Trade Policy to Promote Nutrition and Food Security in Pakistan

General Equilibrium Simulations on Import Tariffs and Productivity

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Acknowldgemnt

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Executive Summary

Global food systems are under severe and continuing stress, marked by rising costs of nutritious foods, widening dietary inequalities, and growing exposure to climate and market shocks. The 2025 State of Food Security and Nutrition in the World report[1] projects that more than 512 million people may remain chronically undernourished by 2030, indicating that progress toward the Zero Hunger goal has stalled. Food price data show a persistent structural disparity between food groups: starchy staples and oils remain the cheapest sources of calories, while animal-source foods, fruits, and vegetables are consistently the most expensive. Ultra-processed foods, though nutritionally poor, are now far cheaper and increasingly common in diets. By 2021 they were about 47 percent less expensive than unprocessed or minimally processed foods. This global shift shows that while calories have become cheaper, healthy diets have become less affordable across much of the developing world.

These international patterns are clearly mirrored in Pakistan, where food and nutrition outcomes remain below those of most peer economies. Despite long-standing agricultural traditions, Pakistan faces a deepening challenge in ensuring food security and adequate nutrition for its population. Rising import dependence, widening trade deficits, and the increasing cost of healthy diets have left the country highly exposed to global price shocks. As of 2024, the cost of a healthy diet stands at about four international dollars per person per day, roughly one-fourth of GDP per capita, making nutritious food unaffordable for nearly 60 percent of Pakistanis. Around 40 million adults remain undernourished, one-third of children under five are stunted, and obesity affects about one-quarter of adults. On nearly all indicators such as undernourishment, stunting, wasting, anaemia, and dietary affordability, Pakistan performs worse than the average for lower-middle-income countries. This highlights the depth of its food and nutrition gap relative to comparable economies.

These outcomes coexist with persistent external imbalances. Agricultural imports reached nearly nine billion US dollars in 2024, compared with exports of about eight billion. The deficit is driven by heavy reliance on imported edible oils, pulses, and processed foods. Applied tariffs on key staples remain modest, around 6 percent for cereals and below 4 percent for oilseeds, offering limited protection to domestic producers and little incentive for local value addition. Combined with weak non-tariff enforcement, this has discouraged investment in farming, processing, and storage capacity.

The FAO report on Repurposing Agricultural Support to Transform Food Systems[2] emphasizes that removing agricultural support may reduce emissions but would also diminish production, reinforcing the need for repurposing rather than withdrawal. To promote health, sustainability, and equity, countries must adopt a food-systems approach that spans production, supply chains, food environments, and consumer behaviour. Transformation must also be inclusive, ensuring that smallholders, women, and rural populations participate and benefit. This ``leave no one behind'' principle is particularly relevant for Pakistan, where fragmented markets and unequal access to finance, inputs, and knowledge limit

[1] FAO, IFAD, UNICEF, WFP, & WHO. (2025). The state of food security and nutrition in the world 2025: Addressing high food price inflation for food security and nutrition. Food and Agriculture Organization of the United Nations.
[2] FAO. (2021). A multi-billion-dollar opportunity: Repurposing agricultural support to transform food systems. Food and Agriculture Organization of the United Nations.

farmers' ability to upgrade productivity and quality. Repurposed agricultural support through targeted incentives, infrastructure, and extension services can make trade policy reform both more effective and socially equitable.

To evaluate the effects of alternative policy choices, a series of general-equilibrium simulations were conducted for Pakistan's agrifood sector. The results indicate that a 20 percent increase in import tariffs on agrifood products could substantially reduce imports and expand domestic production. Imports of cereals decline by about 13.6 percent, pulses by 3.7 percent, and fisheries by 13 percent, while domestic production rises by roughly 12 percent in pulses and more than 8 percent in livestock. Moderate tariff adjustments, around 15 to 20 percent for cereals and 20 to 25 percent for pulses, can therefore ease import pressures and raise farm incomes, with limited welfare costs when combined with productivity support.

Productivity simulations reveal even stronger and more sustainable effects. Current yields for wheat and maize, roughly 3,000 and 6,000 kilograms per hectare, are less than half those achieved in high-performing countries such as Ireland and Oman. Chickpeas and lentils yield only 300 to 600 kilograms per hectare compared with 8,000 in Jordan and 2,500 in China. A feasible 10 percent improvement in productivity across subsectors raises domestic output by about 10 percent, exports by 7 to 8 percent, and welfare by up to 9 percent. The largest gains occur in cereals, oilseeds, fruits, and livestock, confirming that productivity growth complements tariff protection by translating higher prices into genuine supply expansion rather than inflationary effects.

Realising this transformation requires sustained investment in technology, extension, and quality systems. Expanding agricultural extension services, promoting precision agriculture, and building digital dashboards for integrated pest and nutrient management can improve efficiency and reduce post-harvest losses. Better seed quality, biofortified crops, and diversification toward nutrition-rich products such as pulses, fruits, and vegetables can enhance dietary outcomes and export readiness. Aligning domestic standards with GlobalGAP, HACCP, and the British Retail Consortium can improve compliance, food safety, and access to high-value markets.

The analysis employs a general-equilibrium gravity framework that links bilateral trade flows with production and welfare outcomes. The model incorporates both international and domestic trade flows using the Integrated Trade and Production Database (ITPD, Release 3) and applies tariff data from WITS-TRAINS and ITC MacMap. Two counterfactual simulations were implemented: a tariff-increase scenario for agrifood imports and a productivity-improvement scenario for domestic agriculture. The framework captures both direct and indirect effects of these shocks through production, trade, and welfare channels in a consistent global setting.

Overall, the evidence supports a two-stage policy pathway: first, protect, then upgrade. In the short term, carefully calibrated tariffs on selected agrifood imports can provide the stability and confidence needed for domestic producers to invest. In the medium term, narrowing yield gaps, improving quality, and enhancing productivity can make Pakistan's agriculture more competitive and self-reliant. Together, these measures can reduce import dependence, raise rural incomes, improve dietary affordability, and lay the foundation for agri-based industrialization and sustainable food security in Pakistan.

1. Introduction

Pakistan's food and nutrition landscape has undergone a rapid transformation over the past two decades. Traditional diets based on staple cereals, pulses, and fresh produce are increasingly being replaced by processed and packaged foods that are energy-dense but nutrient-poor. This shift, driven by population growth, urbanization, and the globalization of food supply chains, has deepened the country's triple burden of malnutrition, in which undernutrition, micronutrient deficiencies, and obesity coexist. Rising food prices and a steady increase in the cost of a healthy diet have made nutritious foods unaffordable for a majority of households, worsening long-standing inequalities in access to safe and balanced diets. Malnutrition imposes a significant economic burden, estimated to cost Pakistan nearly 3 percent of its gross domestic product each year.[3]

As of 2024, the cost of a healthy diet in Pakistan is estimated at about four international dollars per person per day. On an annual basis, this amounts to roughly one-fourth of GDP per capita, indicating that a substantial share of individual income is required to meet the cost of a nutritious diet. Given the high level of income inequality, rising food prices relative to incomes have pushed a large share of the population beyond affordability limits. Around 60 percent of Pakistanis, or nearly 151 million people, cannot afford a healthy diet. As a result, about 40 million adults, or roughly 16 percent of the population, remain undernourished. The consequences are serious; for instance, one-third of children under five, about 10.7 million, experience stunted growth due to chronic malnutrition, reflecting long-term deficiencies in diet quality and access. At the same time, poor dietary habits and the growing consumption of processed foods have led to a rapid rise in obesity, now affecting around 23 percent of the population, or roughly 31 million adults. This combination of undernutrition and overnutrition illustrates Pakistan's deepening nutritional imbalance and the urgent need for policies that make healthy diets more accessible and affordable.

Agriculture plays a central role in Pakistan's economy, contributing about 23.5 percent to gross domestic product and employing more than 37 percent of the labour force.[4] The sector provides livelihoods for millions of rural households and supplies the raw materials for much of the country's industrial and export activity. Yet despite its significance, productivity remains low and uneven across subsectors, limiting the sector's capacity to support food security and employment growth.

Pakistan's economy remains chronically dollar-deficient, with the trade deficit widening steadily over the past two decades. Within this context, agrifood imports consume a sizeable portion of

[3] Government of Pakistan. (2017). A strategic review of food security and nutrition in Pakistan. Islamabad: World Food Programme

[4] Government of Pakistan. (2025). Pakistan economic survey 2024–25. Islamabad: Ministry of Finance.

total export revenues, reflecting the country's increasing reliance on imported food supplies. The worsening food security conditions amid rapid population growth call for prudent policy action to enhance productivity in domestic agriculture. At the same time, there is a need to recalibrate tariffs and other trade measures to foster local production. Expanding domestic supply capacity and reducing excessive import dependence are essential for improving Pakistan's food and nutrition security in the long run.

This report is structured as follows. Section 2 reviews recent trends in food security and nutrition in Pakistan. Section 3 analyzes the country's agrifood trade performance, while Section 4 examines the structure of tariffs and non-tariff measures shaping food imports. Furthermore, the section outlines the general equilibrium framework used to simulate trade policy scenarios, focusing on productivity improvements and tariff adjustments, and includes the related policy discussion. The final section summarizes the key findings and provides policy recommendations for aligning Pakistan's trade policy with nutrition and healthy-diet objectives.

2. Food Security in Pakistan: Some Stylized Facts

The analysis reviews key indicators of food security and nutrition in Pakistan over time and compares them with global income group averages.[5] Country income classifications follow the World Bank income group definitions. Trends in affordability, undernourishment, stunting, and obesity highlight how access to nutritious food has evolved and where major gaps remain. Together, these indicators provide a concise picture of how Pakistan's food system is performing in terms of ensuring both access and dietary quality.

2.1 Affordability of a Healthy Diet

Affordability provides the most immediate measure of food access and its evolution over time. Figure 1 shows a steady rise in the cost of a healthy diet in Pakistan from 2017 to 2024, both in absolute and relative terms. The daily cost increased from about 3.0 I$ (PPP) per person in 2017 to nearly 4.0 I$ in 2024, representing roughly a one-third increase. When expressed as a share of GDP per capita, the cost rose from around 21.5 percent in 2017 to about 26 percent in 2024. The increase was particularly sharp after 2020, indicating that food costs have grown faster than incomes, making a healthy diet less affordable for the average Pakistani individual.

[5] Charts in this section are based on data from the FAOSTAT databases on Food Security and Nutrition} and on the Cost and Affordability of a Healthy Diet

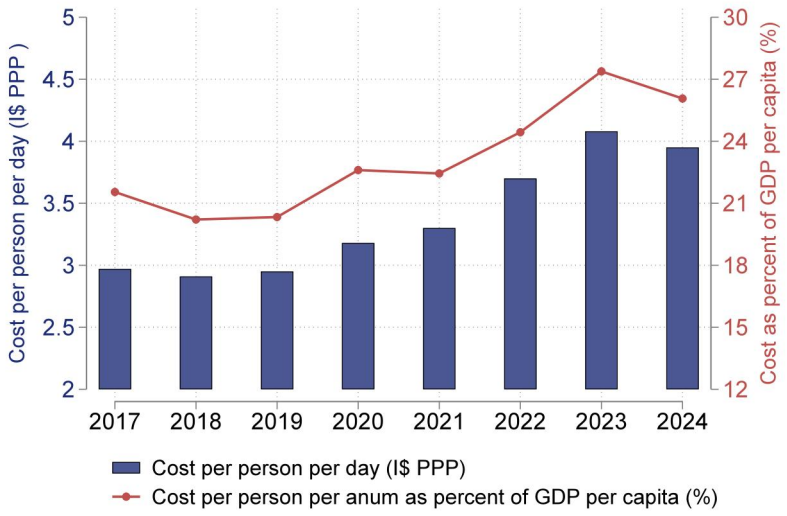

Figure 1: Cost of a healthy diet in Pakistan

Rising costs translate directly into affordability challenges for households. Figure 2 illustrates how the increasing cost of a healthy diet has resulted in persistently high levels of unaffordability. The prevalence of unaffordability (PUA) remained consistently high, hovering between 58 and 64 percent of the population, meaning that more than half of Pakistanis could not afford a healthy diet throughout the period. In parallel, the number of people unable to afford a healthy diet (NUA) climbed from about 131 million in 2017 to nearly 158 million in 2023, before easing slightly to 151 million in 2024. These figures show that even modest income gains have not been sufficient to offset rising food costs, leaving affordability largely unchanged despite economic growth in some years.

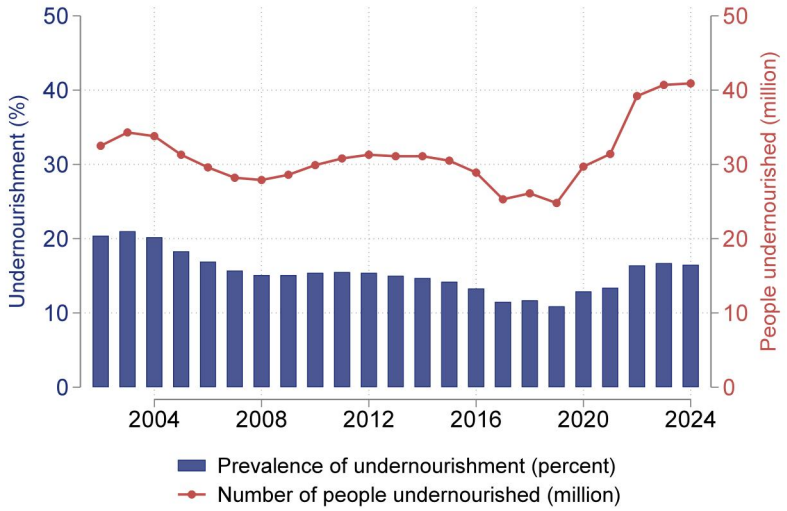

Figure 2: Prevalence of unaffordability in Pakistan

Comparisons with other economies provide additional perspective. Figure 3 shows that about 59 percent of Pakistan's population could not afford a healthy diet in 2017, slightly above the lower-middle-income average of 56 percent. By 2024, unaffordability in Pakistan remained around 60 percent, while the lower-middle-income average had improved to about 47 percent. In contrast, upper-middle- and high-income economies reported much lower rates, near 19 and 6 percent respectively. The widening gap with peers highlights that Pakistan has made little progress in improving diet affordability relative to its income group, suggesting that structural factors rather than short-term shocks continue to constrain food access.

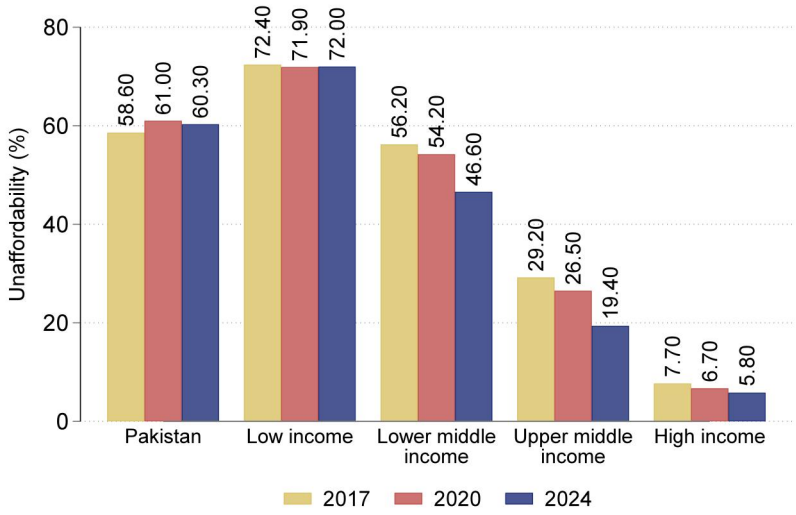

Figure 3: Prevalence of unaffordability – comparison across income groups

Persistent affordability pressures have also undermined progress in reducing undernourishment. Figure 4 shows that the share of undernourished individuals declined steadily from about 20 percent in the early 2000s to nearly 11 percent by 2019, reflecting earlier gains in food availability and access. However, this progress reversed after 2020, with the prevalence of undernourishment increasing to around 16.5 percent by 2024. In absolute terms, the number of undernourished people grew from about 25 million in 2017 to more than 40 million in 2024. The reversal indicates rising nutritional vulnerability, driven by declining food affordability and broader economic constraints that limit both household purchasing power and dietary diversity.

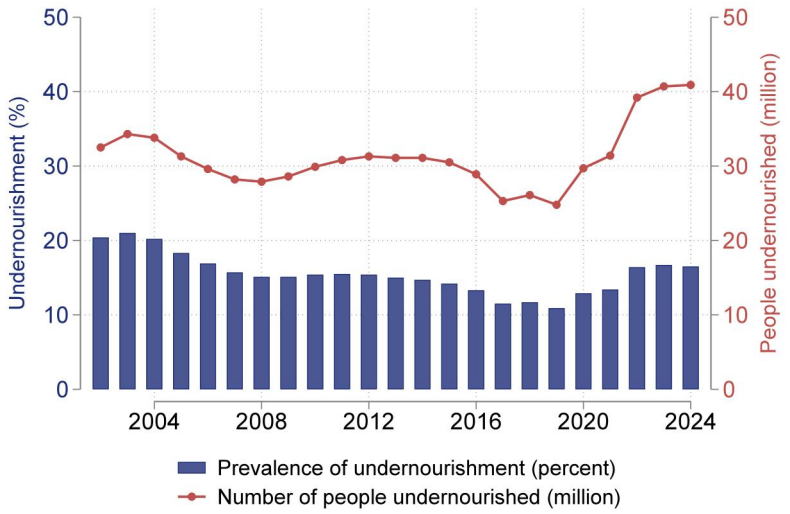

Figure 4: Prevalence of undernourishment in Pakistan

A global comparison further reinforces this picture. Figure 5shows that between 2002-2004 and 2012-2014, the prevalence of undernourishment in Pakistan fell from about 20 to 15 percent, broadly matching the improvement observed in lower-middle-income countries. However, by 2022-2024, Pakistan's rate had risen again to around 16.5 percent, while the lower-middle-income average remained stable near 12.8 percent. In contrast, upper-middle- and high-income economies have maintained very low undernourishment levels of under 3 percent. This comparative pattern suggests that Pakistan's recent setbacks have reversed part of its earlier progress and that restoring affordability will be critical to achieving lasting food security gains.

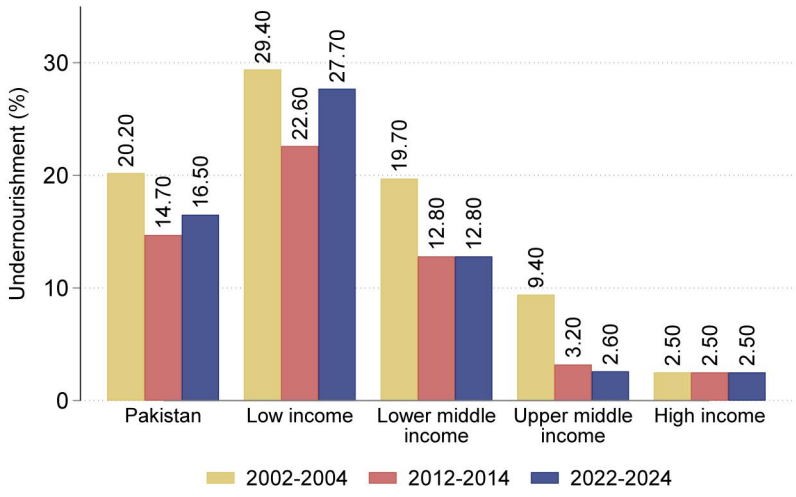

Figure 5: Prevalence of undernourishment – comparison across income groups

2.2 Malnutrition and Its Outcomes

Malnutrition reflects the long-term consequences of inadequate nutrition, poor dietary quality, and unequal access to essential food and health services. It manifests both as chronic undernutrition and as diet-related diseases linked to overconsumption of unhealthy foods. In Pakistan, these twin challenges have persisted for decades, reflecting structural weaknesses in food systems, health care access, and income distribution.

Figure 6 shows the persistently high rates of stunting among children under five years of age. The share of stunted children was around 40 percent in 2000 and remained above this level for more than a decade, peaking near 45 percent in the late 2000s. Although gradual improvement has occurred since 2015, the prevalence remains high at about 34 percent in 2024, equivalent to more than 10 million affected children. These figures demonstrate that, while nutritional programs and social safety nets have produced some gains, chronic undernutrition continues to affect a large share of young children. The persistence of such high rates points to deficiencies in dietary diversity, maternal nutrition, sanitation, and access to health services. In economic terms, this level of child stunting represents a major loss of human potential, undermining learning outcomes, productivity, and future earning capacity.

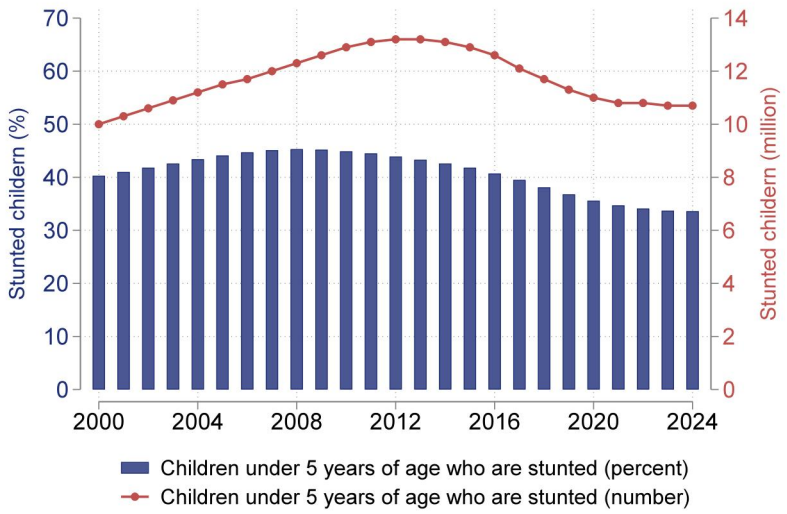

Figure 6: Prevalence of stunted growth among children under five in Pakistan

When compared with global income groups, Pakistan's progress in reducing child stunting appears modest. Figure 7 shows that in 2004 about 43 percent of Pakistani children under five were stunted, a rate broadly aligned with the average for lower-middle-income economies. By 2024 the share had fallen to around 34 percent, a slower improvement than the decline to 29 percent observed across lower-middle-income countries. In contrast, upper-middle- and high-income economies have achieved much lower stunting rates of around 11 and 4 percent

respectively. The slower pace of progress in Pakistan suggests that improvements in food availability have not translated into similar gains in nutrition outcomes. This disconnect between agricultural production and nutritional well-being reflects limited dietary diversification, low consumption of protein-rich and fortified foods, and insufficient targeting of vulnerable groups in public nutrition programs.

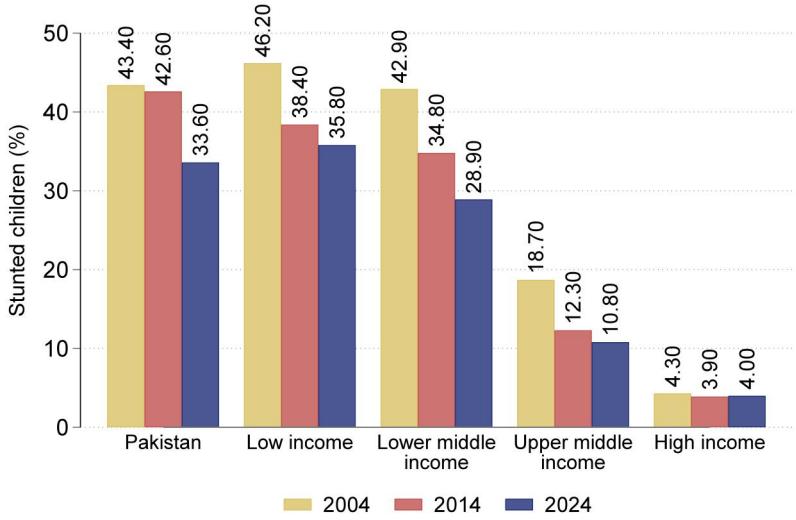

Figure 7: Prevalence of stunted growth among children – comparison across income groups

Alongside chronic undernutrition, Pakistan faces a growing epidemic of overweight and obesity. Figure 8 shows a steady and pronounced increase in obesity within the adult population. The prevalence rose from about 6 percent in 2000 to nearly 23 percent in 2022, with the number of obese adults climbing from roughly 4.5 million to more than 30 million. This rise has been driven by a combination of factors, including increased consumption of processed and fast foods, a decline in physical activity, and rapid urbanization.

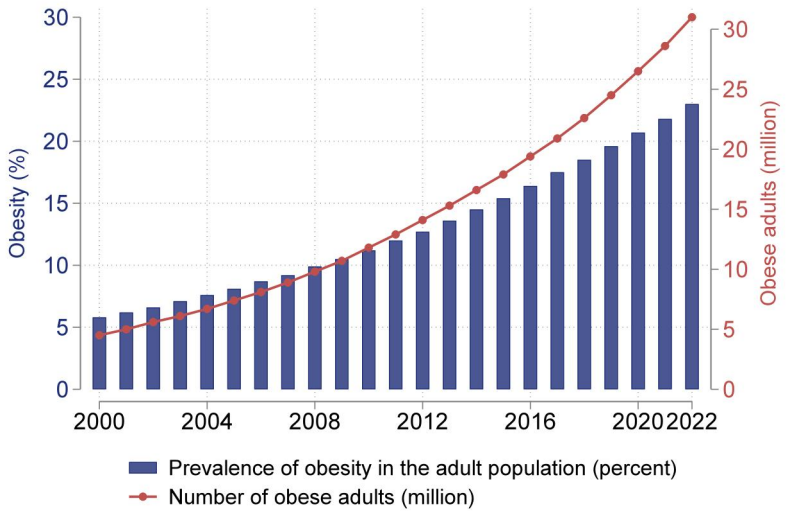

Figure 8: Prevalence of obesity in Pakistan

The shift from traditional, plant-based diets toward calorie-dense, low-nutrient foods has accelerated particularly in urban centers, where rising incomes and changing lifestyles have altered food habits. These trends are contributing to higher risks of diabetes, hypertension, and cardiovascular disease, imposing growing costs on Pakistan's already constrained health system.

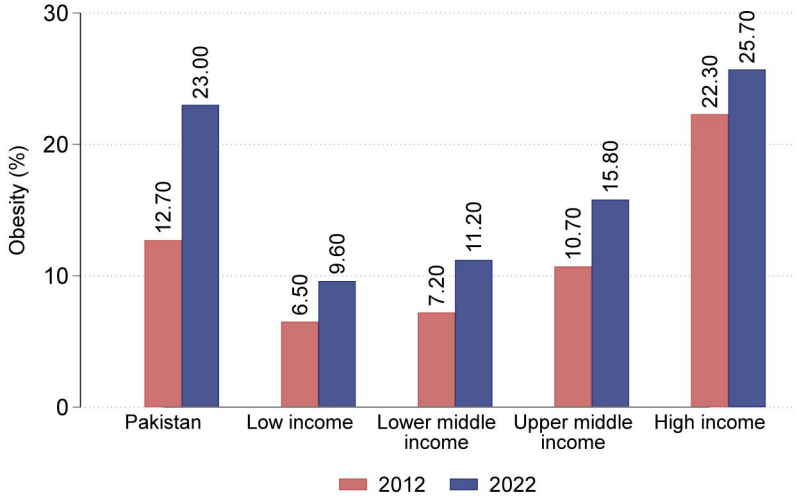

Figure 9: Prevalence of obesity – comparison across income groups

A comparative perspective highlights how rapidly Pakistan is moving through this nutrition transition. Figure 9 shows that obesity among adults increased from about 13 percent in 2012 to 23 percent in 2022, nearly doubling within a decade. This level now exceeds the averages for lower-middle- and upper-middle-income economies, around 11 and 16 percent respectively, and is approaching the high-income average of 26 percent. The pace of increase suggests that

Pakistan is facing a dual challenge typical of middle-income economies, where rising incomes have improved calorie intake but not diet quality. The coexistence of both undernutrition and obesity within the same population underscores systemic issues in food availability, affordability, and health awareness.

Taken together, the evidence points to a deep structural imbalance in Pakistan's nutrition profile. Persistent child stunting, combined with a sharp rise in adult obesity, reflects the unequal distribution of both food quantity and quality. Addressing this dual burden will require policies that improve access to diverse and nutrient-rich foods, promote health education, and encourage more active lifestyles. Without such coordinated action, Pakistan risks continuing a trajectory where economic growth coexists with widespread malnutrition and diet-related disease.

3. Current Situation of Agrifood Trade

3.1 Pakistan's Aggregate Trade Profile

Concerning trade, it is valuable to begin with the aggregate trade profile of the economy. Figure 10 shows that while Pakistan's exports have increased gradually from about 12 billion US dollars in 2003 to around 32 billion in 2024, its imports have grown at a faster pace, rising from 13 to nearly 57 billion over the same period. As a result, the trade deficit has widened significantly, reaching more than 40 billion during 2021-2022 before narrowing somewhat in recent years. The persistent imbalance reflects limited export diversification and continued reliance on imports, leaving the economy vulnerable to recurrent balance-of-payments pressures.

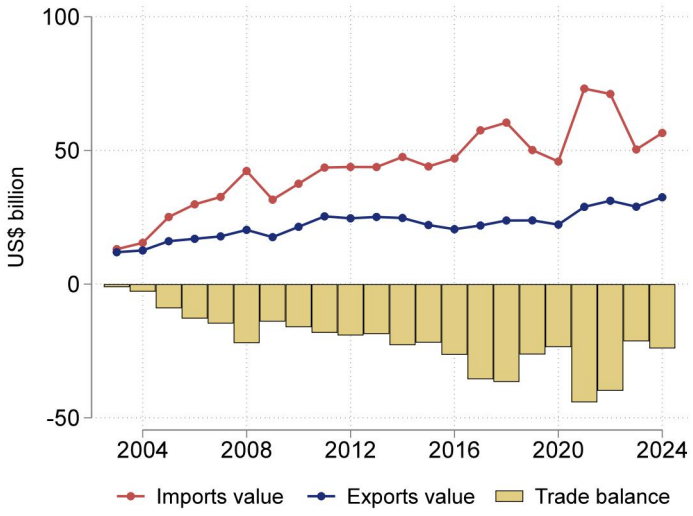

Figure 10: Pakistan's overall trade profile

3.2 Trade Profile of the Agrifood Sector

Pakistan's agriculture sector contributes about 23.5 percent to GDP and employs over 37 percent of the labor force. In terms of agricultural trade, performance has been marked by recurring deficits (Figure 11) Agricultural exports rose from about 1.3 billion US dollars in 2003 to just over 8 billion in 2024, while imports increased more steeply from 1.8 to nearly 9 billion over the same period. The trade balance remained negative for most years, widening sharply during 2020-2022 before narrowing in 2024 as export growth outpaced import expansion. Collectively, Pakistan's agricultural trade remains constrained by limited value addition and heavy dependence on imported food and raw materials.

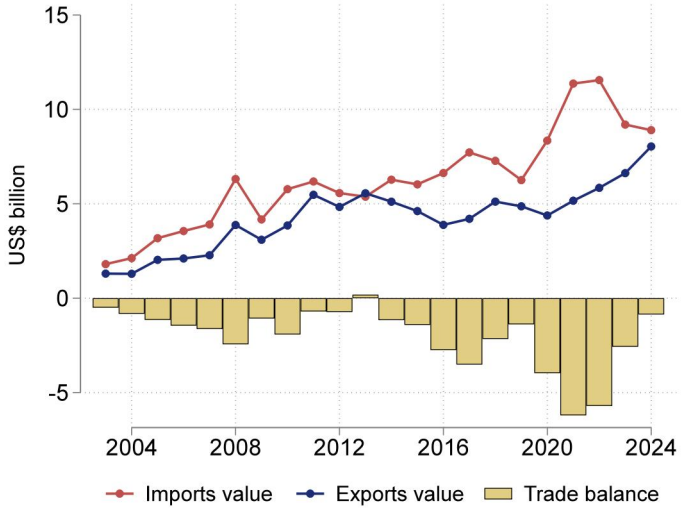

Figure 11: Pakistan's agricultural trade profile

Examining the relative weight of agricultural trade within the overall economy, Figure 12 shows that agricultural imports accounted for around 14 percent of total import spending in 2003 and remained broadly within that range until 2019, before rising sharply to over 18 percent in 2020-2023. The agricultural import burden relative to total export earnings increased more noticeably from about 15 percent in 2003 to above 35 percent during 2016-2022, indicating that food and agricultural imports have absorbed a growing share of foreign-exchange earnings. The pattern underscores Pakistan's continued vulnerability to external shocks through its reliance on imported food and agricultural inputs.

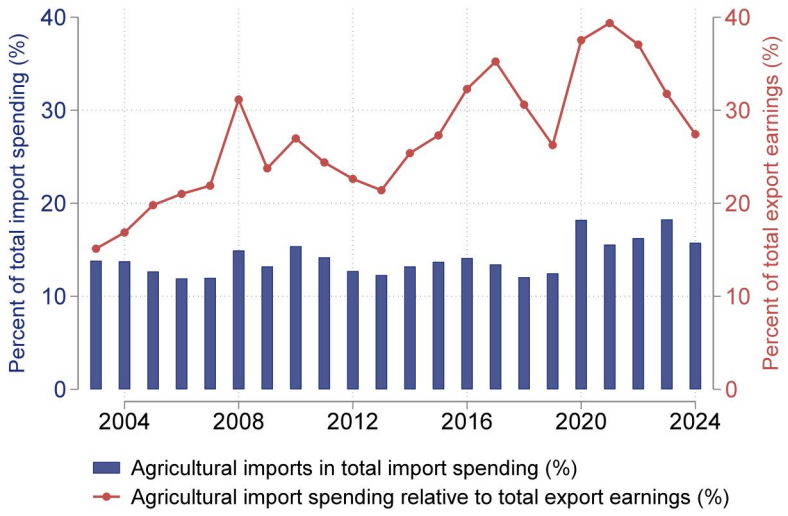

Figure 12: Share of agricultural trade in Pakistan's total imports and exports

Next, Table 1 shows the trade situation for agrifood products in 2024. The data show a relatively better export performance in cereals, meat, fish, and sugar, whereas significant import gaps remain in oilseeds, edible oils, vegetables, and beverages such as tea and coffee. The most pronounced deficit arises from edible oils and fats, with imports exceeding 3 billion US dollars, suggesting Pakistan's dependence on imported cooking oil and related inputs. Collectively, the trade flows pattern indicates a narrow export base dominated by a few primary products and significant reliance on imports for essential food commodities.

Table 1: Product-wise agricultural trade of Pakistan

Code	Product description	Value in 2024 (million US$)		
		Exports	Imports	Balance
01	Live animals	2.03	12.54	-10.51
02	Meat and edible meat offal	517.23	1.31	515.92
03	Fish and crustaceans, molluscs and other aquatic invertebrates	409.41	5.26	404.16
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	59.50	61.11	-1.61
05	Products of animal origin, not elsewhere specified or included	59.52	5.51	54.01
06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	3.39	0.81	2.58
07	Edible vegetables and certain roots and tubers	403.99	1,076.73	-672.74
08	Edible fruit and nuts; peel of citrus fruit or melons	328.49	227.62	100.86
09	Coffee, tea, maté and spices	120.59	861.90	-741.31
10	Cereals	4,488.50	768.70	3,719.80

11	Products of the milling industry; malt; starches; inulin; wheat gluten	53.60	10.47	43.13
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	422.48	1,174.50	-752.02
13	Lac; gums, resins and other vegetable saps and extracts	42.10	21.04	21.06
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	4.13	30.81	-26.68
15	Animal, vegetable or microbial fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	34.91	3,191.86	-3,156.95
16	Preparations of meat, of fish, of crustaceans, molluscs or other aquatic invertebrates, or of insects	10.26	0.43	9.83
17	Sugars and sugar confectionery	548.77	41.43	507.34
18	Cocoa and cocoa preparations	3.74	67.15	-63.42
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	137.68	108.19	29.49
20	Preparations of vegetables, fruit, nuts or other parts of plants	109.61	22.67	86.94

Notes: Author’s calculations based on ITC Trade Map data (2024).

The composition of agrifood trade reveals that Pakistan’s comparative advantage remains concentrated in a narrow set of low-processed and resource-based products. Exports are dominated by cereals, meat, fish, and sugar, which together account for the bulk of agricultural earnings. These items typically involve limited processing or value addition, reflecting structural weaknesses in agro-industrial capacity. On the import side, Pakistan relies heavily on intermediate and consumption goods such as oilseeds, edible oils, pulses, tea, and coffee, which are central to domestic food consumption. The dominance of these imports highlights the country’s dependence on global markets for key nutritional commodities and raw materials for its food industry. Such concentration leaves the trade balance highly sensitive to international price fluctuations and exchange rate volatility.

Beyond the aggregate numbers, these patterns underscore broader policy and structural challenges in the agrifood sector. The persistent import reliance points to productivity gaps in oilseeds, pulses, and horticulture, while the limited export base signals underdeveloped processing and branding capacity. Addressing these weaknesses will require coordinated interventions that promote on-farm efficiency, enhance quality infrastructure, and strengthen backward and forward linkages between farmers, processors, and exporters.

%In the medium term, a shift toward higher value-added, diversified, and quality-assured agricultural exports can help Pakistan improve its trade balance while supporting rural employment and food security.

4. Trade Policy Analysis

4.1 Current Structure of Agrifood Trade Policy

The pattern of agricultural trade outcomes reflects, in part, the incentives created by the country's tariff structure. Understanding how tariffs are distributed across key food and agricultural products helps explain the limited competitiveness of domestic production. Table 2 shows Pakistan's average MFN and applied (AHS) tariff rates across major agricultural and food product groups. The data indicate that Pakistan's current agrifood tariff structure remains relatively moderate and uneven, offering limited protection to several subsectors with strong domestic production potential. Primary food commodities such as cereals (HS10), pulses and vegetables (HS07), and oilseeds (HS12) face low applied tariffs, mostly below 6 percent. Such low rates provide minimal incentive for local producers to expand output or invest in productivity improvements when competing against cheaper imported supplies.

On the other hand, relatively higher tariffs are applied on beverages, dairy products, and other processed foods. The weighted averages indicate that even these higher duties apply to a narrow range of imported goods, while most key staples continue to enter the country at modest tariff levels. This pattern warrants a policy opportunity to rebalance protection in favour of domestic food production and agro-processing. In this regard, raising tariffs on cereals, pulses, edible oils, and other locally producible staples would strengthen domestic supply chains, encourage import substitution, and create a more predictable environment for investment in processing industries. A carefully calibrated increase in agrifood tariffs can support farm incomes, improve rural employment, and contribute to building a more resilient and competitive domestic food sector without compromising availability for consumers.

Table 2: Tariff Rates on Agricultural and Food Products in Pakistan

HS Code	Product Description	Simple average tariffs (%)		Weighted average tariffs (%)	
		MFN	AHS	MFN	AHS
01	Live animals	4.5	2.91	3	3
02	Meat and edible meat offal	14.59	7.33	3.59	2.38
03	Fish and crustaceans, molluscs and other aquatic invertebrates	13.33	9.85	19.04	18.82

04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	17.18	18.99	19.8	19.7
05	Products of animal origin, not elsewhere specified or included	5.44	2.81	2.77	2.77
06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	12.06	9.78	14.51	13.15
07	Edible vegetables and certain roots and tubers	7.44	4.31	3.03	2.64
08	Edible fruit and nuts; peel of citrus fruit or melons	16.84	11.49	18.01	14.65
09	Coffee, tea, maté and spices	7.52	7.13	10.25	9.93
10	Cereals	5.62	5.98	10.2	10.2
11	Products of the milling industry; malt; starches; inulin; wheat gluten	15.22	14.11	16.02	13.48
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	3.74	2.96	3.21	2.96
13	Lac; gums, resins and other vegetable saps and extracts	16.67	14.7	16.42	14.34
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	10.17	7.79	17.47	10.18
15	Animal, vegetable or microbial fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	10.97	9.91	10.67	10.48
16	Preparations of meat, of fish, of crustaceans, molluscs or other aquatic invertebrates, or of insects	20	17.82	20	6.44
17	Sugars and sugar confectionery	15	14.09	12.88	12.5
18	Cocoa and cocoa preparations	11.18	15.4	11.46	5.07
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	19.58	18.29	19.85	16.73
20	Preparations of vegetables, fruit, nuts or other parts of plants	19.23	18.64	19.46	18.57
21	Miscellaneous edible preparations	16.93	16.34	18.21	14.46
22	Beverages, spirits and vinegar	70.83	49.86	38.19	38
23	Residues and waste from the food industries; prepared animal fodder	12	14.05	14.05	11.5
24	Tobacco and manufactured tobacco substitutes; products, whether or not containing nicotine, intended for inhalation without combustion; other nicotine containing products intended for the intake of nicotine into the human body	18.31	16.37	14.31	10.65

Notes: Data from UNCTAD's Trade Analysis and Information System (TRAINS), accessed through the World Integrated Trade Solution (WITS) portal of the World Bank. MFN denotes Most-Favoured-Nation rates; AHS refers

to effectively applied rates including preferences. Simple averages are calculated across HS6 tariff lines, while weighted averages use import weights.

Beyond tariffs, an equally important dimension of trade policy is the range of non-tariff measures that govern agrifood imports. Table 3 shows that Pakistan applies a wide range of NTMs across agrifood imports, though their protective effect remains limited. Most measures are sanitary and phytosanitary (A1-A8) or technical barriers to trade (B1-B8), focused on labelling, packaging, certification, and inspection. These requirements serve regulatory and safety functions but provide little economic protection to domestic producers.

Primary food commodities such as cereals, pulses, vegetables, and oilseeds face multiple NTMs, yet mainly of procedural nature. Processed foods, beverages, and prepared items also encounter conformity and licensing requirements but few direct import restrictions. Overall, Pakistan's NTM framework is compliance-oriented rather than protective. There is scope to recalibrate existing measures to better support domestic food industries. Strengthening conformity assessment, tightening import licensing, and linking quality control with domestic standards could reinforce local production incentives while ensuring food safety and consumer protection.

Table 3: Non-Tariff Measures Applied to Agrifood Imports in Pakistan

HS Code	Number of tariff lines NTM applied	Number of NTMs applied	NTM categories
01	41	16	A1, A3, A8, B3, C3, C9, E3, F6
02	66	11	A1, A3, A8, C3, C9, E3, F6
03	189	14	A1, A3, A8, B3, C3, C9, E3, F6
04	35	11	A3, A8, B1, B7, B8, C9, E3, F6
05	22	9	A8, C9, E3, F6
06	18	15	A1, A5, A8, C3, C9, E3, F6
07	76	15	A1, A3, A4, A8, B3, B7, C3, C9, E3, F6
08	82	6	A1, A3, A8, C3, E3, F6
09	49	12	A1, A3, A8, B1, B3, B7, B8, C3, C9, E3, F6
10	28	11	A1, A3, A8, B3, C3, C9, E3, F6
11	28	5	A1, A3, A8, E3, F6
12	53	19	A1, A3, A5, A8, B3, B7, C3, C9, E1, E3, F6
13	13	10	A1, A3, A8, C3, C9, E1, E3, F6
14	11	3	A3, E3, F6
15	56	17	A1, A3, A4, A8, B1, B7, B8, C3, C9, E1, E3, F6
16	43	6	A1, A3, A8, E3, F6
17	27	7	A3, B1, B7, B8, C3, E3, F6
18	13	3	A3, E3, F6
19	25	11	A1, A3, A8, B1, B7, B8, C3, C9, E3, F6
20	54	12	A1, A3, A8, B1, B7, B8, C3, C9, E3, F6

21	26	6	A3, B1, B7, B8, E3, F6
22	24	9	A3, B1, B7, B8, E1, E3, F6
23	26	6	B1, B7, B8, C3, E3, F6
24	11	4	A3, A8, E3, F6

Notes: Author's elaboration based on data from the ITC Market Access Map (MacMap). For details on the classification of non-tariff measures, see Annex 3.

4.2 General Equilibrium Assessment of Policy Options

The analysis employs a general equilibrium (GE) framework to assess how changes in tariffs and productivity influence Pakistan's agrifood sector.[6] This approach is particularly suited for trade policy evaluation because it links bilateral trade flows with production and welfare outcomes, allowing both direct and indirect effects of policy changes to be captured in a consistent global setting.

The model builds on the structural gravity formulation, explicitly incorporating international and intra-national trade flows using the Integrated Trade and Production Database (ITPD, Release 3; June 2025).[7] This enables the framework to account for domestic reallocation effects when border measures or productivity levels change.[8]

Using detailed trade data from ITPD, complemented by tariff schedules from WITS-TRAINS and ITC MacMap, two sets of counterfactual simulations are conducted: (i) an increase in tariffs on agrifood products imported into Pakistan, and (ii) a productivity shock simulating improvements in Pakistan's agrifood sector. The model relies on standard elasticity parameters from the literature and traces how these shocks propagate through production, trade, and welfare channels within an internally consistent GE system. In the subsequent general equilibrium analysis, agrifood products are systematically grouped into ten analytical subsectors, as detailed in Annex 1: Mapping of Agrifood Subsectors. The accompanying technical framework and estimation procedures are described in Annex 2: Methodological Notes.

4.2.1 Tariff-Adjustment Simulations

To evaluate the short-term implications of trade protection, a counterfactual simulation was conducted in which import tariffs on agrifood products were uniformly increased by 20 percent. This exercise provides an indicative assessment of how higher trade barriers could affect

[6] For applications of GE gravity modeling, see Campos, R. G., I. Reggio, and J. Timini (2024), "ge_gravity2: a command for solving universal gravity models," arXiv:2404.09180 [econ.GN]; and Allen, T., C. Arkolakis, and Y. Takahashi (2020), "Universal Gravity," Journal of Political Economy, 128 (2): 393–433.

[7] Larch, M., Shikher, S., and Yotov, Y. (2025), "*The International Trade and Production Database for Estimation — Release 3 (ITPD-E-R03)*," *USITC Working Paper* 2025-06-A.

[8] For discussion on the role of domestic trade flows, see Yotov, Y. V. (2022), "*On the role of domestic trade flows for estimating the gravity model of trade*," *Contemporary Economic Policy*, 40 (3): 526–540.

imports, domestic output, and welfare across different subsectors of Pakistan's agrifood economy. The results are summarized below.

Table 4: General equilibrium simulation of higher import tariffs across agrifood subsectors

Scenario: 20% increase in import trade costs			
	Imports	Domestic Sales	Welfare
Subsectors	Δ(%)	Δ(%)	Δ(%)
Cereals & Grain Products	-13.6	0.2	-0.09
Oilseeds & Derived Products	-4.52	0.04	-0.39
Sugar & Sweeteners	-13.11	0.01	-0.01
Pulses & Legumes	-3.67	11.93	-3.66
Fruits, Vegetables & Spices	-10.53	0.33	-0.22
Livestock & Animal Products	-6.66	8.41	-6.56
Beverages	-3.13	12.05	-3.13
Fisheries	-12.95	0.14	-1.15
Cash Crops	-6.33	4.52	-3.85
Miscellaneous	-5.18	10.23	-5.17

Notes: Author's calculations based on ITPD data. All values represent percentage changes relative to the baseline. Trade elasticity (theta=7), supply elasticity (psi=1.24). For details on product grouping, see Annex 1: Mapping of Agrifood Subsectors

Raising import tariffs by 20 percent produces a mixed pattern of effects across subsectors. Imports decline sharply in nearly all product groups, confirming that the policy effectively discourages foreign food purchases and allows greater market space for domestic suppliers. The largest import contractions occur in cereals and grain products (-13.6%), sugar (-13.1%), and fisheries (-13.0%), reflecting the high import sensitivity of these categories to cost increases.

Domestic sales, however, show limited overall gains, with significant variation across subsectors. Activities such as pulses and legumes (11.9%), beverages (12.1%), livestock (8.4%), cash crops (4.5%), and miscellaneous foods (10.2%) exhibit the strongest expansion, indicating greater potential for import substitution in these areas. In contrast, cereals, sugar, and fish register only negligible changes in domestic sales, suggesting structural constraints and limited short-run responsiveness.

Welfare effects remain negative for all subsectors, driven by higher consumer prices and reduced real incomes. The losses are minimal in cereals (-0.09%) and sugar (-0.01%) but more pronounced in livestock (-6.56%), cash crops (-3.85%), and miscellaneous foods (-5.17%). Overall, while tariff protection provides temporary relief and modest support to select domestic producers, it entails short-term welfare costs that offset much of the potential production benefit.

To complement the product-level analysis, the general equilibrium simulations were also conducted for the overall agrifood sector. Different combinations of elasticity parameters were applied to test the robustness of results across alternative market settings.[9]

Table 5: General equilibrium simulation of higher import tariffs for agrifood sector

Scenario: 20% increase in import trade costs				
		Imports	Domestic Sales	Welfare
Sector	Parameter settings	Δ(%)	Δ(%)	Δ(%)
Agrifood sector (overall)	θ=5.03; ψ=0	-6.63	0.6	-0.33
Agrifood sector (overall)	θ=5.03; ψ=1.24	-6.72	0.37	-0.54
Agrifood sector (overall)	θ=7; ψ=0	-6.23	0.65	-0.23
Agrifood sector (overall)	θ=7; ψ=1.24	-6.28	0.49	-0.38

Notes: Author's calculations based on ITPD data. All values represent percentage changes relative to the baseline. Trade elasticity (theta) and supply elasticity (psi) combinations correspond to four general equilibrium simulations.

Across all parameter combinations, the results show broadly similar qualitative patterns to the product-wise simulations. Raising import tariffs on agrifood products by 20 percent reduces overall imports by roughly 6-7 percent under all scenarios, confirming that the policy effectively limits foreign food inflows regardless of assumed elasticities. The magnitude of import contraction is slightly larger when the trade elasticity (theta) is lower or when substitution elasticities (psi) are positive, implying stronger import responses under less flexible market conditions.

Domestic sales show small but positive effects in every case, rising between 0.37 and 0.65 percent. The gains are somewhat stronger when (psi=0), indicating that limited substitution between domestic and imported varieties amplifies the increase in local market activity following tariff protection. Even under the most favourable assumptions, however, the expansion in domestic sales remains modest, reflecting persistent structural rigidities and limited spare capacity within agrifood industries.

Welfare declines consistently across all parameter settings, with losses ranging from -0.23 to -0.54 percent. The magnitude of welfare loss is greater when (psi) is positive, suggesting that

[9] The parameter values are drawn from the literature: Campos, R. G., I. Reggio, and J. Timini (2023), Autarky in Franco's Spain: The Costs of a Closed Economy, Economic History Review, 76, 1259–1280; and Gurevich, T., P. Herman, F. Toubal, and Y. V. Yotov (2021), One Nation, One Language? Domestic Language Diversity, Trade, and Welfare, CEPR Discussion Paper Series DP15701, Centre for Economic Policy Research.

increased differentiation between domestic and imported goods amplifies consumer price effects. These results reinforce the pattern observed at the subsector level: tariff increases reduce import dependence and modestly stimulate domestic output but at the cost of lower consumer welfare and overall efficiency.

4.2.2 Productivity Enhancement Simulations

Before simulating productivity shocks in the general equilibrium framework, it is important to assess the scope for improvement within Pakistan's agrifood system. A comparison of crop yields across countries provides a useful benchmark for identifying where productivity gaps are widest and where policy support could have the greatest impact. The yield analysis presented below highlights how Pakistan's agricultural performance lags behind both regional peers and global leaders, underscoring the considerable potential for technological and efficiency gains in domestic farming.

Table 6: Crop yield comparison across South Asia, Asia, and the world

Yield in Pakistan		Highest in South Asia		Highest in Asia		Highest in World	
Crop	Yield	Country	Yield	Country	Yield	Country	Yield
Barley	1,022	India	2,955	Oman	9249	Oman	9,249
Beans	752	Sri Lanka	1,111	Qatar	26475	Qatar	26,475
Cauliflowers and broccoli	25,966	Pakistan	25,966	Jordan	43786	Jordan	43,786
Cherries	3,031	Pakistan	3,031	Uzbekistan	14092	Guyana	52,857
Chickpeas	307	India	1,208	Jordan	8755	Jordan	8,755
Chillies	2,340	Nepal	7,063	Nepal	7063	Morocco	18,897
Dates	5,238	Pakistan	5,238	Kuwait	29831	Albania	30,116
Ginger, raw	750	Nepal	12,852	Taiwan	27930	USA	34,246
Lentils	607	Bangladesh	1,348	China	2555	China	2,555
Maize	6,051	Bangladesh	8,911	Oman	25050	Oman	25,050
Mangoes, guavas and mangosteens	12,572	Pakistan	12,572	UAE	32048	Guyana	49,028
Millet	1,101	Afghanistan	1,586	Azerbaijan	27078	Azerbaijan	27,078
Oilcrops, Cake Equivalent	548	Bangladesh	848	Palestine	2044	Brazil	2,494
Onion	14,414	Afghanistan	17,580	South Korea	73657	South Korea	73,657
Peas	661	Bhutan	1,730	Lebanon	5120	Burundi	5,702
Potato	24,920	India	25,050	Jordan	38758	New Zealand	50,683
Rice	3,905	Bangladesh	4,915	Tajikistan	10296	Tajikistan	10,296
Sorghum	827	Sri Lanka	1,843	Oman	49578	Oman	49,578
Sugar beet	39,411	Pakistan	39,411	Japan	66945	Chile	108,028
Sugarcane	70,435	India	83,940	Iran	98157	Peru	119,323
Tangerines, mandarins, clementines	13,510	Pakistan	13,510	Iran	38958	Iran	38,958
Wheat	3,011	India	3,526	Saudi Arabia	6733	Ireland	9,728

Notes: Author's elaboration based on FAOSTAT data. Yield is expressed in kilograms per hectare (kg/ha) and represents three-year average (2021-2023) to minimize year-specific fluctuations.

The comparison reveals large and persistent yield gaps across most major crops. For staple cereals such as wheat, rice, and maize, Pakistan attains roughly 30-60 percent of the yields achieved by the best-performing countries. For example, wheat yields average about 3,000 kg/ha compared with more than 9,000 kg/ha in Ireland, while maize yields reach around 6,000 kg/ha versus over 25,000 kg/ha in Oman. Similar shortfalls are evident for barley and sorghum,

where productivity levels remain below one-fifth of the global frontier. These gaps point to continued inefficiencies in technology adoption, seed quality, irrigation practices, and farm management.

Among horticultural crops, Pakistan performs relatively better but still trails behind global standards. For instance, cauliflower and broccoli yields in Pakistan match the highest levels in South Asia but remain about 60 percent of those recorded in Jordan. Fruits such as mangoes, dates, and tangerines perform strongly within the region yet fall two to three times short of yields in countries such as Guyana, Albania, or Iran. The divergence highlights the scope for upgrading horticultural production through improved varieties, modern irrigation, and cold-chain logistics.

The weakest performance is found in pulses and oilseeds, where Pakistan's yields are among the lowest in Asia. Chickpeas, lentils, and beans produce only a small fraction of the output seen in countries like Jordan, China, or Qatar, where yields exceed Pakistan's by more than tenfold in some cases. These deficits explain the country's chronic dependence on imported pulses and edible oil products, which contribute heavily to the agrifood trade deficit. Only a few crops show competitive performance (such as cauliflower, sugar beet, and tangerines) where Pakistan ranks highest within South Asia. Even in these cases, however, yields remain far below the global maximum, suggesting that further improvements are both feasible and necessary.

The yield comparison highlights a consistent pattern of underperformance across Pakistan's major crop categories. Closing even a fraction of these gaps could significantly expand domestic supply, improve farm incomes, and reduce import dependence. The following simulations quantify the potential economy-wide effects of such productivity improvements using the general equilibrium model framework.

After assessing yield gaps across major crops, general equilibrium simulations are conducted to quantify the potential macroeconomic effects of improving agricultural productivity. The exercise assumes a uniform 10 percent increase in productivity across all agrifood subsectors, representing a plausible medium-term gain through better technology, input use, and management practices. This scenario allows for evaluating how higher yields and production efficiency translate into changes in trade, output, and welfare relative to the baseline.

Improving productivity across agrifood subsectors generates large positive effects on trade, output, and welfare, in sharp contrast to the outcomes under tariff protection. When yields and production efficiency rise, domestic output and exports expand significantly, while welfare gains are broad-based and substantial. These results emphasize that productivity improvements not only strengthen internal food supply but also enhance the competitiveness of Pakistan's agrifood exports.

At the subsector level, shown in Table 7, all product groups experience sizable increases in domestic output, generally ranging from 8 to 10%. Livestock, cereals, fruits and vegetables, and oilseeds show particularly strong improvements, indicating their high responsiveness to productivity gains. Fisheries continue to record a notable rise in both output and welfare, though the earlier extreme outlier has now normalized with an 8.7% output increase. Welfare effects remain positive across all subsectors, reaching double digits in cereals (10.63 percent), sugar (10.01%), and fruits & vegetables (10.11%). Even smaller welfare gains in pulses (0.24%), beverages (0.60%), and cash crops (2.13%) still represent meaningful improvements relative to the tariff scenario. Overall, productivity enhancements stimulate both domestic and external competitiveness, with exports rising between 2 and 8 percent across most subsectors.

Table 7: General equilibrium simulations of productivity improvement across agrifood subsectors

Scenario: 10% productivity improvement			
	Imports	Domestic Sales	Welfare
Subsectors	Δ(%)	Δ(%)	Δ(%)
Cereals & Grain Products	2.51	9.99	10.63
Oilseeds & Derived Products	8.54	9.83	9.05
Sugar & Sweeteners	2.85	10	10.01
Pulses & Legumes	8.2	8.2	0.24
Fruits, Vegetables & Spices	4.58	9.95	10.11
Livestock & Animal Products	8.14	8.19	7.11
Beverages	8.32	8.32	0.6
Fisheries	6.86	8.7	9.7
Cash Crops	2.68	8.07	2.13
Miscellaneous	8.2	8.2	3.73

Notes: Author's calculations based on ITPD data. All values represent percentage changes relative to the baseline. Trade elasticity (theta=7), supply elasticity (psi=1.24). For details on product grouping, see Annex 1: Mapping of Agrifood Subsectors

To test the robustness of these results, additional simulations were performed for the overall agrifood sector using alternative combinations of elasticity parameters. The results in Table 8 confirm that both the direction and magnitude of effects remain highly stable across parameter settings. Under a 10% productivity shock, exports increase by about 7%, domestic output by roughly 10%, and welfare by around 9% across all elasticity combinations. The minor variations associated with higher (theta) or (psi) values indicate that these gains are resilient to different elasticity assumptions, reinforcing that productivity enhancement consistently strengthens both domestic supply and external competitiveness.

Table 8: General equilibrium simulations of productivity improvement for agrifood sector

Scenario: 10% productivity improvement				
		Imports	Domestic Sales	Welfare
Sector	Parameter settings	Δ(%)	Δ(%)	Δ(%)
Agrifood sector (overall)	θ=5.03; ψ=0	7.16	10	9.22
Agrifood sector (overall)	θ=5.03; ψ=1.24	7.03	9.81	9.04
Agrifood sector (overall)	θ=7; ψ=0	7.05	10	9.24
Agrifood sector (overall)	θ=7; ψ=1.24	6.96	9.85	9.11

Notes: Author's calculations based on ITPD data. All values represent percentage changes relative to the baseline. Trade elasticity (theta) and supply elasticity (psi) combinations correspond to four general equilibrium simulations.

4.3 Discussion and Policy Implications

Pakistan's agrifood trade balance has remained persistently negative, driven by rising imports of edible oils, pulses, and processed foods that continue to outpace sluggish export growth. This dependence not only strains foreign exchange reserves but also exposes the economy to external price shocks. Strengthening domestic food production is therefore a central pillar of both food security and macroeconomic stability.

The agrifood sector also serves as a critical bridge between agriculture and industry. As highlighted in the UNIDO report Industrialization as the Driver of Sustained Prosperity, successful industrializers have built strong linkages between agricultural development, technological innovation, and manufacturing growth. Brazil's Agrotechnology Industrial Research Network, established under Embrapa, demonstrates how coordinated research and technological upgrading in agriculture can drive broader industrial transformation by connecting research institutions with advanced manufacturing and digital systems.[10] This experience reinforces that agricultural promotion is not distinct from industrialization but a vital part of it, offering lessons for Pakistan's own agrifood modernization pathway.

Within this context, a two-stage policy strategy, often described as protect and upgrade}, provides a coherent framework for transforming Pakistan's agrifood sector. In the short term, protection through calibrated import tariffs can offer domestic producers the stability needed to recover margins and reinvest. A moderate and predictable rise in tariffs on key agrifood imports reduces import dependence and creates market space for local producers. This phase is not an end in itself but a breathing period to rebuild production capacity and confidence among farmers. Protection should remain transparent, time-bound, and complemented by facilitation for critical inputs to avoid excessive price inflation or market distortions.

[10] UNIDO (2020). Industrialization as the Driver of Sustained Prosperity. Vienna: United Nations Industrial Development Organization.

In the medium to long term, the emphasis must shift toward upgrading. Sustained competitiveness requires higher yields, technological improvement, and modernisation of value chains. The general equilibrium results confirm that the strongest welfare and output gains occur when tariff protection is combined with productivity growth. Productivity-driven expansion amplifies the benefits of protection by raising domestic output, stabilising food prices, and enhancing export potential. Hence, Pakistan's agrifood strategy must treat tariffs as a short-term stabiliser and productivity as the long-term driver of competitiveness.

Agricultural producer support operates through two main channels: price incentives via border measures and fiscal support through public expenditure. Import tariffs directly influence farmgate prices and can partially correct the negative price signals that have discouraged local production. Yet border measures alone are insufficient to build competitiveness. Fiscal support, if effectively designed, can strengthen productivity and resilience by addressing the structural constraints behind low yields and post-harvest inefficiencies.

Global experience, as highlighted in the FAO report A Multi-Billion-Dollar Opportunity: Repurposing Agricultural Support to Transform Food Systems[11], demonstrates that repurposing fiscal support from price-based measures toward productivity-enhancing and sustainable uses improves both efficiency and equity. For Pakistan, this means reallocating public resources away from untargeted subsidies and toward investments that improve research, technology transfer, irrigation efficiency, and market access. These reforms should also uphold inclusion by supporting smallholders, women, and vulnerable groups in the transition toward higher-value and climate-resilient agriculture.

Fiscal spending can generate broad sectoral benefits when directed toward general services and public goods. Rather than compensating individual producers, such interventions lower systemic costs and improve the enabling environment for the entire agrifood economy. Examples include agricultural knowledge and extension, inspection and safety systems, irrigation and storage infrastructure, and marketing and trade facilitation. These investments not only improve productivity and reduce losses but also strengthen food safety and consumer confidence.

Upgrading quality and compliance systems is equally critical. Evidence from Fiankor et al. (2020)[12] shows that certification schemes such as GlobalG.A.P. and the British Retail Consortium (BRC) significantly improve agrifood export performance. Strengthening laboratories, traceability mechanisms, and standards enforcement can therefore translate domestic

[11] FAO (2021), A Multi-Billion-Dollar Opportunity: Repurposing Agricultural Support to Transform Food Systems, Rome.

[12] Fiankor, D.-D. D., Flachsbarth, I., Masood, A., & Brümmer, B. (2020). Does GlobalGAP certification promote agrifood exports? European Review of Agricultural Economics, 47(1), 247--272.

upgrading into export gains. Such improvements reinforce Pakistan's efforts to integrate with global value chains while maintaining consumer trust in domestic markets.

A key lesson from The State of Food Security and Nutrition in the World 2025[13] is that healthy diets remain unaffordable for many households worldwide because nutritious foods cost far more than starchy staples and oils, while ultra-processed foods are nearly 50 percent cheaper than minimally processed alternatives. This global pattern is mirrored in Pakistan's food system, where consumers increasingly depend on cheap, low-nutrient imports. Productivity improvements in pulses, fruits, vegetables, and other nutrient-dense foods can help reduce their relative cost and make healthy diets more accessible.

Therefore, tariff and fiscal measures should not only address production and trade deficits but also contribute to better nutrition outcomes. By linking agrifood policy with health and social protection objectives, Pakistan can move toward a food system that is both economically viable and nutrition-responsive.

The evidence from simulations and global experience suggests a clear sequencing of reforms. Domestic producers should first be protected through calibrated, short-term tariff adjustments that stabilise markets and provide investment incentives. The next step is to upgrade productivity through repurposed fiscal support and institutional investment in research, technology, and quality systems. Finally, trade, fiscal, and nutrition objectives should be aligned to ensure that food security gains are inclusive, sustainable, and globally competitive.

This integrated approach will enable Pakistan to transition from reactive protection to proactive competitiveness. By combining short-term stability with long-term upgrading, Pakistan can reduce its reliance on imported food, strengthen domestic value chains, and position its agrifood sector as a driver of sustainable economic growth and improved nutrition.

5. Policy Recommendations

The general equilibrium results show that both tariff protection and productivity enhancement are central to strengthening Pakistan's agrifood sector. The policy direction should follow a two-stage approach, "Protect and Upgrade," where short-term border protection provides stability while fiscal and institutional measures drive long-term competitiveness.

(a) Calibrated Tariff Adjustments for Key Agrifood Commodities

Moderate and predictable increases in import tariffs on selected agrifood commodities can restore balance between domestic and foreign suppliers and encourage investment in local

[13] FAO, IFAD, UNICEF, WFP and WHO (2025), The State of Food Security and Nutrition in the World 2025: Addressing High Food Price Inflation for Food Security and Nutrition, Rome.

production. Current tariffs on cereals average only about 6 percent, far below those applied to processed foods and beverages, despite cereals being central to food consumption.

The simulation results show that a 20 percent tariff increase on cereals reduces imports by about 13-14 percent and stabilises domestic output, while welfare effects remain broadly neutral. For pulses, a similar 20 percent rise cuts imports by around 4 percent and lifts domestic output by 12 percent. These findings justify raising tariffs to approximately 15-20 percent for cereals and 20-25 percent for pulses, alongside targeted productivity measures to close yield gaps.

Such calibrated protection could reduce Pakistan's annual food import bill of 3-4 billion US dollars and provide farmers with the breathing space needed to invest in efficiency and innovation. To remain consistent with trade commitments and consumer welfare, tariff measures should be time-bound, rules-based, and complemented by facilitation for key inputs such as seed, machinery, and feed.

(b) Closing Yield Gaps through Productivity Enhancement

Productivity growth is the foundation of lasting competitiveness. Pakistan's yields for major staples remain less than half those of high-performing countries. Wheat averages about 3,000 kg/ha compared with 9,700 kg/ha in Ireland, while maize yields of 6,000 kg/ha lag far behind Oman's 25,000 kg/ha. For pulses, yields of 300-600 kg/ha contrast sharply with over 8,000 kg/ha in Jordan and 2,500 kg/ha in China.

Simulating a 10 percent productivity improvement across agrifood subsectors yields strong outcomes: domestic output rises by roughly 10 percent, exports by 7-8 percent, and welfare by up to 9 percent. Livestock and cereals show output gains of 10-15 percent, while horticulture and oilseeds record welfare improvements exceeding 9 percent.

These results confirm that yield enhancement through improved seed systems, efficient irrigation, mechanisation, and value-chain coordination is the key to translating short-term protection into sustainable growth. Fiscal resources should therefore be repurposed toward research, extension, and technology adoption rather than recurrent subsidies. This includes support for climate-smart agriculture, digital extension, and post-harvest infrastructure that raise efficiency and resilience.

(c) Strengthening the Agrifood System through Institutional Investment and Fiscal Support

Fiscal support should target system-wide strengthening of the agrifood sector rather than individual subsidies. Public investment must build the institutional, technological, and infrastructural foundations for productivity, quality, and competitiveness. Key priorities include:

- Agricultural knowledge and extension: expanding farmer training and digital advisory services to promote precision farming, efficient water use, and climate adaptation.
- Research and innovation: funding development of high-yield, climate-resilient, and biofortified crop and livestock varieties.
- Quality and safety infrastructure: upgrading laboratories, inspection services, and traceability systems to meet international standards such as GlobalG.A.P., the British Retail Consortium (BRC), and HACCP.
- Physical infrastructure: improving irrigation networks, rural roads, storage, and cold-chain facilities to reduce losses and connect producers to markets.
- Marketing and trade promotion: supporting branding, certification, and export facilitation for horticulture and processed agrifood products.
- Market stabilisation mechanisms: maintaining targeted stockholding schemes to manage volatility and protect consumers.

These investments represent repurposed fiscal support consistent with FAO's A Multi-Billion-Dollar Opportunity (2021), which advocates redirecting agricultural spending from distortionary price measures to public goods that enhance efficiency, sustainability, and inclusion. By improving yields, reducing post-harvest losses, and fostering diversification into nutrition-rich foods, such support also advances the affordability of healthy diets. This responds to the global concern, highlighted in The State of Food Security and Nutrition in the World 2025, that nutritious foods remain far costlier than energy-dense and ultra-processed options.

(d) Sequencing and Governance

Effective sequencing is essential for policy credibility. Tariff protection should serve as a short-term stabiliser, followed by rapid scaling-up of productivity and institutional investments. A transparent reform roadmap, spanning three to five years, should specify tariff trajectories, fiscal commitments, and evaluation benchmarks. Inter-ministerial coordination between commerce, food security, and planning agencies is critical for coherence.

Monitoring and annual reporting of agrifood support will improve accountability and allow gradual adjustment of tariffs as productivity improves. Ensuring social protection for vulnerable consumers and smallholders during transition will make reform both equitable and sustainable.

Annexes

Annex 1 Mapping of Agrifood Subsectors

For the general-equilibrium analysis, agrifood products from the ITPD database are grouped into ten subsectors representing broad commodity categories, as shown below.

Agrifood subsectors	ITPD product labels	ITPD codes
Cereals & Grain Products	Wheat; Rice (raw); Corn; Other cereals; Cereal products	1, 2, 3, 4, 5
Oilseeds & Derived Products	Soybeans; Other oilseeds (excluding peanuts); Animal feed ingredients and pet foods	6, 7, 8
Sugar & Sweeteners	Raw and refined sugar and sugar crops; Other sweeteners	9, 10
Pulses & Legumes	Pulses and legumes, dried, preserved	11
Fruits, Vegetables & Spices	Fresh fruit; Fresh vegetables; Prepared fruits and fruit juices; Prepared vegetables; Nuts; Spices	12, 13, 14, 15, 16, 25
Livestock & Animal Products	Live cattle; Live swine; Eggs; Other meats, livestock products, and live animals	17, 18, 19, 20
Beverages	Beverages, nec	22
Fisheries	Fishing	28
Cash Crops	Cocoa and cocoa products; Cotton; Tobacco leaves and cigarettes	21, 23, 24
Miscellaneous	Other agricultural products, nec; Forestry	26, 27

Notes: Author's elaboration based on ITPD agrifood product codes.

Annex 2: Methodological Notes

The analysis applies a general equilibrium (GE) framework with iceberg trade costs and CES preferences. Bilateral trade between countries i and j is given by:

$$X_{ij} = \frac{Y_i E_j}{Y}\left(\frac{\tau_{ij}}{\Pi_i P_j}\right)^{-\theta},$$

where Y_i and E_j are income and expenditure, $\tau_{ij} \geq 1$ are trade costs, and Π_i, P_j are multilateral resistance terms satisfying:

$$\Pi_i^{\theta} = \sum_j \frac{E_j}{Y}\tau_{ij}^{-\theta} P_j^{-\theta}, \qquad P_j^{\theta} = \sum_i \frac{Y_i}{Y}\tau_{ij}^{-\theta}\Pi_i^{-\theta}.$$

This universal gravity structure is consistent with the GE solver ge_gravity2 (Campos et al., 2024; Allen et al., 2020). The data are drawn from ITPD-E Release 3 (June 2025), which includes both international and intra-national flows—an essential feature for identifying elasticities and generating realistic counterfactuals (Larch et al., 2025; Yotov, 2022).

Counterfactual equilibria are expressed in "hat" form ($\hat{z} = z'/z$). Given baseline trade shares $\lambda_{ij} = X_{ij}/E_j$, the new equilibrium shares satisfy:

$$\hat{\lambda}_{ij} = \left(\hat{\tau}_{ij}\frac{\hat{\Pi}_i}{\hat{P}_j}\right)^{-\theta}.$$

Market-clearing conditions determine $\hat{Y}_i$ and $\hat{E}_j$, capturing global feedbacks of policy shocks.

Concerning the tariff shock for imports into Pakistan, ad-valorem tariffs t_{ij} enter the model as part of iceberg trade costs $\tau_{ij} = \left(1 + t_{ij}\right) \tau_{ij}^{0}$, where τ_{ij}^{0} represents the baseline trade barrier. A 20 percent increase in tariffs on agrifood imports into Pakistan implies:

$$\hat{\tau}_{ij} = \frac{1 + t'_{ij}}{1 + t_{ij}}, \quad \text{for } j = \text{PAK},\ i \neq \text{PAK}.$$

For the productivity shock, a Hicks-neutral productivity gain $\widehat{A}_{PAK} > 1$ reduces effective export costs as:

$$\hat{\tau}_{ij} = \widehat{A}_{i}^{-1}, \quad \text{for } i = \text{PAK}.$$

A simple expression illustrates how tariff changes affect trade flows:

$$X_{ij}^{new} = X_{ij}^{base}\left(1 + \tau_{ij}\right)^{-\theta},$$

or equivalently,

$$\ln \quad \left(\frac{X_{ij}^{new}}{X_{ij}^{base}}\right) = -\theta \ln\left(1 + \tau_{ij}\right).$$

Even modest tariff changes can yield large trade responses when elasticities are high. The same mechanism applies to productivity or technology shocks, which alter costs or efficiency and lead the GE system to resolve a new multilateral-resistance-consistent equilibrium.

The parameters include the *trade elasticity* (θ), which governs the responsiveness of bilateral trade flows to changes in trade costs, and the *supply elasticity* (ψ), which captures the ability of domestic output to adjust in response to price changes.

The *simple average tariff* is given by $t^{SA} = \frac{1}{N}\sum_{k=1}^{N} t_k$, while the *import-weighted average tariff* is $t^{WA} = \sum_{k=1}^{N} \omega_k\, t_k$, where $\omega_k = \frac{M_k}{\sum_k\ M_k}$ denotes the import share of product k. The former reflects nominal tariff dispersion, whereas the latter captures the effective rate applied to actual import composition.

Annex 3: Classification of Non-Tariff Measures

The UNCTAD International Classification of Non-Tariff Measures (NTMs) organizes all policy instruments other than tariffs that affect trade, grouping them into broad chapters (A–P) covering sanitary and phytosanitary measures, technical regulations, price and quantity controls, and other trade-related policies, as given below.

Code	Description
A1	Prohibitions or restrictions of products or substances because of sanitary or phytosanitary (SPS) reasons
A2	Tolerance limits for residues and restricted use of substances

A3	Labelling, marking and packaging requirements (SPS)
A4	Hygienic requirements
A5	Treatment for elimination of plant and animal pests and disease-causing organisms in the final product
A6	Other requirements on production or post-production processes
A7	Regulation of foods or feeds derived from, or produced using genetically modified organisms (GMO)
A8	Conformity assessment related to SPS (testing, certification, inspection, quarantine)
A9	Other sanitary and phytosanitary measures, n.e.s.
B1	Prohibitions or restrictions of products or substances because of technical barriers to trade (TBT) reasons
B2	Tolerance limits for residues and restricted use of substances (TBT)
B3	Labelling, marking and packaging requirements (TBT)
B4	Production or post-production requirements (TBT)
B5	Regulation on genetically modified organisms and other foreign species (non-SPS reasons)
B6	Product identity requirement
B7	Product quality or performance requirement
B8	Conformity assessment related to TBT (testing, certification, inspection, traceability)
B9	Other TBT measures, n.e.s.
C1	Pre-shipment inspection
C2	Direct consignment requirement
C3	Requirement to pass through specified port of customs
C4	Import monitoring, surveillance or automatic licensing measures
C9	Other formalities, n.e.s.
D1	Administrative pricing (minimum import prices, reference prices)
D2	Voluntary export price restraints
D3	Variable charges
D4	Anti-dumping measures
D5	Countervailing measures
D6	Safeguard duties
D7	Seasonal duties
D9	Price-control measures, n.e.s.
E1	Non-automatic licensing
E2	Quotas
E3	Prohibitions (non-SPS/TBT)
E4	Quantitative safeguard measures
E5	Export-restraint arrangements
E9	Quantity-control measures, n.e.s.
F1	Customs surcharges
F2	Service charges (inspection, handling, processing fees)
F3	Additional taxes and charges
F4	Internal taxes and charges levied on imports
F5	Decreed customs valuations

F9	Para-tariff measures, n.e.s.
G1	Advance-payment requirements
G2	Multiple exchange-rate practices
G3	Regulation on official foreign-exchange allocation
G4	Regulations concerning terms of payment for imports
G9	Finance measures, n.e.s.
H1	Restrictive import channel (state trading, sole importers)
H2	Compulsory national service (insurance, transport)
H9	Anti-competitive measures, n.e.s.
I1	Local-content measures
I2	Trade-balancing measures
I9	Trade-related investment measures, n.e.s.
J1	Geographical restriction on distribution
J2	Restriction on resellers
K	Restriction on post-sales services
L	Subsidies (excluding export subsidies under P700)
M	Government-procurement restrictions
N	Intellectual-property-related measures
O	Rules of origin
P1	Export licence, quota, prohibition and other quantitative restrictions
P2	State-trading administration for exports
P3	Export-price-control measures
P4	Measures on re-export
P5	Export taxes and charges
P6	Export technical measures (inspection, certification)
P7	Export subsidies
P9	Export measures, n.e.s.

Source: UNCTAD (2019), International Classification of Non-Tariff Measures*, Geneva.*