

Chapter 11

Overcoming Fertilizer Supply Chain Disruptions in Agriculture With Special Reference to India

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ABSTRACT

Agriculture gradually depletes the soil of the essential nutrients for the growth of plants resulting in low crop productivity and yields. Soil is to be continuously fortified by the application of fertilizers to maintain food production. Therefore, an unbreakable supply chain is essential for continuous production of food from the fields. The supply chain gets disrupted following global economic downturn, pandemic or war situations. Due to this disruption supplies are affected, farmers are overburdened by rise in fertilizer prices beyond their reach and it could possibly lead to global food insecurity. India is a major foodgrain producing country and nearly 55% of its 1.44 billion population depends on agriculture for survival. This chapter discuss importance of al fertilizers in Indian agriculture and how the consumption is managed through domestic production and imports. The disruption in global supplies due to Covid 19 and the Ukraine war and problems encountered in making adequate supplies and government efforts to streamline the fertilizer supply chain are discussed.

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INTRODUCTION

Food is the prime requirement of all living beings. It is produced by plants during its lifetime through photosynthesis by absorbing the required minerals from the soil in which it is growing.

Nitrogen, phosphorus and potash are the primary nutrients, sulphur (S), calcium (Ca) are magnesium (Mg) are secondary nutrients and boron (B), zinc (Zn), chloride (Cl), copper (Cu), iron (Fe), manganese (Mn), selenium (Se) molybdenum (Mo) and nickel (Ni) are micronutrients required for plant growth and productivity. Agriculture gradually depletes the soil of the essential nutrients for the growth of plants resulting in low crop productivity and yields. The soil is fortified by the application of mineral fertilizers. Therefore, an unbreakable supply chain is essential for the continuous production of food from the fields. The raw materials to produce mineral fertilizers are not evenly distributed across the globe. Some countries are blessed with natural gas, rock phosphate and potash. Others must manage a regular supply of these materials for their agricultural development. It is at this point that the management of supply chain and logistics become important. The fertilizer supply chain management ensures the availability of an uninterrupted supply of raw material to processing plants, its conversion to specific products for consumption by the farmers, as well as the associated flow of information all along the supply chain. It includes sourcing raw materials, its procurement and movement, processing, storage, and distribution to the end user. Disruptions occur due to economic downturn, pandemic or geo-political conflicts and limit availability and free movement of supplies.

After the Covid 19 pandemic, the fertilizer demand in major agrarian economies including US, EU, Brazil, China, and India have gone up considerably threatening global availability and prices reaching sky high. There was an unprecedented hike in natural gas demand and prices, world over. The conflict between Russia and Ukraine, coupled with China's prohibition on fertilizer exports, caused disruptions to the global fertilizer industry and the flow of raw materials and finished goods. The war in Ukraine will have a catastrophic effect on the already fragile global food production system because of climate change, population growth, and the pandemic. According to Svein Tore Holsether, President and CEO of Yara International, one of the largest fertilizer companies in the world, - This could lead to a significant rise in food insecurity in less developed nations. Farmers in several countries are overburdened by the increases in fertilizer prices beyond their reach, and consequently, many of them are struggling to pay for key components necessary for their production, adding to supply chain disruptions. There are instances of farmers abandoning cultivation which could possibly lead to a global situation of food insecurity. Economically backward countries in Africa, Southern America, and Asia are worst impacted, as observed by UN Secretary-General António Guterres in “Response

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