

## Chapter 2: Literature Review

### 2.1 Introduction

A literature review serves to critically engage with the body of knowledge on a given topic, identifying major debates, methodologies, trends, and gaps. In the context of Indonesia's fertilizer import trade, the literature spans disciplines such as international trade, agricultural economics, supply chain management, and environmental studies. This chapter synthesizes current academic and institutional perspectives on fertilizer trade, with a focus on Indonesia's dependency on imports, the impacts of global events, and policy responses. Drawing on scholarly journals, policy papers, and organizational reports, the review supports the formation of this study's central research questions regarding the vulnerabilities and strategic responses within Indonesia's fertilizer sector.

### 2.2 Fertilizer Trade: Global Context and Theoretical Frameworks

Fertilizer trade has emerged as a critical component of global agricultural systems, driven by the uneven distribution of natural resources and production capabilities. Nitrogen (N), phosphorus (P), and potassium (K) fertilizers are essential for high-yield crop production, yet their availability depends on geographically concentrated reserves—such as potash in Canada and phosphate in Morocco (FAO, 2022). Consequently, countries with limited mineral resources or production capacity rely heavily on imports.

Theoretical frameworks such as **comparative advantage** and **global value chains (GVC)** help explain the international structure of fertilizer trade. According to Gereffi (2018), GVCs shape how agricultural inputs like fertilizers are sourced, processed, and distributed across borders. However, disruptions—like pandemics or geopolitical conflicts expose vulnerabilities in such interdependent systems (Baniya, Rocha, & Ruta, 2022).

For import-dependent countries like Indonesia, fertilizer trade is not merely economic but strategic. Dependence on a small group of suppliers raises risks of price shocks, supply chain disruptions, and food insecurity (World Bank, 2023).

### 2.3 Indonesia's Fertilizer Import Dependency

Indonesia's agricultural sector accounts for a significant portion of GDP and employs nearly one-third of the population (Badan Pusat Statistik, 2023). Despite domestic production efforts, Indonesia relies on imports to meet fertilizer demand particularly urea, NPK, DAP, and MOP (muriate of potash). The major suppliers include Canada, Russia, China, and Jordan, each contributing specialized fertilizers based on their resource endowments (IFA, 2023).

This dependency has been well documented in both academic and policy literature. FAO (2023) notes that Indonesia's fertilizer import levels have remained high due to limitations in domestic processing facilities and raw material shortages. Erwan (2010) critiques the

inefficiency of domestic fertilizer manufacturing, especially its inability to keep pace with rapid agricultural expansion.

Moreover, studies by Hebebrand and Laborde (2022) suggest that supply-side shocks—whether from energy price increases, trade restrictions, or export bans—immediately reverberate through countries like Indonesia, causing domestic price hikes and supply constraints.

## **2.4 Impact of Global Disruptions on Fertilizer Availability**

Recent global crises have intensified scrutiny on fertilizer supply chains. Multiple studies converge on the disruptive effects of:

- **COVID-19 Pandemic**

Beckman and Countryman (2021) show that COVID-19 caused logistical bottlenecks, affecting the timely shipment of fertilizer from global producers. Disruptions in port operations, factory shutdowns, and reduced transportation capacity delayed imports in many developing countries, including Indonesia.

- **Russia-Ukraine War**

The war between Russia and Ukraine has had substantial impacts on the fertilizer market. Russia, a major global exporter of nitrogen and phosphate fertilizers, faced sanctions and export curbs, which led to a tightening of global supply (Balaji & Babu, 2022). FAOSTAT (2022) reported a 20% contraction in global phosphate trade in the first half of 2022. Indonesia, as an importer of Russian fertilizers, experienced cascading price effects.

- **China's Export Restrictions**

China imposed export restrictions on nitrogen and phosphate fertilizers to prioritize domestic food security (World Bank, 2024). These restrictions led to a 90% reduction in urea exports from China in 2023, which substantially affected Indonesia's rice and maize production systems, heavily reliant on nitrogen fertilizers (UNCTAD, 2022).

Together, these disruptions serve as case studies illustrating how global trade policies can undermine agricultural stability in import-reliant economies.

## **2.5 Consequences for Agricultural Productivity and Food Security**

A major theme in recent literature is the connection between fertilizer shortages and declining agricultural productivity. Hasanah (2016) finds that nitrogen fertilizers alone can boost rice yields by 40–60%, and a reduction in their application can dramatically lower output. Data from Indonesia's Ministry of Agriculture supports this, noting a 10–15% drop in yields in some regions between 2021 and 2023 due to fertilizer shortages (BPS, 2023).

Furthermore, Dinda and Fitria (2022) highlight the socio-economic consequences of reduced agricultural productivity: declining farmer incomes, reduced purchasing power, and increased food prices. These effects exacerbate rural poverty and strain Indonesia's broader food security framework. As Glauber and Laborde (2022) argue, countries without buffer systems or fertilizer reserves are more vulnerable to inflationary shocks and dependent on emergency imports, which are often costlier and less reliable.

