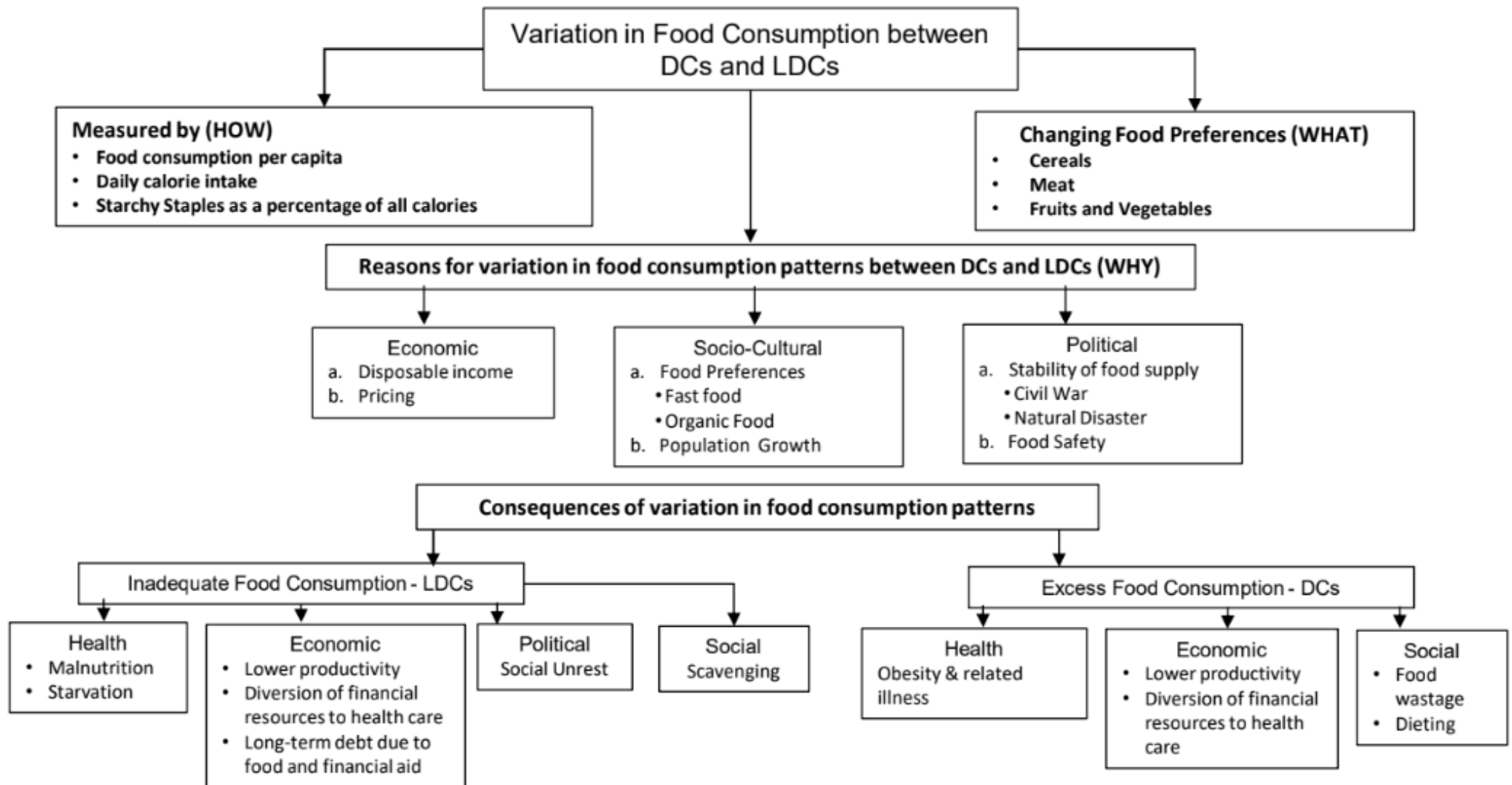


## Chp 4 Gateway 1 – Food consumption patterns changed since the 1960s

Subject content:

Learning Outcomes	Content	Main Terms
<b>Key Question 1: How and why have food consumption patterns changed since the 1960s?</b>		
<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Describe variations in global food consumption patterns between DCs and LDCs over time</li> <li>Describe the changing food preferences in DCs and LDCs</li> <li>Explain why variations exist and persist in food consumption between DCs and LDCs</li> </ul>	<p>A) <u>Knowledge</u></p> <ul style="list-style-type: none"> <li>Variations in global food consumption patterns between DCs and LDCs over time, in terms of               <ul style="list-style-type: none"> <li>Indicators of food consumption                   <ul style="list-style-type: none"> <li>Consumption/kg/yr</li> <li>Starchy staples as percentage of all calories</li> <li>Total daily calorie intake</li> </ul> </li> <li>Changing food preferences</li> </ul> </li> <li>Reasons for the growth and variations in food consumption               <ul style="list-style-type: none"> <li>Economic                   <ul style="list-style-type: none"> <li>Disposable income</li> <li>Pricing</li> </ul> </li> <li>Socio-cultural                   <ul style="list-style-type: none"> <li>Food preferences: organic food and fast food</li> <li>Population growth</li> </ul> </li> <li>Political                   <ul style="list-style-type: none"> <li>Stability of food supply</li> <li>Food safety</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Food</li> <li>Staple food</li> <li>Food consumption per capita</li> <li>Daily calorie intake</li> <li>Food preference</li> <li>Disposable income</li> <li>Organic food</li> </ul>

Learning Outcomes	Content	Main Terms
<ul style="list-style-type: none"> <li>Discuss the impact of variations in food consumption on individuals within DCs and LDCs</li> </ul>	<ul style="list-style-type: none"> <li>Impact of inadequate food consumption on individuals and countries               <ul style="list-style-type: none"> <li>Health                   <ul style="list-style-type: none"> <li>Malnutrition</li> <li>Starvation</li> </ul> </li> <li>Economic                   <ul style="list-style-type: none"> <li>Lower productivity</li> <li>Food aid and economic aid can cause long term debts</li> <li>Diversion of financial resources to health care</li> </ul> </li> <li>Political                   <ul style="list-style-type: none"> <li>Social unrest</li> </ul> </li> <li>Social                   <ul style="list-style-type: none"> <li>Scavenging</li> </ul> </li> </ul> </li> <li>Impact of excess food consumption on individuals and countries               <ul style="list-style-type: none"> <li>Health                   <ul style="list-style-type: none"> <li>Obesity and related illnesses</li> </ul> </li> <li>Economic                   <ul style="list-style-type: none"> <li>Lower productivity</li> <li>Diversion of financial resources to health care</li> </ul> </li> <li>Social issues                   <ul style="list-style-type: none"> <li>Food wastage</li> <li>Dieting</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Malnutrition</li> <li>Starvation</li> <li>Social unrest</li> <li>Scavenging</li> <li>Obesity</li> </ul>
	B) <u>Skills</u> <ul style="list-style-type: none"> <li>Compare food consumption levels between DCs and LDCs shown in maps or graphs</li> <li>Compare how food consumption patterns are influenced by changes in income</li> </ul>	



### Indicators of food consumption

Indicator	Description	Distribution	
		LDCs	DCs
1. <b>Food consumption per capita</b>	<ul style="list-style-type: none"> <li>Def: Average <u>amt of food consumed</u> per year</li> <li>Unit: kg/capita/yr</li> <li>Recorded for individual food groups</li> <li>Determine changes in food consumption patterns over time</li> </ul>	lower	higher
2. <b>Total daily calorie intake</b>	<ul style="list-style-type: none"> <li>Total <u>no. of calories</u> obtained from food consumed per person per day</li> <li>Unit: calories</li> </ul>	lower	higher
3. <b>Starchy staples as percentage of all calories</b>	<ul style="list-style-type: none"> <li>Main source of <u>energy intake</u></li> </ul>	higher	lower

### Changing food preferences

Food groups:

Food group	Cereals	Meat	Fruit & veg
Trend	↓	↑	↑
<b>LDCs</b>	Majority of calorie intake		
<b>DCs</b>	Small percent of calorie intake	Less red meat (health problems)	Increased awareness of health benefits ↑ consumption
Both	↑ income → substitute rice for wheat to make bread, noodles		↑ consumption: efforts of intl org (WHO, FAO)

## Food consumption patterns vary

Factor		LDC	DC
Economic	1. <b>Disposable income</b>	<ul style="list-style-type: none"> <li>• <b>Lower</b> disposable income → lower financial ability → smaller amount + smaller variety</li> <li>• Increase in disposable income → more spent on food               <ul style="list-style-type: none"> <li>◦ e.g. <u>DR Congo</u>: 60% of every US\$1 income increase → spent on food</li> </ul> </li> <li>• Disposable income rise: consume larger amount + larger variety               <ul style="list-style-type: none"> <li>◦ more meat, less cereals</li> <li>◦ e.g. <u>S.Korea</u>: rapid economic growth (1970 ~ 1980)                   <ul style="list-style-type: none"> <li>■ rice consumption ↓ 6%</li> <li>■ meat consumption x 3</li> <li>■ marine product consumption x 2.5</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Higher</b> disposable income → higher financial ability → larger amount + larger variety</li> <li>• Increase in disposable income → less spent on food               <ul style="list-style-type: none"> <li>◦ e.g. <u>US</u>: 20% of every US\$1 income increase → spent on food</li> </ul> </li> <li>• Disposable income rise: consume expensive foods with health benefits               <ul style="list-style-type: none"> <li>◦ e.g. organic food, olive oil</li> </ul> </li> </ul>
	2. <b>Pricing</b>	<ul style="list-style-type: none"> <li>• Less disposable income → <b>more affected</b></li> <li>• e.g. Global food crisis (2006 ~ 2008)               <ul style="list-style-type: none"> <li>◦ <u>Egypt, Indonesia, Haiti</u></li> <li>◦ X afford staple food → 100 mil chronic hunger, poverty</li> <li>◦ spark food riots, street protests</li> <li>◦ govt attempt to control food prices</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Higher disposable income → <b>less affected</b></li> <li>• e.g. Global food crisis (2006 ~ 2008)               <ul style="list-style-type: none"> <li>◦ <u>US</u></li> <li>◦ effects not as dramatic</li> <li>◦ food prices still rise significantly                   <ul style="list-style-type: none"> <li>■ a dozen eggs ↑ 38%</li> <li>■ wheat bread ↑ 12%</li> </ul> </li> <li>◦ select less expensive options</li> </ul> </li> </ul>

Socio-cultural	1. <b>Food preferences</b>	<u>Fast food</u> <ul style="list-style-type: none"> <li>• Globalisation → fast food chains set up restaurants</li> <li>• Convenience + affordable pricing → opt to dine out at these outlets</li> <li>• e.g. <u>India</u> (1991) <ul style="list-style-type: none"> <li>○ open up economy to foreign investors</li> <li>○ US fast food chains enter Indian market <ul style="list-style-type: none"> <li>■ Domino's Pizza</li> <li>■ McDonald's</li> <li>■ Pizza Hut</li> </ul> </li> </ul> </li> </ul>	<u>Fast food</u> <ul style="list-style-type: none"> <li>• Aware of harmful health effects → move away</li> <li>• More concerned over how fast food is prepared + processed <ul style="list-style-type: none"> <li>○ oil</li> <li>○ processed meat</li> <li>○ chemicals</li> </ul> </li> </ul>
			<u>Organic food</u> <ul style="list-style-type: none"> <li>• Health concerns abt conventional methods of growing food <ul style="list-style-type: none"> <li>○ e.g. risk of cancer from use of pesticides</li> </ul> </li> <li>• Choose → perceived health benefits</li> <li>• e.g. <u>US</u> (2011) <ul style="list-style-type: none"> <li>○ 58% prefer to eat organic food</li> </ul> </li> </ul>
	2. <b>Population growth</b>	<ul style="list-style-type: none"> <li>• <u>Higher</u> (increasing) demand for food</li> <li>• Higher population growth rate → higher birth rates <ul style="list-style-type: none"> <li>○ lack of family planning</li> <li>○ need for farm labour</li> </ul> </li> </ul>	
Political	1. <b>Stability of</b>	1) X increase food production (agricultural land)	1) ✓ increase food production (technology)

	<b>food supply</b>	<p>2) X increase food imports</p> <ul style="list-style-type: none"> <li>e.g. Jamaica: hurricane disaster 2004</li> </ul> <p>Civil war: <u>Libya</u> civil war (2011)</p> <ul style="list-style-type: none"> <li>food stocks rapidly depleted</li> <li>food consumption ↓</li> </ul> <p>Natural disaster: <u>Zimbabwe</u> severe drought (2008)</p> <ul style="list-style-type: none"> <li>low rainfall destroy corn harvest</li> <li>food shortage</li> </ul>	<p>2) ✓ increase food imports</p> <ul style="list-style-type: none"> <li>e.g. SG: 90% food supply</li> </ul>
	<b>2. Food safety</b>	<ul style="list-style-type: none"> <li>Proper handling + transport + store food</li> <li>X foodborne diseases → food safe for consumption</li> <li>Govt: set food safety standards + track down contaminated foods</li> </ul>	<p>Japan earthquake (2011)</p> <ul style="list-style-type: none"> <li>nuclear plants damaged → release radioactive materials → contaminate farmland + water sources</li> <li>SG restrict sea imports from Japan</li> </ul> <p>Bovine Spongiform Encephalopathy (BSE) outbreak (2005)</p> <ul style="list-style-type: none"> <li>Europe, US, Canada</li> <li>contract disease by eating meat from infected cow</li> <li>↓ beef consumption</li> </ul>

## Impact of inadequate food consumption

Factor		Description	LDC	DC
Health	1. <b>Malnutrition</b>	<ul style="list-style-type: none"> <li>• X sufficient / balanced amt of nutrients to maintain healthy tissues + organ functions</li> </ul>	Vitamin A deficiency <ul style="list-style-type: none"> <li>• maintain good eyesight in low light</li> <li>• visual impairment and blindness: inadequate consumption of fruits &amp; vegetables</li> <li>• X educational opportunities               <ul style="list-style-type: none"> <li>○ miss chance to attend school</li> <li>○ lower earning power in future</li> </ul> </li> </ul>	Calcium deficiency <ul style="list-style-type: none"> <li>• make strong dense bones</li> <li>• osteoporosis: bones less dense &amp; fragile → fractured / break</li> <li>• X work days and productivity               <ul style="list-style-type: none"> <li>○ e.g. <u>UK</u> (2006): 3 mil suffer, US\$3.7 bil spent for patients</li> </ul> </li> </ul>
			Child deaths <ul style="list-style-type: none"> <li>• e.g. <u>52.5%</u> of all child deaths: caused by malnutrition (2009)</li> <li>• e.g. <u>underweight</u> children               <ul style="list-style-type: none"> <li>○ 78 mil in S.Asia</li> <li>○ 36 mil in Sub-Saharan Africa</li> </ul> </li> <li>• e.g. <u>5 mil</u> die every yr</li> </ul> Generally heavily affected <ul style="list-style-type: none"> <li>• 16% suffer from malnutrition</li> <li>• e.g. <u>Sub-Saharan Africa</u> most heavily affected               <ul style="list-style-type: none"> <li>○ 75% in <u>DR Congo</u></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Elderly: difficulty in digesting / chewing food               <ul style="list-style-type: none"> <li>○ e.g. <u>USA</u> (2006): thousands of elderly people eat too little → die</li> </ul> </li> <li>• Eating disorders               <ul style="list-style-type: none"> <li>○ ingest too little food</li> <li>○ e.g. anorexia nervosa, bulimia</li> </ul> </li> </ul>



	2. <b>Starvation</b>	<ul style="list-style-type: none"> <li>extreme hunger from severe lack of food</li> <li>extreme form of nutrition</li> <li>body becomes skeletally thin, organs become permanently damaged</li> </ul>	<ul style="list-style-type: none"> <li>More common               <ol style="list-style-type: none"> <li>poverty</li> <li>X resources to recover from natural disasters</li> <li>unstable political situation</li> </ol> </li> <li>e.g. <u>Mali</u> (2012)               <ul style="list-style-type: none"> <li>poor harvest + civil rebellion</li> <li>5 mil people affected</li> </ul> </li> <li>e.g. <u>Sub-Saharan Africa</u>: &gt; 1/3 people are malnourished</li> </ul>	
Economic	1. <b>Lower productivity</b>		<ul style="list-style-type: none"> <li>Workers: fall sick → X work productively → low productivity → low income</li> <li>Children: absent from school → X educational opportunities</li> <li>e.g. <u>IFPRI</u> report (2011)               <ul style="list-style-type: none"> <li>India, Sri Lanka, Ethiopia</li> <li>low nutrition lvl ⇔ productivity</li> <li>farmers less innovative &amp; experimental → X implement improvements</li> </ul> </li> </ul>	
	2. <b>Diversion of financial resources to health care</b>		<ul style="list-style-type: none"> <li>More people fall sick → higher demand for health services → higher cost of govt providing health care</li> <li>Higher spending on health care → divert limited financial resources from other areas → slow down economic development</li> </ul>	
	3. <b>Long-term debt due to</b>		<ul style="list-style-type: none"> <li>Food + financial aid given → help cope with insufficient food supply</li> </ul>	

	<b>food and financial aid</b>		<ul style="list-style-type: none"> <li>e.g. <u>US</u> (½ global aid) <ul style="list-style-type: none"> <li>food bought from their supplies + transported on their ships</li> <li>food aid: 34% more expensive than locally purchased</li> </ul> </li> <li>Tied aid → increase national debt of LDC to DC</li> </ul>	
Political	1. <b>Social unrest</b>		<ul style="list-style-type: none"> <li>High food prices → X afford food → hungry → angry, unhappy</li> <li>e.g. <u>Mozambique</u> (2010) <ul style="list-style-type: none"> <li>Russia drought → decrease in wheat production + export → price ↑ 30%</li> <li>violent protest: 400 injured, 10 dead</li> </ul> </li> </ul>	
Social	1. <b>Scavenging</b>		<ul style="list-style-type: none"> <li>searching through rubbish → eat whatever found</li> <li>effects <ol style="list-style-type: none"> <li>1) health risks (bacteria, chemicals)</li> <li>2) dangerous / illegal situations (trespass private property)</li> <li>3) public nuisance (verbally, physically harassed)</li> </ol> </li> <li>e.g. <u>Smokey Mountain</u>, Philippines <ul style="list-style-type: none"> <li>large landfill</li> <li>poor families set up makeshift homes nearby + pick through rubbish → make living</li> </ul> </li> </ul>	

Factor		Description	LDC	DC
Health	1. <b>Obesity and related illnesses</b>	<ul style="list-style-type: none"> <li>• excess fat accumulation due to over-consumption of nutrients</li> <li>• affect body systems → health problems               <ul style="list-style-type: none"> <li>○ high blood pressure</li> <li>○ diabetes</li> <li>○ certain cancers</li> </ul> </li> <li>• other related illnesses               <ul style="list-style-type: none"> <li>○ kidney failure</li> <li>○ hypertension</li> </ul> </li> </ul>	Increasing <ul style="list-style-type: none"> <li>• Rising disposable income</li> <li>• e.g. <u>Brazil, China, India</u></li> <li>• e.g. <u>Mexico, S.Africa</u>: obesity rates &gt; DCs</li> </ul>	More common <ul style="list-style-type: none"> <li>• Higher percentage of adult population with obesity</li> <li>• Higher disposable income → stronger purchasing power → higher calorie intake</li> <li>• e.g. <u>US, Canada, Australia</u> <ul style="list-style-type: none"> <li>○ sweetened beverages, potato chips, fast food</li> <li>○ <u>US</u> (1971 ~ 2000): 14.5% → 30.9%</li> </ul> </li> </ul>
Economic	1. <b>Lower productivity</b>			<ul style="list-style-type: none"> <li>• [same]</li> <li>• e.g. employees of <u>Duke Uni, US</u> <ul style="list-style-type: none"> <li>○ BMI &gt; 40: twice as likely to fall sick / injured at work</li> <li>○ higher compensation claims paid</li> </ul> </li> </ul>
	2. <b>Diversion of financial resources to health care</b>			<ul style="list-style-type: none"> <li>• [same]</li> </ul>
Social	1. <b>Food wastage</b>			<ul style="list-style-type: none"> <li>• Strain on landfills: dispose additional waste</li> <li>• Resources wasted: water, oil used to produce food)</li> </ul>

				<ul style="list-style-type: none"> <li>• e.g. amt of wasted food per capita: DC (<u>100 kg</u>) &gt; LDC (10 kg)</li> </ul>
	2. <b>Dieting</b>			<ul style="list-style-type: none"> <li>• Health benefit: regulate amt of food consumed → ideal body weight</li> <li>• Weight loss industry               <ul style="list-style-type: none"> <li>○ employment + value to economy</li> <li>○ e.g. <u>US</u>: US\$20 billion                   <ul style="list-style-type: none"> <li>■ diet books, medication, medical procedures for losing weight</li> <li>■ create jobs in health sector</li> </ul> </li> </ul> </li> </ul>

**Typical questions****Structured / data questions**

- 1 Gross Domestic Product (GDP) per capita is the total value of all goods and services produced and provided in one year divided by the total population. Study figure below, a graph showing GDP per capita and daily calorie intake for ten selected countries.

Describe and suggest reasons for any relationships between GDP per capita and daily calorie intake shown in the figure above.

[4]

(2014 P2 Q5b)

**Describe:**

- The higher the GDP per capita, the higher the daily calorie intake.
- For example, the country with the lowest GDP per capita of US\$2000 consumes the lowest daily calorie intake of 1600. The country with the highest GDP per capita of US\$40000 has a daily calorie intake of 3400.
- However, there are anomalies such as the country that has the highest daily calorie intake of 3600 but only has a GDP per capita of US\$22000.

**Explain:**

- A possible reason for this relationship is that with higher GDP per capita, a country's population would have more disposable income, thus leaving them with more money to buy food. Therefore, they would be able to consume more food and hence consume more calories.

- 2 Study the photograph below which shows stockpiling of food taking place.

With the help of the photograph, describe how food stockpiling takes place and explain how it helps governments achieve food security.

[5]

(2014 P2 Q6d)

Food stockpiling is done in order to make sure that a country has enough food. This is to make sure that the country has a stable supply of food for its citizens.

Stockpiling is the collecting and storing of food to make sure that a country's citizens have access to food during emergencies. The photograph shows a man carrying sacks of rice, an important staple food in many countries. This shows that countries would usually stockpile staple food such as rice and wheat.

Governments would usually collect food either from imports overseas or from local farms. Food stockpiling gives a country food security, whereby it is able to provide food for its citizens even during emergencies.

- 3 Study the table below, which shows changes in food consumption in Vietnam.

**Change in food consumption in Vietnam 1989 – 2020**

	year			
	1989	1999	2009	2019
calories / person / day	2043	2238	2690	3497
% from protein	19	20	22	25
% from fat	12	16	23	33
% from carbohydrate	69	64	55	42

(2016 P2 Q5)

- (a) Describe the changes in food consumption in Vietnam from 1989 to 2019 shown in the table below. [3]

- There is a general increase in food consumption in Vietnam between 1989 and 2019.
- This can be inferred from the rise in the number of calories consumed per person per day, from 2043 in 1989 to 3497 in 2019.
- There is a total increase in calories from fat, from 12% in 1989 to 33% in 2019, as well as a 27% decrease in the intake of calories from carbohydrates, from 69% in 1989 to 42% in 2019. There is also an increase of 6% in calories from protein, from 19% in 1989 to 25% in 2019.

- (b) Suggest reasons that may explain changes in food consumption. [5]

- There could be a general increase in disposable income. With higher disposable income, the people in Vietnam have more purchasing power to buy and consume a larger quantity and greater variety of food. The demand for meat (which is costlier than carbohydrate staples) probably rose. This could explain why while the intake of calories from carbohydrates has decreased over the years, that of calories from fat and protein has increased.

- There could also be a general increase in population, leading to a greater demand for food.

4 Study the map below, which shows parts of East Africa which experienced food shortages in 2012. (2016 P2 Q6a)

(a) Describe the pattern of food shortages shown in the map above. [3]

- Most regions in East Africa suffered from food shortages, with the exception of the northwestern and southwestern regions, where there was no or minimal food shortage.
- The areas in and around the Ethiopian capital Addis Ababa and the Kenyan capital Nairobi are rather insulated from the food shortage. However, the Somalian capital Mogadishu suffered a major food shortage.
- Regions with an emergency stage of food shortage are concentrated largely in the central and eastern part of East Africa, although pockets can also be found in the northern and southern regions.

(b) Explain the economic and political impacts of food shortages on countries. [5]

**Economic:**

- Food shortages lead to a general reduction in work productivity. Without sufficient food, the economically active stratum of the population will lack proper nutrients and may thus fall ill – or if it were serious, die. This will negatively impact work productivity in the country. The country may thus lose foreign investment as companies and firms choose to withdraw from it.
- The demand for public health services increases as more people begin to fall ill. Public funds and resources will then be required to be diverted to meet the demand. In the process, other sectors will have to give up some of their allocated resources.
- The government may also incur debt should it rely on borrowing to sustain the population through the provision of hand-out rations and financial aid to the people.

**Political:**

- Social unrest and even civil wars may occur as the population protests or turns violent in response to the food shortages. In these cases, the government may be destabilised, causing the country to be politically volatile.

- 5 Study the first figure below, which shows changes in percentage of population who are obese, and the second figure below, which shows changes in total spending on health care, between 2000 and 2015 in the USA.

Using the figures above, describe and explain the relationship between obesity and total spending on health care in the USA between 2000 and 2015. [5]

(2018 P2 Q5b)

**Describe:**

- The more obese people in the USA there are, the higher the total spending on healthcare.
- The percentage of obese people in the USA increased from about 29% in 2000 to 35% in 2015, while the total spending on healthcare increased from US\$1400 billion to US\$3200 billion in the same period.

**Explain:**

- Obesity could have adverse effects on the health of people. Obesity is known to lead to various health problems, such as heart disease, diabetes, high blood pressure and even certain types of cancers.
- Hence, an increase in the obese population would mean that they would likely have to spend more money on healthcare.

- 6 Study the first map, which shows the values of food aid\* in Africa, and the second map, which shows poor countries in Africa which are high in debt.

\* Food aid is the supply of food, or money to purchase food, to tackle hunger and malnutrition.

\*\* The total figure for Sudan includes Sudan and South Sudan.

Using the maps above, comment on whether poor countries in Africa which are high in debt are receiving food aid. [5]

(2018 P2 Q6a)

- Only some of the poor countries in Africa that are high in debt are receiving food aid.
- The countries in eastern Africa, such as Ethiopia, Somalia and Kenya, with the exception of Madagascar, are benefitting from food aid. Among these countries, Ethiopia is receiving the highest amount of food aid, totalling US\$987,000 per year. This is more than 50 times more than the US\$19,000 received by Tanzania per year.
- On the other hand, countries in western Africa are generally not receiving food aid. The food aid received by the two exceptions in western Africa, Guinea and Ghana, is also low compared to that received by eastern African countries, being US\$17,000 and US\$10,000 per year respectively.





**Open-ended questions**

- 7 'Excess food consumption is less important than inadequate food consumption for individuals and countries.'

How far do you agree? Give evidence to support your answer.

[8]

(2015 P2 Q5c)

- 8 'Political factors such as poor governance and civil strife are the major causes of food shortages.'

How far do you agree? Give evidence to support your answer.

[8]

(2019 P2 Q5d)