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CHEMICAL FERTILIZER SUPPLY CHAIN MANAGEMENT IN NEPAL

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ABSTRACT

Nepal's chemical fertilizer supply chain is crucial for ensuring the timely availability of chemical fertilizer to improve agriculture productivity, but fail to meet the demand in term of timeliness and quantity. This study critically analyze the fertilizer demand and supply scenario, procurement systems, subsidies allocation, distribution mechanisms, and private sector participation mainly focusing on subsidized fertilizers over fiscal years 2013/14–2024/25. Mixed-method combining institutional secondary data from MoALD, KSCL, and STCL and semi-structured key informant interviews were used to collect the data and information. Findings show that over the study period fertilizer supply increased up to 441,315 MT but remains below estimated demand of 800,000 MT. Supply proportion of Urea is higher than the technical recommendation. Fertilizer supply are largely managed by public institutions, with limited private sector involvement. The procurement process is lengthy and bureaucratic, and average procurement lead times frequently exceed the 210-day legal standard, leading to delayed imports and frequent shortages. Fertilizer subsidies have improved affordability for farmers but have also generated increasing fiscal pressure due to rising international fertilizer prices. Supply is constrained by weak demand forecasting, insufficient subsidy budget, inadequate storage and external market uncertainties. Procurement reform, strengthening demand forecasting, enhancing storage and distribution, sales price adjustment and private sector participation can support to improve supply chain efficiency.

Keywords: Distribution, Fertilizer, Procurement, Supply Chain, Subsidy

1. INTRODUCTION

Agriculture remains the backbone of Nepal's economy, employing a significant proportion of the population and contributing to national food security and livelihoods. The productivity of the agricultural sector largely depends on the timely availability and efficient use of key inputs. Among these, chemical fertilizer is essential for maintaining soil fertility and improving crop yields (Ezeh *et al*., 2008), thereby contributing significantly to agricultural growth. In recent years, fertilizer demand in Nepal has steadily increased, mainly due to the intensification of cropping systems (MoALD, 2026; Vanlauwe *et al*., 2016) and the need to enhance productivity.

The use of chemical fertilizer began in the 1950s, when private traders imported small quantities of ammonium sulphate from India. During the early 1960s, the government entered in this sector through National Trading Limited, importing fertilizers from countries such as China and

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Russia. Government established Agriculture Input Corporation in 1996 to facilitate fertilizer import and distribution.

Nepal introduced fertilizer subsidy in 1953 through price and transportation support to improve fertilizer access, particularly in hilly regions. The subsidy program was gradually withdrawn in the mid-1990s as part of economic liberalization and market deregulation. However, the private sector failed to ensure an adequate and timely supply of quality fertilizers. Rising international prices, competition from subsidized Indian agricultural products, and the inflow of illegally traded fertilizers further constrained fertilizer availability (Shrestha, 2011). Accordingly, many smallholder farmers faced difficulties accessing affordable and quality fertilizers. Then, the government reintroduced a targeted fertilizer subsidy program in 2009 to improve accessibility and address market inefficiencies. Currently, subsidized fertilizer procurement and distribution are mainly handled by public enterprises, including Krishi Samagri Company Limited (KSCL) and Salt Trading Corporation Limited (STCL). Private sector only participate in import and sales of non-subsidized fertilizer.

Nepal's fertilizer sector is guided by several legal and policy instruments, including Fertilizer Control Order, 1999 (FCO, 1999), the Chemical Fertilizer Directive, 2000, the National Fertilizer Policy, 2002, and the Subsidized Fertilizer Distribution Directive, 2020. These frameworks govern fertilizer quality, import, distribution, and subsidy management. While, the procurement of subsidized fertilizers is carried out in accordance with the Public Procurement Act, 2007 and Public Procurement Regulation, 2007.

Despite its importance, the chemical fertilizer supply chain in Nepal has many problems (Panta, 2018). The country is almost entirely dependent on imports, mainly from India, China and Gulf countries making the supply system highly vulnerable to external market dynamics, trade policies and logistic disruptions. The complex procurement procedure, and limited storage infrastructure exacerbate the supply system resulting periodic shortage, particularly during peak planting season (Gautam *et al.,* 2022). Moreover, geographical constraints and inadequate transportation networks, worsen the distribution process especially in remote and mountainous regions (Bhandari & Neupane, 2021). At present, Nepal's fertilizer supply chain involves a complex network of international suppliers, government agencies, cooperatives, private distributors, and farmers (Panta, 2018). While KSCL and STCL play central roles in the import and distribution of subsidized fertilizer, they often struggle to meet national demand due to limited subsidy budgets, bureaucratic delays, and inadequate infrastructure.

In this context, effective supply chain management is essential to ensure the timely availability, accessibility, and equitable distribution of fertilizer across the country. Therefore, this study aims to analyze the structure, performance, barriers, and uncertainties of Nepal's chemical fertilizer supply chain and identify measures for improving its efficiency and reliability.

2. METHODOLOGY

This study examined the chemical fertilizer supply chain in Nepal with special focus on subsidized fertilizers over fiscal years 2013/14–2024/25. This study is primarily based on secondary information obtained from publications and records of the MoALD, KSCL, STCL.

Data on fertilizer procurement, total lead time, sales, subsidy expenditure, and distribution were compiled and analyzed. Relevant legal and policy documents were reviewed to assess the institutional and regulatory framework which guide fertilizer supply. Key informants were purposively selected from the MoALD, KSCL, and STCL based on their roles, experience, and involvement in fertilizer procurement, distribution, and policy implementation. A semi-structured questionnaire was used to collect qualitative information on procurement, distribution, policy, and operational challenges and uncertainties. The responses were analyzed thematically to identify key issues affecting fertilizer supply. In addition, published literature, journal articles, technical reports, and research studies related to fertilizer demand, supply chains, subsidy policies, and agricultural input management were reviewed to provide supporting evidence and contextual understanding. Descriptive statistics were applied to examine changes in supply, prices, lead time, subsidy spending, and provincial allocation patterns.

The study was primarily based on secondary data, and institutional records, which are subject to limitations in availability, completeness. Consequently, some analyses did not cover the entire study period.

3. RESULTS AND DISCUSSION

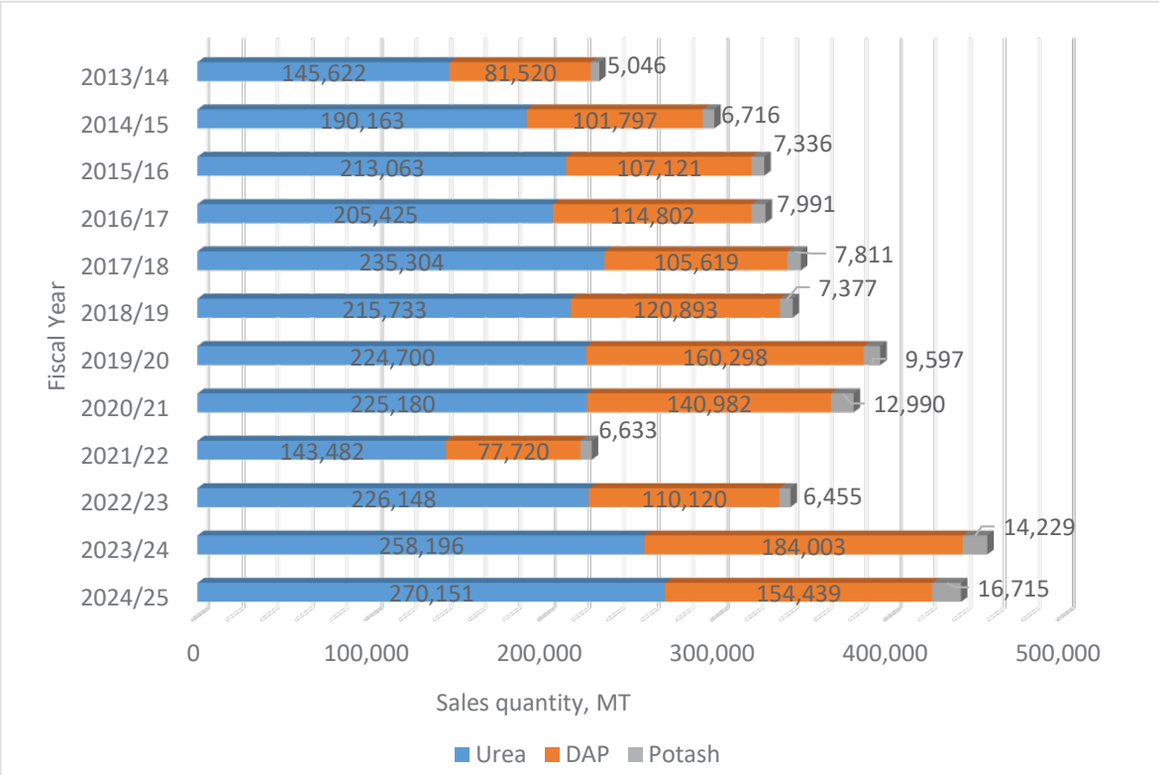
3.1 DEMAND AND SUPPLY OF CHEMICAL FERTILIZER IN NEPAL

Demand

The estimation of fertilizer demand in Nepal is complex task due to the absence of a systematic and scientific forecasting mechanism. It is believed that the substantial amount of fertilizer is informally imported from India, but the reliable database is not available. So it is challenging to calculate the effective demand in Nepal. Gautam *et al*. (2017) projected total effective demand of major fertilizer was 603,500 metric tons (MT). But Ghaire *et al*. (2022) reported that the technical requirement for major fertilizer was 1,296,799.02 MT, and estimated effective demand for major fertilizers (Urea, Diammonium phosphate (DAP), and Muriate of Potash (MoP)) at 520,000 MT. More recent estimates from MoALD revealed that the annual demand for subsidized chemical fertilizers has increased to approximately 800,000 MT (440,000 MT Urea, 280,000 MT DAP and 80,000 MT MoP). This estimates are based on crop-specific nutrient recommendations, Agriculture Census 2021 data, provincial demand assessments, and fertilizer sales trends over the past five years (MoALD,2026a).

Supply

Fertilizer sales scenario of last twelve year have shown a gradual but inconsistent upward trend rising from 232,878.89 MT in FY 2013/14 to 441,314.7 MT in FY 2024/25 (Figure 1). The share of Urea to total supply is consistently high, followed by DAP, while the supply of potash is minimal compared to other two. The supply trends showed a noticeable fluctuations, including a sharp decline in FY 2021/22, followed by a recovery in subsequent years, with the highest supply recorded in FY 2023/24 over the study period. Despite this overall increase, the total supply remains significantly below the estimated demand, indicating a persistent supply–demand gap.



Source: MoALD, 2025 and MoALD, 2026b

Figure 1. Subsidized fertilizer supply scenario during 2013/14 to 2024/25 (in metric tons)

COMPOSITION OF FERTILIZER BASKET

Over the last twelve years, the average composition of fertilizer supplied was 62% Urea, 35% DAP, and only 3% MoP (Figure 2). According to MoALD (2026a), the technically recommended shares of Urea, DAP, and MoP are 49%, 29%, and 22%, respectively. This deviation from these recommendations indicates that public-sector fertilizer supply system has prioritized Urea.

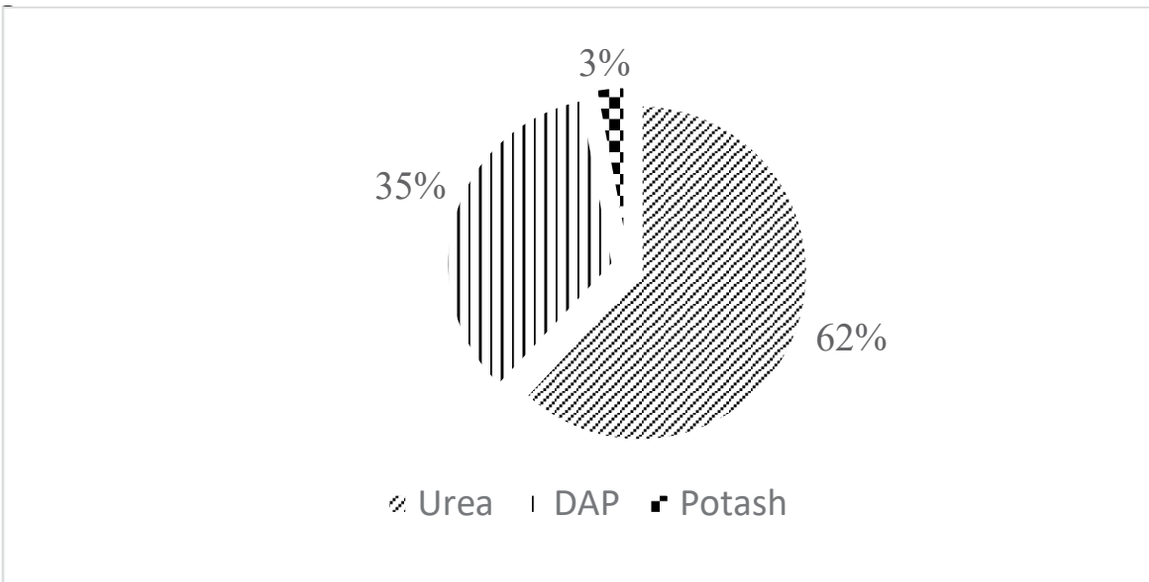


Figure 2: Share of Urea, DAP and MoP to total amount of subsidized fertilizer sales in Nepal (2013/14-2024/25)

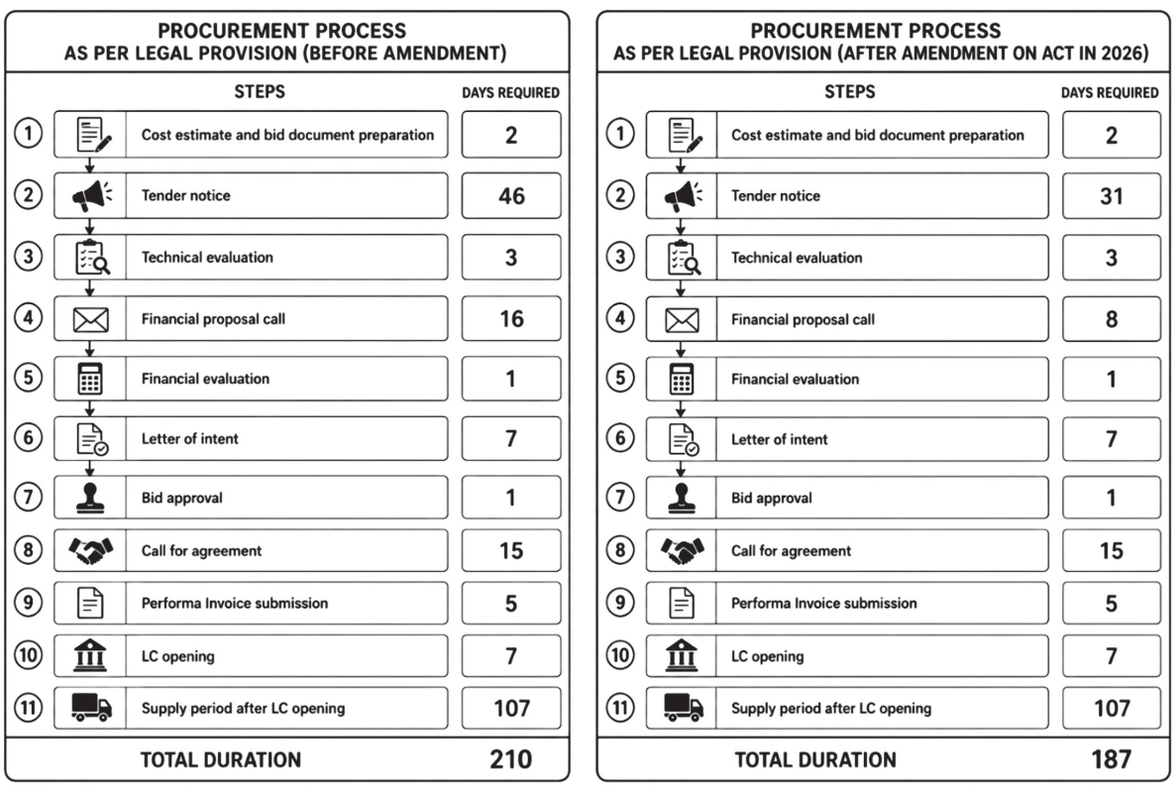
3.2 PROCUREMENT PROCESS AND DURATION

Procurement process

The procurement process of subsidized fertilizer is a centralized, government-led system primarily managed by the MoALD, with operational responsibilities assigned to KSCL and STCL. This process starts with annual demand estimation based on provincial demand, followed by subsidy budget allocation.

The procurement process is solely based on the Public Procurement Act 2007 and its regulation, 2007. Usually global tender process of procurement is applied, but in case of urgency and supply shortage Government- to- Government agreement is also used.

In accordance with the Public Procurement Act, 2007 and its regulation, the current procurement process is time-consuming and needs to be defined as a stepwise process (Figure-3). Prior amendment procurement act in 2026 it demands 45 days for international competitive bidding, which is significant in the tender process. So the tender process has been one of the major drawbacks of the unsuccessful supply of fertilizer in Nepal (Ghaire *et al*., 2022).After the tender announcement, bids are evaluated on technical and financial criteria, and contracts are awarded to qualified suppliers.



Source: KII, 2026

Figure 3: Procurement process and time requirement for each activities

Based on the contact agreement the selected suppliers then import fertilizers mainly via Indian transit routes followed by quality inspection at entry points. Then, fertilizers are distributed

through KSCL and STCL warehouse to cooperatives, agro-vets for final delivery to farmers at subsidized rates. Prior to the 2026 amendment of the Public Procurement Act, the legally prescribed procurement process required approximately 210 days to complete procurement process, but after amendment, there is significant shorten in the tender notice duration and requires 187 days to complete process (Figure -3).

Procurement lead time

As per the Public Procurement Act and Regulations' provision (prior amendment) the procurement process should be completed within 210 days. But over the FY 2018/19–2024/25, it is found that the procurement lead time for fertilizer imports often differs considerably from standard. The average number of days taken to complete fertilizer imports (Urea, DAP, and MoP) over FY 2018/19–2024/25 is given in table-1. The average lead time taken to import Urea was 214–249 days in the early years but spiked sharply to 485 days in FY 2021/22, with extremely high variability, indicating major disruptions in procurement and logistics. The average day taken to import DAP was relatively more stable, ranging from about 140 to 239 days. Potash data are limited, but available figures have suggested moderate import durations.

The variation in procurement lead time might be due to the variation in supply period after letter of credit (LC) opening as tender publication, bid evaluation, contract signing, and LC opening step of procurement process need to be performed under established procedures and remain within the control of procuring agencies, but shipment period is influenced by external factors beyond control of procuring agency.

Table 1 Lead time taken to complete the import of fertilizer during 2018/19 to 2024/25

FY	Type of fertilizer	Average lead time taken to complete the import of fertilizer	Range, days	SD, days
	Urea	258.0	141-499	109.60
2024/25	DAP	220.6	183-273	42.41
	MoP	192.0	184-200	11.31
	Urea	295.5	87*-616	155.70
2023/24	DAP	167.5	103-232	91.22
	MoP	167.5	103-232	91.22
	Urea	183.9	104-236	50.42
2022/23	DAP	185.4	125-228	42.97
	MoP	NA	NA	NA
	Urea	485.2	104-1164#	507.94
2021/22	DAP	140.5	112-169	40.31
	MoP	249.0	NA	NA
	Urea	172.3	115-198	29.60
2020/21	DAP	239.0	174-318	64.36
	MoP	163.0	131-195	45.25

FY	Type of fertilizer	Average lead time taken to complete the import of fertilizer	Range, days	SD, days
2019/20	Urea	214.0	203-225	15.55
	DAP	223.0	NA	NA
	MoP	219.0	NA	NA
2018/19	Urea	248.7	230-260	16.28
	DAP	223	163-272	55.32
	MoP	NA	NA	NA

* Consignment of STCL (STCL as short procurement process compare to process prescribed in procurement act)

for this particular consignment producer country is China, during shipment time China banned export of fertilizer for some period, which extended shipment and delivery times beyond normal expectations.

Source: MoALD, 2026b

Delays in supply often occur when suppliers lack secured stocks or postpone shipments in response to international price fluctuations. Port congestion, railway wagon shortages, and transit bottlenecks further increase lead times (MoALD, 2021). In addition, global disruptions such as the COVID-19 pandemic, the Russia–Ukraine conflict, and export restrictions imposed by producing countries have adversely affected fertilizer supply chains (NewBiz Report, 2025). In many cases suppliers fail to fulfill contracts due to rising international prices, resulting in fertilizer shortages during critical agricultural seasons (NPC, 2022).

3.3 PROCUREMENT AND SUBSIDY

Purchase price

The procurement price of fertilizer in Nepal is determined through international competitive bidding, remains changing due to the regular change in price of fertilizers in international market. There was a 20.1 % increase in price of Urea with a CAGR of 3.45 % during last 12 year. While, the price of DAP increased by 38.3 % with a CAGR of 4.5 % in the same period. But The MoP price growth was somewhat slow and stable during the period. The table-2 highlights the increasing procurement price of fertilizer over time.

Table 2

Average procurement price of fertilizer during FY 2013/14 to 2024/25 (in Rs/ kg)

FY	Urea	DAP	Potash
2024/25	60.10	93.3	59.08
2023/24	60.3	94.09	59.25
2022/23	90.03	121.65	73.71
2021/22	96	124	106
2020/21	46	53	38
2019/20	40	54	46
2018/19	43	61	32

FY	Urea	DAP	Potash
2017/18	38	49	
2016/17	36	47	34
2015/16	41	58	39
2014/15	41	60	43
2013/14	40	55	53

Source: MoALD, 2026b

Procurement volume and subsidy budget

Fertilizer subsidy expenditure in Nepal increased nearly fivefold during FY 2013/14–2024/25, rising from NRs 5,328 million to NRs 26,839 million, though fertilizer procurement volume only approximately doubled with considerable annual fluctuations (Table-3). There was sharp increase in subsidy expenditure particularly after FY 2020/21, mainly due to global fertilizer price shocks associated with the Russia–Ukraine war and other supply chain disruptions. Although procurement volumes generally increased and reached a peak of 523,766 Mt in FY 2023/24, temporary supply disruptions caused a notable decline in FY 2021/22. Over the same period, data shows that the share of fertilizer subsidies to total agricultural budget has been increasing, rising from 18–30% before FY 2020/21 to more than 50% in recent years and the highest at 69% in FY 2022/23, indicating growing fiscal pressure.

However, this subsidy expenditure is not only influenced by external price factors and total quantity procured. As Nepal relies heavily on fertilizer imports, fluctuations in international fertilizer prices and depreciation of the Nepalese Rupee against the US Dollar substantially affected import costs. The exchange rate increased from NRs 94.8 per USD in FY 2013/14 to NRs 131.2 per USD in FY 2024/25, increasing the domestic cost of fertilizer imports. Since retail fertilizer prices are fixed under the subsidy program, these higher import costs were largely absorbed by the government, resulting in increased subsidy expenditures.

Table 3

Total procured quantity, subsidy budget, share of subsidy in the agriculture budget and average subsidy per kg during 2013/14 to 2024/25

FY	Procured quantity, MT	Total subsidy expenditure NRs (in million) (TSE)	Expenditure on the allocation of subsidy budget (%)(TSE/ TSB*100%	Subsidy budget as % total agriculture budget	Average subsidy, in NRs./kg (all product)
2024/25	486883	26839.32	98.08.	50.66	55
2023/24	523766	24345.32	84.9	54.54	46
2022/23	406233	31203.35	100	69.0 #	77
2021/22	177507	14396.76	87	37	81
2020/21	400209	9412.95	78	32	24
2019/20	395905	8315.02	79	30	21

2018/19	327488	8085.33	96	28	25
2017/18	338599	5991.32	125	20	18
2016/17	307771	4840.64	101	18	16
2015/16	293628	5668.08	104	25	19
2014/15	278082	5820.86	104	24	21
2013/14	273239	5328.02	93	27	19

NRs 150 million budget was allocated first, but more NRs 230 million was added later through source confirmation by the Ministry of Finance.TSB (total subsidy budget)

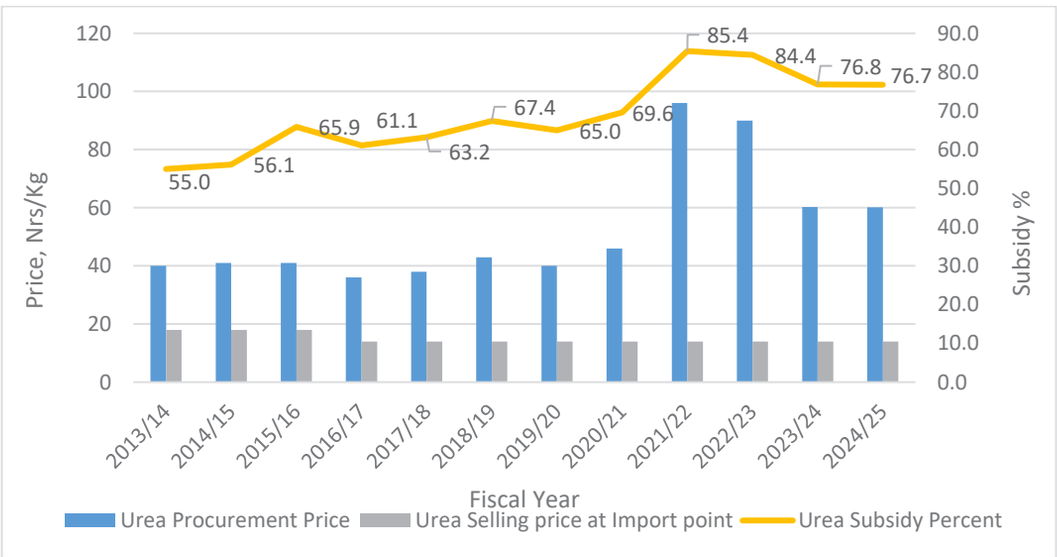
Source: MoALD, 2026b.

Moreover, data shows there was substantial fluctuations of average per kg subsidy given to subsidized fertilizer over the past 12 years (2013/14–2024/25 which was closely linked with changes in international purchase prices and exchange rate of USD. Overall, subsidy levels increased sharply from 2018/19 to a peak in 2021/22, then dropped in 2022/23 before partially stabilizing in 2023/24 (Table 3).

Subsidy by fertilizer type

For subsidy purposes, the government has fixed the selling price Rs 14, Rs 43 and Rs 31 per kg of Urea, DAP, and MoP respectively at the import point. The per-unit subsidy is calculated as the difference between the procurement price and the fixed selling price.

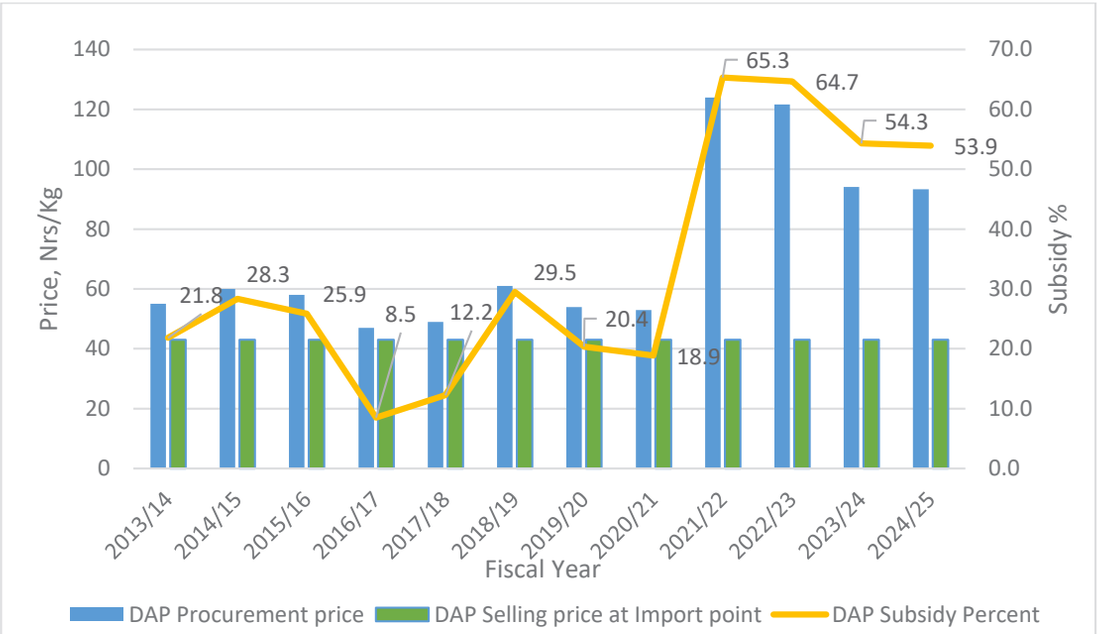
Figure 4 illustrates the trend of procurement price, selling price, and subsidy percentage for Urea over the study period (2013/14–2024/25).The average subsidy level for Urea was 68.9%, indicating a substantial and sustained fiscal commitment by the government to maintain affordable prices for farmers. This subsidy was at the lowest point at 55.0 % in 2013/14 and reached a peak of 85.4 % in 2021/22 and showed decline in subsequent year.



Source: MoALD, 2026b

Figure 4: Procurement price, selling price and subsidy % for Urea over study period (2013/14-2024/25)

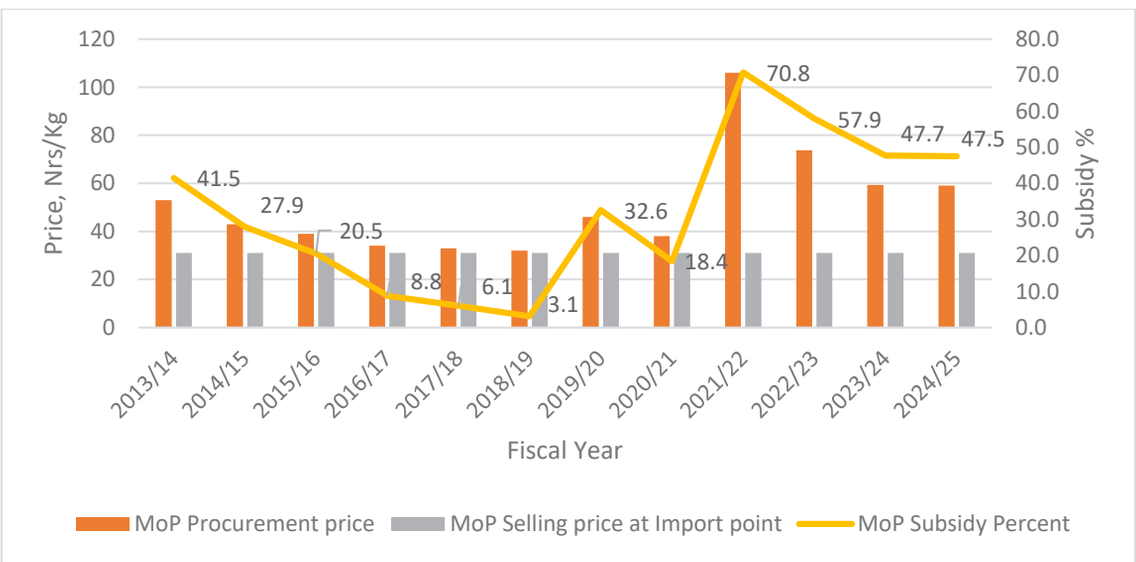
Compared to Urea, DAP consistently received a lower level of subsidy, with an average subsidy of 33.6% during the study period (Figure-5). The subsidy was lowest level at 8.5 % in 2016/17 and highest at 65.3 % in 2021/22 and the subsidy percentage declined in subsequent years.



Source: MoALD, 2026b

Figure 5: Procurement Price, selling price at import point and subsidy percent for DAP over study period (2013/14-2024/25)

For MoP, subsidy was consistently low as compare to Urea and DAP, with average of 31.9% over the period of FY 2013/14-2024/25. It showed continually declining and reached lowest at 3.1% in 2018/19. However, the subsidy increased sharply thereafter, peaking at **70.8% in 2021/22,** and declined in subsequent years due to the reduction in procurement costs.



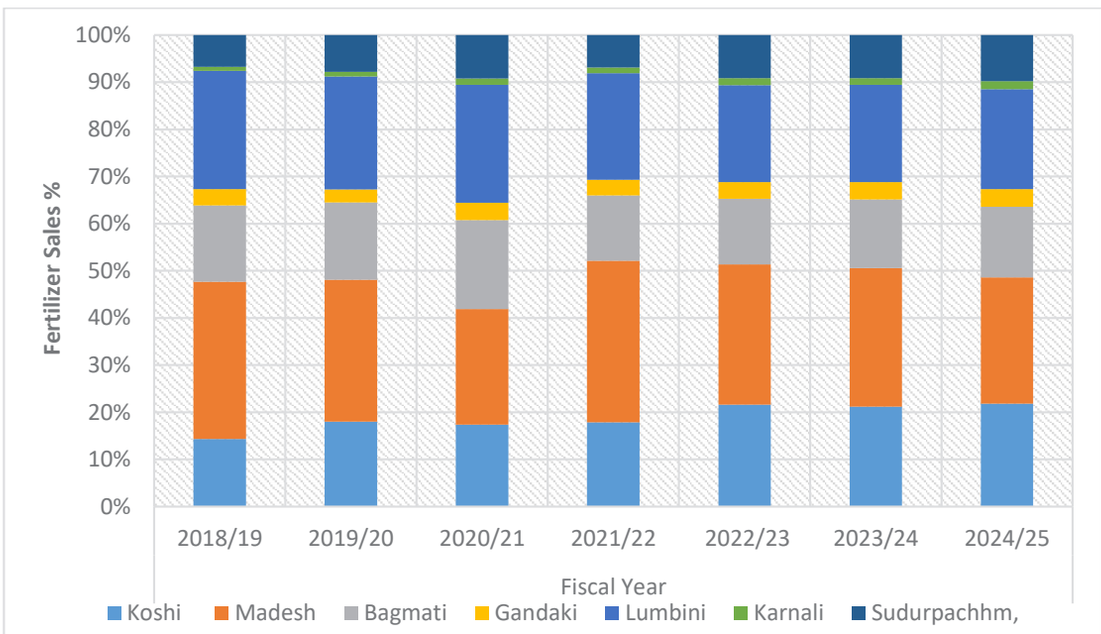
Source: MoALD, 2026b

Figure 6: Procurement price, selling price and subsidy % for MoP over study period (2013/14-2024/25

3.4 DOMESTIC DISTRIBUTION SYSTEM

Nepal's fertilizer distribution system follows a multi-tier structure guided by the Subsidized Fertilizer Distribution Directive and Procedure (GoN, 2020; GoN 2025). The federal committee, Fertilizer Supply and Distribution Management Committee allocates fertilizer quota among provinces based on agricultural indicators such as cultivated area, cropping intensity, irrigation coverage, and commercialization. About 10% of imports are maintained as buffer stock, while the remaining 90% is distributed through provincial and local mechanisms.

Subsequently, provincial-level distribution committees further disaggregate these quotas to local levels, where local committees are responsible for identifying authorized distributors and supervising end user delivery. The operational distribution is primarily managed by KSCL and STCL through their provincial and district offices. Fertilizers are transported from import points to provincial warehouses, then to district-level depots, and finally distributed to cooperatives and private agro-dealers at the village level according to allocated quotas. Transportation services are procured in compliance with the Public Procurement Act 2007 and its regulations, ensuring standardized procedures for contractor selection and pricing. Additionally, distribution agencies have adopted digital systems to improve transparency and tracking in distribution.



Source: MoALD, 2025, MoALD, 2026b

Figure 7: Province wise sales percentage of total sales of subsidized fertilizer

The provincial distribution pattern of total fertilizer sales revealed remarkable regional disparities over recent fiscal years (FY 2018/19-2024/25) (Figure-7). Madhesh province consistently have received the largest share, followed by Koshi and Lumbini provinces, each receiving around 21–22% of total sales. Similarly, Bagmati province showed a moderate but gradually increasing share, rising from about 14% to 18%, possibly due to expanding peri-urban agriculture and commercialization. In contrast, Gandaki province and Karnali received a relatively smaller share, Sudurpashchim (Far West) province received a stable share of around 9–10%. The distribution trend suggests that fertilizer allocation in Nepal is closely aligned with agricultural potential

and production needs, although regional inequalities persist due to geographical and structural differences. According to fertilizer sales data for FY 2024/25, the application rate of subsidized fertilizer varied considerably across provinces. Madhesh Province recorded the highest use at 218 kg/ha, followed by Lumbini (172 kg/ha), Bagmati (170 kg/ha), Sudurpashchim (138 kg/ha), Koshi (135 kg/ha), Gandaki (45 kg/ha), and Karnali (34 kg/ha).

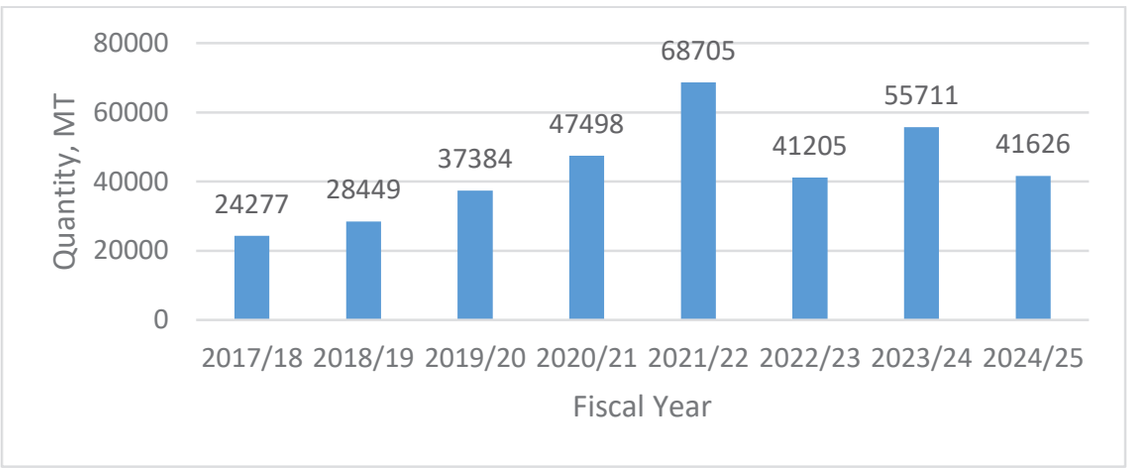
3.5 QUALITY ASSURANCE MECHANISM

Fertilizer Control Order, 1999 has specified quality aspects of chemical fertilizer to be imported in Nepal. The fertilizer trading enterprise has to provide quality assurance certificate issued by producer, independent international surveyor at load port and at the custom entry point. Custom authorities only allow entry once importer provide quality assurance certificate.

FCO, 1999 has provision of surveyor, who issued certificate of the quality, quantity and labeling and packing of imported fertilized whether it is as per FCO or not. The FCO has set standards to ensure the quality of fertilizers imported into the country. These standards have specified the permissible nutrient content, physical properties, and labeling requirements that fertilizers must meet. By following this guidelines, the FCO has ensured only high-quality fertilizers are available to farmers, promoting agricultural productivity and environmental safety. Moreover, the government has appointed fertilizer inspectors, to regulate and control the quality of fertilizer in distribution point.

3.6 PRIVATE SECTOR PARTICIPATION

FCO, 1999, regulate the import and distribution of chemical fertilizer in Nepal, which allows all state and private actors to participate in fertilizer supply management. In case of subsidized fertilizer, the ground is not leveled as subsidy is only disbursed for STCL and KSCL supplies. Therefore, the private sector cannot participate in the Urea, DAP and MoP supplies as the price is so high without subsidy. But in case of non-subsidized fertilizers total supplies managed by private sector.



Source: Author compilation based on data of custom department

Figure 8 Non subsidized chemical fertilizer imported by private sectors over FY 2017/18 to 2024/25

The figure 8 presents the volume of non-subsidized chemical fertilizer imported by the private sector in Nepal over seven fiscal years (2018/19–2024/25). Overall, the data shows an increasing trend with some fluctuations in imported quantities. The imports increased from 24,277 Mt in 2017/18 to a peak of 68,705 Mt in 2021/22, reflecting the growing role of private traders in fertilizer supply. However, imports subsequently declined to 41,205 Mt in 2022/23, recovered to 55,711 Mt in 2023/24, and fell again to 41,626 Mt in 2024/25, indicating year-to-year volatility. These fluctuations may be attributed to changing market conditions, policy environments, and the availability of subsidized fertilizers. Although the private sector has consistently supplied NPK-containing fertilizers, the variability in import volumes suggests that its contribution to the national fertilizer supply remains unstable.

In case of subsidized fertilizer private sector is participate in end user distribution. The Subsidized Fertilizer Distribution Directives, 2020 end the monopoly of cooperatives, allowing local government to license private sector companies and firms to distribute fertilizer along with cooperatives. Thus, private sector involvement have led to a more equitable and efficient distribution of subsidized fertilizer (Thapa *et al.,* 2023)

3.7 CHALLENGES AND UNCERTAINTIES

This study identified several challenges and uncertainties affecting the fertilizer supply chain in Nepal. Key informant interviews revealed Nepal's fertilizer supply system faces persistent challenges, cumbersome import and multilayer distribution mechanisms, inadequate infrastructure, budget constraints, and poor demand forecasting. These issues lead to delayed delivery to farmers and threaten food security.

Table 4

Thematic analysis of key informant interview on challenges and uncertainties of Nepal's chemical fertilizer supply chain

Theme	**Key issues identified by Key Informants**	**Implication in Fertilizer Supply chain**
Weak Demand Forecasting Systems	Lack of reliable demand data, limited information systems	Supply-demand mismatches and recurrent fertilizer shortages during peak cropping seasons
Procurement and Distribution Inefficiencies	Lengthy procurement procedures, insufficient subsidy budget, multiple administrative layers, weak coordination among agencies	Delayed fertilizer procurement and distribution, resulting in untimely availability to farmers
Infrastructure and Logistics Constraints	Limited storage, poor inland transport, inefficient port handling	Increased costs, longer delivery times, and reduced responsiveness to seasonal demand

Theme	Key issues identified by Key Informants	Implication in Fertilizer Supply chain
Market and Institutional Challenges	Weak regulatory capacity, limited private sector participation, cross-border smuggling from India, quality control concerns	Market distortions, unfair competition, and risk of substandard fertilizer products, reducing competition and efficiency.
External Dependency and Supply Chain Uncertainty	Dependence on imports, international price fluctuation, exchange rate fluctuations, export restrictions, geopolitical disruptions	Uncertainty in fertilizer availability, affordability, and supply stability

Source: KII, 2026

This analysis of challenges and uncertainties was primarily based on perceptions and experiences shared by a limited number of key informants from government agencies and fertilizer-importing institutions. So, this findings may not fully capture the views of other stakeholders, including private sector actors, transport service providers, local distributors, and farmers.

4. CONCLUSION AND RECOMMENDATION

The chemical fertilizer supply chain in Nepal remains heavily import dependent, and operationally inefficient. Despite significant government investment on subsidies, there is always issues of delayed and inconsistent supply. The huge gap between demand and supply highlights poor planning and execution. Procurement lead time, averaging over seven months, significantly disrupt timely availability of, particularly during peak seasons. Almost no participation of private sector and dominance of state agencies has constrained competition within the supply chain. At the same time, the increasing share of fertilizer subsidies to total agriculture budget has raised questions about the government's ability to allocate subsidy budget in long run.

This study suggest that Nepal’s fertilizer supply chain needs a comprehensive reform focused on efficiency, sustainability. Shortening procurement procedures and introducing multi-year contracts can reduce delays and ensure timely supply. Strengthening demand forecasting systems based on crop patterns and regional needs is essential for accurate planning. Investment in storage, transportation, and distribution infrastructure particularly in remote areas will enhance timely availability at end user level. Ensuring private sector participation through policy and subsidy reforms can improve competition and system efficiency. Regular sales price adjustment as per the international price can help to address the issue of fiscal burden. At the same time, use of voucher system to better target smallholder farmers. Strengthening monitoring and regulatory mechanisms is critical to control illegal imports and ensure fertilizer quality.

REFERENCES

Bista, D. R., Dhungel, S., & Adhikari, S. (2016). Status of fertilizer and seed subsidy in Nepal: Review and recommendation. *Journal of Agriculture and Environment*, 17, 1–10. https://doi.org/10.3126/aej.v17i0.19854

Bhandari, P. S., & Neupane, H. S. (2021). Fertilizing Nepalese agriculture: The effects of distribution system on chemical fertilizer use. *Nepalese Journal of Agricultural Sciences, 19*, 261–272.

Ezeh, C. I., Onwuka, O. W., & Nwachukwu, I. N. (2008). Correlates of inorganic fertilizer consumption among smallholder farmers in Abia State, Nigeria. *Journal of Agriculture and Social Research,* **8**(1), 56–63.

Gaire, K.R., Vista, S. P & Rawal, N. (2022, April 6-8). Fertilizer policy and subsidy mechanism in Nepal. In Vista, S. P, Devkota S. & Rawal, N (Ed.). *Proceedings of the national symposium on major agricultural input supply and subsidy mechanism in Nepal*. Kathmandu, Nepal: Salt Trading Cooperation Limited, Kathmandu.

Gautam, S., Gaihre, Y. K., Acharya, G. D., Dongol, P., & Choudhary, D. (2022). Fertilizer demand-supply gap and avenues for policy revisits in Nepal. *SAARC Journal of Agriculture,* 20(2), 223–234. https://doi.org/10.3329/sja.v20i2.63583

GoN. (2007). *Public Procurement Act, 2007*. Public Procurement Monitoring Office. https://ppmo.gov.np/content/7404/7404-public-procurement-act-2063/

Government of Nepal. (2007). *Public Procurement Rules, 2007.* Public Procurement Monitoring Office. Government of Nepal

GoN. (1999). *Fertilizer Control Order,1999*. Ministry of agriculture and livestock development. Kathmandu, Nepal

GoN. (2020). *Subsidized chemical fertilizer distribution directives 2020 (In Nepali)*. Ministry of agriculture and livestock development. Kathmandu, Nepal.

GoN. (2025). *Subsidized chemical fertilizer distribution procedure 2025 (In Nepali)*. Ministry of agriculture and livestock development. Kathmandu, Nepal.

MoALD. (2021). *Chemical fertilizer supply in Nepal: opportunities and challenges.* Government of Nepal. Ministry of Agriculture and Livestock Development, Kathmandu, Nepal.

MoALD. (2025). *Statistical Information on Nepalese agriculture 2023/24*. Government of Nepal, Ministry of agriculture and livestock development, planning and development cooperation division. Kathmandu, Nepal

MoALD. (2026a*). Report on Annual fertilizer demand projection.* Ministry of agriculture and livestock development. Government of Nepal. Kathmandu, Nepal

MoALD.(2026b). *Complied fertilizer subsidy audit report 2013/14- 2024/25.* Fertilizer subsidy audit committee. Ministry of agriculture and livestock development. Kathmandu. Nepal.

National Planning Commission. (2022). *Standards for efficient and effective procurement and*

supply of chemical fertilizers. Research, exploration and intergovernmental coordination division, NPC, Kathmandu

NewBiz Report.(2025, March 9). China's Urea Export ban disrupts Nepal's fertilizer supply. New Business Age. https://www.newsbusinessage.com

Panta, H. K. (2018). Supply chain of subsidized chemical fertilizers in Nepal. *Journal of the Institute of Agriculture and Animal Science, 35*(1), 9–20. https://doi.org/10.3126/jiaas.v35i1.22509

Shrestha, R. K. (2010). Fertilizer policy development in Nepal. *Journal of Agriculture and Environment,* 11, 126–137. https://doi.org/10.3126/aej.v11i0.3660

Thapa, G., Gaihre, Y. K., Choudhary, D., & Gautam, S. (2023). Does private sector involvement improve the distribution efficiency of subsidized fertilizer? A natural experiment from Nepal. *Agricultural Economics*, 54(3), 429–446. https://doi.org/10.1111/agec.12768

Vanlauwe, B., et al. (2016). Fertilizers, hybrids, and the sustainable intensification of maize systems in the rainfed mid-hills of Nepal. *European Journal of Agronomy,* 80, 154–167. https://doi.org/10.1016/j.eja.2016.08.003