

DECLARATION

I hereby declare that the Ph.D. thesis entitle “*A Study of Nutrient Based Subsidy Policy of Fertilizers in India and its Impact on Drivers of Buying Behaviour of Farmers.*”, is my own work conducted under the guidance and supervision of Prof. (Dr.) Jayrajsinh D. Jadeja.

The present work has neither been published nor has any degree been awarded to researcher for this work either by this university or by any other university. I hereby also testify that the present work is not based on the work of any other person. In fact, to the best of the researcher’s knowledge, there has been no publication or work on this topic.

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Date: _____

CERTIFICATE

This is to certify that the thesis entitled “*A Study of Nutrient Based Subsidy Policy of Fertilizers in India and Its Impact On Drivers Of Buying Behaviour Of Farmers*” is submitted by Ms. Yadav Preeti Surendraprasad, a research scholar, for the award of Doctor of Philosophy, at Faculty of Management Studies, The Maharaja Sayajirao University of Baroda, Vadodara. To the best of my knowledge, the present work is result of her original investigation and study. No part of the dissertation has ever been submitted for any other degree or diploma at any university.

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Dedicated

to my beloved parents

Shri. Surendra Prasad Yadav

&

Smt. Rita Devi Yadav



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Preeti Yadav

(Research Scholar)

PREFACE

The research on “*A Study of Nutrient Based Subsidy Policy of Fertilizers in India and Its Impact on Drivers of Buying Behaviour of Farmers.*” Has been a challenging yet rewarding experience. The policy has significant implications for sustainable agriculture in India, and understanding its challenges, achievements and future directions is crucial for policy makers, researchers, and stakeholders.

The Indian government implemented a nutrient-based subsidy policy for fertilizers in the year 2010 to incentivize the balanced use of nutrients and reduce the excessive use of urea fertilizer. This policy provides a subsidy based on the nutrient content of various fertilizers rather than on their weight, which has the potential to improve soil health, crop yields, and farm income. This study aims to investigate the impact of this policy on the drivers of buying behaviour of farmers in India.

This thesis aims to provide a critical assessment of the Nutrient Based Subsidy policy, examining its impact on the fertilizer industry, farmers, and the business environment. The research draws on a range of primary and secondary sources, including government reports, academic literature, and expert interviews.

The thesis is divided into several sections, beginning with an introduction to the Indian Agriculture development, then it discusses about the evolution of the fertilizer subsidy regime in India. It also throws light on the fertilizer pricing policies and subsidies in India. It then provides introduction to the Nutrient Based Subsidy policy and its main objectives. Later on, it provides an overview of the implementation of the policy and its impact on the stakeholders. The study also identifies the challenges faced and recommends measures to address them.

I hope this research work will serve as a valuable resource for readers interested in the NBS policy in India and its role in promoting sustainable agriculture. I would like to express my gratitude to all those who contributed to this research, including the farmers, fertilizer industry officers and fertilizer distributors & retailers who provided their insights.

Preeti Yadav
(Research Scholar)

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ABBREVIATIONS

AeFDS	Aadhar enabled Fertilizer Distribution System
AS	Ammonium Sulphate
AUE	Agronomic Use Efficiency
CAG	Comptroller and Auditor General
CAGR	Compound Annual Growth Rate
CAN	Calcium Ammonium Nitrate
CFCL	Chambal Fertilisers and Chemicals Limited
CIF	Cost, Insurance, and Freight
CSA	Climate-Smart Agriculture
DAP	Di-ammonium Phosphate
DBT	Direct Benefit Transfer
DOF	Department of Fertilizers
ECA	Essential Commodities Act
FAI	Fertilizer Association of India
FAR	Fertilizer application Rate
FES	Freight Equalization Subsidy
FFMP	Farmers Fertilizer Management Practice
FMS	Fertilizer Monitoring System
FOB	Free on Board
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
GNVFC	Gujarat Narmada Valley Fertilizers & Chemicals Limited
GOI	Government of India
GSFC	Gujarat State Fertilizers & Chemicals Limited
HURL	Hindustan Urvarak and Rasayan Limited
HYV	High Yield Variety
HYVSP	High Yielding Varieties of Seeds Program
IAAP	Intensive Agriculture Area Programme
IADP	Intensive Agricultural District Program
IASRI	Indian Agricultural Statistics Research Institute

ICC	Intra-Class Correlation
IFFCO	Indian Farmers Fertilizer Cooperative Limited
INM	Integrated Nutrient Management
IPI	International Potash Institute
IPL	Indian Potash Limited
IPM	Integrated Pest Management
K	Potassium
KRIBHCO	Krishak Bharati Cooperative Limited
LLL	Laser Land Levelling
MMBTU	Metric Million British Thermal Unit
MMT	Million Metric Ton
MOP	Muriate of Potash
MoRD	Ministry of Rural Development
MRP	Maximum Retail Price
MT	Metric Ton
N	Nitrogen
NAP	National Agricultural Policy
NBS	Nutrient-Based Subsidy
NFCL	Nagarjuna Fertilizers and Chemicals Limited
NFL	National Fertilizers Limited
NHM	National Health Mission
NPK	Nitrogen Phosphorus Potassium
NPS	New Pricing System
NRLM	National Rural Livelihood Mission
NRP	Normative Referral Price
OECD	Organization for Economic Co-operation and Development
OM	Organic Matter
P	Phosphorus
PFMS	Public Finance Management System
PFP	Partial Factor Productivity

PMBJP	Pradhan Mantri Bhartiya Janurvarak Pariyojna
PMKSK	Pradhan Mantri Kisan Samridhi Kendra
PoS	Point of Sale
PPL	Paradeep Phosphates Limited
RPS	Retention Pricing Scheme
RWCS	Rice-Wheat Cropping System
S	Sulphur
SBS	Second-Best Strategy
SD	Standard Deviation
SHC	Soil Health Cards
SPSS	Statistical Package for the Social Sciences
SSP	Single Super Phosphate
TRQ	Tariff-Rate Quota
USD	United States Dollar
VAT	Value Added Tax
WSF	Water Soluble Fertilizers
WTO	World Trade Organization

GLOSSARY

Term	Definition
Aadhaar	A 12-digit unique identification number issued by the Indian government to residents of India, which is used for various purposes, including identification and authentication in DBT.
Aadhaar Enabled Fertilizer Distribution System (AeFDS)	AeFDS is a system that uses Aadhaar authentication to distribute fertilizers to farmers. It is a part of the government's efforts to reduce fertilizer subsidy leakage and ensure timely delivery of fertilizers to farmers.
AS	A white crystalline solid with the chemical formula $(\text{NH}_4)_2\text{SO}_4$, commonly used as a fertilizer, food additive, and flame retardant.
Balanced fertilization	The practice of applying fertilizers in a balanced ratio to ensure that plants have access to all essential nutrients
Buying Behaviour	The decision-making process that consumers go through when choosing to purchase a product or service.
Crop Type	The specific crops that farmers are growing may influence their choice of fertilizers, as certain types may be better suited for specific crops.
DBT Dashboard	A web-based platform that provides real-time information on the status of Direct Benefit Transfer (DBT) transactions, including the number of transactions, the amount disbursed, and the beneficiaries.

Decontrol	The process of removing government control over the pricing and distribution of fertilizers.
Di-ammonium Phosphate (DAP)	A phosphatic fertilizer that contains nitrogen and phosphorus.
Direct Benefit Transfer (DBT)	A mechanism for transferring fertilizer subsidies directly to the bank accounts of farmers, which reduces leakage and delays in subsidy disbursement.
Fertilizer availability	The supply of fertilizers to farmers, including the quantity and quality of products.
Fertilizer Brand	A specific type or brand of fertilizer, often marketed with a unique name or label.
Fertilizer consumption	The amount of fertilizer used by farmers in a given period.
Fertilizer Dealer	A person or business that sells fertilizers to farmers and end-users.
Fertilizer Distribution	The movement of fertilizers from manufacturers to distributors, retailers and farmers.
Fertilizer grade	The percentage of nutrients (such as nitrogen, phosphorus, and potassium) in a fertilizer product.
Fertilizer import	The purchase of fertilizers from other countries to supplement domestic production.
Fertilizer Industry	The sector that encompasses fertilizer production, distribution, and trade in a country

Fertilizer Monitoring System	A system implemented by the Indian government to monitor the availability, pricing, and distribution of fertilizers in the country.
Fertilizer Pricing	The cost of fertilizers, which can be influenced by supply and demand, production costs, and government policies
Fertilizer Retailing	The process of selling fertilizers directly to farmers through retail outlets.
Fertilizer subsidy	Financial assistance provided by governments to make fertilizers more affordable for farmers.
Fertilizer Subsidy Budget	The amount of funds allocated by the government for fertilizer subsidies in a given financial year.
Fertilizer Subsidy Disbursement	The process of releasing fertilizer subsidies to fertilizer companies or retailers, which may involve various administrative and logistical challenges.
Fertilizer Subsidy Reforms	Changes in the fertilizer subsidy policy or mechanism aimed at improving the efficiency, effectiveness, or sustainability of fertilizer subsidy disbursement.
Fertilizer use efficiency	The percentage of applied fertilizer that is taken up by plants and used for growth.
Fertilizer Wholesaling	The process of selling fertilizers in bulk quantities to distributors and retailers.
Fertilizers	A substance or mixture of substances applied to soil or plants to provide nutrients for growth.

Green Revolution	A period of rapid agricultural development that took place in the 1960s and 1970s, characterized by the widespread adoption of high-yielding varieties of crops, increased use of fertilizers and pesticides, and other technological advancements.
High-yielding varieties (HYVs)	Varieties of crops that produce higher yields than traditional varieties.
Kharif	The Indian term "kharif season" refers to the country's summer growing season, which normally runs from June to October/November.
Land Records	Land records are official documents that contain information about ownership, rights, and transactions related to land.
Mandi	A marketplace or trading centre for agricultural commodities.
Micronutrients	Essential elements required by plants in small quantities, including iron, zinc, and copper.
Minimum Support Price (MSP)	A government-mandated price that ensures that farmers receive a minimum price for their crops. This can influence the demand for fertilizers as farmers may be more willing to purchase fertilizers if they are able to sell their crops at a higher price.
Muriate of Potash (MOP)	A potassium-containing fertilizer.
Nitrogen (N)	A macronutrient that is essential for plant growth and development, particularly for the formation of leaves, stems, and proteins.

NPK Ratio	The ratio of nitrogen, phosphorus, and potassium in a fertilizer, which can vary depending on the specific needs of the plants and the soil conditions.
Nutrient Content	The specific nutrient content of the fertilizer, including nitrogen, phosphorus, and potassium, may influence buying behaviour, as farmers may require different nutrient ratios depending on their specific crop and soil conditions.
Nutrient-based pricing	A pricing system that reflects the nutrient content of fertilizers, rather than just their weight.
Nutrients	Essential elements required by plants for growth and development, including nitrogen, phosphorus, and potassium.
Phosphorus (P)	A macronutrient that is essential for plant growth and development, particularly for root growth, flowering, and fruiting.
Phosphorus Fertilizer	A fertilizer that contains phosphorus, which is often used to enhance root growth and increase flower and fruit production.
PM KISAN Dashboard	PM KISAN stands for Pradhan Mantri Kisan Samman Nidhi. It is a web-based platform developed by the Indian government that provides real-time information on the status of DBT transactions under the PM KISAN scheme, which provides financial assistance to farmers.
Point of Sale (POS) machine	A POS machine is a device used to process card payments at retail locations.

Potassium (K)	A macronutrient that is essential for plant growth and development, particularly for the regulation of water balance and the activation of enzymes.
Potassium Fertilizer	A fertilizer that contains potassium, which is often used to improve plant resistance to stress and disease.
Pradhan Mantri Kisan Samman Nidhi Yojana (PM-KISAN)	It is a government initiative launched in 2019 to provide income support to small and marginal farmers in India.
Product Knowledge	The level of understanding that farmers and end-users have about different types of fertilizers, their benefits, and how they work.
Rabi	In India, the winter planting season is known as "Rabi Season," and it normally lasts from October to March/April.
S	A chemical element present in ammonium sulphate in the form of sulphate ions, which is also important for plant growth and health.
Single Super Phosphate (SSP)	A type of phosphatic fertilizer that is made by reacting rock phosphate with sulfuric acid.
Soil health	The physical, chemical, and biological properties of soil that support plant growth.
Soil Health Card	Soil Health Card is a government initiative that provides information about the nutrient status of the soil to farmers to help them make informed decisions about fertilizer use and crop management.

Soil Health Management	The practice of managing soil health through various methods, such as crop rotation, cover cropping, and integrated pest management.
Soil Testing	The process of analysing soil samples to determine soil properties and nutrient content, which can help guide fertilizer and nutrient management decisions.
Soil Type	The type and quality of soil may also influence fertilizer buying behaviour, as certain types of fertilizers may be more effective in specific soil conditions.
Triple Super Phosphate (TSP)	A highly concentrated phosphatic fertilizer.
Unique Identification Authority of India (UIDAI)	A statutory authority established by the Indian government that issues Aadhaar numbers and provides authentication services for DBT.
Urea	A nitrogenous fertilizer commonly used in agriculture.

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