

DISSERTATION

A Dissertation submitted for impartial fulfillment of the requirement for the award of the for56<sup>th</sup>  
PGDCBM Course at VAMNICOM, PUNE

***A study on fertilizer business and it's impact on LAMPCS in Koraput  
district of Odisha***

Submitted by

**PRACHITA JENA**

ROLL NO 5615

Under the Guidance of

**Shri. A.K Tiwari**

**VAMNICOM PUNE**

Submitted to  
The Programme Director

**VAIKUNTH MEHTA NATIONAL INSTITUTE OF COOPERATIVE MANAGEMENT**

**(A Grant-in-aid Institution under Ministry of Cooperation, Government of India)  
Ganeshkhind Road, Near Pune University,  
Pune – 411 007, Maharashtra, India**

## Index

<b>Sno.</b>	<b>Topic</b>	<b>S no.</b>
1	Acknowledgement	5
2	Certificate	6
3	Declaration	7
4	Executive summary	8
5	Introduction	9-11
6	Objective and methodology	11
7	Review of literature	12- 13
8	LAMPCS Scheme	14
9	MARKFED	15- 16
10	Existing fertilizer supply and practices	16- 19
11	DBT and Epos	25- 26
12	Application	27- 30
13	Fertilizer policy in India	30- 37
14	B component sale of fertilizer	38- 46
15	Analysis	46
16	Conclusion	47

## ACKNOWLEDGEMENTS

I would like to place on record my sincere thanks to Dr. Hema Yadav, Director, Vaikuth Mehta National Institute of Cooperative Management for her constant motivation in completing this work successfully.

I also wish to express my gratitude to Prof. S.Y. Deshpande, Head, Centre for Cooperative Management and Programme Director, 56<sup>th</sup> Post Graduate Diploma in Cooperative Business Management Course, VAMNICOM, PUNE, for his help in my dissertation.

At the outset, I gratefully acknowledge the constant encouragement, able guidance, incisive comments, adept and meticulous correction and academic acumen of my research guide Sri AK Tiwari, VAMNICOM, PUNE, which helped me to carry out the dissertation work successfully. Her goodwill, bounteous wishes me are highly instrumental in the accomplishment of the dissertation. I sincerely and whole heartedly thank her for all the help and cooperation that I have received from her during the course of my dissertation study.

I am grateful to the Secretary and Board Members of the LAMPCS of Koraput district for their cooperation in data collection.

My thanks and appreciations also go to my colleagues, friends and family members in developing the dissertation and people who have willingly helped me out with their abilities.

Ms.Prachita Jena

## **CERTIFICATE**

This is to certify that the Dissertation entitled **“A study on fertilizer business and it’s impact on LAMPCS Of Koraput district of Odisha”** is an original research work carried out by Prachita Jena under my guidance and supervision. No part of this work has been submitted for any other degree earlier.

Date: 15.02.2023

Place: Pune

Shri. A K Tiwary  
Faculty VAMNICOM

# DECLARATION

I hereby declare that the dissertation entitled **“A Study on fertilizer business and it’s impact on LAMPCS Of Koraput district of Odisha”** is the outcome of research work carried out by me under the guidance of Sri AK Tiwari, Faculty, Vaikunth Mehta National Institute of Cooperative Management, Pune, Maharashtra. I further declare that this dissertation has not been submitted previously for the award of any degree either in this Institute or any other Institute.

Date: 15.02.2022  
Place: Pune

Prachita Jena  
Trainee Office

## EXECUTIVE SUMMARY

The Cooperative sector plays a vital role in the economic development of the country and hence it has been recognised as an integral part of our national economy. The Cooperative movement, which is the largest Socio-economic movement in the world, has contributed significantly to the alleviation of poverty, creation of productive employment as well as the enhancement of social integration in the country. The study is based on the data collected from LAMPCS of Koraput district of Odisha. Business activities, analysis of growth, performance, and profitability has been studied during the study period.

In this study an attempt has been made to study the strength weakness, opportunities and threat of the fertilizer distribution system with an idea to take policy decisions to strengthen the system and also to convert weakness to opportunities. While executing the distribution system proper watch to be given on the factors concerning for success of the distribution system.

Based on the findings of the study and conclusion drawn, the following policy options are formulated not only for proper distribution of fertilizer to the beneficiaries but also for improvement in the use of fertilizer and its intake by the crops. Fertilizer Distribution National Productivity Council, Bhubaneswar. The non-availability of different types of fertilizer (Nitrogenous, Phosphoric and potassium) in time with the farmers, the fertilizer used in crops becomes unbalanced which affects productivity. The fertilizer manufacturers should be advised to supply the fertilizer before 15 days of the showing of the crops. Fertilizer is applied to the plant at a particular stage of growth, due to non-availability of fertilizer in time, the farmers miss the stage of growth where fertilizer is to be applied, and as a result total use of fertilizer per hectare becomes less than requirement which reduces productivity

# 1.INTRODUCTION

Agriculture is the backbone of Indian economy. It has gained importance to meet the requirement of over a billion people of the country. Green revolution is an attempt to make the country self sufficient in this regards. Requirement of fertilizer thus, has been the demand of time to increase the food grain productivity. Marketers, including private, public and cooperative sectors are setting their tone to make the right products available to the right consumers at the right place and at the right time of need. The article presents a brief literature on fertilizer marketing in India and its associates.

## 1.1The Cooperative Movement in India –

A Brief History Even before formal cooperative structures came into being through the passing of a law, the practice of the concept of cooperation and cooperative activities were prevalent in several parts of India. Village communities collectively creating permanent assets like village tanks or village forests called Devarai or Vanarai was fairly common. Similarly, instances of pooling of resources by groups, like foodgrains after harvest to lend to needy members of the group before the next harvest, or collecting small contributions in cash at regular intervals to lend to members of the group viz., Chit Funds, impounded water by putting up bunds and agreed to ensure equitable distribution of water, as well as harvesting were yearly partnerships of peasants to cultivate jointly, and distribute the harvested produce in proportion to the labour and bullock power contributed by their partners, were similar instances of cooperation. The agricultural conditions and absence of institutional arrangements to provide finance to agriculturists during the latter part of the nineteenth century led to mounting distress and discontent. The Famine Commission of 1880 and 20 years later, the Famine Commission 1901 both highlighted the deep indebtedness of the Indian farmer, resulting in many cases in his land passing into the possession of the money lending classes. The Deccan Riots and the prevailing environment of discontent resulted in the government taking various initiatives but the legislative measures did not substantially improve the situation. The proposal for agricultural banks was first mooted in 1858 and again in 1881 by Mr. William Wedderburn the District Judge of Ahmednagar, in consultation with Justice M.G. Ranade, but was not accepted. In March 1892, Mr. Frederick Nicholson was placed by the Governor of Madras Presidency (for enquiring into the possibility) of introducing in this Presidency, a system of agricultural or other land banks and submitted his report in two volumes in 1895 and 1897.

In 1901 the Famine Commission recommended the establishment of Rural Agricultural Banks through the establishment of Mutual Credit Associations, and such steps as were taken by the Government of North Western provinces and Oudh. The underlying idea of a number of persons combining together was the voluntary creation of a new and valuable

security. A strong association competent to offer guarantees and advantages of lending to groups instead of individuals were major advantages. The Commission also suggested the principles underlying Agricultural Banks

Developments in the Post-Independence Era After India attained Independence in 1947, cooperative development received a boost, with cooperatives being given a vital role in the various plans formulated by the Planning Commission. The First Five Year Plan (1951-56), outlined in detail the vision of the cooperative movement in India and the rationale for emphasizing cooperatives and panchayats as preferred organizations for economic and political development. The Plan emphasized the adoption of the cooperative method of organization to cover all aspects of community development. It provided for setting up of urban cooperative banks, industrial cooperatives of workers, consumer cooperatives, housing cooperatives, diffusion of knowledge through cooperative training and education and recommended that every government department follow the policy of building up cooperatives. All India Rural Credit Survey Committee (1951) A major watershed initiative at this time was the appointment by Government of the Gorwala Committee, popularly known as the All India Rural Credit Survey Committee. The Committee was appointed in 1951 and submitted its report in 1954. It observed that large parts of the country were not covered by cooperatives and in such areas where it had been covered, a large segment of the agricultural population remained outside its membership. Even where membership did exist, the bulk of the credit requirement (75.2%) was met from other sources. 37 The Committee recommended introducing an integrated system of rural credit, partnership of the government in the share capital of the cooperatives and also appointment of government nominees on their boards, thus participating in their management. The Committee emphasized the importance of training. The creation of the State Bank of India was also a major recommendation. The Government and the elected representatives accepted the basic approach and the major recommendations of the Gorwala Committee. The Union Government acquired a major interest in the Imperial Bank which was converted into the State Bank of India cooperative movement received a spurt. Later on NDDB also ventured into the field of edible oils. After the Indo-China war in 1962, both the Consumer Cooperative Structure and the Public Distribution System (PDS) was strengthened. The government as a matter of policy decided to give preference to consumer or other cooperatives in the allotment of fair price shops and certain States allotted new fair price shops only to cooperatives. With the growth of public deposits in Urban Cooperative Credit Societies, it was felt necessary to insure these under the Deposit Insurance Scheme of Reserve Bank of India. Selective provisions of the RBI Act 1934 and later Banking Regulation Act 1949 were made applicable to Cooperative Banks w.e.f. March 1, 1966 to regulate their banking business and facilitate insurance coverage of deposits. Thus, they became an integral part of the banking system of the country. Some National Institutions which came into existence in the 1960s The Agricultural Refinance Corporation was set up in 1962 by the Government of India to provide long-term loans to cooperatives, through Central Land Mortgage Banks. In 1963, the National Cooperative Development Corporation (NCDC) was established as a statutory corporation by an Act of Parliament. The establishment of the NCDC gave a great boost to the growth of cooperative marketing and processing societies.



While on a visit to Anand in October 1964, impressed by the socio-economic transformation brought about by milk cooperatives, Shri Lal Bahadur Shastri, the then Prime Minister of India, spoke of the desirability of setting up a national level organization, the National Dairy Development Board (NDDB), to replicate the Anand pattern of cooperatives in milk throughout the country. 40 Several other significant organizational developments also took place during this period such as the setting up of various National Cooperative Federations and re-organization of the National Cooperative Union of India (NCUI). In 1967, the Vaikunth Mehta National Institute of Cooperative Management was set up in Pune. Growth of consumer cooperatives was also an important development of this period. Simultaneously, the growth of Land Development Banks also accelerated and rural electric cooperatives and programmes for dairy, poultry, fishery and labour cooperatives were set up. The Fourth Five Year Plan (1969-1974) gave high priority to the re-organization of cooperatives to make cooperative short-term and medium-term structure viable. It also made necessary provisions to provide cooperatives with management subsidy and share capital contribution, as well as for the rehabilitation of Central Cooperative Banks With increasing demand from proponents of an autonomous cooperative movement and reforms in the Cooperative laws, the Government constituted a Committee on Cooperative Law for Democratization and Professionalization of Management in Cooperatives in 1985, headed by Shri K. N. Ardhanareeswaran. The Committee recommended the deletion of those legal provisions in State Cooperative Acts, which militate against the democratic character and autonomy of cooperatives, and also recommended incorporation of several provisions which could activate democratic processes for infusing professional management into cooperatives. Similarly, in 1989 the Agricultural Credit Review Committee under the chairmanship of Prof. A.M. Khusro examined the problems of agricultural and rural credit and recommended a major 42 systemic improvement. The Committee recommended that the Eighth Plan should become the plan for revival of weak agricultural credit societies. Model Cooperatives Act, 1990 In 1990, an Expert Committee, under the chairmanship of Choudhary Brahm Perkash, was appointed by the Planning Commission to make a rapid review of the broad status of the cooperative movement, suggest future directions and finalize a Model Cooperatives Act. The Committee submitted its report in 1991. Since cooperation is a State subject and each State has its own cooperative legislation covering cooperatives whose membership is confined to the State, the report of the Committee, along with a draft Model Cooperative Law, was circulated to all State Governments for their consideration and adoption at State level. These Acts are largely based on the recommendations of the Choudhary Brahm Perkash Committee. Ten States namely Andhra 43 Pradesh & Telangana (1995), MP (1999), Bihar (1996), J&K (1999), Orissa (2001), Karnataka (1997), Jharkhand (1996)), Chhattisgarh (1999) and Uttaranchal (2003), have so far enacted Parallel Cooperative Acts which are enabling and ensure autonomous and democratic functioning of cooperatives. Multi-State Cooperative Societies Act, 2002 The Multi-State Cooperative Societies (MSCS) Act, enacted in 1984, was modified in 2002, in keeping with the spirit of the Model Cooperatives Act. Unlike the State Laws, which remained as a parallel legislation to co-exist with the earlier laws, the MSCS Act, 2002 replaced the earlier Act of 1984. National Cooperative Policy (2002) In 2002, the Government of India enunciated a National Cooperative Policy. The objective of the Policy is to facilitate an all-round development of cooperatives in the country. The policy

promises to provide cooperatives with the necessary support, encouragement and assistance, to ensure their functioning as autonomous, self-reliant and democratically managed institutions, accountable to their members, and making a significant contribution to the national economy. Based on the recommendations made at a Conference of State Ministers for Cooperation, the Government of India in 2002 constituted a Ministerial Task Force to formulate a plan of action for implementation of National Cooperative Policy. The Task Force suggested that a single law instead of parallel laws should be introduced in the States. It also recommended, among others, that in order to depoliticize cooperatives, Members of Parliament or Members of Legislative Assemblies should not be allowed to hold office of any cooperative society. The Companies Amendment Act, 2002 A Committee under the chairmanship of Dr. Y. K. Alagh recommended the amendment of the Companies Act, 1956. On the basis of the recommendations of the Committee, the Producer Companies Bill was introduced in the Parliament and became law on 6th February, 2003 as Part IXA - Producer Companies in the Companies Act, 1956. Based on the cooperative principles of mutual assistance, it provides an alternative to the institutional form that is presently available to cooperative enterprises. 44 NCDC Amendment Act, 2002 Recognizing the need to improve its scope of lending and to bring about changes in its funding, the NCDC Act was amended in 2002, which has enabled it to cover notified services, livestock and industrial activities and more importantly to directly fund cooperatives against suitable security. Task Force on Revival of Cooperative Credit Institutions To nurse the rural cooperative credit system back to health, to ensure that the rural credit doubled over three years and that the coverage of small and marginal farmers by institutional lending was expanded substantially, the Government of India in August 2004 set up a Task Force to suggest an action plan for reviving rural cooperative credit institutions and legal measures necessary for facilitating this process. The Task Force, chaired by Prof. A. Vaidyanathan, recommended that any financial restructuring which did not address the root causes of the weaknesses of the system would not result in its sustained revival and would require legal measures. The recommendations of the Task Force in accordance with its Terms of Reference are basically confined to revival of credit cooperatives for which it suggests a financial package. The Vaidyanathan Committee has also suggested a model cooperative law that can be enacted by the State Governments. Recommendations of the Task Force are being currently implemented.

## **2.OBJECTIVES OF STUDY**

Present study aims at in-depth investigation of previous research work done on fertilizer Marketing. It provides an understanding on the market, situation, scope and status of fertilizer marketing in India, in general.

## **3.METHODOLOGY**

The article involves data collected from past literature, available on fertilizer and agriculture on articles, internet etc. involving both published and unpublished sources. The researchers collection is purely based on secondary data from available sources.

#### **4.Review of Literature**

Review of literature is an in-depth investigation of the previous work done on a topic. It provides an insight to the topic of similar concern. Considerable literatures are available on fertilizer marketing in India and overall. Mentioned below are some of the literatures available in context to the present study.

Awasthi (1997) in his seminar paper outlined the role of IFFCO in fertilizer scenario of the country. The author traced on the relationship between IFFCO and farmers of the country. The marketing setup of the company was found to be significant to meet the sales performance. IFFCO being a cooperative sector made a valuable contribution to the fertilizer marketing in India to enhance the productivity in agricultural output.

[1] Shrotriya highlighted the role of fertilizers in the present scenario of farming. Challenges in terms of promotion, coordination, service, environment, research and development were the major issues and challenges to be overcome by the fertilizer marketing companies. The marketing environment of India keeps on changing therefore there is a need to create awareness among farmers through special promotional activities. It must be organised by manufacturing company according to need of farmer like fertilisers companies agronomists share their knowledge and experience in events like haats, field days, harvest festivals, farmers conferences, crop seminars, kisan melas, agro exhibitions, dealer training programmes, village adoption programmes, crop demonstrations, soil testing, fertiliser recommendation programmes and meeting at agro service centres. The author emphasised identifying promotional needs, up gradation of fertilizer sales point, focusing low fertilizer consumption area, intensive involvement of dealers in promotional programme, strengthening soil testing laboratories, Promoting IPNS, adopting farming system approach and developing ITInfrastructure.

[2] Razzak et al. (2004) in their article outlined use the recommended fertilizer, in recommended dose and at recommended time essential for getting maximum advantages, determined difficulty faced by farmers in Pakistan in the procurement of fertilizer . The author suggested policy measures to enhance the productivity in the farm land through farmer's education, price reduction, improved storage and transportation facilities, improved administrative facilities etc.

[3] Singh (2013) in his research paper highlighted the role of Chemical fertilizers in making the country self-reliant in food grain production. Attempts have been made to study issues like demand and supply position, consumption trends, growth factor of fertilizer in India. The author mentioned that there are various determinants like price factor and non price factor (better seeds, irrigation, and credit) which influence the demand of fertilizers. The

study revealed that non-price factor (better seed, irrigation, credit) play more important role in increasing demand of fertilizers as compared to price factor.

[4] Pramella et al. (2012) studied the performance of companies associated with Indian Fertilizer Industry with the help of ratio analysis, t-test and z-test. Study revealed that there is no significant difference between the performances of companies across the fertilizers Industry. The study found that all companies under fertiliser industries have performed equally well.

[5] Patel (2014) in his research article discussed that chemical fertilizers have played an important role in making the country self reliant in food grain production. The fertilizer sector is adorned with many opportunities, problems and challenges. The entire framework has been discussed in the lights of porter's five forces affecting market competition. This is a framework for industrial analysis, determines the competitive intensity and attractiveness of market.

[6] Quader (2009) in his research paper focused on strategic program to contribute towards growth and development of fertilizer sector in Bangladesh. He estimated the expected demand of fertiliser in Bangladesh, current production capacity and supply of fertiliser. It was found that gap between fertiliser demand and supply was continuously increasing. In order to fulfil the increasing demand of fertiliser product there was need to increase production unit and also the total installed capacity of the fertilizer 2 FERTILIZER MARKETING IN INDIA: A LITERATURE REVIEW Review Of Research | Vol 4 | Issue 1 | Oct 2014 companies. He suggested the plants needed to be planned and built without loss of time, possible plant location, type of plant; total investment and implementation time are some of the crucial factors for developing the fertilizer sector in Bangladesh for sustainable agriculture.

[7] Soni and Singh (2013) in their research paper discussed about cooperative society for efficient distribution of fertilizer, to ensure that the right products are available to the farmer at the right time and at the optimum price, consistent with the provision of a reliable service. Authors analyzed key performance of Chhattisgarh MARKFED. MARKFED is now successfully handling and distributing agricultural fertilizer and pesticides. They function as a bridge between producers and consumer farmers. It was also found that Shortage of Funds, Insufficient warehouses, Lack of Transport Facilities, Malpractices, Untrained Personnel, Lack of Coordination and Supervision, Poor Management are some problem across efficient fertilizer marketing. The paper ends with effective suggestions to overcome these problems.

[8] Roy in his article stressed the importance of market research in fertilizer Industry. Market research help to understand fertilizer market, need of farmers, demand and supply of fertilizer, problem and opportunity of fertilizer market, which help to make appropriate marketing strategy and actions to make growth of fertilizer industries as well agriculture development.

[9] Gupta found that fertiliser products are distributed to village level cooperative society by manufacturer through direct supply system and the supply through federation system. Village level society get direct supply from manufacturer in U.P., Bihar and Rajasthan state but get supply through federation only in Gujarat, M.P., W.B., Tamil Nadu and H.P. Supply both through federations as well as direct supply to the societies in the states of Punjab, Haryana, Maharashtra, Orissa, A.P., Karnataka and Kerala. In direct supply system village level society get higher margin due to elimination of mediator. The author made a comparative study of both systems (direct supply system and supply through federation system) for effectiveness, financial health, efficiency of the village level cooperative fertiliser distribution system.

## **5. Large Area Multipurpose Societies (LAMPS) Scheme**

The multi-purpose cooperative society was started by the Agricultural Department of the Reserve Bank of India. With the endorsement of Co-operative Planning Committee, the Multi-purpose societies were provided with finance for carrying out agricultural operations. The [Primary Agricultural Co-operative Societies](#) for Tribal Areas in many states started to organise Large Area Multi-Purpose Societies (LAMPS) to benefit the tribal community in rural and semi-urban areas. The Ministry of Tribal Welfare has been elevating lives of thousands of tribal women and their families through LAMPS.

### **5.1. Objectives of LAMPS**

The LAMPS is the flagship scheme of [NSTFDC](#) and [Adhivasi Mahila Sashakt Yojna](#) (AMSY) and its core objective is to encourage the tribal women to enhance their financial status by carrying out livelihood activities. Its other objectives are as follows:

- To provide interest-free short-term loans or agricultural credit to tribal members for farming and agriculture.
- To supply the necessary agricultural materials like seeds, fertilizers, pesticides at subsidised prices.
- To provide financial assistance for the purchase of farm animals and cattle like pigs, sheep and plough bullocks with subsidised prices.
- A free-of-cost supply of small agricultural machinery for better agricultural purposes.
- To guide, educate and encourage the marketing of the agricultural products.
- To provide consumption loan whenever the farmer needs with certain loan limit range.
- To guide the landless agricultural farmers in collecting the minor forest products in order to provide seasonal employment.
- To buy, sell and market the products that are acquired from the forests as minor products.

- To assist the tribes with limited loans for Integrated Shopping Programme (ISP) to start small shops in villages as a separate aspect of LAMP.
- To organise and encourage other livelihood activities to add and improve the social standard of all [tribal members](#).

## 5.2 Functions of LAMPS

Tribal development in India is extremely multi-faceted. It is necessary to concentrate on the development of all aspects such as agriculture, industry, education, and living standards of the tribal people.

LAMPS carry out the following activities to bring about the progress in their lives:

- Generating more employment opportunities for the tribal people by collecting and marketing their [Minor Forest Produce](#).
- Offering loans to the tribal women and assist them in helping in functioning their processing units and other livelihood related activities.
- Support them in distributing essential supplies and other consumer articles to their members.
- The scheme further encourages and supports the tribal women to participate in socio-economic activities and improve their financial contribution towards their family.
- It promotes capacity building, creates the identity and helps them climb up the social ladder.
- The LAMPS stand as guarantors for the tribal women to avail financial assistance from NSTFDC.

## 5.3. Women Empowerment through LAMPS

- Economic independence is the main ingredient for the success and empowerment of women. Tribal Women are empowered in their own traditional way and there is relatively less social judgment owing to gender in the tribal society.
- The economic activity undertaken by tribal women is traditional in nature like [animal husbandry](#). It consists of house dairy, Goatery, piggery, duckery, sheep rearing or activity like Bubai Rope making, Sal leaf Plates making etc.
- The intrusion through AMSY leading towards participation in economic activity and the contribution by women in the family income upholds the capacity building creating a Social Identity.
- The latest success of the LAMPS is that majority of the Tribal Women had acquired the Bank Accounts. The passbook carrying their name and photo is a mark of identity and self-respect for them.

## 6. MARKFED

### 6.1 OVERVIEW

- Odisha State Co-Operative Marketing Federation Ltd. (MARKFED) was previously known as Orissa State Co-op Marketing Society.
- Registered in the year 1949 under Bihar-Orissa Co-operative Societies Act,1935. It Started functioning since 11/06/1949.
- The name of the society was amended to Orissa State Co-operative Marketing Federation (OSCMF) Ltd. since 11/05/1976 and mandated to provide qualitative service in the following fields like :-
  - i. Market/ Distribute chemical fertilizers, pesticides, Agricultural implements to the farmers of the State at the right time, right place & at the right price.
  - ii. Procurement of Paddy as State Agency.
  - iii. Procurement of Agricultural commodities under Price Support Scheme (PSS) & Price Stabilization Fund (PSF) to help farmers to get fair price of their produce.

## **6.2.MANPOWER STRENGTH**

- The RCS(O), Bhubaneswar vide order No. 7934 dated 02/03/2009 has approved the staff strength of MARKFED limiting to 371. MARKFED has 126 units. But, the present staff strength is only 244 against sanctioned strength of 371 by RCS(O), Bhubaneswar and total vacancy is 127.
- Approved Strength - 371
- Existing Position - 244

## **6.3.GOVERNANCE**

- The activities of MARKFED are governed as per Bye-Laws of the Federation and provisions of OCS Acts and Rules. The service condition and the rules of the employees are regulated by the Staff Service Rules,1990 approved by the RCS, Odisha. The Paid up share Capital of MARKFED is Rs. 208.29 Cr.

<b><u>Year</u></b>	<b><u>Turnover (in Cr.)</u></b>
--------------------	---------------------------------

2013-14	794.70
2014-15	682.07
2015-16	845.17
2016-17	619.20

#### **6.4.AIMS & OBJECTIVES**

- The Orissa State Co-operative Marketing Federation Ltd. otherwise known as MARKFED-Odisha, is the Apex Cooperative Institution was registered under Bihar-Orissa Cooperative Societies Act'1935 mandated to provide qualitative service in the following fields like Market / distribute chemical fertilizer, pesticides and agricultural implements to the farmers of the State, Procurement of paddy as State Agency & Procurement of Surplus Agricultural commodities under Price Support Scheme to help farmers get fair price of their produce.

#### **6.5.BUSINESS SCENARIO**

##### **6.5.1FertilizerBusiness**

:-

- Primary business of MARKFED is distribution of chemical fertilizer to the farmers through the Cooperative Societies under 'B' component and private dealers having valid fertilizer license. The total sale of fertilizer has been increased from 1.44 lakh MT during 2001-02 to 2.52 lakh MT during 2016-17.
- Sale of fertiliser during kharif 2017-18 (up to 30.09.17) comes to 2.04 lakh MT. Out of which, sale to Cooperative Societies(1906) is almost 71% and contribution of MARKFED to total sale of the State (7.84 lakh MT) is about 27%. MARKFED is also supplying Fertilizer and Pesticides to the Government organizations against their requisitions.
- The sale position of fertilizers (Kharif & Rabi wise) of last 3 years and as on 31.10.17 is given below:



Year	Kharif (in MT)	Rabi (in MT)	Total (in MT)	'B' Comp. sale (%)	Turnover (in crore of Rs.)
2014-15	2,37,699	52,292	2,89,991	51	354.70
2015-16	2,60,099	36,565	2,95,664	57	359.90
2016-17	2,22,949	29,431	2,52,380	61	283.47
2017-18( As on 31.1.18)	2,03,919	15,520	2,19,439	68	245.40

- 
- Consumption of fertilizer by MARKFED during 2016-17 comes to 26 % of the State consumption.
- **Target fixed for the year, 2017-18:-**  
Target for Sale of fertilizer F.Y,17-18 is fixed at 3,86,000 MT, out of which Kharif target is 3,25,000 MT & Rabi target is 61,000 MT. The district wise target is given here under.
- **Bottlenecks in fertilizer operation:-**
  1. During disbursement of Agriculture loan to farmers through PACS / LAMPS, a rider may be fixed regarding availing of inputs like fertilizer on 'B' Component from MARKFED or else sale of fertilizer will be hampered.
  2. As per decision of Govt. only prepositioning of Urea, which is a fast moving fertilizer having less cost in comparison to DAP, Complex & MOP is being made at PACS / LAMPS level. As a result of which, the sale of slow moving fertilizers like DAP, Complex & MOP are being hampered.
  3. MARKFED is playing a vital role in distribution of fertilizer to the remote areas of the state through PACS / LAMPS and dealing with 30 to 35 % of state fertilizer consumption. Whereas, private wholesaler and OAIC are dealing with about 50% and 20% respectively of the State fertilizer consumption.
  4. In order to boost up sale, all the societies may be asked to lift a particular percentage of fertilizer (min. 50%)
  5. The private retailers are not all interested to deal with MARKFED for which the fertilizer business of MARKFED is being affected during peak season.

## 7. EXISTING FERTILIZER SUPPLY PRACTICES/ METHODS:

### 7.1. Fertilizer requirement planning:

Fertilizer requirement for different villages initially estimated by the Village Agricultural Worker (VAW) at GP level through conducting Palli Sabha and Grama Sabha. Then the Assistant Agricultural Officer (AAO) compiles and prepares the total requirement of fertilizer for the block and sends it to the Deputy Director Agriculture (DDA), who compiles the total requirement of the district.

The total requirement of the fertilizer estimated by the Deputy Director of Agriculture for the district is placed in the Agriculture Strategy Committee (ASC) meeting, where collector is the chairman. After the total requirement of the fertilizer for the district is approved by the ASC, it is sent to the Director of Agriculture Food Production (DAFP), who compiles the requirement of the fertilizer for the state both for Khariff, and Rabi season.

### 7.2 Fertilizer indenting pattern:

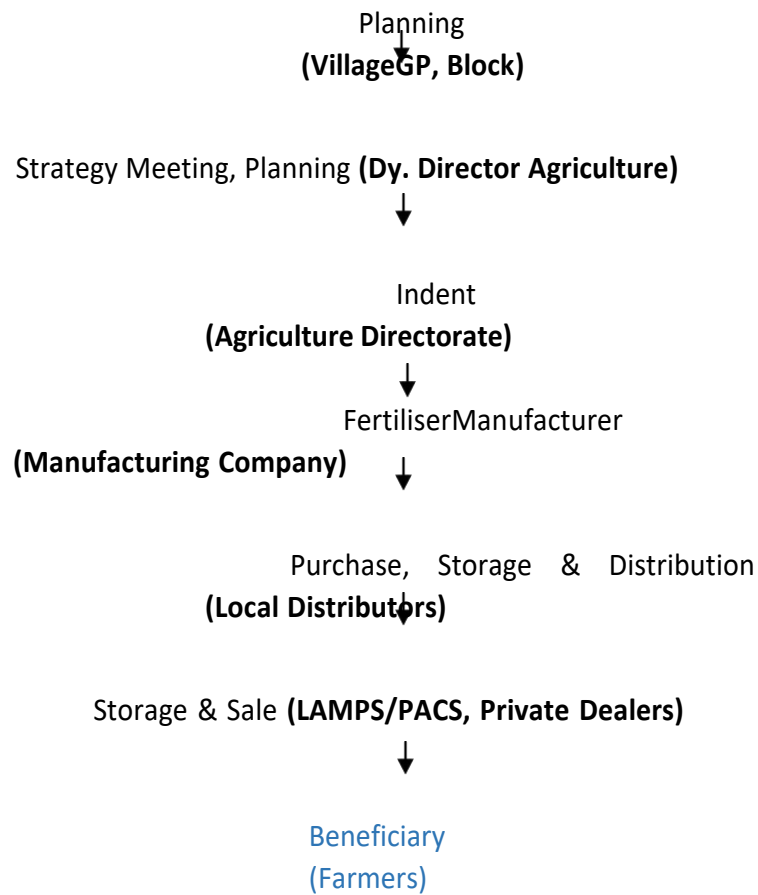
The Director of Agriculture and Food Production, finally send the State's total fertilizer requirement to the different Fertilizer Manufacturing Company as indent for the state. Then the fertilizer manufacturers supply the fertilizers to the state to different distributors. Finally the primary Agriculture cooperative society (PACS), the Large Sized Agriculture Multipurpose Society (LAMPS), and private dealers receive the fertilizer from the distributors and distribute to the beneficiaries.

---

### 7.3 Fertilizer Distribution Channel:

Fertilizer Distribution Channel discussed above is presented through a chart given below.

### CHART SHOWING FERTILISER SUPPLY CHAIN



#### **7.4 Stake Holder/Institutions Involved In Fertilizer Distribution:**

The following stake holders/institutions involved for distribution of fertilizer in the state, which includes.

- MARKFED
- PPL
- Nagarjun Fertilizer
- IFFCO
- Coromondal Fertilizer
- Fertilizer manufacturer
- Fertilizer distributor

- LAMPS
- PACS
- Private dealers
- Village Agriculture Workers(VAW)
- Assistant Agriculture Officer(AAO)

- 
- Deputy Director of Agriculture(DDA)
  - District Collector
  - Director Of Agriculture And Food Production(DAFP)

### 7.5 SWOT ANALYSIS

In this study an attempt has been made to study the strength weakness, opportunities and threat of the fertilizer distribution system with an idea to take policy decisions to strengthen the system and also to convert weakness to opportunities. While executing the distribution system proper watch to be given on the factors concerning for success of the distribution system.

### 7.6 Strength:

- Fertilizer requirement for different villages is estimated at GP level by the Village Agriculture Worker through Palli Sabha/Grama Sabha.
- Fertilizer requirement for the district is estimated by the Deputy Director of Agriculture by compiling the total requirement estimated for different blocks by the Assistant Agriculture Officer.
- The Agriculture Strategy Committee at district level is involved in estimating fertilizer requirement for the district and approves the total requirement.
- In the existing fertilizer distribution system includes Corromandal fertilizer, PPL, IFFCO, Nagarjuna fertilizer which are the major fertilizer companies facilitate fertilizer distribution to the farmers. Through their agencies, Cooperatives societies, LAMPS and private

dealers

- The government officials including District Agriculture Officer, Deputy Director Agriculture, Director of Agriculture and food production and District Collector keep close watch to the fertilizer distribution in the district.
- Technical personnel of the agriculture department visit farmer's field twice in a month, and monitor the use of fertilizer in the crops.

---

#### Weakness:

- The present distribution system does not provide fertilizer to the farmers in time.
- Sufficient quantity of fertilizer is not made available to the farmers, as a result farmers do not able to meet their fertilizer requirement.
- Many of the beneficiary farmers have not undergone any training on fertilizer use on different crops.
- All the farmers even pay 10 to 14% more cost over the minimum retail price (MRP) fixed for different type of fertilizer which affects the poor and marginal farmers for use of proper quantity of fertilizer.

#### 7.7 Opportunities:

- National food security mission and the project on success of Second Green Revolution in Eastern India are operating in Odisha the farmers should take the advantage of such programme.
- 75% of the beneficiary farmers know the use of fertilizer in the crops
- Qualified technical graduates are now working in the department of

agriculture; the farmers should take the advantage of them.

**Threats:**

- Due to non availability of different types of fertilizer (Nitrogenous, Phosphatic and potassium) in time with the farmers, the fertilizer used in crops becomes unbalanced which affects productivity.
- Fertilizer is applied to the plant at a particular stage of growth, due to non availability of fertilizer in time; the farmers miss the stage when fertilizer is to be applied as a result total use of fertilizer per hectare becomes less than requirement which reduces productivity.
- Many farmers are not satisfied on the services provided by the agriculture department on fertilizer distribution.

---

## **8. SUPPLY - DEMAND GAP IN FERTILIZER DISTRIBUTION:**

As per practice, the Deputy Director Agriculture of the district estimate the total requirement of fertilizer for the whole district and send it to the Director of Agriculture who finally place it as indent to different manufacturing industry. The manufacturing industry supplies the fertilizer through their agencies to different blocks. The farmers purchase it for use in the crops. In this study, the total indent is treated as demand for fertilizer and the fertilizer used by the farmers is considered as supply of the fertilizer. Based on this concept total demand and supply gap of fertilizer has been analysed.

**Indian Farmers Fertiliser Cooperative Limited**, also known as **IFFCO**, is [a multi-state cooperative](#) society. IFFCO is wholly owned by Cooperative Societies of India. The society is engaged in the business of manufacturing and marketing of [fertilizers](#). IFFCO is headquartered in [New Delhi](#), India. Started in 1967 with 57 member cooperatives, it is today the biggest co-op in the world by turnover on [GDP](#) per capita (as per World Cooperative Monitor 2021) with around 35,000 member cooperatives reaching over 50 million Indian farmers.

With around 19% market share in [urea](#) and around 31% market share in complex fertilizers (P2O5 terms) IFFCO is India's largest fertilizer manufacturer.

The cooperative was ranked 66th on the [Fortune India 500](#) list of India's biggest corporations as of 2017 with a net worth of \$2.6 billion as on March, 2021.

## **9. HISTORY OF FERTILIZER USE IN INDIA:**

### **1960s**

The food crisis of the early '60s mobilized India's farmers and the founding fathers of a 'young' India to look for longer-term solutions. International organizations, including the American Co-operative Study Team, conducted fertiliser feasibility studies in India to increase production. The cooperative sector in India at that time was distributing 70 per cent of the chemical fertilizers consumed in the country. This sector had adequate infrastructure to distribute [fertilisers](#) but had no production facilities. With the introduction of multi-agency approach by the Government of India in the distribution of fertilizers during 1967, the private trade also entered the field of fertilizer distribution. The private sector production units provided more opportunities to the distribution network of private trade and gave secondary preference to the cooperatives in the matter of supplies. Due to this development, the cooperatives started getting less supplies of the fertilizers.

To overcome this limitation and also to bridge the growing demand for the fertilizers in the country, a new cooperative was conceived. The notion of the cooperative was especially appealing for its core values of self-help, accountability, democracy, equality, equity and solidarity. In 1964, the [Cooperative League of USA](#) proposed to the Government of India that the American Cooperatives were interested to collaborate with Indian Cooperatives in setting up fertiliser production capacity.

The idea appealed to the Government of India and eminent cooperators of the country. As a result, Indian Farmers Fertilizer Cooperative Limited (IFFCO) was conceived and registered on 3 November 1967, as a multi-unit cooperative society with the primary objective of production and distribution of fertilizers. The U.S. Cooperatives through Cooperative Fertilizer International (CFI) provided a financial aid besides technical know-how to IFFCO. 1967 saw proposals submitted for Ammonia, Urea and NPK plants, notably at Kalol and Kandla in [Gujarat](#), and on 3 November 1967, IFFCO was registered as a multi-unit cooperative.

### **1970s**

The Kalol and Kandla plants were commissioned and built with great innovations and indigenous materials. In 1974, the plant at [Kalol, Gujarat](#) was inaugurated and project work for two more plants was initiated.

### **1980s**

Two more Urea plants were commissioned at Phulpur and Aonla in [Uttar Pradesh](#). IFFCO's founding managing director: [Mr. Paul Pothan](#) received the [Padma Shri](#) award for his contribution to the revival and growth of India's Agricultural and farming community. IFFCO became a stakeholder in Industries Chimiques Du Senegal (ICS), [Senegal](#)'s biggest industrial venture to manufacture [phosphoric acid](#).

## 1990s

The Kalol, Kandla, Phulpur and Aonla plants were expanded to increase production capacity and improve production technology to meet the increasing demand for IFFCO fertilizers and meet the growing demand for food in India. This was the decade of major transformation, which set the foundation for the growth that the organisation was about to undertake in the forthcoming years. The process led to significant expansion in the capacity and capabilities of the manufacturing units that resulted in phenomenal increase in the operational efficiency of the plants and brought them at par with the highest global standards. To further improve productivity and profitability an impetus was put on getting IFFCO on the global map and Joint Ventures were established in [Oman](#), [Jordan](#) and [Dubai](#). And diversified the business interests of IFFCO beyond fertilizers to sectors like [General insurance](#), rural telephony, international trading, [pesticides](#) and even rural [e-commerce](#). These steps proved to be a game changer and catapulted IFFCO into a new era.

## 2000s



A view of the IFFCO plant at Aonla, Uttar Pradesh

IFFCO became an autonomous cooperative, expanding its presence and partnerships in India and abroad. 2000 saw the establishing of [IFFCO Tokio General Insurance Company Ltd.](#), and the launch of customized rural-centric insurance products. IFFCO acquired shareholding in the Oman India Fertilizer Company. The Paradeep plant was acquired, and the Kisan International Trading FZE (KIT), a wholly owned [subsidiary](#) for imports, exports and logistics support for fertilizers, raw materials and intermediates, was set up in [Dubai](#). IFFCO also made forays into [Jordan](#), established Jordan India Fertilizer Company L.L.C and promoted IFFCO Kisan Sanchar Ltd, a unique venture to bring the benefits of modern mobile communications to rural India.

## 2010s

IFFCO embarked on several expansion and diversification plans to increase its domestic fertilizer production capacity. These plans also included the acquisition of more plants, further overseas joint ventures and the introduction of several energy reduction measures to improve production efficiency, and minimize carbon footprint. In a joint venture with [Mitsubishi Corporation](#), [Japan](#), IFFCO-MC Crop Science Private Limited was incorporated to provide quality agrochemicals in India. The IFFCO BAZAR was envisioned to introduce the modern retail and information experience to rural India by combining technology with experience to deliver value to consumers in the Indian hinterland.



## Plants

---

- [Kalol, Gujarat](#): Commissioned in 1975 and expanded in 1997, it produces [ammonia](#) (1100 MTPD) and [urea](#) (1650 MTPD).<sup>[7]</sup>
- [Kandla, Gujarat](#): Commissioned in 1975 and first expanded in 1981 and again in 1999, it produces [NPK](#) (10:26:26; Capacity 520,000 MTPD), [NPK](#) (12:32:16; Capacity 700,000 MTPD), [NP](#) (20:20:0:13), [DAP](#) (18:46:0; Capacity 1,200,000 MTPD) and water-soluble fertilisers.<sup>[8]</sup>
- [Phulpur, Uttar Pradesh](#): Commissioned in 1981 and expanded in 1997, it produced [ammonia](#) (9.7 lakh MT) and [urea](#) (17 lakh MT).<sup>[9]</sup>
- [Aonla, Uttar Pradesh](#): Commissioned in 1988 and expanded in 1996, it produced [ammonia](#) (1740 MTPD) and [urea](#) (1515 MTPD).<sup>[10]</sup>
- [Paradeep, Odisha](#): Taken over in 2005, it produces [phosphoric acid](#) (8,75,000 MTPA), [sulphuric acid](#) (23,10,000 MTPA), [NPK](#) (10:26:26), [NPK](#) (12:32:16), [NP](#) (20:20:0:13) and [DAP](#) (18:46:0) grade of fertilisers.<sup>[11]</sup>

## Associates and subsidiaries

---



A farmer using fertiliser on his fields

- IFFCO Tokio General Insurance Company Limited
- IFFCO eBazar Limited
- IFFCO Kisan SEZ Limited
- IFFCO Kisan Sanchar Limited
- IFFCO-MC Crop Science Private Limited
- IFFCO Kisan Finance Limited
- Oman India Fertiliser Company SAOC
- National Commodity & Derivatives Exchange Ltd.
- Kisan International Trading FZE
- Indian Potash Limited
- Jordan India Fertilizer Company LLC
- Sikkim IFFCO Organics Limited
- Industries Chimiques Du Senegal
- CN IFFCO Private Limited

## 10.DBT

Direct Benefit Transfer (DBT)

### **10.1. Status of DBT in Fertilizers:**

The Government has introduced Direct Benefit Transfer (DBT) system in Fertilizers w.e.f. October 2016. Under the fertilizer DBT system, 100% subsidy on various fertilizer grades is released to the fertilizer companies on the basis of actual sales made by the retailers to the beneficiaries. Sale of all subsidized fertilizers to farmers/buyers is made through Point of Sale (PoS) devices installed at each retailer shop and the beneficiaries are identified through Aadhaar Card, KCC, Voter Identity Card etc. Different States/U.T.s have been put on Go-Live mode w.e.f. 01.09.2017 and the Pan-India Roll out has been completed by March, 2018.

A Project Monitoring Cell has been set up at Dept. of Fertilizers to oversee implementation of DBT exclusively. 24 State Coordinators have been appointed across all States to monitor the on-going DBT activities. Implementation of the DBT in Fertilizer Scheme required deployment of PoS devices at every retailer shop and training of retailers for operating PoS device. Across the country, Lead Fertilizer Supplier (LFS) have conducted **15954** training sessions till date. **2.60 Lakh** PoS devices have been deployed across all States.

### **10.2. DBT Dashboards for various stakeholders.**

After successful PAN-India Roll out, attention was devoted to the development of Dashboards/various reports for stakeholders as given below:

1. Kisan Corner
2. DOF/Movement Division
3. States Agriculture Departments
4. District Collector/District Agriculture Officer
5. Fertilizer companies.
6. Marketing Federation

These dash-boards provide various reports, viz.,

- i. Fertilizer Stock position (overall and production):
  - at Ports
  - at Plants
  - in States
  - at District levels
- ii. Proportionate requirement for the season and availability of stocks at various levels
- iii. 'Top 20 Buyers' List

- iv. 'Most Frequent Buyers'
- v. Retailers not selling fertilizers

### **10.3 Direct Cash Transfer to farmers: -**

Direct Cash Transfer to farmers has been under discussion at various forum such as PMO, Cabinet Secretariat and NITI Aayog. A Committee of Secretaries headed by Cabinet Secretary has been setup to develop the broad contours of the DCT framework under which DCT to farmers can be implemented. The last meeting was held on 16.01.2020. The CoS inter alia has recommended to constitute a Nodal Committee to be co-chaired by Secretaries of Department of Fertilizers and Department of Agriculture, Cooperation & Farmers Welfare to formulate and implement Direct Cash Transfer in Fertilizers. Accordingly, a Nodal Committee has been constituted dated 1<sup>st</sup> June, 2020 to formulate policy relating to implementation of Direct Cash Transfer of Fertilizer Subsidy to farmers. The first meeting of Nodal Committee through Video Conference was held on 25.06.2020 and second meeting was held on 28.10.2020. The proceedings of the meetings have been circulated to the all concerned.

### **10.4 Pilot Project in Karnataka**

- A meeting under the chairmanship of Secretary (Fert) and State Govt of Karnataka to explore feasibility of integration of FRUITS system of Karnataka and iFMS had been held on 19.10.2022.
- It has been recommended in the meeting that project may be initiated on pilot basis in particular district of Karnataka. The state Govt will intimate the Pilot district.
- In cases, where identification of farmer / authorization is conveyed from FRUITS to iFMS, POS will check and allow sales of subsidized fertilizer (Urea) to the identified buyer.
- In cases, where no data is conveyed from FRUITS to iFMS, buyer will be able to purchase only non-subsidized fertilizer on non-denial basis.
- State Govt of Karnataka has been requested to convey its readiness for the project.

### **.10.5 SMS to Buyers: -**

The Department of Fertilizers (DoF) has implemented Short Message Services (SMS) to buyers for the sale of fertilizers in the Direct Benefit Transfer (DBT) project. Buyer will receive a receipt on his mobile through SMS on every purchase of fertilizers. Department of Fertilizers (DoF) has introduced SMS system on 30<sup>th</sup> September 2020 in PoS 3.1 version.

- The SMS contains the details viz. Invoice no., retailer name quantity purchased, total amount to be paid and the subsidy borne by the Govt. of India. etc.
- SMS module is used to send periodic SMS to farmer about availability of fertilizer at retail outlet from where he purchased fertilizer earlier.
- Farmer can get information about availability of fertilizer at any retail outlet by sending SMS to +917738299899 (by sending retailer id).

## 11. Agriculture Technology

### 11.1. e-PoS system for distribution and supply of fertilisers

The District Administration of Jogulamba Gadwal has adapted 'e-PoS' digital system for the distribution and supply of fertilisers to family in full proof and transparent manner.

According officials from the Agriculture Department, for the first time Gadwall district is adopting e-PoS digital system on a pilot basis. Based on its success, the District Administration will extend it to other areas. "The main objective behind adopting this new method is to keep a watch on the stocks of fertilisers available with the dealers and the amount of stocks supplied to the farmers.

As part of the pilot project, the District Administration has distributed e-pass machines to most of the dealers supplying fertilisers in the district. Out of a total of 168 dealers present in the district more than 140 of them have got the machines supplied from the Agriculture Department.

As part of the adoption of new e-POS digital system, now the dealers will have to verify the Aadhar numbers of beneficiary farmers in the e-pass machines before supplying fertilisers to them. With the implementation of this new system the District Administration strongly feels that it will keep track of the activities of the dealers and farmers and gives no scope for irregularities.

The Agriculture Officer said that with the adoption of e-POS system, the government wants to implement the cash transfer scheme with an objective to prevent side tracking of fertiliser stocks to grey markets by the dealers.

This system will also ensure that from now onwards the subsidy provided to the farmers will be directly credited into the bank accounts through the direct cash transfer scheme. However, the fertiliser dealers in the district are expressing apprehension that this new system may become an obstacle in the way to adequately supply enough fertilisers to the needy farmers as it will have a limited supply cap.

".



A [farmer](#) spreading [manure](#) to improve [soil fertility](#)

A **fertilizer** ([American English](#)) or **fertiliser** ([British English](#); [see spelling differences](#)) is any material of natural or synthetic origin that is applied to soil or to plant tissues to supply [plant nutrients](#). Fertilizers may be distinct from [liming materials](#) or other non-nutrient [soil amendments](#). Many sources of fertilizer exist, both natural and industrially produced.<sup>[1]</sup> For most modern agricultural practices, fertilization focuses on three main macro nutrients: [nitrogen](#) (N), [phosphorus](#) (P), and [potassium](#) (K) with occasional addition of supplements like [rock flour](#) for micronutrients. Farmers apply these fertilizers in a variety of ways: through dry or pelletized or liquid application processes, using large agricultural equipment or hand-tool methods.

Historically fertilization came from natural or organic sources: [compost](#), [animal manure](#), [human manure](#), harvested minerals, [crop rotations](#) and byproducts of human-nature industries (i.e. [fish processing waste](#), or [bloodmeal](#) from [animal slaughter](#)). However, starting in the 19th century, after innovations in [plant nutrition](#), an [agricultural industry](#) developed around synthetically created fertilizers. This transition was important in transforming the [global food system](#), allowing for larger-scale [industrial agriculture](#) with large crop yields.

[Nitrogen-fixing](#) chemical processes such as the [Haber process](#) at the beginning of the 20th century, amplified by production capacity created during World War II led to a boom in using nitrogen fertilizers.<sup>[2]</sup> In the latter half of the 20th century, increased the use of nitrogen fertilizers (800% increase between 1961 and 2019) have been a crucial component of the increased productivity of [conventional food systems](#) (more than 30% per capita) as part of the so-called "[Green Revolution](#)".<sup>[3]</sup> The use of artificial and industrially-applied fertilizers has led to a number of environmental impacts, creating [water pollution](#) and [Eutrophication](#) caused by nutritional runoff, [carbon](#) and other emissions from fertilizer production and mining, and [contamination and pollution of soil](#). Various types of [sustainable agriculture](#) practices can be implemented to reduce the environmental impact of fertilizer uses alongside other [environmental impacts of agriculture](#).

Inorganic fertilizer use by region

Fertilizers enhance the growth of plants. This goal is met in two ways, the traditional one being additives that provide nutrients. The second mode by which some fertilizers act is to enhance the effectiveness of the soil by modifying its water retention and aeration. This article, like many on fertilizers, emphasises the nutritional aspect. Fertilizers typically provide, in varying [proportions](#):<sup>[18]</sup>

- three main macronutrients:
  - [Nitrogen](#) (N): leaf growth
  - [Phosphorus](#) (P): development of roots, flowers, seeds, fruit;
  - [Potassium](#) (K): strong stem growth, movement of water in plants, promotion of flowering and fruiting;
- three secondary macronutrients: [calcium](#) (Ca), [magnesium](#) (Mg), and [sulfur](#) (S);
- micronutrients: [copper](#) (Cu), [iron](#) (Fe), [manganese](#) (Mn), [molybdenum](#) (Mo), [zinc](#) (Zn), [boron](#) (B). Of occasional significance are [silicon](#) (Si), [cobalt](#) (Co), and [vanadium](#) (V).

The nutrients required for healthy plant life are classified according to the elements, but the elements are not used as fertilizers. Instead [compounds](#) containing these elements are the basis of fertilizers. The macro-nutrients are consumed in larger quantities and are present in plant tissue in quantities from 0.15% to 6.0% on a [dry matter](#) (DM) (0% moisture) basis. Plants are made up of four main elements: hydrogen, oxygen, carbon, and nitrogen. Carbon, hydrogen and oxygen are widely available as water and carbon dioxide. Although nitrogen makes up most of the atmosphere, it is in a form that is unavailable to plants. Nitrogen is the most important fertilizer since nitrogen is present in [proteins](#), [DNA](#) and other components (e.g., [chlorophyll](#)). To be nutritious to plants, nitrogen must be made available in a "fixed" form. Only some bacteria and their host plants (notably [legumes](#)) can fix atmospheric nitrogen (N<sub>2</sub>) by converting it to [ammonia](#). Phosphate is required for the production of DNA and [ATP](#), the main energy carrier in cells, as well as certain lipids.

#### Microbiological considerations

Two sets of enzymatic reactions are highly relevant to the efficiency of nitrogen-based fertilizers.

#### Urease

The first is the hydrolysis (reaction with water) of urea. Many [soil](#) bacteria possess the enzyme [urease](#), which [catalyzes](#) conversion of urea to [ammonium](#) ion (NH<sub>4</sub><sup>+</sup>) and bicarbonate ion (HCO<sub>3</sub><sup>-</sup>).

#### Ammonia oxidation

Ammonia-oxidizing bacteria (AOB), such as species of [Nitrosomonas](#), oxidize ammonia to [nitrite](#), a process termed [nitrification](#).<sup>[19]</sup> Nitrite-oxidizing bacteria, especially [Nitrobacter](#), oxidize nitrite to nitrate, which is extremely mobile and is a major cause of [eutrophication](#).

### 11.2 Classification

---

Fertilizers are classified in several ways. They are classified according to whether they provide a single nutrient (e.g., K, P, or N), in which case they are classified as "straight fertilizers". "multinutrient fertilizers" (or "complex fertilizers") provide two or more nutrients, for example N and P. Fertilizers are also sometimes classified as inorganic (the

topic of most of this article) versus organic. Inorganic fertilizers exclude carbon-containing materials except [ureas](#). Organic fertilizers are usually (recycled) plant- or animal-derived matter. Inorganic are sometimes called synthetic fertilizers since various chemical treatments are required for their manufacture.<sup>[20]</sup>

### Single nutrient ("straight") fertilizers

The main nitrogen-based straight fertilizer is ammonia or its solutions. [Ammonium nitrate](#) ( $\text{NH}_4\text{NO}_3$ ) is also widely used. [Urea](#) is another popular source of nitrogen, having the advantage that it is solid and non-explosive, unlike ammonia and ammonium nitrate, respectively. A few percent of the nitrogen fertilizer market (4% in 2007)<sup>[21]</sup> has been met by [calcium ammonium nitrate](#) ( $\text{Ca}(\text{NO}_3)_2 \cdot \text{NH}_4 \cdot 10 \text{H}_2\text{O}$ ).

The main straight phosphate fertilizers are the [superphosphates](#). "Single superphosphate" (SSP) consists of 14–18%  $\text{P}_2\text{O}_5$ , again in the form of  $\text{Ca}(\text{H}_2\text{PO}_4)_2$ , but also [phosphogypsum](#) ( $\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$ ). [Triple superphosphate](#) (TSP) typically consists of 44–48% of  $\text{P}_2\text{O}_5$  and no gypsum. A mixture of single superphosphate and triple superphosphate is called double superphosphate. More than 90% of a typical superphosphate fertilizer is water-soluble.

The main potassium-based straight fertilizer is [muriate of potash](#) (MOP). Muriate of [potash](#) consists of 95–99% KCl, and is typically available as 0-0-60 or 0-0-62 fertilizer.

### Multinutrient fertilizers

These fertilizers are common. They consist of two or more nutrient components.

#### **Binary (NP, NK, PK) fertilizers**

Major two-component fertilizers provide both nitrogen and phosphorus to the plants. These are called NP fertilizers. The main NP fertilizers are [monoammonium phosphate](#) (MAP) and [diammonium phosphate](#) (DAP). The active ingredient in MAP is  $\text{NH}_4\text{H}_2\text{PO}_4$ . The active ingredient in DAP is  $(\text{NH}_4)_2\text{HPO}_4$ . About 85% of MAP and DAP fertilizers are soluble in water.

#### **NPK fertilizers**

NPK fertilizers are three-component fertilizers providing nitrogen, phosphorus, and potassium. There exist two types of NPK fertilizers: compound and blends. Compound NPK fertilizers contain chemically bound ingredients, while blended NPK fertilizers are physical mixtures of single nutrient components.

[NPK rating](#) is a rating system describing the amount of nitrogen, phosphorus, and potassium in a fertilizer. NPK ratings consist of three numbers separated by dashes (e.g., 10-10-10 or 16-4-8) describing the chemical content of fertilizers. The first number represents the percentage of nitrogen in the product; the second number,  $\text{P}_2\text{O}_5$ ; the third,  $\text{K}_2\text{O}$ . Fertilizers do not actually contain  $\text{P}_2\text{O}_5$  or  $\text{K}_2\text{O}$ , but the system is a conventional shorthand for the amount of the phosphorus (P) or potassium (K) in a fertilizer. A 50-pound (23 kg) bag of fertilizer labeled 16-4-8 contains 8 lb (3.6 kg) of nitrogen (16% of the 50 pounds), an amount of phosphorus equivalent to that in 2 pounds of  $\text{P}_2\text{O}_5$  (4% of 50 pounds), and 4 pounds of  $\text{K}_2\text{O}$  (8% of 50 pounds). Most fertilizers are labeled according to this N-P-K convention,

although Australian convention, following an N-P-K-S system, adds a fourth number for sulfur, and uses elemental values for all values including P and K.

### **Micronutrients**

[Micronutrients](#) are consumed in smaller quantities and are present in plant tissue on the order of [parts-per-million](#) (ppm), ranging from 0.15 to 400 ppm or less than 0.04% dry matter. These elements are often required for enzymes essential to the plant's metabolism. Because these elements enable catalysts (enzymes), their impact far exceeds their weight percentage. Typical micronutrients are [boron](#), [zinc](#), [molybdenum](#), [iron](#), and [manganese](#). These elements are provided as water-soluble salts. Iron presents special problems because it converts to insoluble (bio-unavailable) compounds at moderate soil pH and phosphate concentrations. For this reason, iron is often administered as a [chelate complex](#), e.g., the [EDTA](#) or [EDDHA](#) derivatives. The micronutrient needs depend on the plant and the environment. For example, [sugar beets](#) appear to require [boron](#), and [legumes](#) require [cobalt](#),<sup>[1]</sup> while environmental conditions such as heat or drought make boron less available for plants.

### **11.3. Environment**

---

Synthetic fertilizer used in agriculture has [wide-reaching environmental consequences](#). According to the [Intergovernmental Panel on Climate Change \(IPCC\) Special Report on Climate Change and Land](#), production of these fertilizers and associated [land use](#) practices are drivers of [global warming](#). The use of fertilizer has also led to a number of direct environmental consequences: [agricultural runoff](#) which leads to downstream effects like [ocean dead zones](#) and waterway contamination, [soil microbiome](#) degradation,<sup>[28]</sup> and accumulation of toxins in ecosystems. Indirect environmental impacts include: the [environmental impacts of fracking](#) for [natural gas](#) used in the [Haber process](#), the agricultural boom is partially responsible for the rapid [growth in human population](#) and large-scale industrial agricultural practices are associated with [habitat destruction](#), [pressure on biodiversity](#) and agricultural [soil loss](#).

In order to mitigate environmental and [food security](#) concerns, the international community has included food systems in [Sustainable Development Goal 2](#) which focuses on creating a [climate-friendly](#) and [sustainable food production system](#).<sup>[29]</sup> Most policy and regulatory approaches to address these issues focus on pivoting agricultural practices towards [sustainable](#) or [regenerative agricultural](#) practices: these use less synthetic fertilizers, better [soil management](#) (for example [no-till agriculture](#)) and more organic fertilizers.

Nitrogen fertilizers are made from [ammonia](#) (NH<sub>3</sub>) [produced](#) by the [Haber–Bosch process](#).<sup>[21]</sup> In this energy-intensive process, [natural gas](#) (CH<sub>4</sub>) [usually supplies the hydrogen](#), and the nitrogen (N<sub>2</sub>) is [derived from the air](#). This ammonia is used as a [feedstock](#) for all other nitrogen fertilizers, such as [anhydrous ammonium nitrate](#) (NH<sub>4</sub>NO<sub>3</sub>) and [urea](#) (CO(NH<sub>2</sub>)<sub>2</sub>).

Deposits of [sodium nitrate](#) (NaNO<sub>3</sub>) ([Chilean saltpeter](#)) are also found in the [Atacama desert](#) in [Chile](#) and was one of the original (1830) nitrogen-rich fertilizers used.<sup>[32]</sup> It is still mined for fertilizer.<sup>[33]</sup> Nitrates are also produced from ammonia by the [Ostwald process](#).



## Phosphate fertilizer

Phosphate fertilizers are obtained by extraction from [phosphate rock](#), which contains two principal phosphorus-containing minerals, [fluorapatite](#)  $\text{Ca}_5(\text{PO}_4)_3\text{F}$  (CFA) and [hydroxyapatite](#)  $\text{Ca}_5(\text{PO}_4)_3\text{OH}$ . These minerals are converted into water-soluble phosphate salts by treatment with [sulfuric](#) ( $\text{H}_2\text{SO}_4$ ) or [phosphoric acids](#) ( $\text{H}_3\text{PO}_4$ ). The large production of [sulfuric acid](#) is primarily motivated by this application.<sup>[34]</sup> In the [nitrophosphate process](#) or Odde process (invented in 1927), phosphate rock with up to a 20% phosphorus (P) content is dissolved with [nitric acid](#) ( $\text{HNO}_3$ ) to produce a mixture of phosphoric acid ( $\text{H}_3\text{PO}_4$ ) and [calcium nitrate](#) ( $\text{Ca}(\text{NO}_3)_2$ ). This mixture can be combined with a potassium fertilizer to produce a *compound fertilizer* with the three macronutrients N, P and K in easily dissolved form.

## Potassium fertilizers

[Potash](#) is a mixture of potassium minerals used to make potassium (chemical symbol: K) fertilizers. Potash is soluble in water, so the main effort in producing this nutrient from the ore involves some purification steps; e.g., to remove [sodium chloride](#) ( $\text{NaCl}$ ) (common [salt](#)). Sometimes potash is referred to as  $\text{K}_2\text{O}$ , as a matter of convenience to those describing the potassium content. In fact, potash fertilizers are usually [potassium chloride](#), [potassium sulfate](#), [potassium carbonate](#), or [potassium nitrate](#).<sup>[36]</sup>

## NPK fertilizers

There are four major routes for manufacturing NPK fertilizers (named for their main ingredients: nitrogen (N), phosphorus (P), and potassium (K)):

1. steam granulation,
2. chemical granulation,
3. compaction,
4. bulk blending.

The first three processes are used to produce compound NPKs. During steam granulation raw materials are mixed and further granulated using steam as binding agent. Chemical granulation process is based on chemical reactions between liquid raw materials (such as [phosphoric acid](#), [sulfuric acid](#), [ammonia](#)) and solid raw materials (such as [potassium chloride](#), recycle material). Compaction implements high pressure to agglomerate dry powder materials. Lastly, bulk blends are produced by mixing straight fertilizers.

"[Organic fertilizers](#)" can describe those fertilizers with an organic – biologic – origin—that is, fertilizers derived from living or formerly living materials. Organic fertilizers can also describe commercially available and frequently packaged products that strive to follow the expectations and restrictions adopted by "[organic agriculture](#)" and "[environmentally friendly](#)" gardening – related systems of food and plant production that significantly limit or strictly avoid the use of synthetic fertilizers and pesticides. The "organic fertilizer" *products* typically contain both some organic materials as well as acceptable additives such as nutritive rock powders, ground sea shells (crab, oyster, etc.), other prepared products such as seed meal or kelp, and cultivated microorganisms and derivatives.

Fertilizers of an organic origin (the first definition) include [animal wastes](#), plant wastes from agriculture, [seaweed](#), [compost](#), and treated [sewage sludge](#) ([biosolids](#)). Beyond manures, animal sources can include products from the slaughter of animals – [bloodmeal](#), [bone meal](#), [feather meal](#), hides, hoofs, and horns all are typical components.<sup>[18]</sup> Organically derived materials available to industry such as sewage sludge may not be acceptable components of organic farming and gardening, because of factors ranging from residual contaminants to public perception. On the other hand, marketed "organic fertilizers" may include, and promote, processed organics *because* the materials have consumer appeal. No matter the definition nor composition, most of these products contain less-concentrated nutrients, and the nutrients are not as easily quantified. They can offer soil-building advantages as well as be appealing to those who are trying to farm / garden more "naturally".<sup>[37]</sup>

In terms of volume, [peat](#) is the most widely used packaged organic soil amendment. It is an immature form of coal and improves the soil by aeration and absorbing water but confers no nutritional value to the plants. It is therefore not a fertilizer as defined in the beginning of the article, but rather an amendment. [Coir](#), (derived from coconut husks), bark, and sawdust when added to soil all act similarly (but not identically) to peat and are also considered organic soil amendments – or texturizers – because of their limited nutritive inputs. Some organic additives can have a reverse effect on nutrients – fresh sawdust can consume soil nutrients as it breaks down, and may lower soil pH – but these same organic texturizers (as well as compost, etc.) may increase the availability of nutrients through improved cation exchange, or through increased growth of microorganisms that in turn increase availability of certain plant nutrients. Organic fertilizers such as composts and manures may be distributed locally without going into industry production, making actual consumption more difficult to quantify.

## 12. Application

---

Fertilizers are commonly used for growing all crops, with application rates depending on the soil fertility, usually as measured by a [soil test](#) and according to the particular crop. Legumes, for example, fix nitrogen from the atmosphere and generally do not require nitrogen fertilizer.

### Liquid vs solid

Fertilizers are applied to crops both as solids and as liquid. About 90% of fertilizers are applied as solids. The most widely used solid inorganic fertilizers are [urea](#), diammonium phosphate and potassium chloride. Solid fertilizer is typically granulated or powdered. Often solids are available as [prills](#), a solid globule. Liquid fertilizers comprise anhydrous ammonia, aqueous solutions of ammonia, aqueous solutions of ammonium nitrate or urea. These concentrated products may be diluted with water to form a concentrated liquid fertilizer (e.g., [UAN](#)). Advantages of liquid fertilizer are its more rapid effect and easier coverage.<sup>1</sup> The addition of fertilizer to irrigation water is called "[fertigation](#)".

### Urea

Urea is highly soluble in water and is therefore also very suitable for use in fertilizer solutions (in combination with ammonium nitrate: UAN), e.g., in 'foliar feed' fertilizers. For

fertilizer use, granules are preferred over prills because of their narrower particle size distribution, which is an advantage for mechanical application.

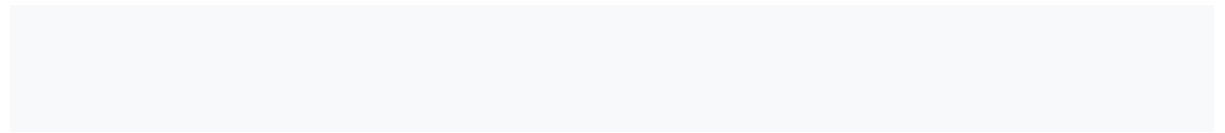
Urea is usually spread at rates of between 40 and 300 kg/ha (35 to 270 lbs/acre) but rates vary. Smaller applications incur lower losses due to leaching. During summer, urea is often spread just before or during rain to minimize losses from [volatilization](#) (a process wherein nitrogen is lost to the atmosphere as ammonia gas).

Because of the high nitrogen concentration in urea, it is very important to achieve an even spread. Drilling must not occur on contact with or close to seed, due to the risk of germination damage. Urea dissolves in water for application as a spray or through irrigation systems.

In grain and cotton crops, urea is often applied at the time of the last cultivation before planting. In high rainfall areas and on sandy soils (where nitrogen can be lost through leaching) and where good in-season rainfall is expected, urea can be side- or top-dressed during the growing season. Top-dressing is also popular on pasture and forage crops. In cultivating sugarcane, urea is side-dressed after planting, and applied to each [ratoon](#) crop.

Because it absorbs moisture from the atmosphere, urea is often stored in closed containers.

Overdose or placing urea near seed is harmful.



Recently nitrogen fertilizers have plateaued in most developed countries. China although has become the largest producer and consumer of nitrogen fertilizers. Africa has little reliance on nitrogen fertilizers. Agricultural and chemical minerals are very important in industrial use of fertilizers, which is valued at approximately \$200 billion. Nitrogen has a significant impact in the global mineral use, followed by potash and phosphate. The production of nitrogen has drastically increased since the 1960s. Phosphate and potash have increased in price since the 1960s, which is larger than the consumer price index. Potash is produced in Canada, Russia and Belarus, together making up over half of the world production. Potash production in Canada rose in 2017 and 2018 by 18.6%. Conservative estimates report 30 to 50% of crop yields are attributed to natural or synthetic commercial fertilizers. Fertilizer consumption has surpassed the amount of farmland in the United States. [Global market](#) value is likely to rise to more than US\$185 billion until 2019. The European fertilizer market will grow to earn revenues of approx. €15.3 billion in 2018.

Data on the fertilizer consumption per hectare [arable land](#) in 2012 are published by [The World Bank](#). The diagram below shows fertilizer consumption by the European Union (EU) countries as kilograms per hectare (pounds per acre). The total consumption of fertilizer in the EU is 15.9 million tons for 105 million hectare arable land area (or 107 million hectare arable land according to another estimate). This figure equates to 151 kg of fertilizers consumed per ha arable land on average by the EU countries.

## Environmental effects



[Runoff](#) of [soil](#) and fertilizer during a rain storm

Use of fertilizers is beneficial in providing nutrients to plants although they have some negative environmental effects. The large growing consumption of fertilizers can affect soil, surface water, and groundwater due to the dispersion of mineral use.



Large pile of [phosphogypsum](#) waste near [Fort Meade, Florida](#).

For each ton of phosphoric acid produced by the processing of phosphate rock, five tons of waste are generated. This waste takes the form of impure, useless, radioactive solid called [phosphogypsum](#). Estimates range from 100,000,000 and 280,000,000 tons of phosphogypsum waste produced annually worldwide.

### Water

Phosphorus and nitrogen fertilizers when commonly used have major environmental effects. This is due to high rainfalls causing the fertilizers to be washed into waterways. Agricultural run-off is a major contributor to the eutrophication of fresh water bodies. For example, in the US, about half of all the lakes are [eutrophic](#). The main contributor to eutrophication is phosphate, which is normally a limiting nutrient; high concentrations promote the growth of cyanobacteria and algae, the demise of which consumes oxygen. Cyanobacteria blooms ('[algal blooms](#)') can also produce harmful [toxins](#) that can accumulate in the food chain, and can be harmful to humans. Fertilizer run-off can be reduced by using weather-optimised fertilization strategies.

The nitrogen-rich compounds found in fertilizer runoff are the primary cause of serious oxygen depletion in many parts of [oceans](#), especially in coastal zones, [lakes](#) and [rivers](#). The resulting lack of dissolved oxygen greatly reduces the ability of these areas to sustain oceanic [fauna](#). The number of oceanic [dead zones](#) near inhabited coastlines is increasing.

As of 2006, the application of nitrogen fertilizer is being increasingly controlled in northwestern Europe and the United States. In cases where eutrophication can be reversed,

it may nevertheless take decades and significant soil management before the accumulated nitrates in [groundwater](#) can be broken down by natural processes.

### **Nitrate pollution**

Only a fraction of the nitrogen-based fertilizers is converted to plant matter. The remainder accumulates in the soil or is lost as run-off. High application rates of nitrogen-containing fertilizers combined with the high [water solubility](#) of nitrate leads to increased [runoff](#) into [surface water](#) as well as [leaching](#) into groundwater, thereby causing [groundwater pollution](#). The excessive use of nitrogen-containing fertilizers (be they synthetic or natural) is particularly damaging, as much of the nitrogen that is not taken up by plants is transformed into nitrate which is easily leached.

Nitrate levels above 10 mg/L (10 ppm) in groundwater can cause '[blue baby syndrome](#)' (acquired [methemoglobinemia](#)). The nutrients, especially nitrates, in fertilizers can cause problems for natural habitats and for human health if they are washed off soil into watercourses or leached through soil into groundwater.

Impact of chemical fertilizers and pesticides on agriculture and allied sectors in the country

The Standing Committee on Agriculture (Chair: Hukmdev Narayan Yadav) submitted a report on 'Impact of chemical fertilizers and pesticides on agriculture and allied sectors in the country' on August 11, 2016.

- The Standing Committee on Agriculture (Chair: Hukmdev Narayan Yadav) submitted a report on 'Impact of chemical fertilizers and pesticides on agriculture and allied sectors in the country' on August 11, 2016. Key observations and recommendations of the Committee include:
- **Consumption of fertilizers:** The Committee observed that the consumption of chemical fertilizers in the country has been increasing along with the level of agricultural production. Agricultural production increased from 83 million tonnes in the 1960s to 252 million tonnes in 2014-15. Use of chemical fertilizers (such as those containing nitrogen, phosphorus and potassium) increased from one million tonnes to 25.6 million tonnes in the same period.
- The country would have to produce 300 million tonnes of food grains by 2025 in order to provide for its population. The Committee noted that 45 million tonne of fertilizers would be required to meet this target. Of this, 6-7 million tonnes may be met from organic fertilizers, but the rest would be met by chemical fertilizers. It recommended that a comprehensive study should be undertaken to measure the impact of chemical fertilizers and pesticides on soil fertility and general health.
- **Availability of fertilizers:** While the consumption of chemical fertilizers in the country has increased from 17.4 million tonnes in 2001-02 to 25.5 million tonnes in 2012-13, the domestic availability has only increased from 14.5 million tonnes to 16.1 million tonnes. This indicates that there has been an increase in the import of fertilizers.

- **Imbalance in use of fertilizers:** The Committee observed that currently, 292 out of the 525 districts (56%) in the country account for 85% of its fertilizer use. In addition, the ratio of consumption of fertilizer has been skewed towards nitrogen. The ratio of usage of nitrogen, phosphorus and potassium fertilizers is 6.7:2.4:1, as compared to the recommended usage ratio of 4:2:1. The Committee recommended that a strategy should be initiated to promote the balanced use of fertilizers.
- **Excessive use of pesticides:** The Committee observed that the consumption of chemical pesticides in the country increased from 55,540 tonnes in 2010-11 to 57,353 tonnes in 2014-15, while their imports increased from 53,996 tonnes to 77,376 tonnes in the same period. The Committee noted that excessive use of pesticides may have a deteriorating effect on the health of both humans and animals. However, inadequate funds are a constraint in taking up comprehensive research in this regard. The Committee recommended that a policy should be put in place regarding the import and usage of pesticides.
- **Fertilizer subsidy policy:** The Committee noted that the present policy of fertilizer subsidy excludes liquid fertilizers, bio-fertilizers, and farm organic manure, among others. These are considered to be more effective in restoring soil health, and are environment friendly. The present policy has been ineffective in promoting the balanced use of fertilizers. The Committee recommended that the existing fertilizer subsidy policy should be revised, and a new policy which is more favourable to Indian conditions should be formulated.
- **Promotion of bio-fertilizers and organic farming:** The Committee noted that there is a need to increase the use of bio-fertilizers, and move towards organic farming. It recommended that a Policy should be put in place to incentivise the use of bio-fertilizers. Farmers should be provided with financial and technical support to enable them to switch to organic farming on a large scale.
- **Regulating authorities for fertilizers:** The Committee observed that the present system of certifying new fertilizers is time consuming. It recommended that a Fertilizer Development and Regulating Authority should be established to streamline the process of certification, quality checks, innovations, and fixing prices of fertilizers.
- **Administration of pesticides:** While the production of pesticides is monitored by the Ministry of Chemicals and Fertilizers, their usage is administered by the Ministry of Agriculture. The Committee noted that there is a need to review the Insecticide Act, 1968, to provide for a regulatory framework for the pesticides sector. A Pesticides Development and Regulation Authority should also be created to regulate the manufacturing, import and sale of pesticides in the country.
- Investigations carried out under All India Coordinated Research Project on 'Long Term Fertilizer Experiments' over five decades at fixed sites have indicated that continuous use of nitrogenous fertilizer alone had deleterious effect on soil health and crop productivity showing deficiencies of other major and micro nutrients. Even with recommended doses of NPK and more, deficiency of micro and secondary nutrients

has become yield limiting factors over the years. Deficient nutrient may also affect plant growth and cause plant physiological disorders. There is also possibility of nitrate contamination in groundwater above the permissible limit of 10 mg NO<sub>3</sub>-N /L due to excessive/over-use of nitrogenous fertilizers, particularly in light textured soils that has consequence on human/animal health if used for drinking purpose. ICAR recommends soil test based balanced and integrated nutrient management through conjunctive use of both inorganic and organic sources of plant nutrients to reduce the use of chemical fertilizers, preventing deterioration of soil health, environment and contamination of groundwater. In addition, split application and placement of fertilizers, use of slow releasing N-fertilizers and nitrification inhibitors, growing leguminous crops and use of resource conservation technologies (RCTs) are also advocated.

- As per the latest information available, the consumptions of chemical fertilizers in the country during 2017-18, 2018-19, 2019-20 and 2020-21 (upto kharif 2020) are 54.38, 56.21, 59.88 and 33.85 million tonnes of fertilizer products (Urea, Di-Ammonium Phosphate (DAP), Murate of Potash (MOP), Complexes and Single Super Phosphate (SSP), respectively.
- The Government has launched a National Mission on Soil Health Card to promote soil test based balanced and judicious fertilizer application in the country. Similarly, organic farming is being promoted under Parampragat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain Development for North East Region (MOVCD-NER) in the country. Trainings and demonstrations are organized through ICAR institutions including Krishi Vigyan Kendras (KVKs), and agricultural universities to educate farmers on all these aspects.

### 13.Urea Policy(Pricing and Administration)

- At present, there are 34 Gas Based urea manufacturing units in the country with installed annual capacity of 258.34 LMT approx.
  - The MRP of urea is statutorily fixed by the Government of India and at present it is Rs. 242 for a 45 kg bag of urea which includes Rs. 354/MT as dealer margin for private traders/PSUs/Cooperatives and Rs. 50/MT which is paid to retailers for acknowledging the receipt and reporting the stock in mFMS (iFMS) as additional incentive. The MRP is exclusive of taxes and charges towards neem coating. The difference between the delivered cost of fertilizers at farm gate and MRP payable by the farmer is given as subsidy to the fertilizer manufacturer/importer by the Government of India.
  - The following policies regarding subsidy payment to urea units are in place since 2003:
    - i. New Pricing Scheme (NPS) - I for the period from 01.04.2003 to 31.03.2004.
    - ii. NPS – II for the period from 01.04.2004 to 31.09.2006.
    - iii. NPS – III for the period from 01.10.2006 to 01.04.2014.
    - iv. Modified NPS – III for the period from 02.04.2014 to 31.05.2015
  - The current policies by which subsidy is being paid to urea units are as under:

- v. NPS-III and Modified NPS – III regarding compensation of fixed cost and variable cost e.g. the cost of bag, water charges & electricity charges to continue till further orders.
- vi. New Urea Policy – 2015 (amended from time to time) (Applicable for 25 gas based urea units).
- vii. Notification dated 17th June, 2015 (amended from time to time) – Applicable for Madras Fertilizers Limited- Manali Southern Petrochemicals Industries Corporation (SPIC) - Tuticorin and Mangalore Chemicals & Fertilizers Limited (MCFL).
- (viii) New Investment Policy – 2012 (amended from time to time) – Applicable for Chambal Fertilizers and Chemicals Limited's Gadepan-III plant, Matix Fertilizers and Chemicals Limited's Panagarh plant, Ramagundam Fertilizers and Chemicals Limited's Ramagundam plant and Hindustan Urvarak and Rasayan Limited's Gorakhpur plant.
- 14.FERTILIZER POLICY IN INDIA

#### **14.1.New Urea Policy (Applicable for 25 gas based urea units)**

- The New Urea Policy-2015 (NUP-2015) has been notified by Department of Fertilizers on 25th May, 2015, which was initially made effective from 1st June, 2015 upto 31st March, 2019, with the objective of maximizing indigenous urea production, promoting energy efficiency in urea production and rationalizing subsidy burden on the government.
- As per NUP – 2015, the preset energy norms for the 25 gas based urea units fixed during earlier policies have been mopped up and they are eligible to get the concession rate on the basis of revised energy norms fixed for each group from 1st June, 2015 to 31st March, 2018 which is the simple average of pre-set energy norms of NPS-III and average actual energy consumption achieved during the years 2011-12, 2012-13 and 2013-14 or the pre-set set energy norms of NPS-III, whichever is lower.
- The urea units were given target energy consumption norms to be achieved in the year 2018-19. For Group-I, target energy norms for the year 2018-19 is 5.5 G Cal/MT (except Tata Chemicals Limited-Babrara for which existing pre-set energy consumption norm of NPS-III i.e. 5.417 G Cal/MT will continue). For Group-II and Group-III, the target energy consumption norms for the year 2018-19 have been 6.2 G Cal/MT and 6.5 G Cal/MT respectively.
- The compensation for other variable cost e.g. the cost of bag, water charges & electricity charges and fixed cost are determined in accordance with existing provisions of NPS-III (notified on 8th March, 2007 ) and Modified NPS-III (2nd April, 2014).
- For production upto 100% re-assessed capacity (RAC), the 25 gas based urea units are entitled to get total cost of production of urea, which includes fixed cost and variable cost.
- For production beyond RAC, the units are entitled for their respective variable cost and a uniform per MT incentive equal to the lowest of the per MT fixed costs of all the indigenous urea units subject to import parity price plus weighted average of other incidental charges which the government incurs on the imported urea. However, vide notification dated 7th April, 2017, a further amendment was incorporated for production of urea beyond RAC during 2016-17 such that units were entitled beyond their respective variable cost and a uniform per MT incentive equal to the lowest of the per MT fixed cost of all indigenous urea



units subject to sum of import parity price, other incidental charges which the Government incurs on the import of urea and weighted average of Central Government levies of urea paid by the urea manufacturing units. Vide said amendment, it has been decided that in event of any fluctuation in Import Parity Price that would have adverse impact on the production beyond RAC by urea units, Department of Fertilizers is authorized to take appropriate decision in consultation with Department of Expenditure.

- Five units namely MFL-Manali, MCFL-Mangalore, SPIC-Tuticorn, BVFCL-Namrup-II and BVFCL-Namrup-III are not covered under this scheme because these units were not connected to gas pipeline network in the country at the time when NUP was introduced. As per NUP – 2015, Namrup-II and Namrup-III units of BVFCL are proposed to be closed and a new high efficiency unit will be installed, which will be dealt separately under their restructuring proposal. Till then, these two units are functioning under the provisions of Modified NPS-III.

- Vide Notification dated 14th May, 2019, the provisions of NUP-2015 have been extended from 1st April, 2019 till further orders, except for the provisions which stand already amended vide notification of even number dated 28th March, 2018.

#### **14.2.For Naphtha based urea units**

- The three Naphtha based urea units viz., Madras Fertilizers Limited- Manali (CPSU), Southern Petrochemicals Industries Corporation (SPIC) - Tuticorin and Mangalore Chemicals & Fertilizers Limited (MCFL) are governed by Policy Notification dated 17th June, 2015, which allows these units to operate urea production using Naphtha as feedstock till gas availability and connectivity to these three units either by gas pipeline or by any other means. The Naphtha based urea units are entitled to get subsidy as per the following conditions:

(i) These units will be eligible for subsidy on the basis of the revised energy norms from the date of notification, which would be the simple average of pre-set energy norms of New Pricing Scheme (NPS) – III and lowest yearly specific energy consumption achieved during the years 2011-12, 2012-13 and 2013-14 or the pre-set energy norms of NPS – III, whichever is lower.

(ii) The concession rate for these plants will be determined notionally on the basis of weighted average of the delivered cost of RLNG to recently converted plants after deducting state taxes (VAT, Entry tax) on RLNG or the cost of production of urea from Naphtha/FO after deducting state taxes levied on Naphtha/FO consumed for urea production (VAT, Entry tax) on Naphtha/FO, whichever is lower.

(iii) The compensation for other variable cost e.g. the cost of bag, water charges & electricity charges and fixed cost will be determined in accordance with existing provisions of NPS – III and Modified NPS – III.

- **The specific energy consumption norms for these three units from 2018-19 was fixed as 6.5 Gcal/MT.**

- After getting the gas pipeline connectivity, MFL-Manali, MCFL-Mangalore and SPIC-tuticorin have started urea production on natural gas feedstock w.e.f. 29<sup>th</sup> July, 2019, 12<sup>th</sup> December, 2020 and 13<sup>th</sup> March, 2021, respectively.

#### **Amendment to New Urea Policy NUP – 2015**

- **Vide notification dated 28th March, 2018, Department of Fertilizers has approved the following decisions with regard to Target Energy Norms given to all urea manufacturing units (except BVFCL):**

(i) For 11 urea manufacturing units viz., YFIL, NFL-Vijaypur-II, GIL, CFCL-Gadepan-I & II, IFFCO-Aonla-II, RCF-Thal, IFFCO-Kalol, IFFCO-Aonla-I, IFFCO-Phulpur-I&II, the target energy consumption norms as mentioned in Para 3.2 of NUP-2015, will come into force w.e.f. 1st April, 2018.

(ii) The existing norms under New Urea Policy-2015 for remaining 14 urea manufacturing units viz., NFL Vijayppur-I, KRIBHCO-Hazira, KFL-Shahjahanpur, NFCL-Kakinada-I, NFCL-Kakinada-II, GNFC-Bharuchm GSFC-Vadodara, NFL-Bathinda, NFL-Nangal, NFL-Panipat, SFC-Kota, KFCL-Kanpur, RCF Trombay-V, ZACL-Goa are hereby extended for further period of 2 years i.e. till 31st March, 2020 with the following penalties:

(a) Penalty equivalent to 2% energy of difference between NUP Energy norms and Target Energy norms of NUP-2015, for the first year i.e. 2018-19.

(b) Penalty equivalent to 5% energy of difference between NUP Energy norms and Target Energy norms of NUP-2015, for the second year i.e. 2019-20.

(c) Urea manufacturing units must achieve Target Energy Norms during the extended period of 2018-19 to 2019-20 failing which additional penalties may be imposed on defaulting units in consultation with the Department of Expenditure.

(iii) The aforesaid target energy norms may be continued upto 31st March, 2025. Meanwhile, an expert body under NITI Aayog would be engaged to recommend the energy norms to be achieved from 01st April, 2025.

(iv) The three Naphtha based urea units viz., MFL, MCFL, SPIC are also allowed the existing energy norms under Para (2) of policy notification dated 17th June, 2015 for another two years i.e. till 31st March, 2020 or till these units get the gas pipeline connectivity, whichever is earlier. There will be no mopping up of energy efficiency for a fix period of 5 years from date of gas pipeline connectivity as per Para 3 (viii) and 5 (ii) of NPS-III policy dated 8th March, 2007.

- Subsequently, vide notification dated 7th July, 2020, the existing Energy Norms of the 14 urea units mentioned in para (ii) above, have been further extended till 30.09.2020 with penalty equivalent to 10% of energy difference between NUP Energy Norms and Target Energy Norms of NUP-2015.

- Further, vide Notification dated 18<sup>th</sup> November, 2022, DoF has notified CCEA's approval as under:

(i) The provisions of notification dated 7<sup>th</sup> July, 2020 extended for 14 urea manufacturing units viz, KRIBHCO-Hazira, NFL-Vijaipur-I, NFCL-Kakinada-I, KFL-Shahjahanpur, NFCL-Kakinada-II, GNFC-Bharuch, GSFC-Vadodara, KFCL-Kanpur, SFC-Kota, RCF-Trombay-V, ZACL-Goa, NFL-Nangal, NFL-Bathinda and NFL-Panipat up to 30<sup>th</sup> September, 2022 or till the units achieve the Target Energy Norms (TEN), whichever is earlier, with the penalty equivalent to 10% energy of difference between NUP energy norms and target energy norms of NUP-2015 from 1<sup>st</sup> October, 2020 to 30<sup>th</sup> September, 2022.

(ii) An additional penalty of 2% will be imposed on all the units which are not TEN compliant w.e.f. 1<sup>st</sup> October, 2022. This additional penalty along with the penalty imposed earlier will be in effect till 31<sup>st</sup> March, 2023, by which date all units should mandatorily be TEN compliant and no further extension will be allowed.

(iii) In case, the six urea manufacturing units namely KRIBHCO-Hazira, NFCL-Kakinada-I, NFCL-Kakinada-II, GSFC-Vadodara, RCF-Trombay-V and ZACL-Goa (after excluding the 8 urea manufacturing units which have either successfully implemented the ESS or are being allowed to use coal as mix of energy) are not able to meet the TEN even by the extended timeline of 31<sup>st</sup> March, 2023, Department of Fertilizer would move a proposal after in depth examination, for consideration of Department of Expenditure and the said proposal would be examined on its own merit.

### **New Investment Policy – 2012**

• **The Government has notified New Investment Policy – 2012 on 2nd January, 2013 with the main objective to facilitate fresh investment, make India self-reliant and reduce import dependency in urea sector. The salient features of NIP – 2012 are as follows :-**

i. The policy supports gas based plants.

ii. It has structure of a flexible floor and ceiling price calculated at delivered price of gas from US \$6.5 to US \$ 14/mmbtu.

iii. The floor price has been determined at a Return on Equity (RoE) of 12% and the ceiling price at a RoE of 20%.

iv. For Greenfield/Revival and Brownfield Projects, the floor and ceiling shall increase in tandem with increase in delivered gas price i.e. every USD 0.1/mmbtu increase in delivered gas price will increase the floor and ceiling by USD 2/MT upto delivered gas price of USD 14/mmbtu.

v. Beyond delivered gas price of USD 14/mmbtu, only floor will be increased.

vi. For Revamp Projects, floor and ceiling have been linked to delivered gas price of USD 7.5/mmbtu and floor and ceiling shall increase by USD 2.2/MT for every increase in delivered gas price of 0.1/mmbtu.

vii. It supports revival of closed units.

viii. It encourages investment by Indian industry in Joint Venture abroad in resource rich countries

ix. For units in North Eastern states, the special dispensation regarding gas price that is being extended by GOI/State governments will be available to any new investment. Suitable adjustments will be made to applicable floor and ceiling price in case the delivered price (after allowing for special dispensation) falls below USD 6.5 per mmbtu, subject to approval of Ministry of Finance.

### **Amendment in NIP-2012**

- **Vide notification dated 7th October, 2014, the following amendments were made in the New Investment Policy–2012 (NIP-2012):-**

(i) Para 8.1 of NIP-2012 is replaced as follows:

‘Only those units whose production starts within five years from the date of this amendment notification will be covered under the policy. Subsidy will be given only upon domestic sale as at present for a period of 8 years from the date of start of production. Thereafter, the units will be governed by the urea policy prevalent at that time.’

(ii) To ensure seriousness/credibility of the project proponents under NIP-2012 and for timely execution of the projects, all the project proponents will be required to furnish Bank Guarantee (BG) of Rs. 300 crores for each project. The BG will be linked to milestones in the project cycle. Out of Rs. 300 crores, Rs. 100 crores of BG will be released after finalization of LSTK/ EPCA contractors and release of advance to the contractor’s account; Rs. 100 crores of BG will be released on completion of equipment ordering and supply to the site or midpoint of the project cycle, whichever is earlier; and the balance of Rs. 100 crores of BG on completion of the project. PSUs are, however, exempted from furnishing the BG.

(iii) A Committee of Secretaries comprising Secretary (Fertilizers), Secretary (Department of Expenditure), Secretary (MoPN&G), Secretary (Planning Commission) and Secretary (Agriculture) with Secretary (Fertilizers) as Chairman is constituted to take decisions on various issues which will arise during the implementation of NIP-2012.

### **Uniform Freight Policy**

- DOF announced the uniform freight policy (UFP) with effect from April 1, 2008 vide notification dated July 17, 2008 with an objective to ensure the availability of fertilizers in all parts of the country, especially distant/remote corners of the country. The freight subsidy is paid to the urea units for the transportation of urea from Plant/Port to the Block/District.

- Based on the recommendations of Tariff Commission, the slab-wise rates in respect of primary road movement upto 500 Kms were notified for the year 2008-09 vide notification dated 17.6.2015. The said rates are escalated/ de-escalated annually by Department of Fertilizers.

- Vide Notification dated 1st September, 2011, Department of Fertilizers had issued Normative Per tonne per Km Transportation Rates for the year 2007-08, 2008-09 and 2009-10 based on recommendations made by Tariff Commission in the case of secondary movement of fertilizers from unloading rake point to retail point. The escalated/de-escalated Per Tonne Per kilometre (PTPK) for road transportation in the case of secondary movement of fertilizers are notified by Department of Fertilizers annually.
- Subsequently, the freight rates for primary and secondary movement have been notified by the Department of Fertilizers from time to time.

### **14.3.Phosphatic and Potassic (P&K) Policy**

#### Phosphatic and Potassic (P&K) Fertilizer Policy and Projects

##### **14.3.1.Concession scheme/nutrient based subsidy policy for decontrolled Phosphatic &potassic fertilizers**

Government of India decontrolled Phosphatic and Potassic (P&K) fertilizers with effect from 25th August 1992 on the recommendations of Joint Parliamentary Committee. Consequent upon the decontrol, the prices of the Phosphatic & Potassic fertilizers registered a sharp increase in the market, which exercised an adverse impact on the demand and consumption of the same. It led to an imbalance in the usage of the nutrients of N, P & K (Nitrogen, Phosphate and Potash) and the productivity of the soil. Keeping in view the adverse impact of the decontrol of the P&K fertilizers, Department of Agriculture & Cooperation introduced Concession Scheme for decontrolled Phosphatic & Potassic (P&K) fertilizers on ad-hoc basis w.e.f. 1.10.1992, which has been allowed to continue by the Government of India upto 31.3.2010 with changed parameters from time to time. Then the Government introduced Nutrient Based Subsidy Policy w.e.f. 1.4.2010 (w.e.f. 1.5.2010 for SSP) in continuation of the erstwhile Concession Scheme for decontrolled P & K fertilizers.

The basic purpose of the Concession Scheme and Nutrient Based Subsidy Policy has been to provide fertilizers to the farmers at the subsidized prices. Initially, the ad-hoc Concession Scheme was introduced for subsidy on DAP, MOP, NPK Complex fertilizers. This scheme was also extended to SSP from 1993-94. Concession was disbursed to the manufacturers/importers by the State Governments during 1992-93 and 1993-94 based on the grants provided by Department of Agriculture & Cooperation. Subsequently, DAC started releasing payment of concession to the fertilizer companies based on the certificate of sales issued by the State Governments on 100% basis.

The Government introduced the system of releasing 80% 'On Account' payment of concession in 1997-98 to the fertilizer companies month-wise, which was finally settled based on the certificate of sales issued by the State Government. During 1997-98, Department of Agriculture & Cooperation also started indicating an all India uniform Maximum Retail Price (MRP) for DAP/NPK/MOP. The responsibility of indicating MRP in respect of SSP rested with the State Governments. The Special Freight Subsidy Reimbursement Scheme was also introduced in 1997 for supply of fertilizers in the difficult areas of J&K and North-eastern States, which continued upto 31.3.2008. Based on the cost price study of DAP and MOP conducted by Bureau of Industrial Costs & Prices (BICP - now

called Tariff Commission), Department of Agriculture & Cooperation started announcing rates of concession based on the cost plus approach on quarterly basis w.e.f. 1.4.1999. The total delivered cost of fertilizers being invariably higher than the MRP indicated by the Government, the difference in the delivered price of fertilizers at the farm gate and the MRP was compensated by the Government as subsidy to the manufacturers/importers for selling the fertilizers at the MRP indicated by the Government.

The administration of the scheme was transferred from Department of Agriculture & Cooperation to Department of Fertilizers w.e.f. 1.10.2000. The Government introduced a new methodology for working out subsidy to complex fertilizers w.e.f. 1.4.2002 based on the recommendations of the Tariff Commission. The complex manufacturers were divided into groups based on feedstock for sourcing Nitrogen, such as gas, naphtha, imported ammonia. With the passage of time, the structure of DAP industry also changed as some of the new DAP manufacturing plants were established using the Rock Phosphate for manufacturing indigenous Phosphoric acid/DAP. Accordingly, the Tariff Commission made a fresh Cost Price Study and submitted its report in February 2003. Payment of concession to the DAP manufacturing units from 2003-04 to 2007-08 was made as per two groups depending upon the source of the raw materials (Rock Phosphate/ Phosphoric acid). Based on the decisions of the Government in 2004-05, Department of Fertilizers framed a proposal suggesting methodology to link phosphoric acid price with international DAP price. Subsequently, the matter was referred to the Expert Group. The Expert Group under Prof. Abhijit Sen, submitted its report in October 2005.

The recommendations of the Expert Group were considered by an Inter-Ministerial Group (IMG). Tariff Commission conducted fresh cost price study of DAP/MOP and NPK complexes and submitted its report in December 2007. Based on the examination of the Tariff Commission Report and the longterm approach suggested by the Expert Group under the Chairmanship of Prof. Abhijit Sen, the Government approved the Concession Scheme with effect from 1.4.2008 for DAP/MOP/NPK Complexes/ MAP, which continued upto 31.3.2010 with certain modifications. The final rates of concession were worked out on monthly basis. Concession for indigenous DAP was the same as that of imported DAP (on the basis of import parity price). Concession on complex fertilizers was based on the methodology recommended by Tariff Commission with certain modifications.

The NPK complex industry was divided into 4 groups, depending upon the source of Nitrogen, gas, naphtha, imported Urea-ammonia mixture and imported Ammonia. A separate cost of 'S' for Sulphur containing complex fertilizers was recognized w.e.f. 1.4.2008. The input/fertilizer prices for Concession Scheme was derived on the basis of an outlier methodology. The Buffer Stocking Scheme was allowed to continue with 3.5 Lakh MTs for DAP and 1 Lakh MTs for MOP as buffer. Modifications in certain elements of the Concession Scheme were also carried out with effect from 1.4.2009 to adjust parameters of concession scheme to International pricing dynamics and rationalize 'N' pricing group-wise as well as payment system. Certain changes were effected in the existing policy for P & K Fertilizers. Accordingly, w.e.f. 1.4.2009 final rates of concession were worked out on monthly basis, taking into account the average international price of the month preceding the last month or the actual weighted average C&F landed price at the Indian ports for the current month, whichever lower with respect to DAP and MOP. In case of raw materials/ inputs for complex

fertilizers, there was a lag of one month. From 1.12.2008, payment of concession has been made to the manufacturers/importers of the Decontrolled fertilizers (except SSP) on the basis of arrival/ receipt of fertilizers and certificate of receipt by the State Government/statutory auditor of the company subject to final settlement on the basis of sale of the quantity.

The MRPs of the P&K fertilizers, which has been indicated by the Government/State Government, has been constant since 2002 till 31.3.2010. The MRPs of the NPK complexes were reduced w.e.f. 18.6.2008. In order to enhance the basket of fertilizers in the Concession Scheme, Mono- Ammonium Phosphate (MAP) was included into the Concession Scheme w.e.f. 1.4.2007, Triple Super Phosphate (TSP) was inducted into the Concession Scheme w.e.f. 1.4.2008 and Ammonium Sulphate (AS) manufactured by M/s FACT and M/s GSFC was inducted w.e.f. 1.7.2008.

### **(A) Nutrient Based Subsidy Policy for decontrolled Phosphatic & Potassic fertilizers**

In the implementation of Concession Scheme, it has been experienced that no investment has taken place in last decade. The subsidy outgo increased exponentially by 530% during 2004 to 2009 with about 90% of the increase due to rise in the international prices of fertilizers and inputs. Agricultural productivity did not register increase in commensurate with the increase in the subsidy bill. The MRP of the fertilizers remained constant from 2002 onwards. A Group of Ministers (GoM) constituted to look into all aspects of the fertilizer regime, recommended that Nutrient Based Subsidy (NBS) may be introduced based on the contents of the nutrients in the subsidized fertilizers. The Hon'ble Finance Minister in its Budget Speech 2009 announced for introduction of Nutrient Based Subsidy Policy for Phosphatic & Potassic fertilizers with the objective of ensuring Nation's food security, improving agricultural productivity and ensuring the balanced application of fertilizers. The Government introduced the Nutrient Based Subsidy (NBS) Policy w.e.f. 1.4.2010 in continuation of the erstwhile Concession Scheme for decontrolled P & K fertilizers (w.e.f. 1.5.2010 for SSP). The details of Nutrient Based Subsidy Policy are as under:

- NBS is applicable for Di Ammonium Phosphate (DAP, 18-46-0), Muriate of Potash (MOP), Mono Ammonium Phosphate (MAP, 11-52-0), Triple Super Phosphate (TSP, 0-46-0), Single Super Phosphate (SSP, 0-16-0-11), Ammonium Sulphate (AS - (Caprolactum grade by GSFC and FACT) and 16 grades of complex fertilizers which. Primary nutrients, namely Nitrogen 'N', Phosphate 'P' and Potash 'K' and nutrient Sulphur 'S' contained in the fertilizers mentioned above are eligible for NBS.
- Any variant of the subsidized P&K fertilizers covered under NBS Policy and are fortified/coated with Boron and Zinc, as provided for under FCO, will continue to be eligible for subsidy. Such fortified/coated grades of fertilizers will attract an additional per tone subsidy to encourage their application along with primary nutrients. Additional subsidy rates are Rs. 300 per MT and Rs. 500 per MT for Boron and Zinc respectively.
- An Inter-Ministerial Committee (IMC) has been constituted with Secretary (Fertilizers) as Chairperson and Joint Secretary level representatives of Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW), Department of Expenditure (DOE), NITI Aayog and Department of Agricultural Research and Education (DARE). This Committee recommends per nutrient subsidy for 'N', 'P', 'K' and 'S' before the start of the financial year

for decision by the Government (Department of Fertilizers). The IMC also recommends a per tonne additional subsidy on fortified subsidized fertilizers carrying secondary (other than 'S') and micro-nutrients. The Committee considers and recommends inclusion of new fertilizers under the subsidy regime based on application of manufacturers/ importers and its need appraisal by the Indian Council for Agricultural Research (ICAR), for decision by the Government.

- NBS to be paid annually on each nutrient namely, 'N', 'P', 'K' and 'S' has been decided/announced by the Government for 2020-21.
- Distribution and movement of fertilizers along with import of finished fertilizers, fertilizer inputs and production by indigenous units continues to be monitored through the on-line web based "Integrated Fertilizer Monitoring System (iFMS)" (erstwhile FMS and mFMS).
- The fertilizer companies are required to print Maximum Retail Price (MRP) along with applicable subsidy on the fertilizer bags clearly. Any sale above the printed MRP will be punishable under the EC Act.
- In addition to NBS, freight for the movement and distribution of the decontrolled fertilizers by rail and road is being provided to enable wider availability of fertilizers in the country as per guidelines dated 23.7.2012 (Annexure – 'A').
- In order to examine the reasonableness of MRPs of P&K fertilizers, the companies shall continue to submit the certified cost data as per the requirement and directions of DOF from time to time. The companies shall also report MRPs of P&K fertilizers regularly to DOF.
- Manufacturers of customized fertilizers and mixture fertilizers are eligible to source subsidized fertilizers from the manufacturers/ importers after their receipt in the districts as inputs for manufacturing customized fertilizers and mixture fertilizers for agricultural purpose. There is no separate subsidy on sale of customized fertilizers and mixture fertilizers.
- The payment of subsidy to the manufacturers/importers of P&K fertilizers shall be released as per the procedure and terms and conditions mentioned in the Department Notification No. D(FA)/CCEA/2011 dated 25.10.2020 and D(FA)/2016/DBT dated 17.3.2017, as amended from time to time.

### **(B) Nutrient Based Subsidy Per Kilo Gram of Nutrients**

Based on the recommendations of the Inter Ministerial Committee constituted under the Nutrient Based Subsidy Policy, the Government has allowed the per Kg NBS for 'N', 'P', 'K' & 'S' (Nitrogen, Phosphate, Potash and Sulphur) and the amount of subsidy per MT on the Phosphatic & Potassic fertilizers for 2010-11 to 2020-21 is as per Annexure 'B'.

### **Movement**

#### **Introduction of Movement Division**

Fertilizer Movement Division is entrusted with ensuring adequate and timely availability of fertilizers to the farmers in all parts of the country on the basis of requirement furnished by Department of Agriculture & Farmer's Welfare (in consultation with respective state Governments). The Division prepares agreed supply plan in consultation with Manufacturers/Importers to fulfil the monthly requirement in the country. The movement of all major subsidized fertilizers is monitored through an online web based monitoring system i.e. integrated Fertilizers Monitoring System (iFMS) & e-Urvarak DashBoard.



## **Information about Movement Division**

The Department of Fertilizers has been entrusted the responsibility of ensuring movement, distribution and allocation of subsidized chemical fertilizers, from various fertilizer plants and ports in accordance with the State-wise, season-wise & month-wise requirement assessed by the Department of Agriculture & Farmer's Welfare (DA&FW). The distribution of imported urea is made keeping in view the requirements of each of the States/UTs.

### **15. FERTILIZER ASSESSMENT:**

i) The assessment of the requirement of chemical fertilizers i.e. Urea, DAP, MOP & NPK for each season is finalized by Department of **Agriculture & Farmer's Welfare (DA&FW)** in consultation with state Governments.

ii) For this, biannual Zonal Conferences are held before start of each cropping season i.e. Kharif (April to September) and Rabi (October to March).

### **16. PREPARATION OF SUPPLY PLAN:**

i) To fulfill the monthly requirement as projected by DA&FW, Movement Division prepares agreed supply plan in consultation with Manufacturers / Importers.

### **17. MONITORING OF FERTILIZERS:**

i) Department of Fertilizers (DoF) has developed an IT enabled system viz., Integrated Fertilizer Management System (iFMS), which captures end to end details of Fertilizer in terms of Production, Movement, availability, requirement, Sale etc. Concerned stakeholders like DoF, State Agriculture Departments, District Collectors, Fertilizer Companies are all provided with separate user passwords for operating and monitoring purposes.

(ii) Weekly Video conference is conducted jointly by DA&FW, DoF with State Agriculture Officials, corrective actions are taken to dispatch fertilizer as indicated by the State Governments.

iii) DoF ensures availability of fertilizers at State level. State Governments are responsible for equitable distribution as per District/ Block level requirement.

iv) The gap in the requirement and indigenous production of Fertilizers is met through imports.

### **18. IMPORT OF FERTILIZERS:**

i) Import of urea for direct agriculture use is made on Government Account through STEs viz. IPL, NFL & RCF to bridge the gap between indigenous availability and assessed demand.

ii) P&K Fertilizer (DAP, MOP and NPK) are under Open General Licence (OGL) as per Foreign Trade Policy.

**The Shipping –I section** of DOF is entrusted with the post fixture work of vessels arriving with Urea cargo imported on Govt. account, including granular urea shipment from Oman to India under Urea Off Take Agreement with OQ Trading, Dubai. Post fixture work of shipping and port operations include are as follows:-

1. Examining the specifications of the vessels contained in the fixture note issued by RCF (Chartering Agency of DoF) and terms and conditions of port nomination message issued by the Shipping II section for coordinating with handling agents of DOF at the ports in receiving the cargo;
2. Examining the shipping documents received from the suppliers of the cargo associating with the handling agents in completing the inward entry documentation required by the port;
3. Examining the terms, conditions and exceptions of the Charter Party Agreement (CP) of the vessel for ascertaining the feasibility in handling operation;
4. Monitoring the discharge and evacuation of cargo at the ports;
5. Settlement of demurrage/dispatch at the load and discharge port and finalizing the Lay Time calculations in terms of CP;
6. Examining the Joint Draft Survey Report to ascertain the quality and quantity of urea cargo received;
7. Defending the interest of UOI in marine arbitration and court matters.

Apart from this, Shipping –I section is also monitoring the arrival of other grades of fertilizers like DAP and MOP on private account to ascertain the availability and requirement of the material for agronomic purpose.

### **Shipping-II**

1. Shipping-II section in the Department of Fertilizers is looking after pre-fixture work of vessels arriving with urea cargo on government account including shipments of granular urea from OQ Trading, Dubai under Urea Off Take Agreement (UOTA).
2. Examination of specifications of vessels offered by RCF (a chartering Agency of DoF) for loading urea cargo.
3. Examination of fixture note and Charter Party terms, conditions and exceptions.
4. Fixation of urea vessels including OMIFCO urea and nomination of discharge port.
5. Study of general average cases and preparation of brief/write-ups for counsels in maritime arbitrations.

6. Co-ordination with OQ Trading, Handling Agents (IFFCO and KRIBHCO) and RCF regarding shipping arrangements.
7. Issue of Nomination Letters and Letter of Authority of urea cargos imported on government account and shipments of granular urea from OQ Trading, Dubai under Urea Off Take Agreement (UOTA).
8. Recommendations to Ministry of Port, Shipping and Waterways for NOC for import of Urea and P&K fertilizers.
9. Recommendation to DGFT for the appointment of STEs.
10. NIT through CPP Portal for the appointment of Fertilizer Marketing Entities (FMEs) for handling and marketing of imported urea.

**20.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN KORAPUT DISTRICT  
FROM 01.04.2019 TO 30.09.2019  
(Qty in MTs and Value Rs. in lakh)**

Sl. No.	Name of the LAMPCS	Urea	MOP/ IPL	DAP (IFFCO )	DAP (PPL/ I PL)	IFFCO 20-20-0-13	PPL 20-20-0-13	MOP (PPL)	Total Quantity	Value
1	Kotpad	535.14	110.95	52.00	40.00	0	0	45.00	783.09	84.79
2	Kundura	221.76	75.00	81.50	51.25	0	0	45.00	474.51	71.29
3	Kumuliput	123.84	25.00	0	25.00	0	0	10.00	183.84	20.01
4	Umuri	141.80	87.75	0	67.50	0	0	0	297.05	42.33
5	Borigumma	315.45	92.50	108.50	55.00	0	0	20.00	591.45	82.86
6	Boipariguda	246.60	51.40	88.00	15.00	5.00	0	0	406.00	52.77
7	Kamta	463.50	163.50	212.50	45.50	0	0	30.00	915.00	133.62
8	Nandapur	38.25	5.00	20.00	0	67.50	0	0	130.75	22.13
9	Kunduli	58.50	0	2.50	0	22.50	0	0	83.50	8.66
10	Laxmipur	117.90	0	22.50	0	142.50	25.00	0	307.90	46.85
11	Bandhugaon	60.30	0	25.00	0	0	0	0	85.30	10.35
12	Narayanpatna	193.50	5.00	74.00	0	0	0	0	272.50	31.57
13	Kakirigumma	56.75	7.50	12.50	15.00	37.50	12.50	0	141.75	22.09
14	Lamataput	60.75	5.00	0	25.00	0	112.50	0	203.25	34.10
15	Dasamantapur	40.46	0	15.00	0	90.00	0	0	145.46	24.46
16	Pottangi	83.25	0	5.00	0	20.00	0	0	108.25	10.26
17	Padwa	52.20	10.00	0	0	20.00	25.00	0	107.20	13.87
18	Dumuriput	27.00	0	0	0	0	23.00	0	50.00	6.30
19	Podagada	54.90	0	0	0	47.50	50.00	0	152.40	23.03
20	Sunki	31.50	0	5.00	0	10.00		0	46.50	5.22
21	Total	2923.34	638.60	724.00	339.25	462.50	248.00	150.00	5485.69	746.56

21.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN KORAPUT DISTRICT  
FROM 01.10.2019 TO 31.03.2020

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP/IP L	DAP (IFFCO)	PPL 20-20-0-13	MOP (PPL)	IFFCO 20-20-0	Total Quantity	Value
1	Kotpad	40.81	15.00	30.00	0	0	0	85.81	12.99
2	Kundura	0	0	0	0	0	0	0.00	0.00
3	Kumuliput	4.50	5.00	5.00	0	0	0	14.50	2.34
4	Umuri	0	0	0	0	0	0	0.00	0.00
5	Borigumma	0	10.00	27.00	0	0	0	37.00	8.24
6	Boipariguda	0	0	0	0	0	0	0.00	0.00
7	Kamta	39.60	15.00	41.00	0	0	5.00	100.60	15.69
8	Nandapur	24.75	0	0	0	0	0	24.75	9.94
9	Kunduli	0	0	0	0	0	0	0.00	0.00
10	Laxmipur	25.20	0	0	0	0	68.00	93.20	15.83
11	Bandhugaon	0	0	0	0	0		0.00	0.00
12	Narayanpatna	34.20	0	45.00	0	0		79.20	12.65
13	Kakirigumma	25.20	2.50	5.00	0	0	5.00	37.70	11.53
14	Lamataput	9.90	0	0	0	0	0	9.90	9.21
15	Dasamantapur	0	0	0	0	0	0	0.00	0.00
16	Pottangi	0	0	0	0	0	0	0.00	0.00
17	Padwa	0	0	0	0	0	0	0.00	0.00
18	Dumuriput	0	0	0	0	0	0	0.00	0.00
19	Podagada	0	0	0	0	0	0	0.00	0.00
20	Sunki	0	0	0	0	0	0	0.00	0.00
21	Total	204.16	47.50	153.00	0.00	0.00	78.00	482.66	98.42

22.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN  
KORAPUT DISTRICT FROM 01.04.2020 TO 30.09.2020

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	N.P.K 20-20-0-13	Total Quantity	Value
1	Kotpad	667.98	203.30	241.00	0.00	1112.28	129.89
2	Kundura	628.16	230.50	378.40	25.00	1262.06	173.16
3	Kumuliput	475.83	148.60	260.00	0.00	884.43	114.74
4	Umuri	258.66	51.00	27.50	0.00	337.16	30.45
5	Borigumma	138.60	10.00		0.00	148.60	9.68
6	Boipariguda	371.48	85.50	135.00	5.00	596.98	69.78
7	Kamta	389.70	98.00	153.45	0.00	641.15	76.77
8	Nandapur	55.80	3.00	41.00	20.00	119.80	17.44
9	Kunduli	59.40		13.00	30.00	102.40	12.27
10	Laxmipur	75.60		27.00	67.00	169.60	23.70
11	Bandhugaon	51.75		26.00	83.50	161.25	25.26
12	Narayanpatna	71.60	8.50	46.00	60.50	186.60	28.25
13	Kakirigumma	66.60	7.00	61.50	190.00	325.10	56.21
14	Lamatapur	327.51	5.00	109.50	0.00	442.01	45.67
15	Dasamantapur	154.35	2.50	2.50	0.00	159.35	9.31
16	Pottangi	42.75	5.00	59.00	34.00	140.75	23.96
17	Padwa	72.00	2.50	5.00	11.00	90.50	7.87
18	Dumuriput	55.80	2.00	10.00	29.50	97.30	11.60
19	Podagada	24.75		5.00	7.50	37.25	4.05
20	Sunki	59.85	1.50	10.50	9.00	80.85	7.92
21	Total	4048.16	863.90	1611.3	5	7095.41	877.98

**23.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN  
KORAPUT DISTRICT FROM 01.10.2020 TO 31.03.2021**

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	NPK 20-20-0-13	Total Quantity	Value
1	Kotpad	138.11	25.00	25.00		188.11	18.07
2	Kundura	97.65	18.00	50.00		165.65	20.51
3	Kumuliput	0				0.00	0.00
4	Umuri	16.65	15.00	10.00		41.65	5.85
5	Borigumma					0.00	0.00
6	Boipariguda					0.00	0.00
7	Kamta					0.00	0.00
8	Nandapur	5.40			10.00	15.40	2.15
9	Kunduli					0.00	0.00
10	Laxmipur					0.00	0.00
11	Bandhugaon					0.00	0.00
12	Narayapatna	4.50	2.50	10.00	5.00	22.00	4.04
13	Kakirigumma	22.50	2.50	7.50	73.00	105.50	17.13
14	Lamataput	99.45		55.00		154.45	18.78
15	Dasamantapur	22.50				22.50	1.29
16	Pottangi					0.00	0.00
17	Padwa					0.00	0.00
18	Dumuriput					0.00	0.00
19	Podagada					0.00	0.00
20	Sunki	11.25				11.25	0.65
21	Total	418.01	63.00	157.50	88.00	726.51	88.47

24.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN KORAPUT DISTRICT FROM 01.04.2021 TO 30.09.2021

(Qty in MTs  
and Value Rs.  
in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	N.P.K 20-20- 0-13	Total Quantit y	Value
1	Kotpad	475.16	148.50	230.85	25.00	879.51	117.63
2	Kundur a	351.36	169.00	328.75	25.10	874.21	137.22
3	Kumulip ut	348.75	107.50	165.00	32.50	653.75	87.58
4	Umuri	275.31	52.00	37.50	20.00	384.81	39.24
5	Borigu mma	85.50	2.50	2.50		90.50	6.11
6	Boiparig uda	407.70	75.00	169.00	66.50	718.20	91.88
7	Kamta	203.85	20.00	20.00		243.85	21.02
8	Nandap ur	62.06	2.50	15.00	79.00	158.56	24.27
9	Kunduli	50.40		7.50	75.00	132.90	19.79
10	Laxmipu r	53.33		25.00	79.00	157.33	24.78
11	Bandhu gaon	60.98			82.00	142.98	20.82
12	Narayan patna	57.60	2.00	30.50	65.00	155.10	24.91
13	Kakirigu mma	83.70		40.00	171.25	294.95	48.34
14	Lamata put	179.10		65.00		244.10	26.45
15	Dasama ntapur	124.20	30.00	30.00		184.20	20.77
16	Pottangi	77.85		30.00	53.00	160.85	22.30
17	Padwa	74.70			52.50	127.20	15.24
18	Dumuri put	90.45	4.50	10.00	93.50	198.45	27.58
19	Podaga da	52.20		15.50	25.50	93.20	12.09
20	Sunki	86.85		10.00	22.50	119.35	12.38
21	Total	3201.03	613.50	1232.10	967.35	6013.98	800.40



**25.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN  
KORAPUT DISTRICT FROM 01.04.2021 TO 31.03.2022**

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	N.P.K 20-20-0- 13	Total Quantit y	Value
1	Kotpad	475.16	148.50	230.85	25.00	879.51	117.63
2	Kundura	351.36	169.00	328.75	25.10	874.21	137.22
3	Kumulip ut	348.75	107.50	165.00	32.50	653.75	87.58
4	Umuri	275.31	52.00	37.50	20.00	384.81	39.24
5	Borigum ma	85.50	2.50	2.50		90.50	6.11
6	Boiparig uda	407.70	75.00	169.00	66.50	718.20	91.88
7	Kamta	203.85	20.00	20.00		243.85	21.02
8	Nandap ur	62.06	2.50	15.00	79.00	158.56	24.27
9	Kunduli	50.40		7.50	75.00	132.90	19.79
10	Laxmipu r	53.33		25.00	79.00	157.33	24.78
11	Bandhu gaon	60.98			82.00	142.98	20.82
12	Narayan patna	57.60	2.00	30.50	65.00	155.10	24.91
13	Kakirigu mma	83.70		40.00	171.25	294.95	48.34
14	Lamata put	179.10		65.00		244.10	26.45
15	Dasama ntapur	124.20	30.00	30.00		184.20	20.77
16	Pottangi	77.85		30.00	53.00	160.85	22.30
17	Padwa	74.70			52.50	127.20	15.24
18	Dumuri put	90.45	4.50	10.00	93.50	198.45	27.58
19	Podaga da	52.20		15.50	25.50	93.20	12.09
20	Sunki	86.85		10.00	22.50	119.35	12.38
21	Total	3201.03	613.50	1232.10	967.35	6013.98	800.40

**26.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN  
KORAPUT DISTRICT FROM 01.04.2022 TO 30.09.2022**

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	N.P.K 20-20-0-13	Total Quantity	Value
1	Kotpad	426.60	107.50	25.00	149.50	708.60	113.81
2	Kundura	382.68	51.50	85.00	40.85	560.03	78.19
3	Kumuliput	228.20	40.00	66.10	65.00	399.30	65.10
4	Umuri	312.75	52.50	7.50	65.00	437.75	57.28
5	Borigumma	164.30	25.00	7.00	9.50	205.80	23.31
6	Boipariguda	324.00	40.00	39.55	142.00	545.55	85.12
7	Kamta	175.73	15.00	15.00		205.73	20.95
8	Nandapur	85.50	2.50	16.50	77.50	182.00	32.84
9	Kunduli	82.35	2.50		49.00	133.85	20.44
10	Laxmipur	65.25		15.00	70.40	150.65	28.32
11	Bandhugaon	65.25		10.00	100.50	175.75	36.10
12	Narayanpatna	69.30	6.00	10.00	80.50	165.80	32.38
13	Kakirigumma	90.90		17.00	104.50	212.40	40.18
14	Lamatapur	307.75	2.50	122.50		432.75	53.94
15	Dasamantapur	88.20	2.50	15.00	30.00	135.70	19.20
16	Pottangi	87.62			45.50	133.12	18.85
17	Padwa	185.40	25.00	7.50	74.50	292.40	43.85
18	Dumuriput	140.85	20.00	22.50	53.00	236.35	37.08
19	Podagada	63.95	2.50	5.00	40.00	111.45	17.96
20	Sunki	110.25		10.00	50.00	170.25	24.43

21	Total	3456.81	395.00	496.15	1247.25	5595.21	849.33
----	-------	---------	--------	--------	---------	---------	--------

27.B COMPONENT SALE OF FERTILISER TO DIFFERENT LAMPCS BY MARKFED IN KORAPUT DISTRICT FROM 01.10.2022 TO 15.01.2023

(Qty in MTs and Value Rs. in lakh)

Sl. No.	Name of the LAMPCS	Urea	MOP	DAP	NPK 20-20-0-13	Total Quantity	Value
1	Kotpad	0	0	0	0	0	0
2	Kundura	0	0	0	0	0	0
3	Kumuliput	0	0	0	0	0	0
4	Umuri	0	0	0	0	0	0
5	Borigumma	0	0	0	0	0	0
6	Boipariguda	0	0	0	0	0	0
7	Kamta	0	0	0	0	0	0
8	Nandapur	0	0	0	0	0	0

9	Kunduli	0	0	0	0	0	0
10	Laxmipur	0	0	0	15.00	15.00	4.38
11	Bandhugaon	0	0	0	0	0	0
12	Narayanpatna	0	0	0	0	0	0
13	Kakirigumma	0	0	0	0	0	0
14	Lamataput	0	0	0	0	0	0
15	Dasamantapur	0	0	0	0	0	0
16	Pottangi	0	0	0	0	0	0
17	Padwa	0	0	0	0	0	0
18	Dumuriput	0	0	0	0	0	0
19	Podagada	0	0	0	0	0	0
20	Sunki	0	0	0	0	0	0
21	Total	0	0	0	15.00	15.00	4.38

## 28. Analysis

Issues	Actionable solution
1. AT PEAK TIME THE MARKFED IS UNABLE TO PROVIDE REQUIRED BRAND OF FERTILISER TO PACS/LAMPCS	THE MARKFED SHOULD KEEP ADEQUATE STOCK IN THEIR GODOWN TO CATER THE NEED OF PACS/LAMPCS AT PEAK TIME
2. THE PACS/LAMPCS ARE AVAILING CASH CARRY LOAN WITH 13% INTEREST PER ANNUM. BUT SUPPLY FERTILIZER TO FARMERS UNDER 'B' COMPONENT WITH 5% INTEREST. SO, THE PACS ACCRUE LOSS OF 8% IN THIS FERTILISER BUSINESS	THIS ISSUES OF LOSS IN FERTILISER BUSINESS NEEDS TO BE SETTLED BY CHANGING THE MODALITIES RELATING TO FERTLISER BUSINESS LIKE PACS/LAMPCS SHOULD BE INDEPENDENT OF DCCB IN FERTILIZER BUSINESS,IF THEY HAVE SUFFICIENT OWN FUND
3. THE FARMERS AVAILING ST LOAN BELOW RS.50,000.00 ARE NOT CHARGED WITH INTEREST IN SUCH CASE THE SOCIETY MAKING KIND LOAN IS A LOSS OF INTEREST AS THE SOCIETY IS TO PAY 13% INTEREST	THIS ISSUES OF LOSS IN FERTILISER BUSINESS NEEDS TO BE SETTLED BY CHANGING THE MODALITIES RELATING TO FERTLISER BUSINESS
4. THE TRANSPORTATION CHARGES/ STORING/ MAN POWER UTILISATION / OTHER EXPENCES DOES NOT COMPENSATE FOR SELLING OF FERTILISER TO NON LOANEE FARMERS AS THE SOCIETY IS TO SALE ONLY WITH MSP	PACS/LAMPCS SHOULD NOT BE PRESSURISED FOR CASH SALE OF FERTILIZER. PROVISION MAY BE MADE FOR COMPULSORY MEMBERSHIP OF PACS/LAMPCS BEFORE AVAILING FERTILIZER
5. ONE POS MACHINE IS PROVIDED TO EACH PACS/LAMPCS	AT PEAK PERIOD, IT IS DIFFICULT TO SALE FERTILIZER THROUGH SINGLE POS DEVICE. PROVISION MAY BE MADE FOR SUPPLY OF MULTIPLE POS DEVICE TO PACS/LAMPCS
6. OFTEN, EXTRA T.C IS BORNE BY PACS/LAMPCS FOR FERTILIZER MOVEMENT	AS SOCIETY IS ALSO A BUSINESS ORGANISATION LIKE MARKFED/IFFCO ALL LOSS SHOULD NOT BE IMPOSED ON THE PACS/LAMPCS ONLY FOR GREATER INTEREST OF THE FARMERS AND SURVIVAL OF PACS/LAMPCS, LOSS (IF

	ANY) SHOULD BE SHARED BY ALL STAKEHOLDERS.
--	---

## 29.CONCLUSION

Based on the findings of the study and conclusion drawn, the following policy options are formulated not only for proper distribution of fertilizer to the beneficiaries but also for improvement in the use of fertilizer and its intake by the crops. Fertilizer Distribution National Productivity Council, Bhubaneswar. The non-availability of different types of fertilizer (Nitrogenous, Phosphoric and potassium) in time with the farmers, the fertilizer used in crops becomes unbalanced which affects productivity. The fertilizer manufacturers should be advised to supply the fertilizer before 15 days of the sowing of the crops. Fertilizer is applied to the plant at a particular stage of growth, due to non-availability of fertilizer in time, the farmers miss the stage of growth where fertilizer is to be applied, and as a result total use of fertilizer per hectare becomes less than requirement which reduces productivity. Keeping this in view, the government officials like Deputy Director of agriculture and collector of the district should take steps for adequate and timely supply of fertilizer, so that the farmers will not only use balance doses of fertilizer but also fertilizer can be applied at proper stages of crop growth, which will lead higher productivity. Fertilizer inspectors should be vigilant for sale of the fertilizer not more than minimum retail price<sup>4</sup>. Farmers training on fertilizer use in agriculture should be increased. Visit of the technical personnel to the farmer's field may be made in an organized way preferably a fixed date/day of a week/fortnight/ month may be fixed to a particular group of farmers so that farmers must meet with their field problems. Supply of fertilizer may be increased to meet the requirement of the farmers in terms of quantity and type of fertilizer.