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Indian fertilizer subsidy conundrum: Tracking the recent developments

PRAVEEN K V[1], ALKA SINGH[1*], PRAMOD KUMAR[1], G K JHA[1], KINGSLY I[1] and ADITYA K S[1]

ICAR-Indian Agricultural Research Institute, New Delhi 110 012, India

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ABSTRACT

Subsidies to fertilizers have played a crucial role in yield improvement in Indian agriculture, yet it is being criticised recently for issues like soil nutrient imbalance, inequity in distribution etc. Several policies are being implemented in India to control scorching fiscal burden due to fertilizer subsidy, control the diversion of subsidised fertilizers and better the soil nutrient balance. Present study was carried out at the Division of Agricultural Economics, ICAR- IARI, New Delhi during 2020–21 to understand the status of fertilizer subsidies in India and its distribution. The prime objective of the study is to assess who benefits from the fertilizer subisides. Secondary data collected from various issues of Fertilizer Statistics, Agricultural Statistics at a Glance, and the Direct Benefit Transfer (DBT) dashboard, as well as on primary data collected from 200 farmers and 60 fertilizer retailsers of Karnal district, Haryana are used for analysis. The farmers, for whom the subsidies are announced, don't seem to get a fair share of it. It is the industry that benefits most from the subsidies, and they have been heavily subsidised especially in the 1990s and after 2010. The stakeholder perception of DBT is in support of the scheme, and both farmers as well as retailers reported increased fertilizer availability after the implementation of the scheme. Aadhar authenticated fertilizer purchase under DBT is hence a welcome development that has the potential to manage the irregularities surrounding the fertilizers to some extent.

Keywords: DBT, Fertilizer subsidies, Stakeholders' perception, Subsidy distribution

Fertilizer use in Indian agriculture has swollen since the green revolution (Chand and Pavithra 2015). The introduction of subsidies to fertilizers proved to be crucial in achieving this feat by ensuring the fertilizer availability at affordable prices (Gulati and Banerjee 2015). However, over the years, the fiscal burden due to fertilizer subsidy rose from ₹60 crores in 1976-77 to ₹70000 crores in 2019-20 (FAI 2020). Besides, it is criticized that manufacturers reap most of the benefits out of subsidies than farmers (Gulati and Narayanan 2003). The leakages in subsidies have remained another cause of worry (Kishore *et al.* 2013). Though the subsidies help increase foodgrain production, the onus of decline in soil nutrient balance also rests on it (Sharma and Thaker 2009). The nutrient balance for the year 2017-18 in Haryana, Punjab, Uttar Pradesh, Madhya Pradesh and Rajasthan are still biased towards nitrogen. At the same time, Himachal Pradesh, Kerala, Tamil Nadu, Maharasthra and North-easterns states reported a deficit in use of nitrogen. This prevalence of both the extremes at the same time is an issue to be addressed immediately (Chand and Pavithra 2015).

Present address: [1]ICAR-Indian Agricultural Research Institute, New Delhi; [2]ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi. *Corresponding author e-mail: asingh.eco@gmail.com.

The highly subsidized urea is overused relative to other fertilizers, which has resulted in significant environmental externalities (Prasad 2009). The excessive use of nitrogen results in atmospheric pollution (Kanter *et al.* 2015). Leaching of nitrogen would further increase the nutrient load thus polluting the water bodies (Good and Beatty 2011). Several policy reforms are being attempted by the government to manage this. The latest among them is the Direct Benefit Transfer (DBT) for fertilizer subsidy distribution which was introduced in April 2016 on a pilot basis in 16 districts of the country and later rolled out nationally in April 2018. DBT is a modified subsidy payment system, where companies will be paid subsidy only after retailers have sold fertilizer to farmers after authentication using Aadhar through Point of Sale (PoS) machines by retailers. In this backdrop, the paper focuses exploring recent trends in fertilizer production and consumption along with issues related with fertilizer subsidies and the stakeholder perception on DBT in fertilizers.

MATERIALS AND METHODS

Present study was carried out at the Division of Agricultural Economics, ICAR- IARI, New Delhi during 2019–20 used secondary data on fertilizer production, consumption, subsidies, and prices collected from various issues of Fertilizer Statistics, Agricultural Statistics at a Glance, and the DBT dashboard. An estimation of the farmers' share in budgetary fertilizer subsidy was attempted

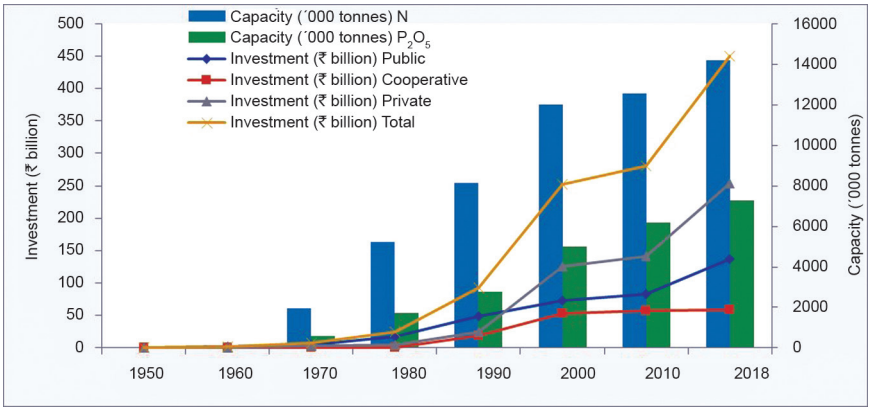
using the import parity price concept provided by Gulati and Narayanan. The method estimates the price that the farmers will have to pay for the imported fertilizers, with the assumption that the imports are open. The free trade price or c.i.f price is compared with the actual price that the farmers pay, and the difference between these two would indicate the subsidy that farmers receive per unit of fertilizer. Since the estimated subsidy using this approach depends mainly on the import prices, the figures may differ with those given in the central government budgets. A comparison of subsidies calculated using import parity method and the actual figures from the central government budget would suggest the share of subsidies going to farmers and industry. To assess the perception of farmers and retailers on DBT scheme, primary data was collected from Karnal district of Haryana during January-March 2020. Karnal was purposefully selected since pilot DBT in fertilizers was run there. In the second stage, we selected Karnal block from among all the six blocks based on maximum area under paddy. Within this block, we randomly selected 4 villages (Kalampura, Kachhwa, Sangohi, Landhora) from which to draw households and retailers for our sample. In the final stage, from these 4 villages, a total of 200 farmers and 60 fertilizer retailers were surveyed using a structured survey schedule to collect primary data regarding their perception on the DBT and the operational difficulties if any.

RESULTS AND DISCUSSION

Structure of fertilizer industry and fertilizer production and consumption trends: India is a key player in the global fertilizer market, and it depends on both production as well as imports to ensure adequate domestic fertilizer supplies. At present, India stands second in the world production and consumption of nitrogen fertilizers. Besides, it stands third and second respectively in production and consumption of phosphorous fertilizers. Potash fertilizers are not produced in India, but it is the fourth largest consumer of this nutrient. It is also the second-largest producer of urea and DAP in the world. Although imports have decreased in the recent periods, especially after the year 2010, still it is a very important component of the Indian fertilizer market, since it constitutes about 38% of the total fertilizers consumed in the year 2018-19. About 26% of nitrogen, 45% of phosphorous and entire potash fertilizers are imported for use in Indian agriculture (FAI 2020).

A total of 26 urea manufacturing plants and 19 DAP and other complex fertilizer plants operate in the country. The private sector leads in the fertilizer production capacity in the country with the overall capacity to produce 6.4 million tonnes (47%) of nitrogenous and 2.8 million tonnes (70%) of phosphorous fertilizers. This is followed by cooperative and public sectors respectively. More than half of the total investments in the industry is by the private sector (57%), followed by the public (30%) and cooperative sectors (13%) (FAI 2020) (Fig 1).

The capacity to produce both N and P_2O_5 fertilizers has increased continuously from the mid-1980s till 2000 decade, after which there was noticeable stagnation. Consumption of fertilizers has been consistently higher than that of production (Table 1). It is important to note that in the case of nitrogenous fertilizers, India's production pace did not match with that of consumption resulting into a steep rise in imports, especially in last one and a half-decade. In recent years, imported fertilizers have become a very important component of the Indian fertilizer market, as it constitutes about 38% of the total fertilizers consumed in the year 2018–19. In addition to this, about 45% of phosphorous and entire potash fertilizers are currently imported for use



Source: Fertilizer Association of India 2020

Fig 1 Capacity development and investment in the Indian Fertilizer industry.

Table 1 Production, consumption and imports of fertilizer nutrients in India (million tonnes)

Year	Production			Consumption				Imports			
	N	P_2O_5	Total	N	P_2O_5	K_2O	Total	N	P_2O_5	K_2O	Total
1981	3.14	0.95	4.09	4.07	1.32	0.68	6.07	1.51	0.45	0.80	2.76
1991	7.30	2.56	9.86	8.05	3.32	1.36	12.73	0.57	0.97	1.24	2.77
2001	10.69	3.84	14.53	11.31	4.38	1.67	17.36	0.28	0.49	1.70	2.47
2011	12.29	4.36	16.65	17.30	7.91	2.58	27.79	5.58	4.26	2.56	12.40
2018	13.33	4.59	17.92	17.63	6.91	2.68	27.22	4.71	3.16	2.64	10.53

Source: Fertilizer Association of India 2020

in the agriculture sector (FAI 2020).

Fertilizer subsidies: Trend and share in the distribution: The introduction of Retention Price Scheme (RPS) for urea in the year 1976-77 marked the initiation of the subsidy regime for fertilizers in India. Retention price scheme was recommended to promote domestic production and consumption of fertilizers. Retention prices were calculated on a cost-plus approach and it was determined separately for each plant producing urea. The subsidy on urea was calculated as the difference between retention price and the statutorily notified sale price for each urea unit separately. The RPS, even though succeeded in encouraging domestic production, it also gave rise to huge budgetary fertilizer subsidies, which increased fivefold since the onset of the new millennium. The trend in major subsidies in India indicate that the fertilizer subsidy is the second largest after the food subsidy. However, the growth in fertilizer subsidies between 2001 and 2017 was noticeable (20%), and even higher than the growth in subsidies towards food (15%) as well as total subsidies (16%). The share of subsidy to indigenous fertilizers in total fertilizer subsidies increased from 9.39% in the year 1977-78 to 84.80% in 1990-91. The recent hike in subsidy share of indigenous urea from 22% to more than 50% during 2010-11 to 2017-18 itself is clear evidence that the government is still not able to gain control over the mounting domestic subsidies.

The subsidy to urea, which is the most commonly used fertilizer in India has increased continuously over the years unlike the declining trend in subsidies for P_2O_5 and K_2O fertilizers. Since the MRP for urea is kept constant by the government and the industry is subsidised by an amount equivalent to the difference between the production cost and MRP, the increase in the price of feedstock resulted in heavier subsidy burden for the government. On the other hand, the decontrolling of P_2O_5 and K_2O has resulted in a hike in the prices of those fertilizers and the farmers started substituting them with urea. This also helps explain the upward trend of urea and the downward trend of P_2O_5 and K_2O subsidies after 2010-11. The above analysis indicates that fertilizer subsidy might have helped in increasing consumption of fertilizers from 17.35 MMT in 2001 to 27.22 MMT in 2017 (in nutrients) as reflected by increased per ha consumption from 90.1 kg in 2001 to 137.4 kg in 2018. However, the domestic production has increased only marginally indicating that much of the increased consumption has been met by rising imports.

Distribution of fertilizer subsidies between farmers and industry: The results of the estimation of the farmers' share in budgetary fertilizer subsidy (Table 2) revealed that the share of farmers in the budgetary subsidies increased from 63.27 % in the triennium average ending (TE) 1995-96 to 85.55% in TE 2005-06, and then decreased to 64.91% in TE 2015-16. The industry received the remaining quantum of subsidy, and as stated above, the decrease in the farmers' share between TE 2005-06 and TE 2015-16 is due to the decrease in import parity price of fertilizers during the period. The average share of farmers in the subsidies for the entire period starting from 1990-91 to 2016-17 was estimated to be 59.61% (and the industry share to be 40.39%). This share varied year by year as per the import parity prices.

In some years the estimates of farmers' share have crossed 100%, which indicates that in addition to the entire budgetary subsidy going to the farmers, the fertilizer industry is implicitly taxed to the tune of more than 100%. Such higher estimates are got since the import parity prices during those years were very high and if the industry could equate the domestic prices to the import parity prices, they could have made huge profits. However, the domestic prices were very much lower than the import parity prices (since controlled by the government, and the payments to the industry were based on the weighted average of the retention prices of each plant). The industry thus lost their chance to make profits which were possible under a free trade regime. This lost potential profit is considered as the implicit tax which we mentioned earlier. The import parity prices during TE 1995-96 and 2015-16 were lower, so was the farmers' share in subsidy in comparison to the TE 2005-06. This indicates that the fertilizer industry was highly subsidised during the 1990s decade, which was reduced to a considerable extent in the 2000s decade. However, the reduction in import parity prices of urea, DAP and MOP in the 2010s decade resulted in return to the higher level

Table 2 Estimation of farmers' share in fertilizer subsidy

Particulars	TE 1995-96	TE 2005-06	TE 2015-16	Average
Estimation of per tonne subsidy received by farmers on import parity basis				
Urea (₹/tonne)	2461	5340	13430	
DAP (₹/tonne)	-1606	2075	6072	
MOP (₹/tonne)	-391	3138	5530	
Estimation of total subsidy going to farmers (₹ million)	36736	134364	473343	
Fertilizer subsidy as per budget (₹ million)	58066	157053	98185	
Share of budgetary subsidy going to farmers (%)	63	85	64	59
Share of urea in total budgetary subsidies to fertilizers (%)	90	68	66	67
Share of budgetary urea subsidy going to farmers	75	103	85	78

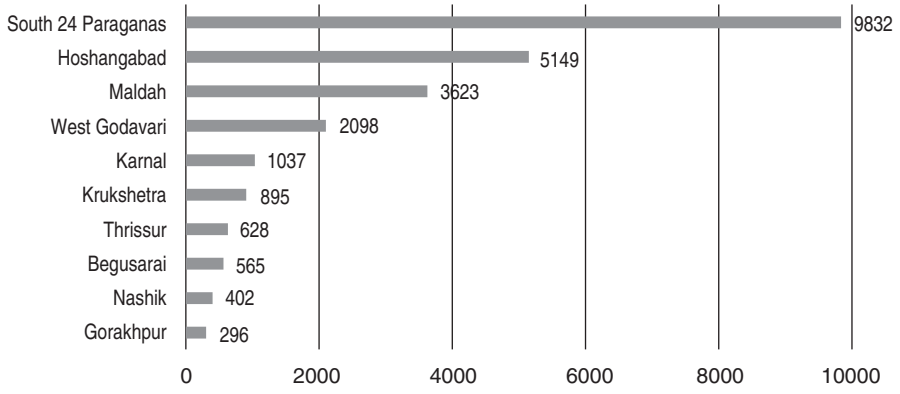
Source: Authors' estimates based on Fertilizer Association of India 2020

of industry subsidisation.

Diversion of subsidised fertilizers: The diversion of subsidised fertilizers for non-agricultural or industrial use has been an issue that the government wanted to curb for several years. Diversion, along with smuggling across porous borders to neighbouring countries are believed to inflict losses to the Indian farmers who are the intended beneficiaries of subsidised fertilizers. Urea is the favourite fertilizer for diversion since it has alternative uses in industries like glues, plastics, animal feeds, pesticides, cardboards etc. The government has estimated the diversion and smuggling of urea to the tune of 41% in the year 2012-13, based on the data on urea allocation, and that of actual use based on the cost of cultivation survey (GoI 2014 and 2016). The diversion had occurred mostly at the wholesale/retail level, which was manifested in terms of frequent fertilizer shortages at farm level. This ultimately led to black marketing by selling at higher prices than those directed by the government. The mFMS initiative and DBT has increased accountability of stakeholders including fertilizer manufacturers, wholesalers, and retailers. It has also enhanced transparency with improved tracking of physical movement of fertilizer from manufacturers to farmers and is expected in reducing diversion of fertilizer for other purposes. An analysis of retailers' sales data from mFMS categorized by the amount of fertilizer purchase by buyers during 2017-18 (Fig 2) showed that most beneficiaries made purchase transactions under 200 bags of fertilizers, and the number of transactions exceeding 200 bags was found extremely low in all the districts. However, data also revealed that few districts like South 24 Parganas, Hoshangabad, Maldah, West Godavari, Karnal etc. have shown to have more than 1000 transactions exceeding 200 bags in a year. Some of these transactions could be potentially the diverting ones (diverting urea for non-agricultural purposes). The argument that larger farmers and the farmers who intend to buy for more than one season are more in such districts, cannot be blindly considered since we have to place these transactions in the light of porous international or state boundaries and the benefits that the diverters could make by transporting the fertilizers across the boundaries.

Retailers' and farmers' perception on DBT in fertilizers: Fertilizer retailers revealed that they were initially worried that transactions through PoS would pose problems during peak seasons due to higher transaction time. One-third of sample retailers opined that it is very easy for them to log in to the PoS machine and operate it. The signal strength for operating the PoS machine is adequate as revealed by 82% of the sample retailers in the study area. Even though the majority of the retailers (58%) felt that the redressal mechanism is strong, some of them (16%) also pointed out the lack of proper repairing facilities for PoS machines. Few retailers have reported "adjusted transactions" to handle peak load, problems in buyer's aadhar authentication, higher transaction time, PoS machine failures etc. Some retailers perceived stock management is still not done effectively and the delay in stock updates at different points in the supply chain is causing problems since it restricts the retailers from selling fertilizers. This again promotes the adjusted transactions, which goes against the intentions of DBT. A majority of the retailers (82%) opined that reduction in urea diversion at the wholesale level has resulted in abundant urea in the supply chain after the introduction of DBT.

Most of the sample farmers (95%) surveyed were aware of the DBT. Retailers were the major source of information about DBT for them followed by newspaper and television. The Aadhar numbers of farmers are noted by the retailers because of which the farmers need not carry aadhar card with them. However, all the retailers revealed that farmers were never denied with fertilizers, even though they do not bring the aadhar details with them. It was found that in a sizeable number of cases physical transaction was done at once and the stocks were adjusted later to carry out the transactions smoothly during peak season. Even though some of the farmers felt that fertilizer purchase is taking more time than earlier, they were readily cooperating with the reform. Similar is the case of difficulties in biometric authentication. All the sample farmers unanimously reported the increased availability of fertilizers, especially urea since the pilot programme has rolled out. About 90% of the sample farmers wanted the DBT to continue since they felt it is of benefit for them. However, most of the farmers did not like the idea of linking fertilizer purchase with land records and soil health cards. This result strongly supports the fact that the retailers and the farmers have not been adversely affected at all by the DBT in terms of sales of urea or its non-availability.



Source: Compiled from http://164.100.128.10/mfmsReports/farmerBuying GoI, 2018

Fig 2 Number of transactions exceeding 200 bags of fertilizers in pilot districts during the year 2017-18.

Policy implications: In this paper, we present the stakeholder perception regarding the DBT scheme for fertilizer subsidy distribution. The initial part of the paper explains the context in which the DBT was implemented in the

country. In the attempt to do so, the key role of India in the world fertilizer market is explained by tracking the country's fertilizer production, consumption and import trends. The evolution of fertilizer subsidy and issue of who benefits from the fertilizer subsidies in the country are dealt in details to make clear the picture of the financial burden that the fertilizer subsidy inflicts on the government. The farmers, for whom the subsidies are announced, don't seem to get a fair share of it. It is the industry that benefits most from the subsidies, and they have been heavily subsidised especially in the 1990s and after 2010. Aadhar authenticated fertilizer purchase under DBT is a welcome development that has the potential to manage the irregularities surrounding the fertilizers to some extent.

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