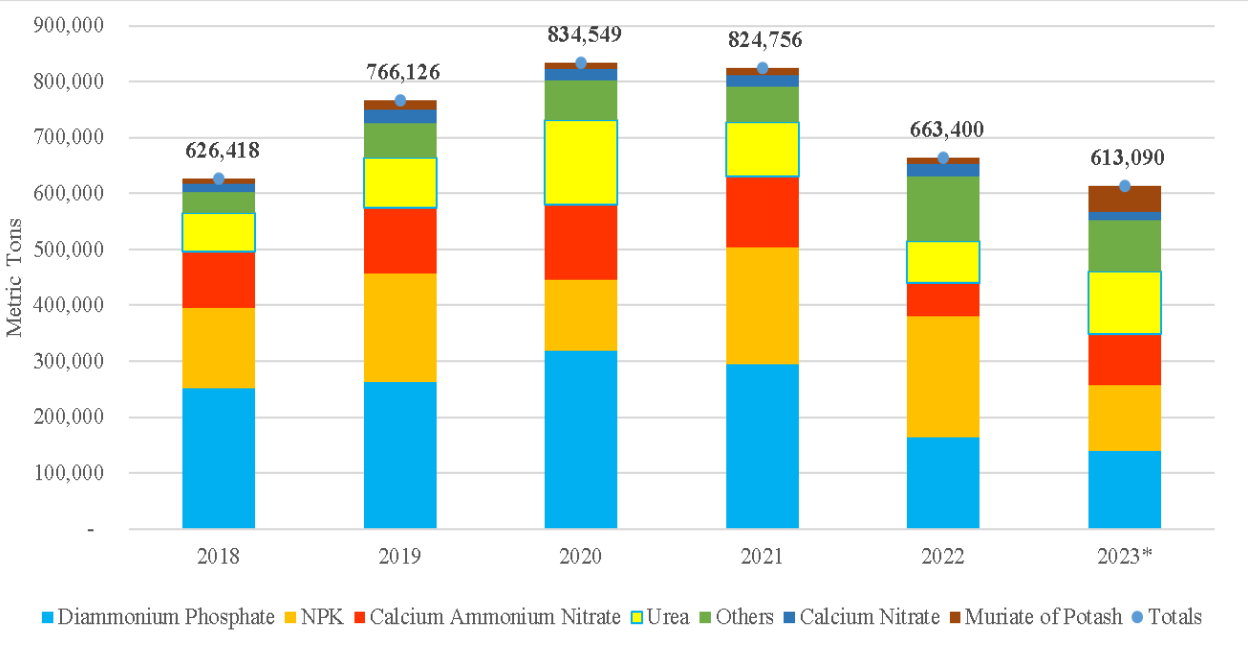
3.2. Trends in fertiliser imports

As shown in *Figure 3,* fertiliser imports increased between 2018 and 2020 before declining starting in 2021. The increase in imports between 2018 and 2020 is due to low and stable international prices coupled with favourable foreign exchange rates between the US dollar and Kenya shilling. Additionally, imports and apparent consumption were highest in 2020 despite the COVID-19 outbreak. In 2020, there was an uptick in agricultural activities, especially by the working/employed population who returned to the farms during the pandemic due to job losses in the formal sector.

In 2021, fertiliser imports started declining owing to several factors:

1. Unfavourable trade policies. For instance, China suspended fertiliser exports until June 2022 to ensure domestic availability. Similarly, Russia imposed restrictions on nitrogen imports, curtailing production.
2. The surging cost of natural gas in Europe resulted in widespread production cutbacks in ammonia—an essential component for nitrogen fertilisers—while escalating thermal coal prices in China led to a rationing of electricity use in some provinces, forcing fertiliser factories to cut production.
3. Energy prices rose in the United States as Hurricane Ida hampered natural gas production on the Gulf Coast, causing several large fertiliser producers to declare *force majeure* and halt production.
4. Finally, as has already been well-documented, the Russia-Ukraine war has affected two of Africa's biggest fertiliser sources, further affecting supply.

Figure 3: Trends in fertiliser imports

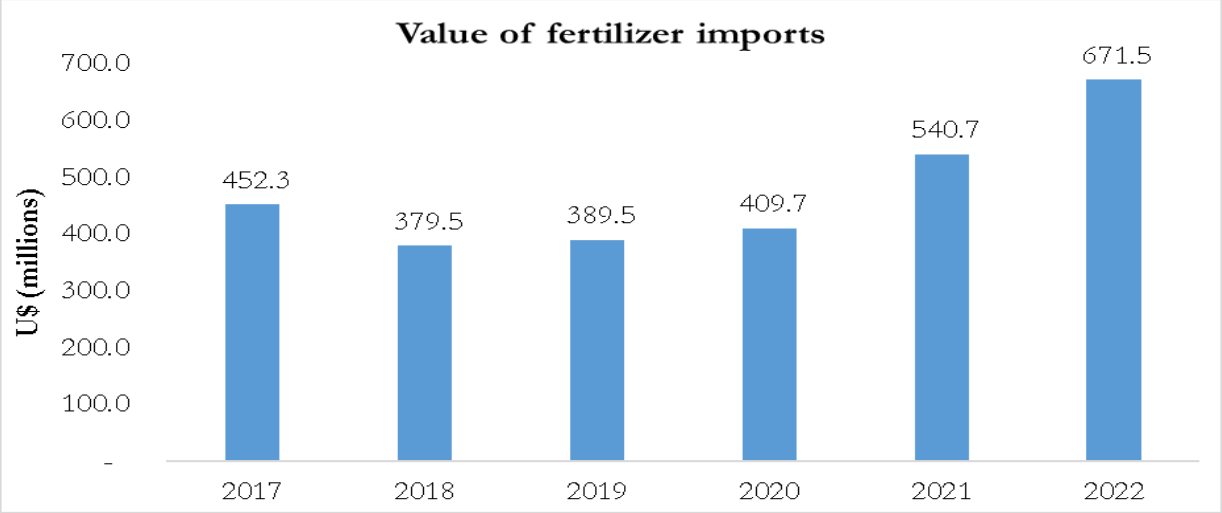


Source: Fertiliser Association in Kenya, 2023 [data available up to August 2023]*

DAP accounts for the largest portion of the imported fertiliser followed by NPK, CAN and Urea. However, between 2021 and 2023, the import share of NPK and other non-conventional fertiliser brands increased drastically compared to DAP and Urea as the government actively encouraged and advocated the use of NPK to address soil acidity occasioned by the continuous use of DAP fertilisers.

The fertiliser import bill has been on an upward trajectory over the past five years – between 2018 and 2022, it rose from $380 million to $672 million, representing a 43% increase in the fertiliser import bill (*Figure 4*). The private sector is largely responsible for this bill. Except for fertiliser imported by Kenya Tea Development Authority and private flower farms, the private retail industry accounts for 78% of fertiliser imported into Kenya. On this account, the government's involvement in the fertiliser trade negatively affects the private sector's investments.

Figure 4:Value of fertiliser imports to Kenya



Source: World Bank Data, 2023

Kenya's fertiliser market is relatively well developed compared to most other countries in Sub-Saharan Africa. It is dominated by the private sector, with the government providing regulatory oversight and implementing subsidy programmes. The private sector has well-established importers/manufacturers with well-coordinated supply networks with fertiliser producers and shipping companies. It has access to financing and a range of fertiliser business models. The private sector has invested over $90 million (Ksh 13 billion) in manufacturing, blending and granulation plants throughout the country. The private sector has also invested in an extensive distribution network to ensure accessibility for farmers.

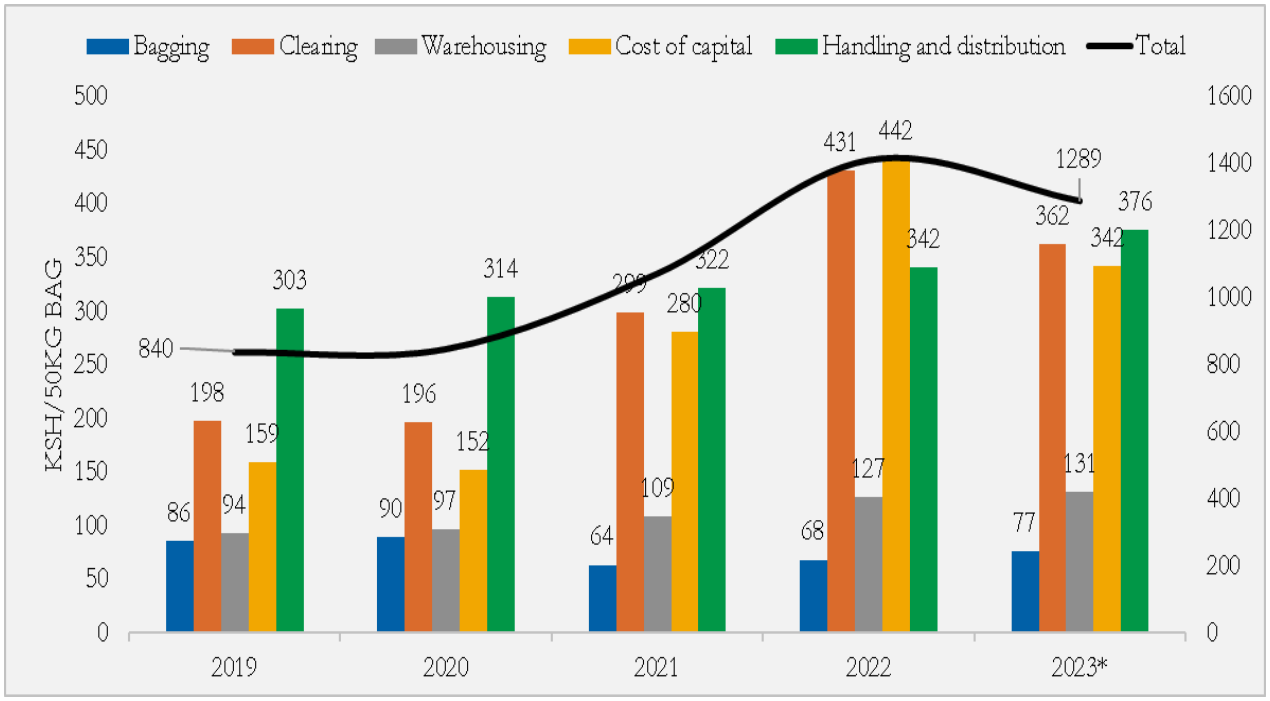
3.3. Commercial fertiliser cost build-up (Ex-CIF-Agro Dealer)

Figure 5 presents the cost build-up for the commercial fertiliser ex-CIF price in Mombasa, up to the last mile, for agro-dealers in the local market in Kitale. The cost components include clearing, bagging, warehousing, cost of capital, and handling and distribution to agro-dealers.

Handling and distribution costs include road freight, loading and offloading, and other related costs.

Over the past five years, the costs of delivering fertiliser to the last mile have risen. In 2023, the total cost of delivering to last-mile agro-dealers in Kitale was Ksh 1,289 per 50 kg bag compared to Ksh 840 in 2019. The costs of clearing and capital have also doubled over the past five years and are key contributors to rising costs of delivery to the last mile.

Figure 5:Fertiliser cost build-up (ex-CIF)



Source: VIFAA, KENYA, 2023

Table 1 presents the cost of financing, handling and distribution costs ex-warehouse at distributor and last mile agrodealer nodes. The average price for 50kg bag to the furthest regional distributor and the last mile agrodealer in Kitale County was Ksh 5,318 and Ksh 5,591 respectively.

Table 1: Cost build-up (Ex-warehouse -distributor and last-mile agrodealer)

		Distributor			Last-mile agrodealer		
Fertilizer type	Ex-warehouse	Financing	Handling & distribution	Wholesale price	Handling/ distribution/ financing	Landing cost	Retail price
CAN	4,750	342	321	5,413	55	5,468	5,520
UREA	4,700	342	321	5,363	55	5,418	5,683
NPK	4,500	342	321	5,163	55	5,218	5,515
Yara Microp	4,650	342	321	5,313	55	5,368	5,650
NPK 23:23:0	4,785	342	321	5,448	55	5,503	5,715
Kynomaizec	4,500	342	321	5,163	55	5,218	5,468
Fomi	4,700	342	321	5,363	55	5,418	5,588
Average				**5,318**		**5,373**	**5,591**

3.4. Implementation of the NFSP-2

3.4.1. Sourcing and costs of subsidy programme fertiliser

The government mandated the Kenya National Trading Corporation (KNTC) to engage companies to supply fertiliser under the NFSP-2. Through single sourcing, the agency procured a total of 472,500 metric tonnes of fertiliser, representing about 80% of imported fertiliser, in

2022. KNTC single-sourced two suppliers – ETG, which supplied 242,500 metric tonnes (MT), and Yara East Africa Limited, which supplied 170,000 MT of assorted fertilisers (*Table 2*). The fertilisers are supplied on a consignment basis, and not all quotas that were allocated to each supplier have been delivered to the government stores. In addition, KNTC directly imported 15,000 MT of NPK and another 30,000 MT of Fomi Kuzia/Otesha (a fertiliser brand manufactured in Dodoma, Tanzania). KNTC also contracted First Quality Supplies Limited to import 25,000 tonnes of CAN.

Table 2: Quantities of fertiliser brands procured for the NFSP-2 in 2023

Fertiliser type	**Tonnes**	**No. of 50Kg Bags**
ETG Falcon CAN	22,500	450,000
ETG Falcon NPK 23:23:0	160,000	3,200,000
ETG Kynomaizec	15,000	300,000
ETG Falcon Urea	22,500	450,000
ETG Urea	22,500	450,000
Yara Amidas	2,500	50,000
Yara CAN	50,000	1,000,000
Yara Microp	45,000	900,000
Yara Miller Power Microp	70,000	1,400,000
Yara Sulfan	2,500	50,000
KNTC Fomi Kuzia/Otesha	30,000	400,000
KNTC CAN	25,000	500,000
KNTC NPK 23:23:0	15,000	300,000
Total	**472,500**	**9,450,000**

Source: MoALD, 2023

Local suppliers imported, cleared, bagged, and paid warehousing charges before supplying the government with fertiliser in 50kg bags, for distribution. The contract is on a consignment basis, obligating the suppliers to keep track of the sales and stocks at various stores, and they get paid once the consignment has been sold.

The government paid ex-warehouse prices for the fertiliser as shown in *Table 3*. The prices ranged between Ksh 4,500 and Ksh 4,785. An additional Ksh 750 per 50kg bag was allocated for handling and distributing the fertiliser to the NCPB/KNTC stores. Consequently, the average landing cost for the subsidised fertiliser to NCPB/KNTC stores during the long-rain season of 2023 was Ksh 5,405, compared to the national average wholesale and retail prices of Ksh 5,318 and Ksh 5,591 respectively. The results show that the government and the private sector achieved roughly the same cost for last-mile distribution, but the private sector has the edge in getting the commodity closest to the farmer.

Table 3: Fertiliser prices (by type), handling & transportation costs paid by the government for the NFSP in 2023

Fertilizer type	Ex-warehouse	Handling & distribution	Landing cost at NCPB	Subsidy price	Actual costs incurred by farmers
CAN	4750	750	5,500	2,875	3,075

Fertilizer type	Ex-warehouse	Handling & distribution	Landing cost at NCPB	Subsidy price	Actual costs incurred by farmers
UREA	4700	750	5,450	3,500	3,700
NPK	4500	750	5,250	3,275	3,475
Yara Microp	4650	750	5,400	3,500	3,700
NPK 23:23:0	4785	750	5,535	3,500	3,700
Kynomaizec	4500	750	5,250	3,500	3,700
Fomi	4700	750	5,450	3,500	3,700
Average			**5,405**	**3,379**	**3,579**

Source: Authors' calculation using data from MoALD and FAK

3.4.2. Distribution of subsidised fertiliser and timing under NFSP

The government registered 3,228,412 farmers in the registration exercise before distribution through chiefs and their assistants[3]. Since the NFSP inception, 3,628,512 E-vouchers have been issued to registered farmers through the platform[4]. However, only 553,479 vouchers (15%) had been redeemed by the end of the 2023 main cropping season 2023.

The NFSP-2 programme initially targeted 12 primarily maize-producing counties namely: Trans-Nzoia, Uasin Gishu, Nakuru, Narok, Migori, Nyandarua, Elgeyo Marakwet, Kericho, Kakamega, Bungoma, Bomet and Nandi. The programme expanded its coverage at the beginning of March 2023 to a total of 29 counties (Baringo, Busia, Embu, Garissa, Homa Bay, Isiolo, Kajiado, Kiambu, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Meru, Murang'a, Nyamira, Nyeri, Mombasa, Taita Taveta, Tana River, Tharaka Nithi, Siaya, Vihiga, and West Pokot).

Farmers started redeeming their vouchers from the first week of February 2023 in readiness for the onset of rains in March. By the end of the 2023 long-rain season, the government had distributed 142,324 metric tonnes of fertilisers (equivalent to 2,846,481 50kg bags) to the initial 12 counties (*Table 4*). Cumulatively, 175,060 metric tonnes (equivalent to 3,501,201 50kg bags) had been distributed by 30th July 2023.

Table 4: Total quantities of fertiliser purchased by farmers (tonnes)

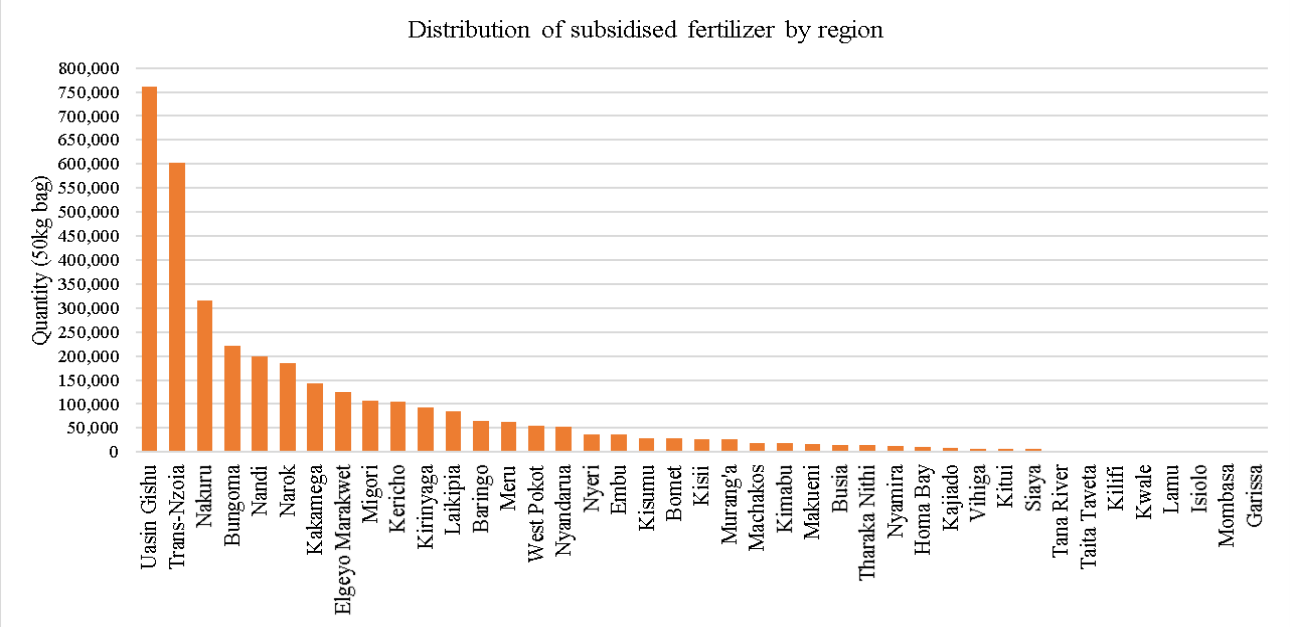
	Total quantities (Tonnes)	Farmer payments (Ksh)	Distribution and handling (Ksh)	Total fertiliser value
Initial 12 target counties	142,324	9,996,730,550	2,134,860,750	12,131,591,300
Additional 29 counties	32,736	2,238,189,500	491,040,000	2,729,229,500
Total fertiliser sold to farmers	**175,060**	**12,234,920,050**	**2,625,900,750**	**14,860,820,800**
Stock balance as @ 30/7/2023	35,617			
Total procured and delivered	**210,677**			

[3] Fertiliser Subsidy Programme Updates, July 2023

[4] The number of vouchers issued to a farmer is determined by the number of value chains one is involved in. A maize and sugarcane farmer would get two vouchers.

Despite the programme's broad coverage, the distribution is skewed towards major maize-growing areas of the country. 79% of the subsidised fertiliser distributed in the 2023 main season went to 10 counties only. Furthermore, Uasin Gishu and Trans-Nzoia received 22% and 17% of the total subsidised fertiliser in the same period (*Figure 6*). This finding is consistent with a survey by Makau et al. (2016), which found that the general fertiliser subsidy model used between 2008 and 2018 was skewed geographically and favoured maize-growing regions.

Figure 6: Subsidised fertiliser by County



Source: MoALD, 2023

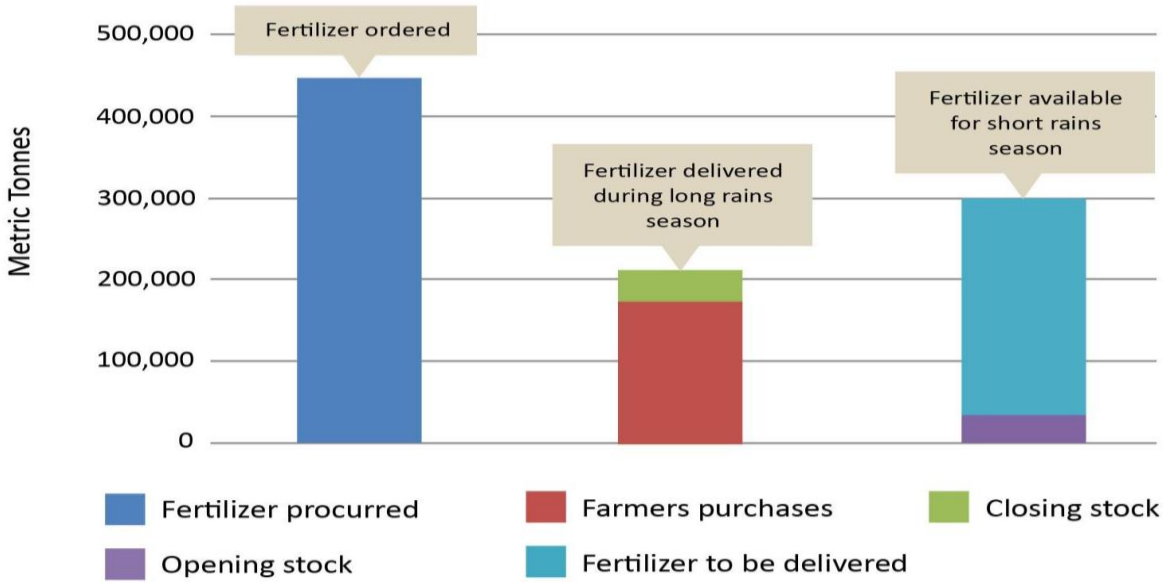
The inventory of the subsidised fertiliser at the end of the 2023 main season is shown in *Figure 7*. Overall, the government procured 472,000 tons of fertiliser for the subsidy programme in 2023. About 210,000 tons were delivered to various NCPB stores, out of which farmers purchased 175,000. Over 35,000 tons of subsidised fertilisers lie undistributed in different depots, mainly because they were only available for distribution after the planting season had already progressed.

Furthermore, these fertilisers might have been procured without prior sensitisation and extension information regarding their presence and preferred areas of use. It means, therefore, that, going into the short season, there were stocks of undistributed fertilisers from the long-rains season in NCPB depots.

Moreover, about 261,000 tonnes of procured fertiliser have yet to be delivered. Therefore, the total stock balances of subsidised fertiliser for the short season of 2023 are about 297,000 tons. The estimated annual demand is about 800,000 tons, and the consumption for the short season is about 30% of the annual demand. Consequently, the available subsidised fertiliser stock exceeds the short-season demand. In other words, the fertiliser market is saturated with subsidised fertiliser, and private retail fertiliser traders will not be in business in the short season of 2023. The impact of this includes stagnation in the growth of the sector, as a

significant portion of players in the importation/manufacturing of fertiliser won't operate. The subsidised fertiliser brands have also been made available to such a large extent that any new fertiliser product idea may not be accepted in a market that limits innovation.

Figure 7: Fertiliser inventory at the end of the long-rain season of 2023 (30th July 2023)

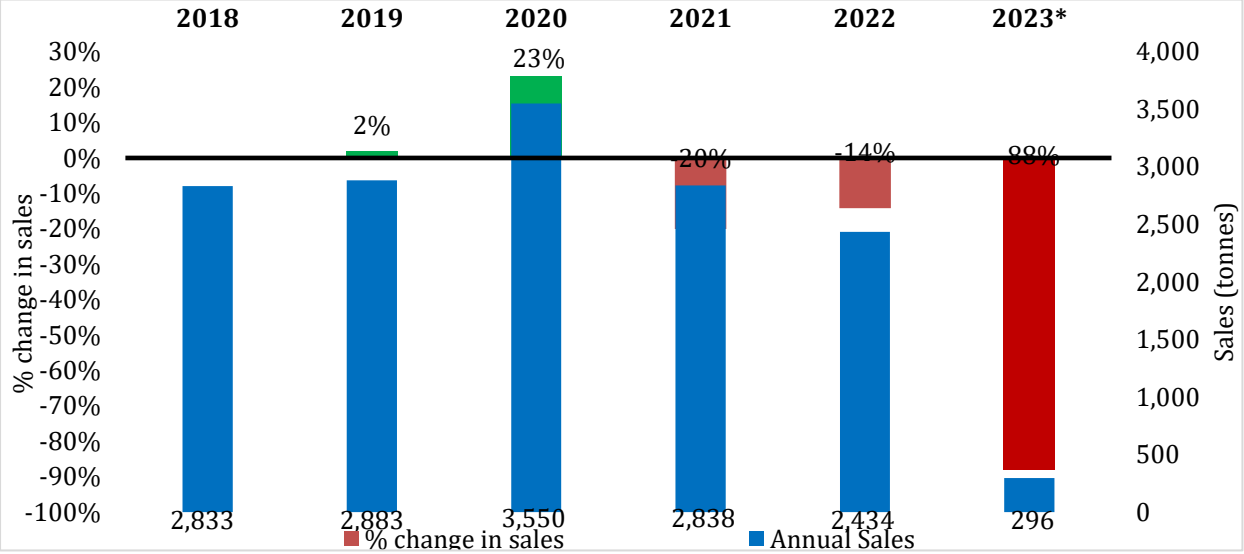


Source: Authors' calculation using data from MoALD

3.5. Assessment of impact on private-sector fertiliser retail business

The assessment of the impact on the private sector is undertaken through the evaluation of changes in fertiliser sales by distributors and stockists (last mile agro-dealers). Figure 8 presents total fertiliser sales and percentage changes in sales volumes of distributors. The analysis of fertilizer purchases, sales and closing stocks by counties of study are presented in Annexes 4 to 9. Fertiliser sales by distributors increased between 2018 and 2020 but started declining thereafter. The increase in sales up to 2020 was attributed to a decline in the price of fertilisers in the international market and increased farming activities in 2020 due to redundancies in formal employment occasioned by the COVID-19 pandemic. The volume of fertiliser that was handled by distributors declined by 33% between 2020 and 2022 primarily due to price surges during the same period that affected affordability by farming households. The average volumes of fertilisers handled by distributors in the 2023 main season declined by 88%, largely due to the fertiliser subsidy that saturated the market. The government distributed about 3.5 million bags of subsidised fertilisers, selling at a maximum of Ksh 3500, compared to a retail price of Ksh 6,800 among stockists.

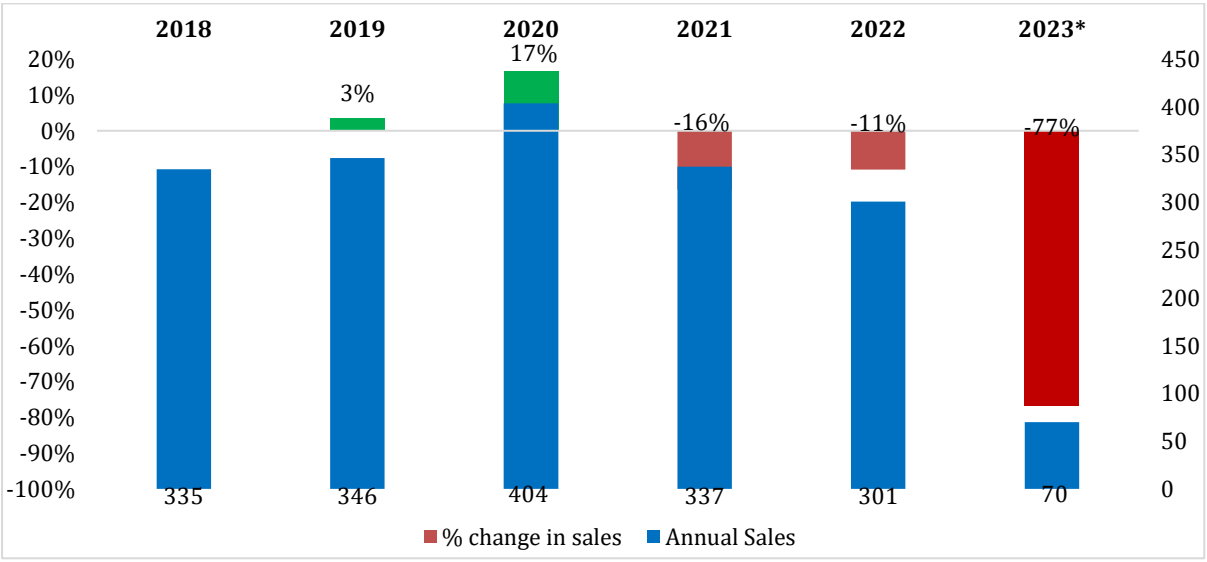
Figure 8: Distributors' sales volumes



Source: Authors' computation ***half-year sales**

The volumes of fertiliser handled by stockists (last mile agro-dealers) follow similar trends observed among the fertiliser distributors. Sales volumes declined by 37% between 2020 and 2022 due to high fertiliser prices in the international market. In the main season of 2023, sales volumes declined by 77% (see *Figure 9*). This is, again, attributed to the government fertiliser subsidy. The decline in fertiliser sales by agro-dealers is also reflected in the sales of complementary inputs other than fertiliser. This subsidy has already and will continue to tremendously impact last-mile agro-dealers – and create a vast supply gap if they are driven out of business for both farming inputs, and other value-adds like extensions services.

Figure 9: Stockists sales volume



Source: Authors' computation

4.0. Conclusions and Recommendations

The NSFP programme was a noble initiative whose aim was to cushion farmers against skyrocketing fertiliser prices. However, despite its noble nature, its implementation model negatively impacted private fertiliser traders, crowding their investments out of the fertiliser market.

As a stop-gap measure, the programme ought to have leveraged the many years of investment done by the private sector, especially on the value chain infrastructure. The government ultimately chose to develop its own value chain, brought on board new implementing partners, and negated available procurement protocols by single-sourcing importers and fertiliser distributors. This assessment has pinpointed the cost-effectiveness and efficiency of the programme and the impact it has created on private traders.

In conclusion, the study notes that:

i. The subsidy made fertiliser affordable to farmers, but excluded the pivotal and well-developed private sector channel with last-mile distribution coverage, negatively impacting the execution/efficacy of the subsidy programme.
ii. The government and the private sector achieved roughly similar costs for last-mile distribution, even though private sector retailers get the commodity closer to the farmer. After factoring in the handling and distribution costs, the average landing price for a 50-kg bag of subsidised fertiliser was Ksh 5,405 compared to between Ksh 5,352 and Ksh 5,597 to the last mile stockist.
iii. The subsidised fertiliser is not easily accessible because there is no last-mile distribution. The increased cost to access NCPB depots resulted in reduced uptake.
iv. Overall, there was low redemption of the E-vouchers issued, partly because the fertiliser was delivered late into the season in some areas or there was no sensitisation on the type of subsidised fertilisers that would be distributed.
v. Despite the programme's broad coverage, distribution is skewed towards major maize-growing areas of the country (about 79% of the subsidised fertiliser distributed in the 2023 main season went to 10 counties only).
vi. Exclusion has already and will continue to negatively affect the micro-small and medium scale fertiliser businesses. The fertiliser volumes that are handled by last-mile agro-dealers reduced by between 77% and 88%, and continued exclusion will significantly weaken the private sector, including through divestment. If the last mile agro-dealers are unable to stay operational, there will be a huge hole in the supply chain left unfilled. This is because agro-dealers provide way more than just fertilisers to farmers.
vii. The subsidy programme disrupted the marketing plans of the private sector's fertiliser traders. The subsidy was announced when most businesses had stocked for the season. This led to businesses holding large stocks of unsold fertiliser.

Recommendations:

i. Inclusive subsidy programmes have a higher chance of creating stronger outcomes. It is in the best interest of farmers and the broader agricultural sector across all of Kenya to implement the subsidy via the private sector, to leverage its wide, efficient distribution network.
ii. The government should revitalise and deliver the subsidy through NVSP.
iii. There is a need for proper prior sensitisation and extension information regarding the fertiliser types and preferred areas of use to increase the redemption and uptake of subsidised fertilisers.
iv. The government should declare in advance the fertiliser types and quantities it intends to subside before the season starts for the private sector to adjust its marketing plans.

5.0. References

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6.0.Annexes

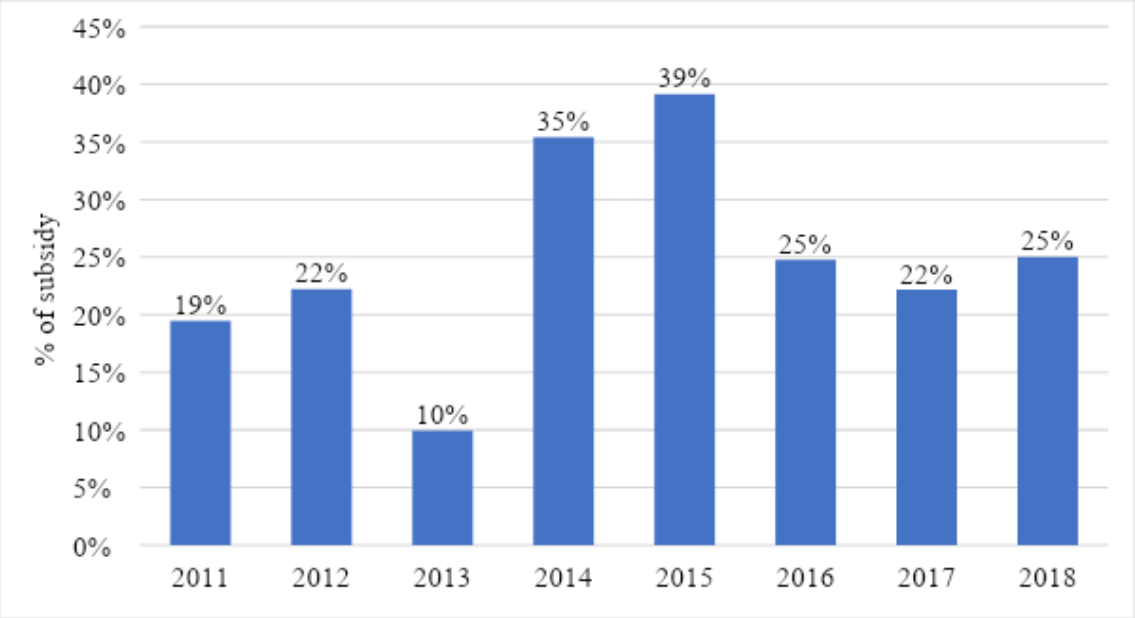
Annex 1: Total fertiliser quantity purchased by farmers since the inception of the NFSP

County	Total 50kg-bags redeemed	Farmer payments (Ksh)	Distribution and handling cost incurred by government (Ksh)	Total value of fertiliser
Baringo	63,896	223,828,250	47,922,000	271,750,250
Bomet	27,867	97,457,350	20,900,250	118,357,600
Bungoma	221,677	774,296,550	166,257,750	940,554,300
Busia	15,363	53,249,400	11,522,250	64,771,650
Elgeyo Marakwet	124,831	438,851,900	93,623,250	532,475,150
Embu	35,746	124,965,000	26,809,500	151,774,500
Garissa	5	17,500	3,750	21,250
Homa Bay	11,297	39,518,350	8,472,750	47,991,100
Isiolo	274	954,000	205,500	1,159,500
Kajiado	7,926	27,734,000	5,944,500	33,678,500
Kakamega	142,621	498,621,800	106,965,750	605,587,550
Kericho	105,351	368,479,050	79,013,250	447,492,300
Kiambu	18,797	65,703,500	14,097,750	79,801,250
Kilifi	1,846	6,438,000	1,384,500	7,822,500
Kirinyaga	92,704	280,178,000	69,528,000	349,706,000
Kisii	26,492	91,615,000	19,869,000	111,484,000
Kisumu	28,520	96,072,500	21,390,000	117,462,500
Kitui	6,117	21,391,500	4,587,750	25,979,250
Kwale	1,192	4,168,000	894,000	5,062,000
Laikipia	84,767	296,655,200	63,575,250	360,230,450
Lamu	873	3,029,500	654,750	3,684,250
Machakos	19,378	67,775,000	14,533,500	82,308,500
Makueni	16,324	57,063,000	12,243,000	69,306,000
Meru	61,877	216,074,500	46,407,750	262,482,250
Migori	106,076	369,983,200	79,557,000	449,540,200
Mombasa	55	192,500	41,250	233,750
Murang'a	26,044	91,085,500	19,533,000	110,618,500
Nakuru	316,403	1,104,910,400	237,302,250	1,342,212,650
Nandi	199,870	699,078,300	149,902,500	848,980,800
Narok	185,931	640,642,700	139,448,250	780,090,950
Nyamira	11,916	41,362,350	8,937,000	50,299,350
Nyandarua	53,003	184,938,250	39,752,250	224,690,500
Nyeri	36,378	126,843,000	27,283,500	154,126,500
Siaya	6,078	21,266,950	4,558,500	25,825,450
Taita Taveta	2,053	6,910,500	1,539,750	8,450,250
Tana River	3,239	9,935,500	2,429,250	12,364,750
Tharaka Nithi	14,223	49,755,500	10,667,250	60,422,750
Trans-Nzoia	601,763	2,130,850,200	451,322,250	2,582,172,450
Uasin Gishu	761,088	2,688,620,850	570,816,000	3,259,436,850
Vihiga	6,839	23,762,500	5,129,250	28,891,750
West Pokot	54,501	190,645,000	40,875,750	231,520,750
Total	**3,501,201**	**12,234,920,050**	**2,625,900,750**	**14,860,820,800**

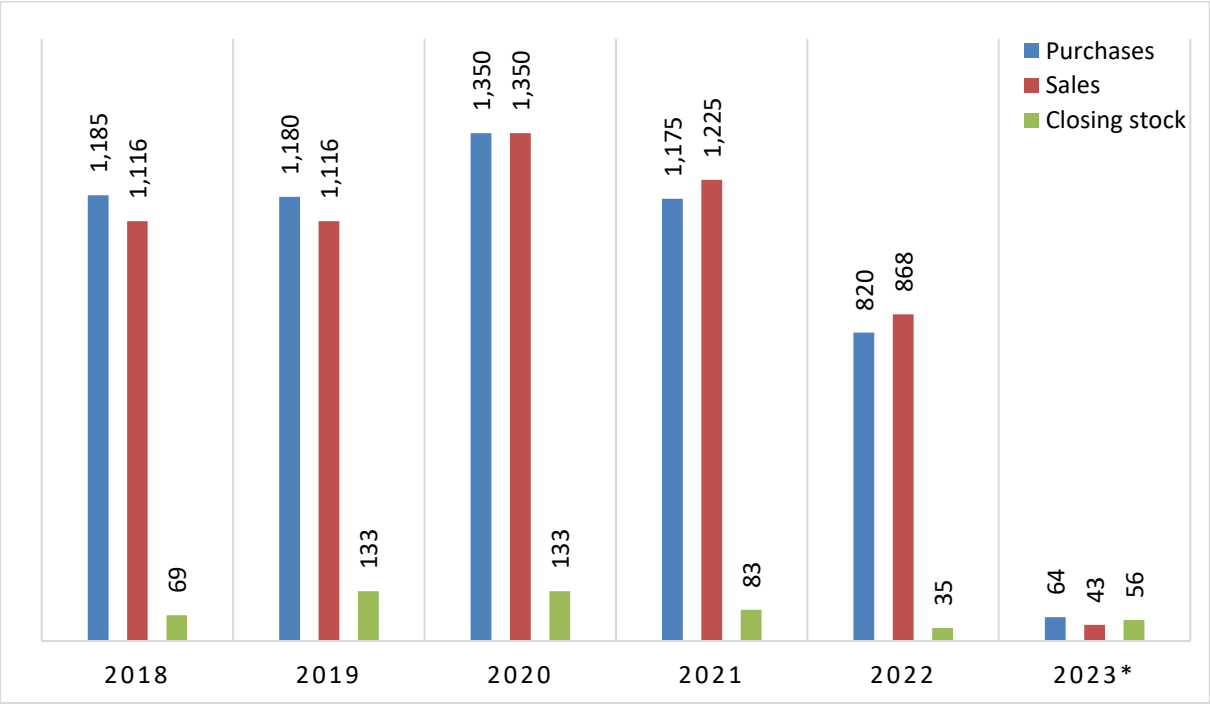
Annex 2: Fertiliser stock balances at the end of the long rains season of 2023 (30th July 2023)

Fertiliser	Tonnes	No. of 50kg-bags
ETG Falcon CAN	2,261.60	45,232
ETG Falcon NPK 23:23:0	1,281.50	25,630
ETG Kynomaizec	4,982.10	99,642
ETG Sulphate of Ammonium	549.7	10,994
ETG Falcon Urea	4,351.80	87,036
Fomi Kuzia Top dressing	885.6	17,711
Fomi Otesha Planting	657.1	13,141
KNTC CAN	11,410.80	228,216
KNTC NPK 17:17:17	2,026.10	40,521
KNTC NPK 23:23:0	26.6	531
KNTC Urea	112.9	2,257
Yara Amidas	1.8	36
Yara CAN	2,934.40	58,687
Yara Microp	1,621.30	32,426
Triple Super Phosphate	138.1	2,762
Yara Miller Power Microp	1,011.20	20,223
Yara Sulfan	152.8	3,055
Yara Topdressing Microp	1,390.50	27,810
Total	**35,617.30**	**712,346**

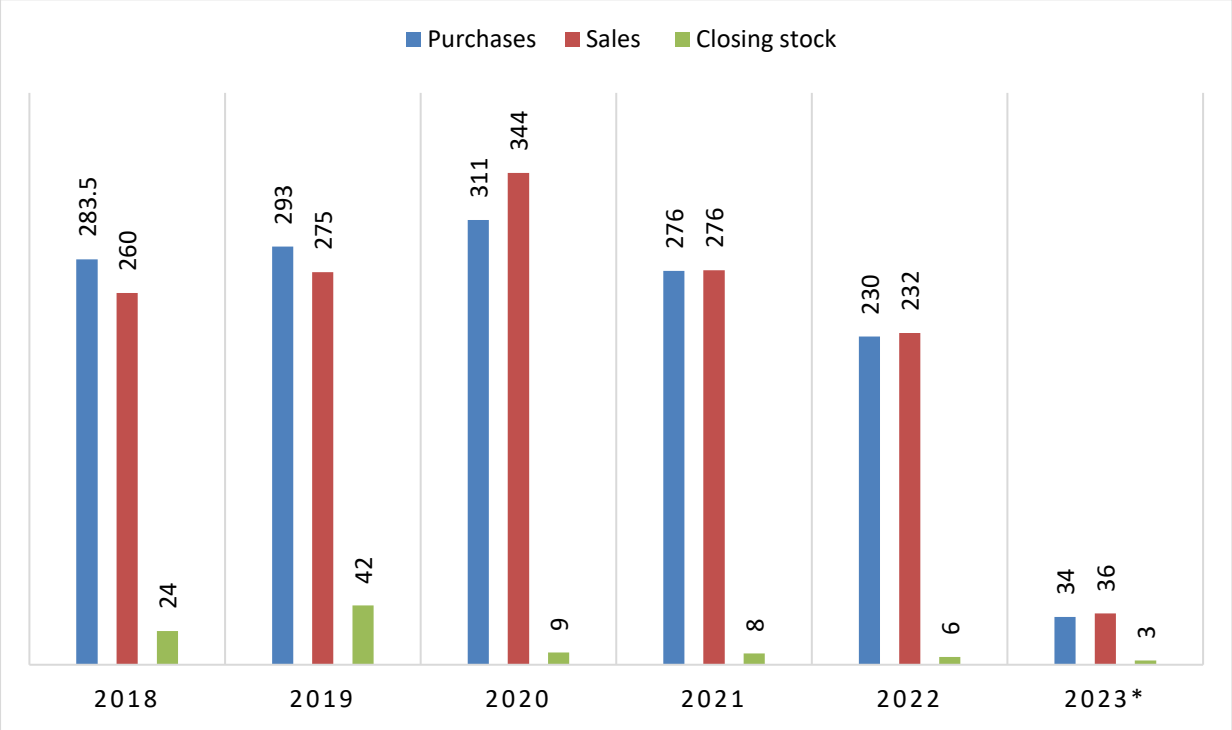
Annex 3: Share of subsidy coverage to annual fertiliser demand



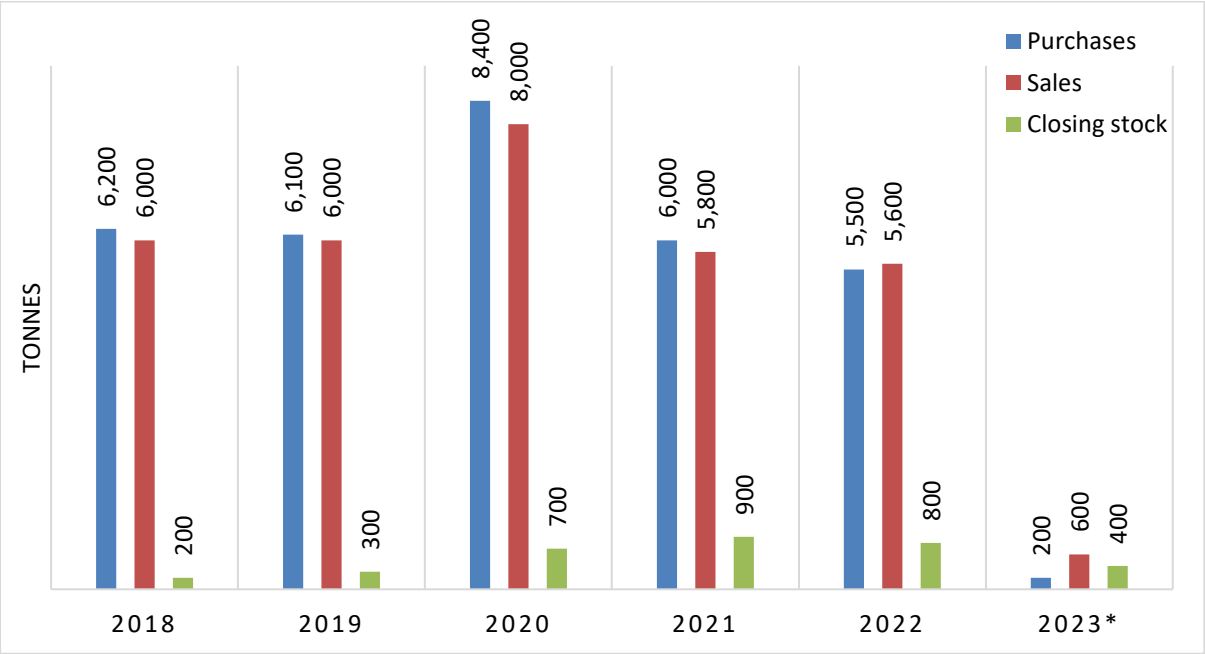
Annex 4: Nakuru County distributors' sales volumes



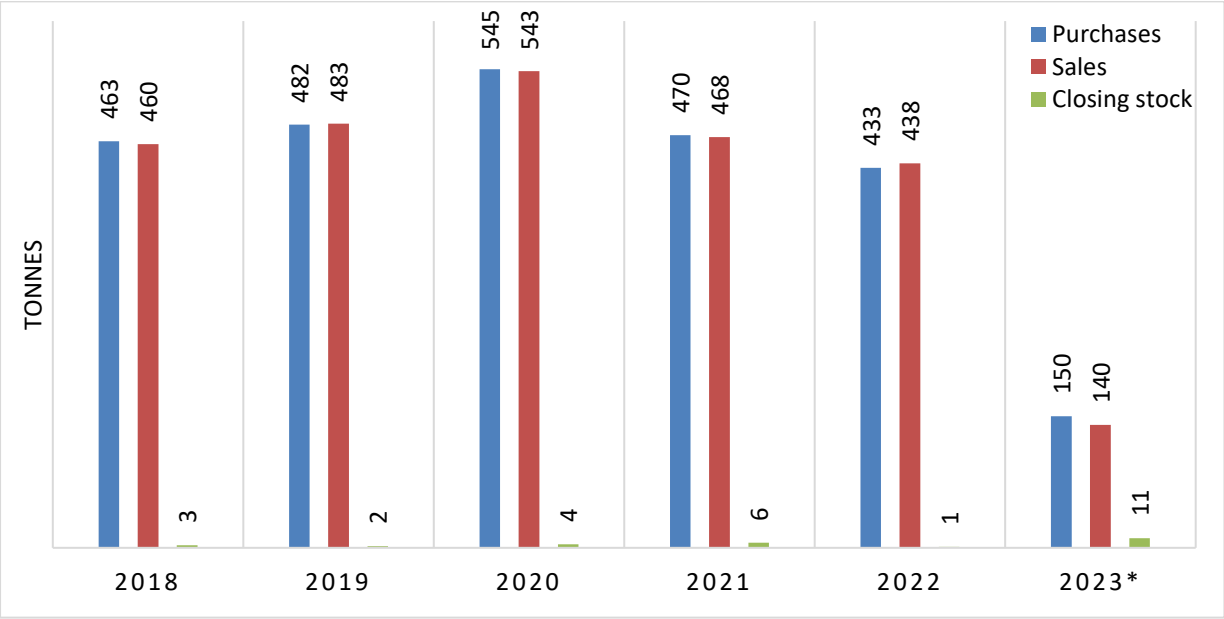
Annex 5: Nakuru County stockists' sales volumes



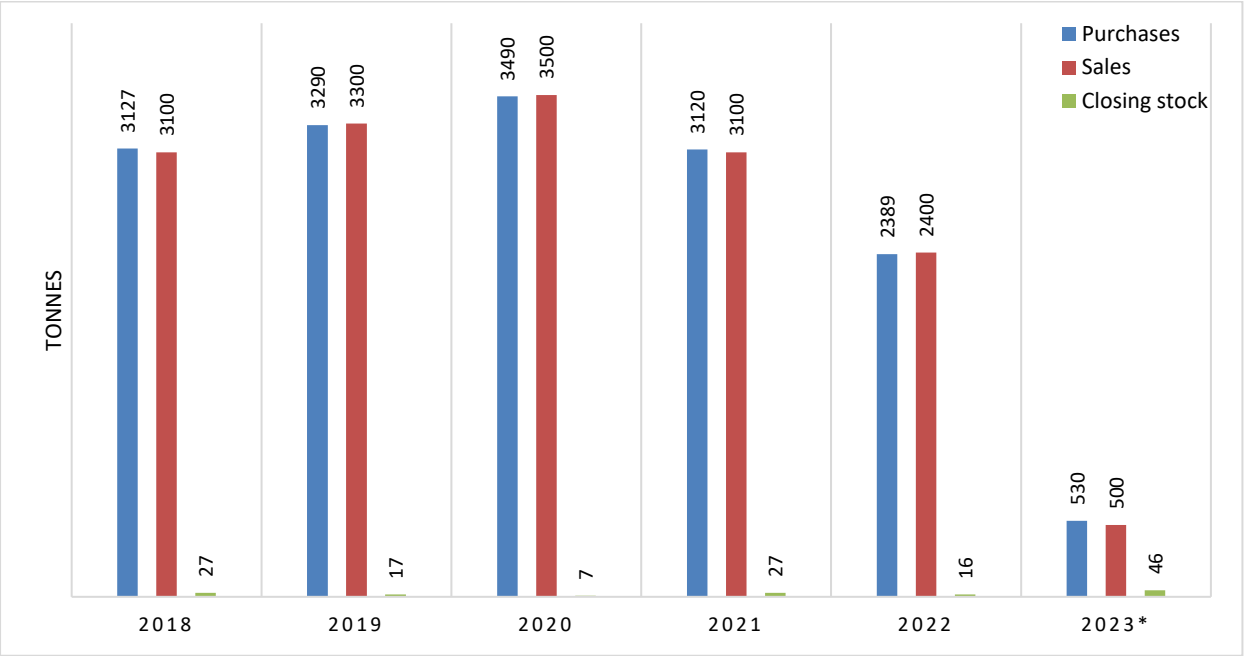
Annex 6: Kericho County distributors' sales volumes



Annex 7: Kericho County stockists' sales volumes



Annex 8: Uasin Gishu County distributors' sales volumes



Annex 9:Uasin Gishu County stockists' sales volumes