Policy Brief No. 9

National Academy of Agricultural Sciences

Direct Benefit Transfer of Fertilizer Subsidy: Policy Perspectives

New Delhi
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Preface

In order to increase agricultural productivity and food supplies in a sustainable manner, the Government of India has been incentivizing farmers through provision of subsidies on critical inputs such as fertilizers, irrigation and power. This helped realize the goal of self-sufficiency in production of staple food crops especially cereal crops and the GoI was confident enough to enact one of its kind - National Food Security Act. Nonetheless, the continuous provision of fertilizer subsidy has come under criticisms on several counts including its hidden negative externalities to natural resources particularly soil health due to imbalanced/excessive use, and increasing fiscal burden. There are also concerns about leakages in their distribution, diversion for non-agricultural uses and artificial scarcity during the peak demand. In order to improve fiscal prudence, monitor sales on real-time basis and encourage balanced use of plant nutrients, the Department of Fertilizers (DoF) of the Government of India launched a direct benefit transfer (DBT) scheme for fertilizer subsidy in 2018 under which the subsidy is disbursed to fertilizer manufacturers/importers on real-time sale basis. Its ultimate goal is to implement the direct cash transfer (DCT) for remittance of subsidy directly in to the bank accounts of farmers, the ultimate beneficiaries. It is a formidable task.

In order to discuss challenges in implementation of DBT for farmers and the plausible institutional and policy solutions, the National Academy of Agricultural Sciences (NAAS) organized an Experts' Meet on "Direct Benefit Transfer under Nutrient-based Subsidy Regime" on March 11, 2020. This meeting was attended by the representatives of DoF, Fertilizer Industry and Farmers' Organizations, Policymakers and Academicians.

On behalf of the Academy, I appreciate the efforts of Dr B.S. Dwivedi and Dr J.P. Mishra for convening the Experts' Meet and bringing out its recommendations in the form of this policy brief. I hope the feedback provided to the policymakers and other stakeholders will lead to refining modalities for effective implementation of DBT of fertilizer subsidy. I would like to express my gratitude to Shri J.N.L. Srivastava, Former Secretary, Government of India, Dr Chhabilendra Roul, Secretary, DoF, and all other participants including the resource persons for their valuable inputs. My thanks are also due to Dr Kusumakar Sharma and Dr P.S. Birthal for editorial support in preparing this document.

Trilochan Mohapatra
President

Round Table Discussion: Direct Benefit Transfer of Fertilizer Subsidy: Policy Perspectives

Chairman: Dr T. Mohapatra, President, NAAS

Co-Chair: Dr J.C. Katyal, Vice-President, NAAS

Convener: Dr B.S. Dwivedi, Head, SS&AC, ICAR-IARI

Co-Convener: Dr J.P. Mishra, OSD (PPP), ICAR

List of discussants

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3. Dr S.K. Chaudhari, DDG(NRM), Indian Council of Agricultural Research, New Delhi
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10. Dr Anjani Kumar, Research Fellow, IFPRI, New Delhi
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12. Mr Yogendra Kumar, Marketing Director, IFFCO, New Delhi
13. Dr A.K. Padhee, Director (Country Relations and Business Affairs), ICRISAT, New Delhi
14. Mr Dharam Pal, Additional Secretary, Department of Fertilizers, Ministry of Chemicals and Fertilizers, New Delhi
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16. Dr A.K. Patra, Director, ICAR-Indian Institute of Soil Science, Bhopal, Madhya Pradesh
17. Mr T.S. Rao, Chief General Manager, KRIBHCO, Noida, Uttar Pradesh
18. Dr Chhabilendra Roul, Secretary, Department of Fertilizers, Ministry of Chemicals and Fertilizers, New Delhi
19. Mr Ritesh Kumar Sahu, OSD (DBT), Department of Fertilizers, New Delhi
20. Dr C.S.C. Sekhar, Professor, Institute of Economic Growth, University of Delhi, Delhi
21. Dr A.K. Singh, Secretary, National Academy of Agricultural Sciences, New Delhi
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24. Mr Naresh Sirohi, Vice President, BJP Kisan Morcha, Ghaziabad, Uttar Pradesh
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26. Dr Deepak Varshney, Research Collaborator, International Food Policy Research Institute (IFPRI), New Delhi

Direct Benefit Transfer of Fertilizer Subsidy: Policy Perspectives

1. Introduction

Fertilizer is one of the most important inputs in agricultural production. Together with other inputs it played a driving role in transforming the agrarian sector by enhancing agricultural productivity and food supplies that propelled the country towards self-sufficiency in several food and non-food commodities. The demand for food grains continues to rise; by 2030 it is projected to increase to 320-340 million tonnes (NITI Aayog, 2018; Kumar and Joshi, 2016). The role of fertilizers gets further magnified as the finite natural resources, especially land, may not be available for cultivation beyond a threshold, and enhancing productivity is the only option for sustaining future growth in food production. This vertical growth will require all the quality inputs in larger quantities for two reasons; first, the crop response to inputs, especially fertilizer nutrients, is decreasing gradually due to excessive exploitation of native soil reserves; and second, the increased frequency of extreme weather events have been disrupting the normal physiological activity of the plant-soil systems. These result in excessive economic stress on farmers for investment in fertilizers and other critical farm inputs. The farm inputs have to be made available to farmers at affordable prices, especially to the small and marginal farmers through the instrument of subsidy so as to enable them to bear the cost of higher production. In turn, it helps arresting food inflation and keeping food prices affordable to consumers.

In view of the critical importance of fertilizer nutrients towards enhancing and sustaining growth in agricultural production, the Government of India has been subsidizing fertilizers. However, the subsidy on fertilizers has often been criticized as the cost incurred by a farmer is much higher than the maximum retail price (MRP) (GOI, 2017), and also due to leakages and sale of fertilizers on higher prices by creating artificial shortages in the market during the peak demand periods. In order to enhance efficiency and transparency in sales of fertilizers, monitor transactions on real-time basis and reduce leakages to bring fiscal prudence in fertilizer subsidy, a Direct Benefit Transfer (DBT) scheme was launched on pan-India basis in 2018. Unlike DBT on LPG (liquefied petroleum gas), the fertilizer subsidy is not transferred to farmers' accounts but is disbursed to industry on real-time sale basis that is monitored through the point of sale (PoS) machines. To this extent, DBT of fertilizer subsidy is a misnomer. But the ultimate aim is to implement Direct Cash Transfer (DCT) to the farmers' accounts. The Government of India has been debating and piloting DBT in fertilizers for quite some time. The Implementation of DBT/DCT of fertilizer subsidy is, however, a complex issue, as it involves several challenges such as identification of beneficiaries, entitlements for subsidy, incomplete digitization of land records, differential subsidy rates on different fertilizers, *etc*. The modalities of the DCT are being discussed by the Committee of Secretaries chaired by Cabinet Secretary, Government of India. For analyzing the challenges and suggesting possible solutions, the National Academy of Agricultural Sciences organized an Experts' Meet on "Direct Benefit Transfer under Nutrient-based Subsidy Regime" involving representatives of the Department of Fertilizers, Government of India, Indian Council of Agricultural Research, fertilizer industry and farmers' organizations. The present document highlights relevant issues and major recommendations emerging out of the deliberations in this meeting.

2. Fertilizer Consumption in India

During 1960-61 to 2018-19, the total fertilizer ($N+P_2O_5+K_2O$) consumption increased by 93 times, while the consumption of individual nutrients N, P_2O_5 and K_2O increased by 83, 130 and 92 times (**Figure 1**) (FAI, 2019). While there was a progressive increase in fertilizer consumption the introduction of nutrient-based subsidy (NBS) in 2010 brought P and K under NBS leaving urea (N) out of its ambit. This gave a knee-jerk to fertilizer consumption in the subsequent years. Implementation of NBS resulted in substantial price hike of P and K fertilizers, while price of urea remained almost unchanged. As a consequence, in 2014-15 there was a decline of 24 and 28 per cent respectively in the consumption of P and K fertilizers, while the consumption of N that shares a larger pie of the total fertilizer consumption increased marginally. There are only two instances during the past six decades i.e., during 1999-2003 and 2010-2014 when fertilizer consumption declined, but the decline during 2010 to 2014 was much larger.

The growth trajectory of fertilizer consumption has shown progressive regression over time. It seems that the peak of fertilizer consumption has already reached, and immediate spur is unlikely in the near future. However, the consumption has turned positive after 2014-15, suggesting farmers' awareness regarding the importance of P and K fertilizers in raising farm productivity and profits. Total fertilizer consumption that had dipped to 25.58 million tonnes in 2014-15 has reached to 27.23 million tonnes in 2018-19. This comprises 17.64, 6.91 and 2.68 million tonnes of N, P_2O_5 and K_2O, respectively. On a long-term trajectory, the fertilizer consumption and foodgrain production are positively related (r= 0.96).

3. Subsidy on Fertilizers and Farm Inputs

The main inputs for which the subsidy is provided by the central and state governments include fertilizers, seeds, weedicides, power, farm machinery, and animal feed. The subsidies on inputs other than fertilizers are programme-oriented and available to select beneficiaries (identified by the implementing

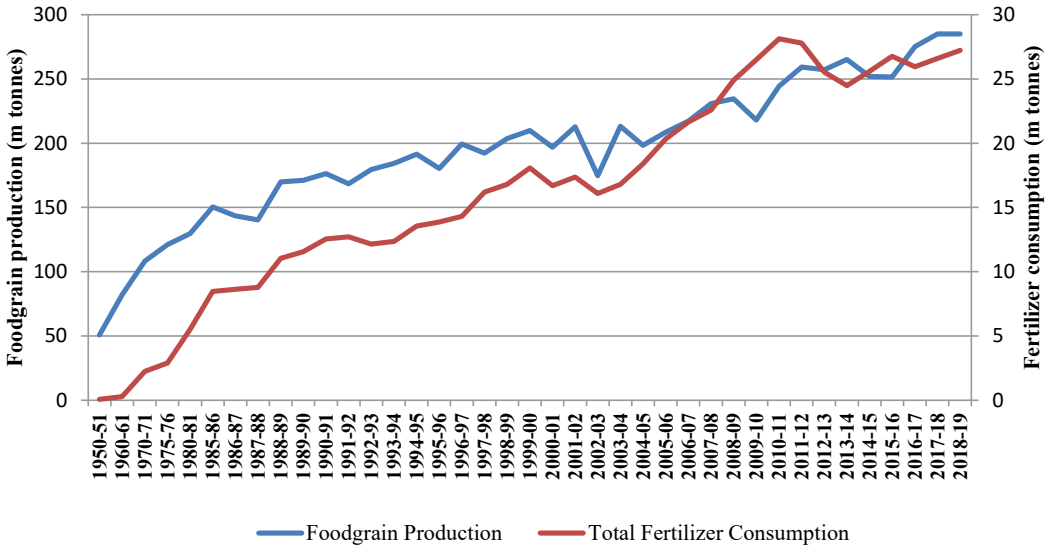

Figure 1. Fertilizer consumption and foodgrain production since 1950-51

Source: FAI (2019)

agencies) and the power subsidy in agriculture is available to those who have electricity connections. The critics often argue that the objective criteria in beneficiary selection are not always followed to distribute subsidies related to seed, pesticides, farm machinery, *etc*. On the other hand, fertilizer subsidy is universally available at source and available to all farmers and cultivators (lessees). Hence, everybody is entitled to avail benefits of fertilizer subsidy irrespective of the purpose. Fertilizer subsidy accounts for the lion's share of the total subsidy bill (**Table 1**). Nitrogenous fertilizers are highly subsidized to the extent that the MRP of urea remained unchanged at Rs 5,360 per tonne (5% extra for neem-coating) since November 2012. The P and K fertilizers are covered under NBS, wherein a fixed amount of subsidy is paid on each grade of subsidized fertilizer based on the nutrient content, and MRP is fixed by the fertilizer manufactures at a 'reasonable' price. Besides, manufactures are paid freight subsidy for transporting fertilizers from plants/ports to different destinations. The amount of fertilizer subsidy in 2019-20 was at Rs. 79,996 crores, comprising Rs. 53,629 crore for non-NBS (urea) and Rs. 26,367 crore for NBS component.

4. Direct Benefit Transfer of Fertilizer Subsidy

The recommendations contained in the Economic Survey 2015-16 to bring-in specific reforms in the fertilizer sector are: de-canalizing urea imports to ensure timely availability of fertilizers; bringing urea under NBS, and targeting fertilizer subsidies, i.e., ensuring subsidies only to small and marginal farmers with no exclusion of landless farmers tilling someone else's land (GOI, 2016). Subsequently, in the Union Budget 2016-17 it was mentioned that based on successful experience of DBT of LPG subsidy, the DBT in fertilizer subsidy would be introduced on a pilot scale in a few districts in the country. Whereas various recommendations of Economic Survey regarding reforms in fertilizer sector are yet to fructify, the Department of Fertilizers implemented DBT on pilot scale (w.e.f. October 2016 in 17 districts). The pan-India roll-out of DBT was completed in March 2018. Under the scheme, the entire subsidy on fertilizers is to be released to fertilizer companies based on the actual sales by retailers to the beneficiaries. The PoS devices have been used by the retailers to monitor sale of subsidized fertilizers and identify beneficiaries through Aadhar Card, Kisan Credit Card, Voter Identity Card, *etc*. Training has also been imparted to retailers as well as wholesalers for operating PoS device. In all, 24

Table 1. Fertilizer subsidy during 2015-16 to 2019-20

	2015-16	2016-17	2017-18	2018-19	2019-20
Gross cropped area (million ha)[#]	198.36	198.36	198.36	198.36	198.36
No. of operational holdings (million)	138.36	138.35	146.12[*]	146.12	146.12
Fertilizer consumption ('000 tons)	26753	25949	26591	NA	NA
Subsidy on urea (Rs. crores)	47470	42748	44223.31	44995.35	53629.0 (BE)[$]
Nutrient based subsidy (Rs. crores)	18843	22252	22244.26	25090.35	26367.0 (BE)
Total subsidy on fertilizers (Rs. crores)	66313	65000	66467.57	70085.70	79996
Subsidy for interest subvention (Rs. crores)	13397	13397.13	13045.72	14987	18000
Total subsidy (Rs. crores)	79710	78397.13	79513.29	85072.70	97996

*Source: MoAFW (2017; 2019) and Budget Document (2018-19); [#]latest GCA is available for 2014-15; *Agriculture Census (2018); [$]BE: Budget Estimates*

Coordinators have been appointed across all the states to monitor on-going DBT activities. Multi-lingual Help Desk has been set up to provide quick response to the queries of stakeholders. Prior to DBT, the fertilizer companies were entitled to receive subsidy on receipt of fertilizers at district level, whereas the subsidy is transferred now to the companies on realization of their sales to farmers/beneficiaries at the retail point through PoS machines and biometric authentication. This model of subsidy payment envisages release of subsidy to the fertilizer companies within seven working days from the date of submission of claims. By linking the actual sales to the subsidy payments, the movement of fertilizers along the entire chain from manufacturers to the end-users could be tracked effectively (Padhee, 2018).

5. Potential Benefits of DBT

Implementation of DBT of fertilizer subsidy has several direct and indirect benefits to farmers, fertilizer industry and government. The potential direct benefits are:

- Creation of Aadhar-seeded database of beneficiaries
- Providing transaction visibility at the level of buyers
- Linking of actual sales to subsidy payments
- Possibility of linking Soil Health Card (SHC) data with DBT for optimal use of nutrients, hence saving of subsidy
- Prevention of leakages and diversion of fertilizers to non-agricultural uses

In addition, the following are the indirect benefits:

- Putting-up PoS device at 2.26 lakh fertilizer retailers provides enormous opportunity for the governments to reach farmers, as this channel can also be utilized for service delivery by other departments of the ministries implementing similar schemes.
- Digitization of transactions would create purchase history of farmers, which can prove useful to financial institutions to provide credit to the farmers.

6. Major Challenges in Implementation of DBT

Despite several benefits, there are a number of challenges in implementation of DBT. Under the traditional DBT model, subsidies are directly transferred to the bank account of the beneficiaries. In case of fertilizers the benefits are transferred to the fertilizer manufactures/importers based on the retail sales, whereas the farmers pay MRP. It would, however, be desirable to develop a model where farmers could be the beneficiary and allowed to purchase fertilizer of their choice and the subsidy gets routed through their account. Major challenges constraining successful implementation of DBT are as follows:

(i) Challenges in area-based approach of DBT

Some economists recommend to provide equated amount of subsidy to farmers based on the size of operational landholding. With macro-scale computations, considering estimated total subsidy of Rs. 79,996 crores and gross cropped area (GCA) the subsidy amount comes to Rs. 4033 per hectare. However,

given that the fertilizer consumption is a function of a crop's or its variety's nutrient requirement, the diversity in cropping pattern, management practices, seasons, resource endowments and native nutrient supply make this criterion complex.

Fertilizer consumption varies widely across states and may not have a definite trend matching with the GCA. About 44.7 percent of the GCA consumes more than 62 percent of the total fertilizer use (fertilizer consumption for TE 2016-17 and GCA for TE 2014-15). For Andhra Pradesh, Punjab, Haryana, Bihar, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal and Karnataka, their share in fertilizer consumption is much higher than the share in GCA (**Figure 2**). Hence, the subsidy based on simply area basis will put farmers at a disadvantage. The ratio between share of fertilizer consumption and share of GCA in Maharashtra, Gujarat, Chhattisgarh, Odisha, Kerala and J&K is either 1 or close to 1, which suggests that farmers in these states will either not benefit or only marginally benefit from the area-based subsidy. The states where the ratio is less than 0.75 will benefit from the area-based subsidy. These include the northeastern states, and rainfed states like Rajasthan and Madhya Pradesh. On the whole, this will put farmers cultivating 45% GCA at disadvantage. While 18% will remain unaffected, 7.4% will benefit marginally and only 28.8% will garner maximum benefit. Besides, the administration of area-based approach of subsidy for DBT may also confront the following challenges:

Seasonal variability in fertilizer application: The two major cropping seasons in India are *kharif* and *rabi*. Fertilizer application during *kharif* is restricted depending upon the water availability; whereas assured irrigation during *rabi* season is associated with relatively higher fertilizer input, especially in intensively cropped areas. The recommended rates of fertilizers and their phasing in different seasons also vary significantly.

Rainfed versus irrigated: About 53% of the GCA in the country is rainfed where the recommended doses of fertilizers are relatively low. In view of uncertain water availability, only basal application of fertilizers in the moist soil zone is preferred. However, both the irrigated and rainfed cropping

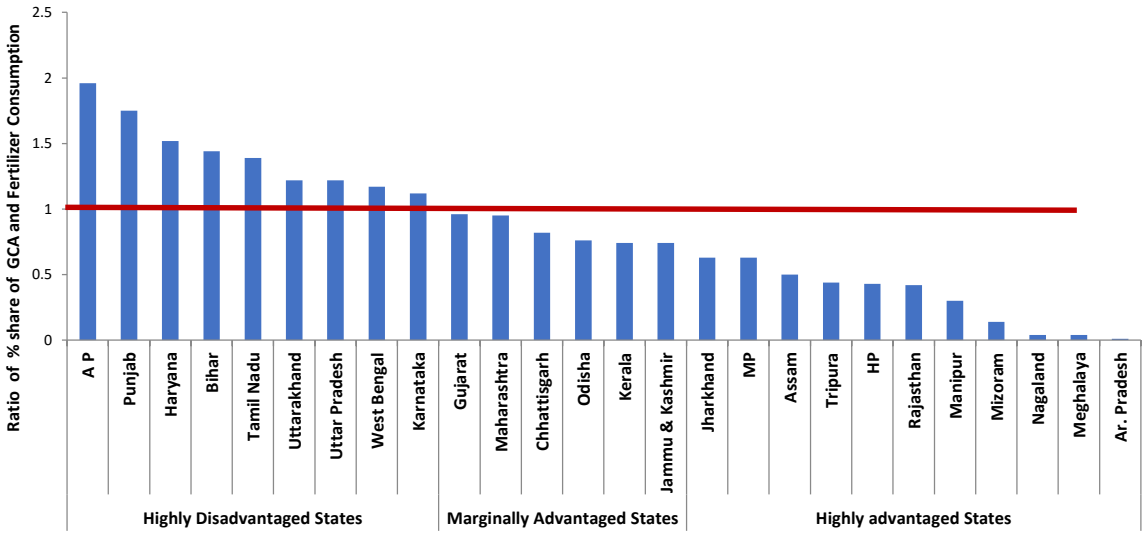

Figure 2. Ratio of share in gross cropped area and fertilizer consumption in different states (Calculations based on total fertilizer consumption (TE 2016-17) and Gross cropped area (TE 2014-15)

may be practiced by a farmer in irrigated as well as rainfed areas depending upon water availability. Thus, deciding judicious rates of fertilizer subsidy for irrigated and rainfed areas will be a challenge.

Crop failure, re-sowing and fallows: Another daunting challenge for estimating fertilizer subsidy on area basis relates to crop failure. An analysis of long-series district-level data on rainfall (20 years) shows that 75-100 districts remain in the deficit to scarce category. In case of no rains or very less rains during the sowing period, farmers leave their fields fallow or resort to re-sowing of some contingency crops applying additional doses of fertilizers and seed of alternate crops. Distinguishing area that remains unsown and/or that under failed crop for estimating fertilizer use would be rather challenging.

Legumes versus non-legumes: It is common to use none or very low amount of fertilizers, especially urea or N-fertilizers, in leguminous crops. While the ecological barriers limit the options for farmers to raise high fertilizer requiring crops in certain regions, yet there are some crops which can be grown successfully despite their relatively higher fertilizer requirement as compared to that of pulses or legumes. Even post-harvest estimates may not help in mainstreaming the DBT of subsidy on fertilizers in such cases, if crops like jowar, bajra or maize are harvested for cob or fodder.

Cropping intensity as a criterion: Cropping intensity is an indicator for profitable use of land resources, but it does not always suggest estimates of fertilizer consumption. The areas growing long-duration crops like sugarcane need much higher quantity of fertilizers as compared to those even with cropping intensity of 200% or above in many states.

Inter-state and intra-crop variations: **Figure 3** depicts the highest and the lowest fertilizer consumption in a given crop in different states. The data are derived from the cost of cultivation summary tables provided by the Directorate of Economics & Statistics, Ministry of Agriculture and Farmers' Welfare. Apparently, the inter-state variation for a crop is very large. For instance, the cost of cultivation data (2014-15) of various crops reveal that fertilizer use in rice varies from 24 kg/ha in Assam to 288 kg/ha in Karnataka. Even during *rabi* season, which is largely irrigated, the fertilizer use in crops like wheat varies from 54 kg/ha in Himachal Pradesh to 247 kg/ha in Punjab. In case of pigeon pea, it ranges from 7.6 kg/ha in

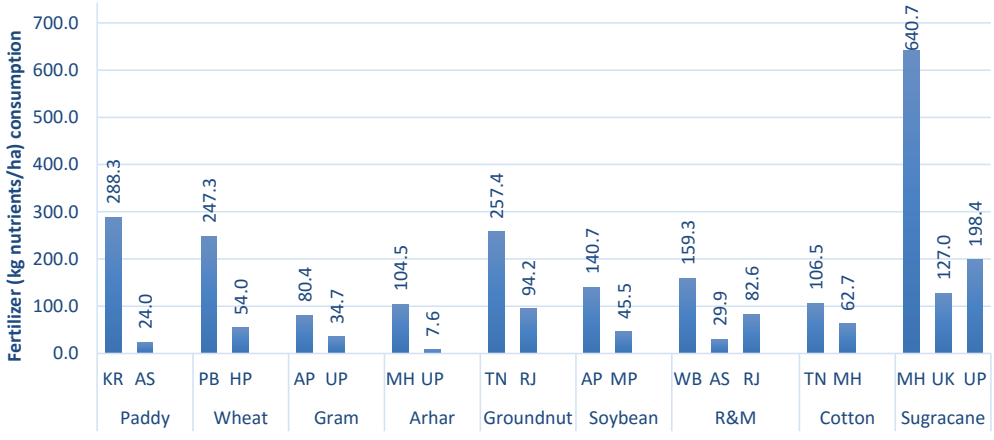

Figure 3. Variation in fertilizer use (kg nutrients/ha) in important crops in different states

Source: MoAFW (2015); https://eands.dacnet.nic.in

Uttar Pradesh to 105 kg/ha in Maharashtra. The states of Maharashtra, Tamil Nadu and Andhra Pradesh use almost 2 to 3 times more fertilizer in sugarcane than do Uttar Pradesh and Uttarakhand.

Intra-state and inter-crop variations: The intra-state and inter-crop variations in fertilizer usage are also very large. For instance, the fertilizer use in different crops in Andhra Pradesh ranges from 9.9 to 550 kg/ha, while in Maharashtra it ranges between 36 to 641 kg/ha (**Table 2**). Pulses invariably use less fertilizers, followed by oilseeds and cereals. Sugarcane and potato receive a higher dose of fertilizers.

Table 2. Intra-state and inter-crop variations in fertilizer use (kg nutrients*/ha)

State	Crop	Fert. use (kg/ha)	State	Crop	Fert. use (kg/ha)	State	Crop	Fert. use (kg/ha)
AP	Sugarcane	550.0	Madhya Pradesh	Groundnut	166.0	Odisha	Groundnut	166.0
	Blackgram	9.9		Pigeonpea	20.0		Greengram	0.1
Assam	Potato	84.6	Punjab	Wheat	247.3	WB	Potato	639.4
	Rice	24.0		Groundnut	161.5		Rapeseed-mustard	159.3
Bihar	Maize	158.4	Rajasthan	Wheat	141.9	UK	Sugarcane	127.0
	Gram	63.18		Greengram	2.3		Wheat	88.1
Gujarat	Groundnut	215.7	Tamil Nadu	Sugarcane	417.5			
	Greengram	30.9		Blackgram	26.9			
Haryana	Paddy	209.2	Maharashtra	Sugarcane	640.7			
	Pearlmillet	62.9		Blackgram	36.0			
Karnataka	Sugarcane	391.3	Uttar Pradesh	Potato	390.6			
	Greengram	37.2		Blackgram	0.6			

*$N+P_2O_5+K_2O$
Source: MoAFW (2015); https://eands.dacnet.nic.in

(ii) Land owner versus lessee

Agrarian structure in India is changing. Absent landlordism and informal leases are on the rise. Data extracted from NSSO reports indicate that in several states the leased-in area has doubled between 2003 and 2013 (**Figure 4**). It is difficult to access the number of tenant cultivators because of informal tenancy in most cases. Nonetheless, the number of lessee cultivators has increased over time, and more than one-third of these are landless, and 56% are marginal land owners. The lessee farmers cultivate over one-fourth of the total operational holdings in some of the states.

It is interesting to note that the land leased-in by pure tenants (landless households) increased by 2.5 times since 1991 (from 12.1% in 1991 to 30% in 2012–13). In some of the states, this number has doubled (**Figure 5**). Such a significant increase in pure tenants underlines the landless households' contribution to food security. In the present system of fertilizer sales, both land owners and tenants can purchase fertilizers at MRP. However, with implementation of DBT (or finally DCT) of fertilizer subsidy on land ownership basis, a large number of tenants will be excluded unless some alternate mechanism is put in place to safeguard their interests.

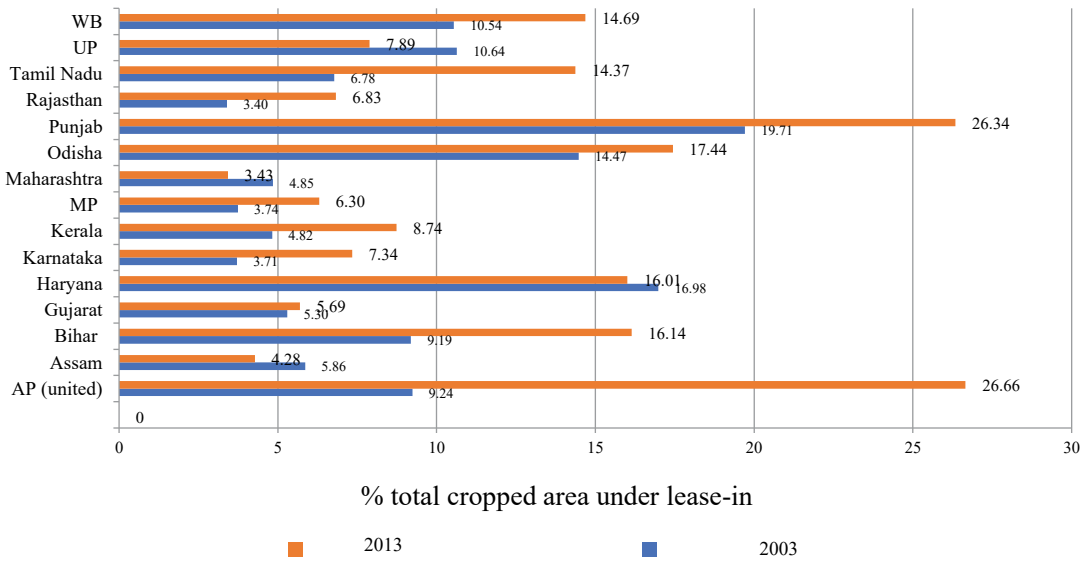

Figure 4. Change in area leased-in under different states

Source: NSSO (2003; 2013)

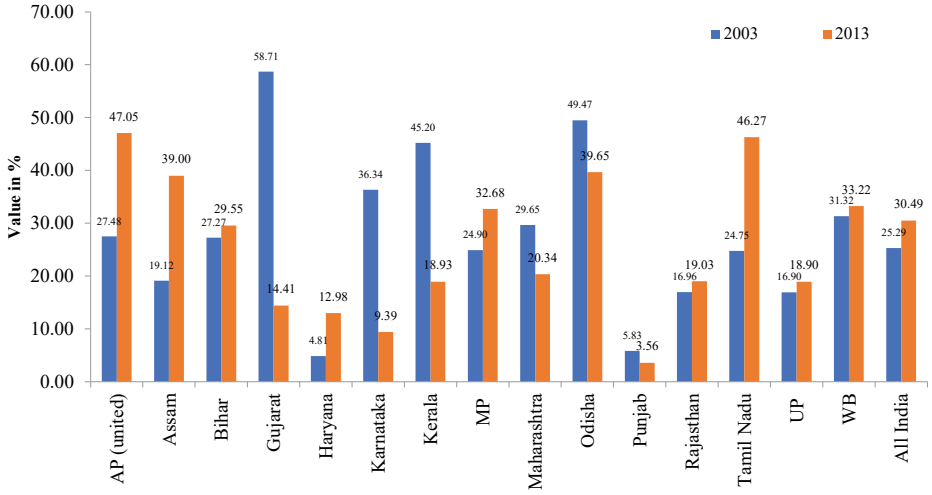

Figure 5. Share of leased-in land by pure tenants in the total leased-in area in different states

Source: NSSO (2003; 2013)

(iii) Upfront payment on market price

DBT for fertilizer subsidy is much more complex than DBT for other schemes. In this case, neither beneficiary nor beneficiary entitlements are defined, and everyone is allowed to purchase subsidized fertilizers. As subsidy amount is more than twice of the subsidized price, a shift from MRP to market price will lead to a huge burden on farmers as they will be required to pay market price upfront. If DBT is implemented for fertilizers alone, farmers practicing organic farming or using less fertilizer will not benefit much. On the other hand, farmers using more fertilizers will benefit more, which may lead to excessive use of fertilizers.

(iv) PoS machine-related issues

A case study conducted in Yamunanagar district of Haryana by Agricultural Economics Research Centre, University of Delhi revealed that nearly half of the PoS machines were not working perfectly. Apart from this, issues related to authentication of Aadhar Cards of farmers, particularly after upgradation of PoS software, were also noticed. Some other problems identified include: (a) session 'timed-out' problems (nearly 10 minutes) with the newer version of software, (b) network or server-related issues in some regions, (c) hardware-related issues like small keypad, low performance of battery, *etc*. (d) vanishing of ink of the printed receipt in few days, and (e) hanging of software, taking too much time as re-login is required. These problems need to be resolved with necessary upgradation of PoS machines.

(v) Problems in biometric authentication

The above-mentioned case study further underlines a few more problems associated with Aadhar Card authentication on PoS machines, for example, farmers not bringing Aadhar Card, sending their representatives (i.e., family member, neighbour or worker) to purchase fertilizers, and fading away of thumb impression due to excessive agricultural work or aging. Similarly, there is no option in the PoS machine for information on leased-in/leased-out land. As the retailers don't wish to lose customers, they sell fertilizers without any authentication. Obviously, such entries are adjusted against someone other than the actual buyers. In some cases, diversion of subsidized fertilizer (urea) to non-agricultural purposes (for example plywood manufacturing) has also been noticed.

7. Probable Solutions

The possible solutions that emerged from the discussion in this meeting are as follows:

- It is important to define beneficiaries of fertilizer subsidy, as the fertilizers are sold in 'no denial mode' and everybody (farmer or non-farmer) is entitled to avail the subsidy. It would be better if the benefit primarily goes to smallholders, and appropriate incentives are introduced to encourage efficient use of plant nutrients.
- While consensus on phasing out the fertilizer subsidy is yet to evolve, rationalization of the subsidy regime is unavoidable. Raising price of urea through its inclusion in the NBS would help reducing fertilizer subsidy, as urea alone accounts for 67% of the total fertilizer subsidy. Also, this is essentially needed to improve the health of domestic industry, besides encouraging balanced use of fertilizers. For this, informed discussion among stakeholders is needed, especially, farmers need to be informed about benefits of bringing urea under the NBS.
- Reforms are unavoidable, as the fertilizer subsidy bill has reached about Rs. 80,000 crores in 2019-20. The alternate products like microbial consortia, bio-stimulants enriched compost, plant growth promoters, *etc*., and their specifications should appropriately be included in Fertilizer (Control) Order, 1985 and Pesticide Management Bill, 2020 to promote their trade and commercialization, so as to substitute a part of the fertilizers through these alternate sources.
- Soil Health Card (SHC) may prove useful in successful implementation of DBT of fertilizer subsidy, as it would help to rationalize fertilizer use and facilitate customization of fertilizers.

So far, 220 million SHCs have been distributed, and the experiences in implementation of SHC scheme has led to initiation of the model village programme involving field demonstrations for soil test-based fertilizer usage. However, robustness of SHC has to be ensured, as any reform implemented on the basis of faulty SHC may bring-in more problems than solutions.

- The DBT of fertilizer subsidy in its present form serves very limited purpose of monitoring real-time sale of fertilizers. It does not promote balanced fertilization. There is a need to link DBT with adoption of best management practices including judicious use of fertilizers to achieve higher nutrient use efficiency.
- The DBT may not be restricted to fertilizers. It should rather include use of organic manures, green manure, biofertilizers, *etc.* to encourage integrated plant nutrient supply and sustain higher crop yields without impairing the soil health. Amendments for problem soils, for example gypsum and liming materials, may also be included for benefit of farmers cultivating sodic/acid soils. An e-wallet kind of tool may be introduced to enable the farmers to avail benefits of subsidy for timely procurement of the agri-inputs without any financial hardships.
- The Prime Minister Fasal Bima Yojana (PMFBY) and agriculture credit are area-based schemes. These could be used to integrate land records that may further be integrated with SHC to access fertilizer subsidy for individual farmers on area basis. However, the area-based fertilizer subsidy may not be advisable in view of diversity in cropping intensity, fertilizer consumption and productivity levels across states as well as within a state.
- A composite model for DCT of fertilizer subsidy may be worked out. The district-level fertilizer consumption data and cropped area may help to estimate a minimum value of subsidy for each district. The ICAR-KVK network may contribute enormously towards this exercise. A comprehensive study may be assigned to ICAR by DAC&FW to suggest a minimum value of cash transfer as fertilizer subsidy for each district. The minimum threshold so arrived may be given upfront to each farmer in the district, and remaining amount, if any, may be reimbursed on the basis of actual fertilizer use.
- Care must be taken while transferring fertilizer subsidy in cash exclusively based on entitlement/ right of records due to size of holdings, as it omits the principle of efficiency and equity to those who use fertilizer the most and need the Government support for the same. In most cases, small farms are better managed with respect to input use. Smallholders often use higher amount of fertilizers to enhance their production from the limited farmland. Fertilizer subsidy in cash on area basis may be a limiting factor for them in enhancing production.
- The lessee farmers require alternative arrangement away from their entry in any form in the land records. The Andhra Pradesh model of "loan eligibility cards" may be broadened under the framework of Model Agricultural Land Leasing Act, 2016 proposed by the NITI Aayog for benefit of the lessee farmers.
- DBT is enacted with some specific objectives, and it is not linked with NBS. It is one of the ways to offer direct support to farmers. However, disbursement of subsidy through DBT should be performance-linked, and not unconditional. For this, identification of performance indicators and evolving an effective mechanism for their regular monitoring is necessary.

8. Major Recommendations

Based on the deliberations and detailed discussion the following policy recommendations emerged:

- At present, fertilizers are sold in 'no denial mode' *i.e.*, everybody is entitled to purchase fertilizers and avail the benefit of subsidy offered thereon, irrespective of their use for agricultural or non-agricultural purposes. The effective implementation of DBT would essentially require identification of the beneficiaries entitled for fertilizer subsidy, thus necessitating the definition of beneficiary-be it land owner or cultivator. The definition proposed by National Commission on Farmers, 2006 may be considered for this purpose.

- For ultimate culmination of DBT in to DCT to the farmers, land leasing issues need to be addressed immediately. The states must consider proactively to enact new land tenancy act or update the existing laws based on the Model Agricultural Land Leasing Act, 2016 proposed by the NITI Aayog. Till then, the subsidy may go to land owners. As the tenancy is mostly informal, it may adapt to the policy change.

- Present budgetary provision of Rs. 71 thousand crores for fertilizer subsidy is inadequate to disburse the subsidies (backlog + current) to fertilizer industry, leading to undesirable hardships in managing day-to-day affairs as fertilizer production is a capital-intensive process. Matching budget allocation should, therefore, be ensured for effective implementation of DBT. Also, all efforts may be made to ensure weekly disbursement of subsidies as envisaged in the existing DBT policy.

- In order to achieve full benefits of NBS, there is need to bring urea under its ambit or gradually raise the prices of urea. Exclusion of urea from NBS and its highly subsidized price is one of the major reasons for unbalanced fertilizer use. Domestic urea industry suffers badly if the subsidy is not disbursed in time, as only 23% of the urea cost is recovered through MRP (remaining 77% through subsidy received from Department of Fertilizers). A change in pricing of urea is a pre-requisite for the success of DBT/DCT.

- With adequate budget allocation for fertilizer subsidy, change in urea pricing and disbursement of subsidies on weekly-basis, the DBT in its present form may be continued till the modalities for DCT are finalized. The existing IT infrastructure has to be strengthened. Enforcing retailer accountability and Aadhar seeding of land records and SHC may prove extremely beneficial.

- For success of DCT, digitization of land records should be completed at the earliest. Also, the subsidy amount may be paid to farmers in advance through e-wallet to avoid hardship on account of purchase of fertilizers at market prices. Such advance cash transfer should be made 15-30 days prior to normal sowing time to ensure that the money is spent for purchase of fertilizers only. Farmers may be given choice to use this amount for purchase of fertilizers, organic manures, green manure seed or other nutrient sources. In this transparent mechanism, the beneficiary will be able to know the government spending on his/her fertilizer consumption.

- In view of the majority (86%) of farm holdings belonging to marginal and small category, any ceiling based on the holding size may not be advisable for availing subsidy. It should be given per hectare basis irrespective of the holding size, states, agro-climatic conditions or crops grown. Yet, the DCT should be performance-based and not unconditional. Good agronomic practices

e.g., soil test-based fertilizer use, integrated nutrient management, efficient use of irrigation water, residue recycling, etc. need to be incentivized using ICTs so as to enhance fertilizer use efficiency and sustain high productivity.

- Linking DCT with SHC is projected to encourage balanced use of plant nutrients and restoration of soil health. For this, correctness/robustness of information provided in the SHC and timely availability of all deficient nutrients in the market must be ascertained. General fertilizer recommendations for different crops prescribed by the states need to be revised at the earliest. Customized fertilizers as per the SHC recommendations may be made available.
- In view of the widespread deficiency of Zn and B in soils, it is suggested to mandatorily fortify some of the urea allocated to the regions predominated with deficiency of these micronutrients.
- Research on fertilizer needs to be encouraged to look for novel alternatives with higher use efficiency. Sequential reforms are needed to decontrol fertilizers and improve the health of domestic fertilizer industry. A roadmap should be prepared for bringing-in reforms in fertilizer sector.
- In order to enhance farmers' awareness regarding the ill-effects of indiscriminate use of fertilizers and the benefits of balanced fertilization, extensive field demonstrations and farmer education programmes need to be undertaken involving state extension machinery, KVKs and fertilizer industry. Such a campaign is essentially required to ensure effective use of subsidy by farmers when the same is remitted to their accounts through DCT.

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