

## Global Food Security In The Context Of International Crises The Russian-Ukrainian War As a Case Study

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### Abstract:

This study examines the impact of the Russian–Ukrainian war on global food security, highlighting its effects on food supply chains, prices, and agricultural production. As major exporters of grains, vegetable oils, and fertilizers, disruptions in Russia and Ukraine led to reduced food availability, rising global prices, and increased food insecurity, particularly in food-importing and developing countries. Using data from international organizations, the research shows that the crisis exposed the fragility of global food systems and the risks of dependence on limited suppliers. The study concludes that strengthening food security requires diversified supply sources, strategic food reserves, resilient logistics, and enhanced international cooperation to better withstand future global crises.

**Keywords:** Global food security, international crises, Russian-Ukrainian war, food supply chains, food prices, grains, vegetable oils, food-importing countries, international cooperation.

### First axis: Introduction to food security

#### Requirement : The concept of food security

Food security is a cornerstone of sustainable development and societal stability, ensuring that individuals have access to sufficient, safe, and nutritious food to meet their basic nutritional needs for healthy growth and physical activity. The Food and Agriculture Organization of the United Nations (FAO) defines it as: "the state in which all people, at all times, have access to sufficient and nutritionally adequate food .<sup>1</sup>"

,The concept of food security encompasses four key dimensions: food availability, food access food utilization, and sustainability. These dimensions are interconnected, such that weakness in one negatively impacts the others, potentially leading to recurring food crises, as has .<sup>2</sup> occurred in many countries affected by conflict and economic crises

#### requirement : Dimensions of food security

##### Food availability refers

to the sufficient quantity of food available in the market or through domestic production to meet the needs of the population. It depends on domestic agricultural production, food stocks and international trade , .<sup>3</sup>

##### Food access :

This relates to individuals' ability to obtain food, both financially and geographically. Even when food is available, it may not be accessible to all groups due to poverty or inadequate .<sup>4</sup> infrastructure

##### Nutritional utilization :

,This relates to the body's efficiency in using available food, and is linked to food quality dietary diversity, and the individual's overall health .<sup>5</sup>

### **Sustainability :**

It relates to the ability to maintain food security for future generations through the efficient management of natural resources and the adoption of sustainable agricultural practices .<sup>6</sup>

#### **requirement : Indicators for measuring food security**

Several indicators are used to measure food security, including :

The Global Hunger Index (GHI) measures the level of hunger and malnutrition among the .<sup>7</sup> population

Calorie coverage ratio , which refers to the ratio of an individual's calorie consumption to their basic needs .<sup>8</sup>

The food poverty index, which measures the ability of households to secure food through their income .<sup>9</sup>

These indicators reflect the different dimensions of food security and help policymakers assess the level of risk and develop effective strategies to reduce it .

#### **requirement : The relationship between food security and economic development**

Food security is a pivotal factor in promoting economic development. Adequate food increases workforce efficiency, reduces healthcare costs resulting from malnutrition, contributes to societal stability, and mitigates social conflicts .<sup>10</sup>

Recent studies have shown that countries experiencing recurring food crises face difficulties in achieving sustainable economic growth, while countries with stable food security have greater opportunities to attract investments and boost national productivity .<sup>11</sup>

Food security is not simply a matter of food production; it is a multidimensional concept encompassing availability, access, utilization, and sustainability . It forms a fundamental basis for achieving sustainable development and becomes even more critical in the context of international crises and armed conflicts, which disrupt supply chains and create significant challenges for countries and societies .<sup>12</sup>

#### **axis : Theoretical and methodological framework**

##### **requirement : Basic theories in food security analysis**

Food security analysis is based on a range of economic and social theories that help to understand its dimensions and the reasons for its vulnerability during crises. Among the most prominent of these theories are:

##### **Food Availability Theory Approach ):**

This theory focuses on the quantity of food available in a country, whether from domestic production or imports, considering food availability as the fundamental condition for achieving This theory is widely used in analyzing crises resulting from conflicts or .<sup>13</sup> food security natural disasters, where reduced production or disruptions to supply chains exacerbate food insecurity .

##### **The Access Approach theory asserts that**

the mere availability of food is insufficient to guarantee food security; rather, individuals must be linked to<sup>14</sup> possess the economic and geographical means to access it. This dimension poverty, unemployment, and income distribution within societies, showing that resource-rich countries may suffer from food insecurity among certain groups if economic justice is not achieved .

##### **Nutritional Utilization Theory Approach ):**

Focuses on the ability of individuals to utilize available food nutritionally, which includes food This theory suggests that food alone<sup>15</sup>.quality, dietary diversity, and overall health is not . enough if there are health problems or chronic malnutrition

### **Sustainability theory Approach ):**

It calls for preserving food security for future generations through the wise management of natural resources, and adopting sustainable agricultural practices and modern technologies that reduce waste and protect the environment .<sup>16</sup>

#### **requirement : Study methodology**

Studying the impact of international crises on food security requires **a rigorous scientific methodology**. It combines quantitative and qualitative analysis :

#### **Quantitative analysis :**

This is used to measure the impact of the Russian-Ukrainian war on food indicators such as grain and oil prices, agricultural production rates, and levels of food waste. It relies on data from the Food and Agriculture Organization (FAO) the World Bank, and United Nations , reports .<sup>17</sup>

#### **Qualitative analysis focuses**

on understanding the impact of the crisis on consumer behavior, government policies, and supply chain strategies. It relies on interviews with experts in agriculture and international trade and analysis of official documents and media reports , .<sup>18</sup>

#### **Integrating quantitative and qualitative aspects :**

,This integration allows for a comprehensive understanding of the dimensions of food security linking field and statistical data with the political and economic reality of international crises .

#### **requirement : Data sources and indicators used**

**reliable sources** are used, including :

**Food and Agriculture Organization (FAO):** To provide data on food production, waste, and .<sup>19</sup> food prices

**Bank and the International Monetary Fund :** To provide economic data and food poverty indicators .<sup>20</sup>

**Academic and research institutions :**Such as IFPRI , World Food Programme which , provides in-depth analyses of food security .<sup>21</sup>

**Reports from the United Nations and the countries concerned :** To monitor the impact of conflicts on supply chains and local markets .

#### **Key indicators used :**

Global Hunger Index (GHI)

Prices of basic food commodities (wheat, corn , vegetable oils

agricultural crop productivity

Level of food waste and the ratio of imports to local self-sufficiency

#### **requirement : Defining the study variables**

In this study, the variables can be divided into :

**Independent variable :**The Russian-Ukrainian War -(International Crisis.

**Dependent variables :**Food security indicators such as :

Food prices

Food availability rate

Import ratio and self-sufficiency

Consumers' ability to access food

**Intermediate variables :**Government policies, economic sanctions, and international logistics

It can be argued that studying the impact of international crises on food security requires **a robust theoretical framework and a multidimensional methodology** that combines quantitative and qualitative approaches. Understanding the economic, political, and

environmental challenges enables the development of effective policies to address food crises and ensure global food sustainability.<sup>22</sup>

### **Third axis: The international context before the Russian- -Ukrainian war**

#### **requirement : The structure of global food supply chains**

Global food supply chains are **an interconnected and complex network** that includes production, transportation, storage, processing, and distribution . Before the outbreak of the Russian- -Ukrainian war in 2022, these chains relied heavily on a limited number of major commodity-producing and exporting countries, making the global food system vulnerable to any shock .

These chains are characterized by key features :

**Production focus :** A limited number of countries dominate the production of basic grains and edible oils, such as Russia and Ukraine for wheat and corn, and the United States and Canada for corn and soybeans .<sup>23</sup>

**Reliance on international transport :** Food delivery relies on sea and air transport, with most wheat exports passing through the Black Sea, which will become a critical weakness<sup>24</sup> later .

**Globalization and trade :** International trade facilitation allows non-producing countries to meet their needs through imports, which means that any global disruption has a direct impact<sup>25</sup> on prices

#### **The second requirement: Major producing and exporting countries**

Before the war, some countries played a pivotal role in global food security :

##### **Russia and Ukraine :**

Russia is one of the largest exporters of wheat and durum wheat to the Middle East and North Africa .

Ukraine is known as the "breadbasket of Europe" and exports large quantities of corn, barley<sup>26</sup> and vegetable oils

##### **States of America :**

The world's largest producer of corn and soybeans, it plays a key role in the grain and oil<sup>27</sup> markets

##### **Canada and Brazil :**

Canada dominates wheat and soybean production, while Brazil focuses on soybeans and meat<sup>28</sup>

##### **Arab countries :**

It relies heavily on imports, especially wheat and oils . Egypt, Algeria, and Morocco import<sup>29</sup> large proportions of Russian and Ukrainian wheat

#### **Third requirement: Interdependence between economies**

Global supply chains before the war showed **a high degree of economic interdependence :**

Reliance on imports of grains and oils makes importing countries vulnerable to external shocks .

Shocks such as price hikes or disruptions to shipping lead to food shortages and higher<sup>30</sup> domestic prices

Producing countries rely on foreign markets to generate profits, making them vulnerable to<sup>31</sup> international policies and economic sanctions

#### **requirement : Weaknesses in supply chains before 2022**

Prior to the outbreak of war, there were a number of **fundamental weaknesses** in global food supply chains :

**Production focus :** Reliance on a limited number of countries makes the global food system<sup>32</sup> vulnerable to any political or natural shock

**Increased reliance on maritime transport :** Any disruption to maritime shipping routes, such <sup>33</sup>.as those in the Black Sea, leads to a complete disruption of supply

**Disparities in production capacities :** Some countries cannot produce enough to cover their <sup>34</sup>.domestic consumption, making them dependent on imports

**Lack of storage and reserves :** Weak food reserves in some countries increase the impact of <sup>35</sup>.any shock on food availability

Analysis of the pre-war international context reveals that global food supply chains were **fragile and vulnerable to shocks** due to the concentration of production and the dependence of importing countries on a limited number of exporters. This situation created fertile ground for the exacerbation of food security crises in the event of any international conflict, as subsequently occurred with the outbreak of the Russian-Ukrainian war -in 2022, where the <sup>36</sup>.shock directly impacted food availability and prices in global markets

**Fourth axis: The Russian- -Ukrainian war: background and motivations requirement : Causes of conflict**

The roots of the Russian-Ukrainian war lie -in multiple political, economic, and geostrategic factors , which directly and indirectly affect global food security. Among the most prominent of these reasons are:

**Political and historical tensions :**

These include historical disputes between Russia and Ukraine over borders and sovereignty over certain regions such as the Crimean Peninsula, and conflicts over political influence in <sup>37</sup>.Eastern Europe

**Economic and strategic interests include**

control over natural resources, including Ukraine's fertile agricultural land, which is among the <sup>38</sup>.richest in the world for grain and oil production

**Relations with the West and military alliances :**

The rise of Western influence, particularly NATO's expansion into Eastern Europe, has placed <sup>39</sup>.strategic pressure on Russia, prompting it to take military action to protect its interests

**requirement : The evolution of events since 2022**

The war broke out in February 2022 and quickly escalated into a large-scale military conflict encompassing many key Ukrainian wheat and corn-producing regions. Key milestones of the war :

**Direct military offensive :**

This included seizing key agricultural areas, disrupting transport lines, and closing vital Black <sup>40</sup>.Sea ports

**International economic sanctions imposed on Russia :**

The sanctions led to difficulties in exporting Russian grain, and increased transportation and <sup>41</sup>.insurance costs, which affected global prices

**The**

**Ukrainian response** focused on protecting agricultural land, securing export routes, and <sup>42</sup>.negotiating with international parties to keep agricultural exports possible

**requirement : The impact of the crisis on international trade**

The war led to major disruptions in global trade :

**Food supply disruptions :**

Russia and Ukraine are major exporters of wheat, corn, and vegetable oils. Disruptions to their <sup>43</sup>.exports have affected global markets, particularly in the Middle East and Africa

**Global food prices have risen :**

Wheat and corn prices have increased by more than 30% in some markets, putting pressure on<sup>44</sup>.importing countries

**Changing international trade routes :**

,Many importers were forced to seek alternatives such as Canada, the United States, and Brazil<sup>45</sup>.which increased transportation costs and affected supply chains

**Fourth requirement: Economic sanctions and their repercussions**

Western economic sanctions against Russia have significantly impacted global food security :

**Financial and insurance export restrictions :**

,Some sanctions prevented Russian companies from accessing international insurance<sup>46</sup>.hindering the transport of grain to foreign markets

**Rising energy prices :**

Sanctions have led to increased gas and oil prices, which has impacted food production costs<sup>47</sup>.and the transportation of agricultural products

**Impact on developing countries :**

Those countries that rely on grain imports from Russia and Ukraine have faced severe food shortages and a significant rise in domestic prices, threatening the food security of millions of<sup>48</sup>.citizens

,It is clear that the Russian- -Ukrainian war has dealt a major blow to global food security destroying a portion of agricultural production, disrupting supply chains, and causing a significant rise in prices. This leads us to **the fifth section: The Impact of War on Global ,Food Security** , which will analyze the effects of this crisis on food availability, access to food and food stability in different countries .

**axis : The impact of war on global food security**

**requirement : High food prices**

, Ukrainian war has led to a sharp rise in -global **prices for basic food commodities particularly wheat, corn, and vegetable oils. This is due to the disruption or reduction of exports from Russia and Ukraine, which together account for approximately 30 of %** .<sup>49</sup> **global exports.From global wheat exports**

**Wheat :** The price of wheat has increased by more than 35% in global markets since the start<sup>50</sup>.of the war

**Corn :** Countries that rely on imports of Ukrainian corn, such as Egypt and Turkey, were<sup>51</sup>.affected by the price increase of 20-25%

**Vegetable oils :** Supply shortages have led to an increase in oil prices of approximately 40% in<sup>52</sup>.some markets

This increase has put considerable pressure on importing countries, especially in the Middle East and Africa, and has increased the risk of food insecurity among the most vulnerable groups .

**requirement : weak food availability in the markets**

The war has **disrupted supply chains** and agricultural production in Ukraine, affecting food availability in local and international markets .

**Direct impact on production :** ,Agricultural operations in the affected areas have stopped especially during the harvest season, which has reduced the amount of grain available for<sup>53</sup>.export

**Transmission lines interrupted :** The closure of Ukrainian ports on the Black Sea has<sup>54</sup>.disrupted maritime shipping, affecting exports of grain and oil

**Increased reliance on alternatives :** ,Importing countries, such as Canada, the United States and Brazil, were forced to seek alternative sources, leading to increased transportation costs<sup>55</sup>.and delivery times

As a result of these disruptions, global food security has suffered from a decline in overall food availability, particularly in countries that rely on imports for more than 50% of their food needs

**requirement : Declining production in conflict-affected countries**

Ukraine, as one of the world's major producers of wheat and corn, has seen a significant decline in agricultural production as a result of the war :

<sup>56</sup>Damage to agricultural infrastructure, such as fields, warehouses and ports

<sup>57</sup>Shortage of agricultural labor due to displacement or conscription

<sup>58</sup>Shortages of fertilizers and fuel due to economic sanctions and high prices

These factors combined to significantly reduce domestic production, affecting Ukraine's ability to meet its internal needs as well as export .

**requirement : Effects on importing countries**

Food-importing countries, particularly in the Middle East, North Africa and sub-Saharan Africa, were the most affected :

**Local price increases :** ,The rise in global prices was directly reflected in local markets<sup>59</sup>.increasing food inflation rates

**Food poverty is worsening :** The weakened purchasing power of families has led to an increase<sup>60</sup>.in food insecurity, especially among vulnerable groups

**Pressure on governments :** Some governments were forced to increase food subsidies or<sup>61</sup>.reduce taxes on grain imports to avoid a social crisis

**requirement : The situation of developing countries versus developed countries**

The effects of war on food security differ between developing and developed countries :

**Developing countries :** They face significant difficulties in securing food due to reliance on imports and weak financial reserves. For example, Egypt, Lebanon, and Yemen have<sup>62</sup>.experienced a sharp rise in wheat and oil prices

**Developed countries :** It has larger food reserves and financial capacity to absorb shocks, but<sup>63</sup>.has been partially affected by rising prices and increased production and transportation costs

The study shows that the Russian- -Ukrainian war **has caused a comprehensive shock to global food security** through rising prices, reduced food availability, and decreased production 'in conflict zones. It also highlights the fragility of global supply chains and countries dependence on a limited number of exporters. This leads to **the sixth section: The Interplay of War with Supply Chains** , where the impact of war on agricultural logistics and food supplies will be analyzed in depth .

**axis : The intersection of war with supply chains**

**requirement : Disrupting agricultural supply chains**

The Russian-Ukrainian war has -directly affected **agricultural supply chains** , particularly with regard to grains and vegetable oils :

1. **Closure of seaports :** Ukrainian ports on the Black Sea were closed, halting grain and<sup>64</sup>.oil exports to global markets

2. **Land transport was disrupted :** Due to military conflicts, many overland shipments<sup>65</sup>.have stopped, and access to regional and international markets has become more difficult

3. **Local agricultural production has declined** .The destruction of agricultural infrastructure and the shortage of labor have affected the quantity of harvest available for export, increasing the pressure on importers .<sup>66</sup>

As a result, large gaps have emerged in agricultural supply chains, making them more vulnerable to any additional shocks .

**requirement : Fertilizer shortage and high prices**

Fertilizers are essential for ensuring sustainable agricultural production, and the war has led to :

1. **Disruption in fertilizer supplies** : Russia exports a large proportion of fertilizers to <sup>67</sup>Europe and developing countries, and sanctions and war have reduced these supplies
2. **Global fertilizer prices are rising** : The shortage led to increased agricultural <sup>68</sup>production costs, and consequently, higher food prices in local and international markets
3. **Impact on future production** : Reduced fertilizer use threatens agricultural <sup>69</sup>productivity in the coming seasons, increasing the risk of food insecurity

**Third requirement: Logistics and Black Sea Maritime Transport**

Maritime transport is the backbone of global supply chains for grains and oils :

1. **Ukrainian ports** : Before the war, Ukraine exported grain and oil through its main <sup>70</sup>Black Sea ports, activity of which has almost completely ceased since the start of the conflict
2. **Impact on shipping costs** : The disruption to maritime transport has led to an increase <sup>71</sup>in insurance and shipping prices by more than 50% for some destinations
3. **Searching for alternative routes** : Importing countries resorted to longer and more expensive shipping routes through Western European ports, which increased the cost of supply . supplies<sup>72</sup> and food

**Fourth requirement: Impact on animal and plant food chains**

Animal and plant production were affected sequentially due to supply disruptions :

1. **Plant production** : The shortage of grains and fertilizers has led to a decrease in the <sup>73</sup>production of staple grains, which has affected the animal feed industry
2. **Animal production** : Reduced availability of animal feed has led to increased costs for raising livestock and poultry, which has been reflected in the prices of meat and dairy <sup>74</sup>products
3. **Food waste** : Difficulties in transportation and delays in delivery have led to increased <sup>75</sup>food waste, especially of perishable products

It is clear that the Russian --Ukrainian war has not only affected agricultural production but has also disrupted **the entire food supply chain** , from production through transport and distribution to the end consumer. This leads us to **the seventh section: National and International Policies for Dealing with the Crisis** , where we will discuss the measures taken by countries and international organizations to mitigate the war's impact on global food security .

**axis : National and international policies for dealing with the crisis**

**First requirement: Government measures to ensure food security**

Governments have taken several measures to counter the effects of the Russian- -Ukrainian war on local food markets :

1. **Food reserve storage** :  
Some countries have relied on increasing strategic reserves of grains and oils to ensure stable <sup>76</sup>supplies amid disruptions to supply chains
2. **Price controls and financial support** :  
Governments imposed price controls on some basic commodities or provided direct financial support to the most vulnerable households to mitigate the impact of rising prices on purchasing <sup>77</sup>power



3. **Diversifying import sources :**

4.

Importing countries sought to open new markets for supply, such as turning to Canada, the<sup>78</sup>.United States, and Brazil, to reduce dependence on Russia and Ukraine

5. **Facilitating internal transport and distribution :**

6.

Some countries have developed plans to increase logistical efficiency and ensure food access<sup>79</sup>.to rural and remote areas by improving transport and storage networks

**second requirement : International responses (organizations, institutions )**

International organizations played a pivotal role in **mitigating the effects of the crisis on global food security :**

1. **Food and Agriculture Organization (FAO)**

has provided advanced analyses for forecasting food supply and demand, and has contributed<sup>80</sup>.to supporting importing countries through technical and financial assistance programs

2. **The World Food Programme (WFP)**

provided emergency food assistance to countries most affected by rising prices and supply<sup>81</sup>.shortages, particularly in Africa and the Middle East

3. **The World Bank and the International Monetary Fund** have provided financing packages to support food and energy imports and strengthen countries' ability to absorb price<sup>82</sup>. shocks

4. **Regional and international cooperation :**

Coordination mechanisms have been established between countries to ensure the flow of grains<sup>83</sup>.and oils through alternative routes, and to reduce the impact of the war on global markets

**requirement : Preferential trade and tax breaks**

To mitigate the effects of the crisis, some countries adopted **flexible trade policies :**

1. **Reducing customs duties on grains and oils :**

This contributed to lowering import costs and stimulating local markets to continue providing<sup>84</sup>.food

2. **Concluding preferential trade agreements :**

,These enabled importing countries to obtain larger quantities of food at subsidized prices<sup>85</sup>.especially for low-income countries

3. **Stimulating domestic production :**

Some governments have provided financial and technical incentives to farmers to increase<sup>86</sup>.domestic production in response to import disruptions

**requirement : Regional cooperation**

Regional cooperation has **mitigated the effects of war on food security** through :

1. **Mechanisms for food exchange between neighboring countries :**

<sup>87</sup>.such as reciprocal import and export programs between Arab and European countries

2. **Developing alternative maritime and river transport routes :**

to overcome the disruption of Black Sea ports and ensure the delivery of grains and oils to<sup>88</sup>global markets

3. **Coordinating agricultural policies :**

promoting local production, managing strategic stocks, and sharing data to avoid sudden<sup>89</sup>.market shortages

The study demonstrates that national and international responses formed a crucial safety net to mitigate the impact of the Russian --Ukrainian war on food security. Through **strategic stockpiling, price support, diversification of sources, and collaborative international solutions** , some countries were able to lessen the shock for their citizens. This also highlights

the importance of **sustained regional and international cooperation** to ensure the resilience .of supply chains in the face of future crises

#### **Eighth axis: Lessons learned and recommendations**

##### **First requirement: Lessons learned from the Russian- -Ukrainian war**

Recent experience shows that the Russian- -Ukrainian war has been a **comprehensive shock to global food security** , and several key lessons can be drawn :

##### **1. The fragility of global supply chains :**

The crisis confirms that countries' reliance on a limited number of exporters makes them vulnerable to shocks, and that diversifying food sources is essential to ensuring sustainable <sup>90</sup>.food security

##### **2. The importance of strategic stockpiling :**

The war showed that having strategic reserves of grains and vegetable oils reduces the <sup>91</sup>.immediate impact on local markets and gives governments time to adapt to shocks

##### **3. Resilience in trade and logistics policies :**

Countries that were able to redirect supply routes and diversify their markets were able to <sup>92</sup>.reduce the impact of the crisis on food security

##### **4. The necessity of regional and international cooperation :**

Coordination between countries and international organizations has helped mitigate the effects of the war on markets, emphasizing that food security cannot be protected in isolation from <sup>93</sup>.international cooperation

##### **Second requirement: Recommendations to ensure sustainable food security**

Based on the lessons learned, strategic recommendations can be made at both the national and international levels :

##### **1. Diversification in production and imports :**

- ❖ Encouraging local production of basic commodities .
- ❖ <sup>94</sup>Opening new import markets to reduce dependence on a limited number of countries

##### **2. Strengthening strategic reserves :**

- ✓ Establishing national and regional stockpiles of grains and oils .
- ✓ Developing inventory tracking and management systems to ensure a rapid response to <sup>95</sup>shocks

##### **3. Developing the logistics infrastructure :**

- Improving transport and storage networks, including ports and inland roads .
- <sup>96</sup>Using digital technology to enhance supply management efficiency

##### **4. and regional cooperation :**

- Strengthening bilateral and regional agreements to secure the flow of food supplies .
- Supporting international programs such as the World Food Programme and the Food and Agriculture Organization to provide technical and financial assistance to importing <sup>97</sup>countries

##### **5. Flexible fiscal and economic policies :**

- ✚ Providing direct financial support to the most vulnerable families .
- ✚ <sup>98</sup>Monitoring prices and mitigating the impact of food inflation on poor groups

##### **requirement : Strengthening food security in the face of future crises**

To ensure the sustainability of food security, future crises must be viewed from a **prevention and proactive perspective** :

##### **1. Strategic planning :**

,Developing national and regional plans to deal with potential shocks, including conflicts <sup>99</sup>.natural disasters, and climate change

2. **Investing in agricultural technology :**

developing smart farming methods, using sustainable fertilizers, and improving agricultural<sup>100</sup>.productivity to reduce dependence on foreign supplies

3. **Enhancing countries' resilience :**

Building economic and political resilience through diversifying energy and food resources to<sup>101</sup>.ensure the stability of local markets in the event of any international shock

4. **Awareness and scientific research :**

Developing research studies on food security and supply chains, and spreading awareness about<sup>102</sup>.the importance of food sustainability and protecting natural resources

The Russian-Ukrainian war has clearly -exposed the fragility of global food security and highlighted the need for **strategic planning, diversification, and international cooperation** to ensure the sustainability of food supplies. By implementing the recommendations above, the impact of future crises on food security can be mitigated, and the most vulnerable populations around the world can be protected .

This research has highlighted **the impact of the Russian-Ukrainian war -on global food security** , focusing on food supply chains, rising prices, declining production, and national and international responses. The main findings can be summarized as follows :

1. **The fragility of global supply chains :**

The crisis has shown that reliance on a limited number of exporting countries, particularly Russia and Ukraine, makes global food security vulnerable to sudden shocks, necessitating the<sup>103</sup>.diversification of food sources and the strengthening of local production

2. **Price increases and their impact on importing countries :**

The war led to a significant increase in the prices of grains and vegetable oils, which negatively affected the purchasing power of families, especially in developing countries, and exacerbated<sup>104</sup>.food insecurity

3. **The impact of the war on food production :**

,The conflict led to the destruction of agricultural infrastructure in Ukraine, labor shortages and disruptions to maritime transport, resulting in a significant decrease in grain and oil<sup>105</sup>.production, and consequently, a shortage in global supply

4. **The vital role of national and international responses :**

Government policies such as strategic stockpiling, price support, and diversifying import sources proved effective in mitigating the impact of the war. International and regional organizations also played a pivotal role in coordinating food aid and ensuring the continuity of<sup>106</sup>.supplies

5. **Lessons learned and recommendations :**

,The crisis underscores the need for strategic planning, enhanced logistical resilience investment in agricultural technology, and deepened international and regional cooperation to<sup>107</sup>.ensure sustainable food security in the face of future crises

**Importance of the research**

The importance of this research lies in its examination of the impact of international conflicts ,on global food security, highlighting the complex relationship between politics, economics and agriculture. Furthermore, the study provides a scientific foundation upon which governments and international organizations can build to develop sustainable strategies for<sup>108</sup>.strengthening supply chains and protecting the most vulnerable populations

**Future Recommendations**

1. **Diversifying production and import sources :** To reduce dependence on a limited number of exporting countries .

2. **Strengthening strategic reserves :** To ensure market stability during times of crisis .

3. **Developing the logistics infrastructure** :To ensure efficient food delivery to all areas .
4. **Deepening international and regional cooperation** : To ensure the resilience of supply chains and protect food security .
5. **Investing in agricultural research and technology** : To boost productivity and reduce food waste .

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