Chapter 4
Climate Change as a Risk Multiplier in Supply Chains in the Arab Region: Sustainability Challenges and Adaptation Strategies

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ABSTRACT

Climate change represents one of the most pressing challenges facing supply chain management in the Arab region. This chapter examines how climate change functions as a risk multiplier, amplifying existing vulnerabilities in supply chains across food security, energy systems, and critical infrastructure. Drawing on recent empirical evidence and theoretical frameworks, this study analyzes the mechanisms through which climate impacts cascade through regional supply networks, creating compound risks that exceed the sum of individual threats. Through systematic lit-

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erature review and case study analysis of countries including Yemen, Iraq, Sudan, and Palestine, we identify critical adaptation strategies and policy interventions necessary for building resilient supply chains in politically and economically fragile environments. The findings reveal that institutional weaknesses compound climate vulnerabilities, while digital technologies offer promising pathways for enhancing forecasting, monitoring, and transparency.

INTRODUCTION

The Arab region stands at a critical juncture where environmental pressures intersect with complex socio-political realities to create unprecedented challenges for supply chain management. In 2024, the region experienced its hottest year on record, with average temperatures reaching 1.08°C above the 1991-2020 baseline and several countries reporting temperatures exceeding 50°C (World Meteorological Organization, 2025). The Arab world is now warming at nearly twice the global average rate, with recent research confirming the region's status as one of the world's clearest climate change hotspots (Abou Samra et al., 2025). This accelerated warming, combined with severe droughts, unprecedented flooding, and mounting water scarcity, has exposed critical vulnerabilities in the supply chains that underpin regional food security, manufacturing capabilities, and economic prosperity.

The Middle East and North Africa (MENA) region faces a unique constellation of challenges that distinguish it from other global regions grappling with climate change. Hosting 15 of the world's 20 most water-scarce countries (World Meteorological Organization, 2025), the region must simultaneously manage extreme resource constraints, heavy dependence on food and energy imports, fragile critical infrastructure, and in many cases, active armed conflicts that further destabilize supply networks. Water consumption in the region has grown by 540% between 2014 and 2020, reaching 360 million m^3 in 2020, while climate projections suggest temperatures will rise 1.5–3°C by 2050 with precipitation declining 5–20% (Qasem, 2025). Approximately 85% of food demands are satisfied through imports, including 93% of cereals, 62% of meat, and 56% of vegetables (Gulf Research Center, 2024), creating structural vulnerabilities that climate change threatens to transform from manageable challenges into systemic crises.

Traditional supply chain management literature has predominantly focused on economically and politically stable environments, leaving a significant gap in understanding how supply chains function—and can be made resilient—in contexts characterized by conflict, institutional fragility, and environmental extremes. This chapter addresses that gap by examining how climate change acts as a "risk multiplier" in the Arab region's supply chains, not merely creating new isolated threats