

# Reforms in fertilizer subsidy in India: The way forward

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## Background

The Government of India (GoI) has supported farmers in terms of price and agriculture inputs over the past several years. This has not only contributed to the start of a [green revolution](#) but also increased the use of fertilizer by farmers and

resulted in higher yields.<sup>1</sup> India is currently the second-largest consumer of fertilizer globally after China.<sup>2</sup> The following table illustrates the GoI's expenditure on various fertilizers from 2016 to 2019, as per data on 26<sup>th</sup> June, 2019.

**Table-1 (in billion USD)<sup>3</sup>**

Year	Gross subsidy
2016-17	9.9
2017-18	9.7
2018-19	10.3
2019-20 (on 26 <sup>th</sup> June, 2019) <sup>4</sup>	4.1

The government's role in shaping the fertilizer landscape goes back to 1957 when it introduced the Fertilizer Control Order (FCO) to regulate the sale, price, and quality of fertilizers in the market. The Movement Control Order (MCO) followed this

in 1973 to regulate the distribution of fertilizer.<sup>5</sup> The GoI introduced a [range of fertilizer subsidies](#) in 1977 to ensure stability in price and efficient distribution to farmers.

1. Price support for agriculture includes not only the subsidies provided by GoI (on inputs, such as fertilizers) but also in other forms, such as Minimum Support Price (MSP), which provides farmers a minimum price guarantees for their agriculture produce.

2. [Standing committee on chemicals and fertilizers \(2017-18\)](#)

3. [Lok Sabha reply on fertilizer subsidy to famers](#); conversion @ 1 USD= INR 71

4. Spending on fertilizer and its use ramps up toward the end of the calendar year in India.

5. <https://cfqcti.dacnet.nic.in/dutenf.html> and <http://fert.nic.in/page/work-allocation-0>

# Challenges in fertilizer subsidy and government reforms

Over the years, the distribution of fertilizer in India became prone to “leakages”.<sup>6</sup> [The Economic Survey of 2015-16 estimated that 65% of the fertilizer distributed did not reach the intended beneficiaries](#)—small and marginal farmers.<sup>7</sup> The government undertook several initiatives to bring about increased transparency in the fertilizer distribution system. These include advances in technology and initiatives, including the [Fertilizer Management System \(FMS\)](#) introduced in 2007 and the [coating of urea](#) with extract of *neem* (*Azadirachta indica*) in 2008.<sup>8,9</sup> The government continued to reform its fertilizer subsidy distribution by including the fertilizer subsidy under the Direct Benefit Transfer system (DBT) in 2016–17.

DBT in fertilizer (DBT-F) is a modified subsidy payment system under which the government remits a subsidy to fertilizer companies after retailers have sold fertilizer to farmers through successful [Aadhaar-based biometric authentication](#).<sup>10</sup> Currently, fertilizer companies receive their subsidy every week after they submit data on the sale of *Aadhaar*-based fertilizer to the Department of Fertilizers (DoF).

MSC’s [recent assessment highlights](#) that the DBT-F system has significantly improved from the

pilot phase and has been operating effectively across India. The GoI saved [USD 1.54 billion \(about INR 108 billion\) during the first year when DBT-F was implemented](#). DBT-F has facilitated [real-time tracking](#) of fertilizer movement, demand estimation, and stock availability. It has also reduced recordkeeping and paperwork for fertilizer dealers.

Despite improvements in fertilizer distribution in India, [several challenges remain](#). These include:

- 1 The lack of a dedicated fertilizer beneficiary database;
- 2 The absence of a cap on fertilizer entitlements that allows farmers to buy any amount, irrespective of need;
- 3 The different levels of subsidy provided to the fertilizer manufacturing plants based on their cost of production;
- 3 The disproportionate use of urea as opposed to other types of fertilizer, such as fertilizers containing phosphorous (P) or Potassium (K) nutrients, or both.

6. Fertilizer especially urea is diverted to across the borders to neighbouring countries such as Nepal and Bangladesh and for use in industries such as explosives, automobile, among others.

7. <https://www.indiabudget.gov.in/budget2016-2017/es2015-16/echapvol1-09.pdf>

8. Urea, also called carbamide, is the diamide of carbonic acid. Its formula is H<sub>2</sub>NCONH<sub>2</sub>. Urea has important use as a fertilizer.

9. Urea is coated with the extract of *neem* (*Azadirachta indica*) seeds. Neem-coated urea minimizes loss due to leaching and prevents its misuse for industrial purposes as it slows the release of urea when applied

10. *Aadhaar* is India’s national identification system, which uses citizens’ biometrics (<https://uidai.gov.in/>). When a farmer authenticates using *Aadhaar*, the fertilizer retailer requests the farmer’s *Aadhaar* number, which they then enter into the PoS device in the farmer’s presence. The farmer then applies their finger to the PoS device for biometric authentication.

We will address each of these [challenges](#) in more detail in the following section:



#### Lack of a dedicated fertilizer beneficiary database:

Unlike other subsidy programs of the GoI including fuel and food, the fertilizer subsidy is universal and does not rely on a centralized beneficiary database. In its current design, anyone with an eligible identity card<sup>11</sup> can obtain fertilizer from a designated dealer across the country. Since fertilizer subsidy lacks a dedicated database, the government will continue to struggle to accurately target the intended beneficiaries and further reduce its expenditure on the subsidy.

Relatively new programs that support farmer incomes, such as “[PM Kisan](#)” represent promising initiatives of the GoI to work with states to build a farmer database. Only time will tell if the introduction of these support programs will help the government identify farmers and improve targeting of its agriculture subsidies.



#### Uncapped entitlement:

Under the fertilizer subsidy, farmers can purchase an unlimited number of fertilizer bags. The fertilizer requirement per farmer varies widely across the country and depends on the type of climate, land—both irrigated and un-irrigated, soil, and the crop they farm. The complexity of estimating the fertilizer required by farmers has thus far precluded the GoI from capping the fertilizer entitlement. Due to the lack of a dedicated farmer database and limits on entitlements per farmer, the government has found it difficult to assess and control the production and distribution of fertilizer in the country. It is, therefore, necessary to assess and limit the amount of fertilizer a farmer can buy in a particular farming season.



#### Varying provision of production plant-wise subsidy:

An added layer of complexity is introduced to the system because the urea subsidy to the manufacturers varies depending on the cost of production at their manufacturing plants. The production costs for plants vary widely based on the use of natural gas—either domestic gas or LNG or both—or other modes of inefficient and costly feedstock, such as naphtha. Some production plants also use a combination of both natural gas and costlier feedstock. The cost of production per unit of urea, therefore, varies from plant to plant. Currently, the GoI calculates the subsidy amount as the difference between the delivered cost of urea at the farm gate and the price payable by the farmer. Since the delivered cost of urea at the farm gate for fertilizer companies differs due to variation in production costs, the subsidy amount is also different for fertilizer plants.

Ironically, the manufacturing plants that use inefficient and costly feedstock receive a higher subsidy because they have a higher cost of production as opposed to manufacturing plants that use efficient feedstock, such as natural gas. The government, therefore, needs to change its urea subsidy policy to incentivize efficient fertilizer manufacturing plants and discourage inefficient and costly manufacturing plants.



#### Indiscriminate use of urea:

The higher subsidy on urea, as compared to other fertilizers, makes it cheaper and thus promotes its overuse. This increases the government’s subsidy expenditure. This also disturbs the N-P-K ratio in the soil, which hurts crop quality and the overall farming ecosystem.

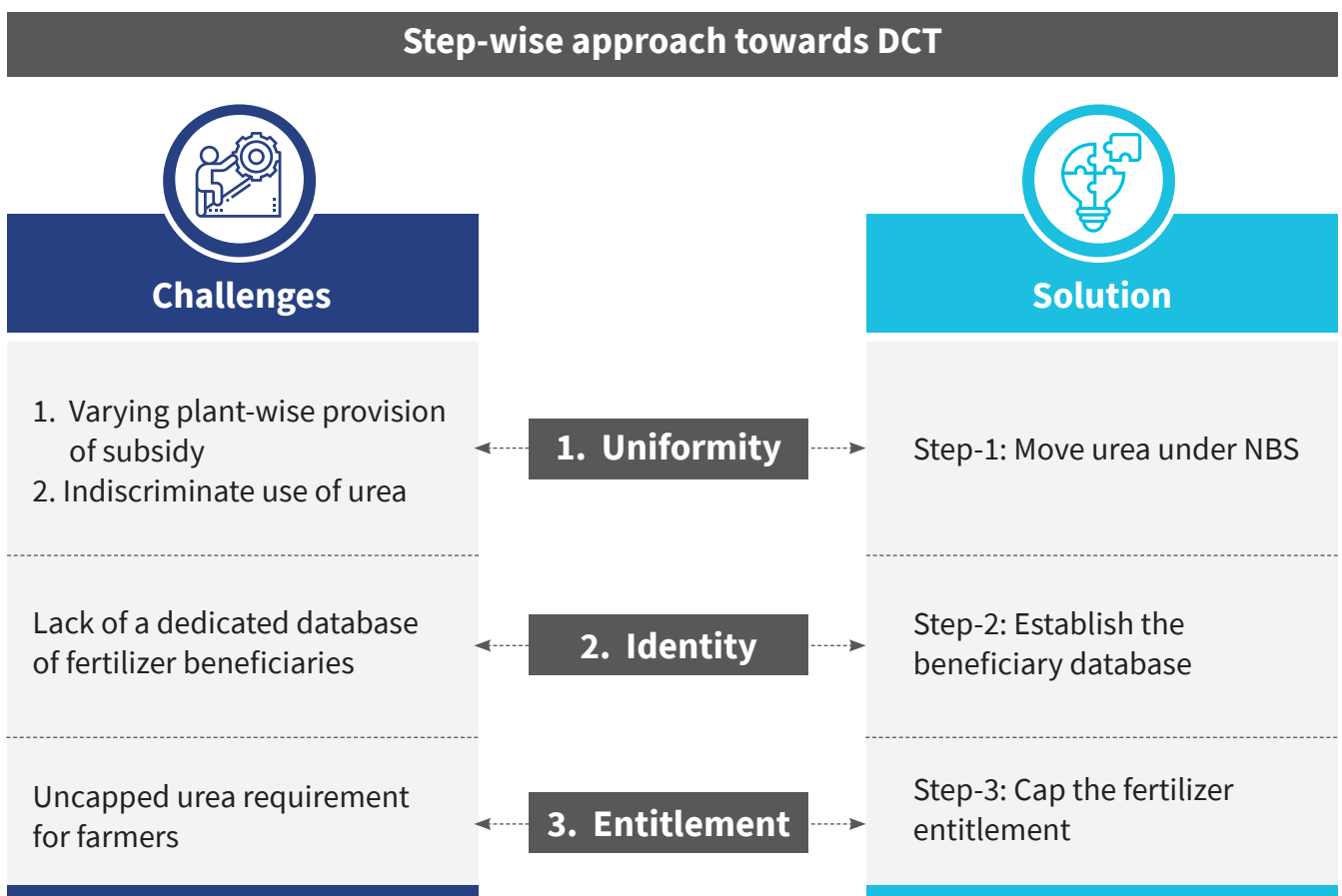
11. Either the *Aadhaar* card, a Kisan Credit Card provided by banks, or the voter identity card

Recently, [policymakers have discussed transferring the fertilizer subsidy directly to the bank accounts of farmers](#) rather than to fertilizer companies every week. The proposed direct cash transfer (DCT) is believed to nudge farmers to use fertilizer judiciously and efficiently while reducing program administration costs for the GoI. However, three main design barriers must be addressed before defining the blueprint of DCT for fertilizer subsidy.

The first barrier relates to the complex subsidy calculation mechanism that varies for each urea plant, as mentioned in point c above. This makes it difficult for the GoI to standardize the subsidy to be paid to each farmer. The second barrier involves identifying eligible farmers—both land-owning farmers and tenant farmers—to precisely

target recipients of the fertilizer subsidy. The last and most difficult barrier to overcome is building a model to calculate and cap the fertilizer requirement.

Until these design barriers are resolved, it will be difficult to build an optimal and efficient DCT model. Although the implementation of the DCT model will see an emergence of [similar challenges that other government cash transfer programs face](#). MSC believes that the transition to [DCT is inevitable and is the next logical step](#) to improve the efficiency of the fertilizer subsidy distribution system. However, it should follow a gradual approach and [resolve the barriers in a planned](#), stepwise manner. The section below covers recommendations to address each of these barriers.



## Step-1: Moving urea under the nutrient based-subsidy program

The urea subsidy constitutes approximately 70% of the total fertilizer subsidy. The remaining 30% is allocated to non-urea fertilizers, that is, phosphorous and potash (P&K)-based fertilizers. Most fertilizer reforms in the country have related to P&K-based fertilizer prices—the government has deliberately controlled urea prices to protect farmers from price shocks. The government decontrolled P&K-based fertilizer prices in 1991. It subsequently introduced the nutrient-based subsidy (NBS) program for P&K-based fertilizers in 2010.

Under the NBS policy, the Gol announces a fixed rate of subsidy in INR per kilogram on each nutrient of subsidized P&K-based fertilizers on an annual basis—Nitrogen-N, Phosphate-P, Potash-K, and Sulfur-S. The per-kilogram subsidy rates on the nutrients N, P, K, S are converted into a per-ton subsidy and paid to the P&K-based fertilizer manufacturing plants. The NBS policy has helped the government bring uniformity to subsidy prices of P&K-based fertilizers and reduced the subsidy budget considerably.

Currently, the Gol follows a dual policy regime to calculate subsidies for urea and P&K-based fertilizers. Urea is not under the purview of the NBS program and is subject to tighter price control. Therefore, the price of urea is far less than P&K-based fertilizers. If urea is brought under NBS, the Gol should be able to introduce uniformity to the calculation of urea subsidy for fertilizer manufacturing plants. Under NBS, all urea-manufacturing plants would receive a fixed subsidy rate on an INR per kilogram basis on the Nitrogen (N) content of subsidized urea, a deviation from the current system whereby they are paid on the cost of production. Bringing

urea under the NBS is the necessary first step toward DCT, as it will enable uniformity in the mechanism to calculate subsidies. However, it is important to note that including urea under NBS might increase the price burden on farmers.

## Step-2: Fixing the beneficiary database

Currently, the number of actual farmers in India remains elusive. The [agriculture census 2015-16](#) cites the total number of operational holdings<sup>12</sup> in the country at 146 million. The government's program to support farmer incomes, PM Kisan, uses the 2015-2016 agriculture census to estimate the number of farmers and corresponding annual budget for the program. Today, [approximately 90 million farmers have registered under the PM Kisan program](#). The government has been struggling to identify the remaining 56 million farmers under the program.

Another farmer-focused initiative launched by the Gol is the [Soil Health Card \(SHC\)](#) program<sup>13</sup>, which estimates the total number of farmers in the country at 125 million. This number is significantly different from the amount estimated by both the agriculture census and the PM Kisan program. The farmer count under the agricultural census, PM Kisan, and the SHC program highlight the uncertainty around the total number of land-owning farmers in India. Moreover, the databases created under these programs do not count tenant farmers who informally lease land to cultivate crops.

The [70<sup>th</sup> round of the NSSO Report estimates average tenancy around 10.4%](#) of the farmer population in India with higher tenancies in Andhra Pradesh (35.7%), Bihar (22.7%), Odisha (16.9%), Haryana (14.8%), West Bengal (14.7%), and Tamil Nadu (13.5%). Most Indian states have not created digitized records of tenant farmers.

12. Operational land holding is land used wholly or partly for agricultural production and operated (directed/managed) by one person alone or with the assistance of others, without regard to title, size or location.

13. The Soil Health card program is a government initiative that provides farmers with the status of soil nutrients in their holdings and advice on the amount of fertilizer they should apply to maintain soil health in the longer term.

However, the Andhra Pradesh government recently passed the [Crop Cultivator Rights Act 2019](#) to formally register tenant farmers and provide agriculture credits and other farming incentives.

MSC believes that the best way to create a robust farmer database is to use the existing PM Kisan database along with the database of registered tenant farmers, if available, in each of the Indian states. Other states that lack a registered tenant database should make policy provisions to formalize tenancy and create a digital database. The proposed approach might exclude the tenant farmers until the time the remaining states create digital databases of tenant farmers.

### Step-3: Capping the fertilizer entitlement

Once a comprehensive and accurate farmer database is created, the next challenge involves finalizing the fertilizer subsidy entitlement. Capping the fertilizer subsidy is a complex procedure because fertilizer requirements vary significantly across India depending on the crop grown, the agro-ecological region, land size, soil type, land type—whether irrigated or unirrigated, and the crop season—whether Rabi, Kharif, or Zaid. A standard fertilizer entitlement for all farmers across India is impractical.

**Therefore, the government should consider a calculation mechanism with the following design principles to estimate farmer entitlements:**

- 1 The prevalence of crops grown in a certain state or district and area cultivated under each crop should be used to determine the top crops of that particular district or state;
- 2 SHC data, which provides the general fertilizer recommendations (GFR) of fertilizer nutrients (NPK) per hectare for the major crops cultivated in a particular district or state;

- 3 The weighted average area of production and GFR per hectare for the major crops in a district or state should be used to calculate the fertilizer subsidy entitlement per hectare. This could then be converted into a cash equivalent amount based on the existing rates of fertilizer subsidies under NBS;
- 4 The subsidy amount thus calculated can be then transferred to the farmer ahead of every farming season through the [proposed DCT model](#).

The effectiveness of the proposed mechanism is limited to the availability of accurate and contemporary data. In addition, the mechanism to calculate the fertilizer entitlement does not account for the change in cropping patterns in a particular state.



# Piloting before roll-out at a national level

Once the GoI has addressed the above barriers, MSC recommends conducting a pilot to determine the efficacy of the proposed DCT model. The DBT-F pilot conducted in Krishna and West Godavari districts of Andhra Pradesh provided the GoI with invaluable insights that were used to improve the fertilizer distribution system and scale it at the national level effectively.

Based on digitized land records, the number of farmers, and uniformity of state topography, MSC recommends piloting the proposed model of fertilizer distribution in any of the following four states, all of which have a high percentage of digitized land records that can find use as the basis for the beneficiary database.

## Haryana

- Land record digitization: **93%**
- Number of operational landholdings: **1,628,00**

## Punjab

- Land record digitization: **94%**
- Number of operational landholdings: **1,093,000**
- Implementing [DBT in electricity](#) to farmers

## Telangana

- Land record digitization: **99%**
- Number of operational landholdings: **5,948,000**
- Using land records database to implement [Rythu Bandhu](#), a state-run income transfer program for farmers and PM-KISAN

## Andhra Pradesh

- Land record digitization: **97%**
- Number of operational landholdings: **8,524,000**
- Rationalized tenancy through the [AP Crop Cultivator Rights Act, 2019](#)

We propose the first pilot to commence in Andhra Pradesh as it has the pre-requisite number of farmers in its farmer database, as well as a tenant database.



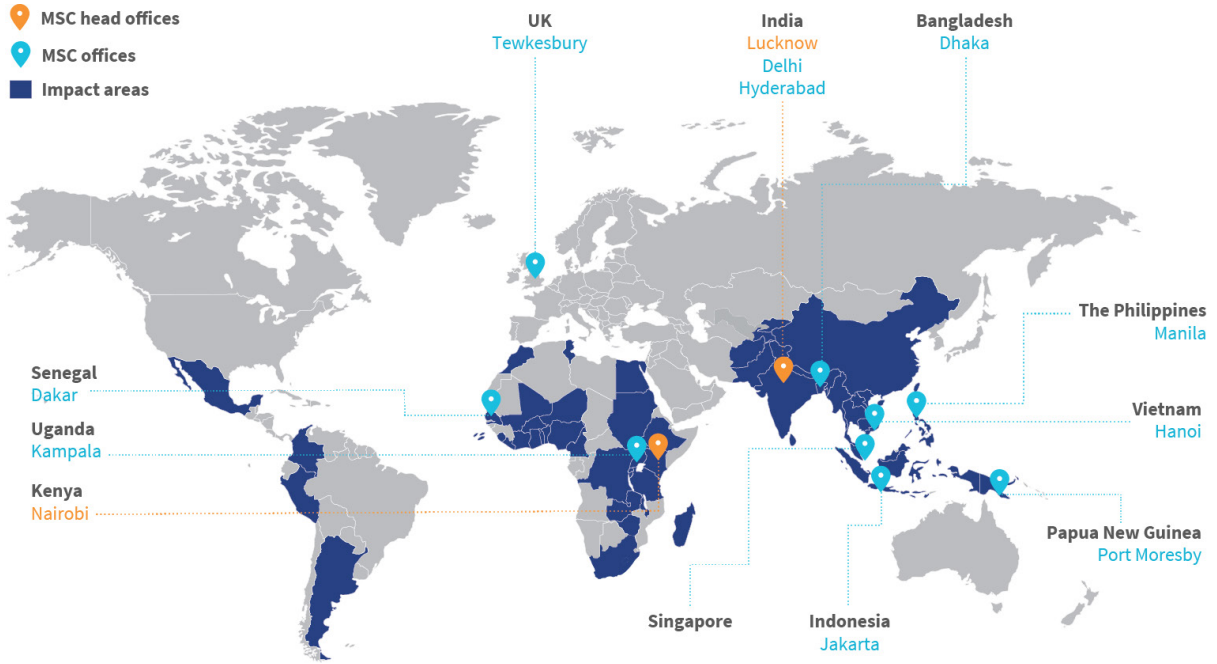


## Conclusion

The framework outlined in the [Economic Survey 2015-16](#) suggested both in-kind and cash transfers as potential solutions to address challenges the fertilizer distribution system has presented. Over the past few years, the GoI has made continuous efforts to streamline the in-kind distribution of fertilizer, but the GoI has yet to pilot a cash transfer model in fertilizer distribution. Further reforming the Indian fertilizer subsidy regime is a daunting task given the lack of availability of a robust farmer database, uncapped fertilizer

entitlements, varying degrees of fertilizer subsidies, and disproportionate use of urea.

This document has outlined detailed recommendations based on MSC's extensive work on the DBT-F regime and other DBT programs, both cash and in-kind modalities. The GoI should expedite the decision-making process on the DCT model, thereby completing its digital transformation journey of the Indian fertilizer subsidy regime.



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