Question 2

Bad weather and falls in consumer incomes can have different impacts on the prices of agricultural products such as vegetables, rice and grains.

(a) Explain the different impacts on the prices of vegetables due to bad weather and falls in consumer incomes. [10]

(b) Discuss the effectiveness of different measures that might ensure stability of food prices to consumers. [15]

(a)
Requirement (1): DD reason (falls in consumer incomes) to explain different impacts on prices of vegetables
Requirement (2): SS reason (bad weather) to explain different impacts on prices of vegetables

Suggested answer

Introduction

Question interpretation:

- In a free market economy, prices of goods are determined by the forces of demand and supply. Hence in this context, changes in demand for or supply of vegetables will affect the prices of vegetables.

Definition of terms:

- Demand for vegetables refers to the quantities of vegetables that consumers are willing and able to purchase in a given period of time at various prices, ceteris paribus.
- Supply of vegetables refers to the quantities of vegetables that suppliers are willing and able to sell in a given period of time at various prices, ceteris paribus.

Body/ Development

Using ISSUE framework as a tool of analysis:

State initial equilibrium:
Initially, the market for vegetables is in equilibrium at the intersection of demand (D1) and supply (S1).

Requirement 1: Link to demand factor

Falls in consumer incomes would cause the demand for vegetables to fall. As incomes fall, purchasing power of consumers falls hence demand for vegetables decreases, assuming vegetables are normal necessities (0<YED<1), ceteris paribus. Demand curve

will shift to the left from D1 to D2 by a small extent as seen in Figure 1. At the original price P1, there is a surplus of vegetables and this will result in a downward pressure on price. When price falls, quantity demanded increases while quantity supplied rises. The surplus will gradually be eliminated and a new equilibrium is attained where new equilibrium is at Q2 and equilibrium price at P2. Hence there is a slight fall in price of vegetables from P1 to P2.

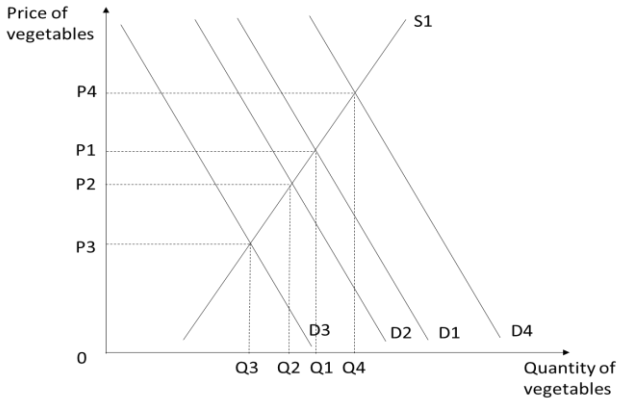

Figure 1

Explore the different impacts of change in demand on prices

However, if consumers consider vegetables as an inferior good, the fall in incomes may instead cause the demand for vegetables to rise instead, as consumers eat more vegetables than meat due to affordability, although vegetables may not be good substitutes for meat. Hence the demand for vegetables may rise from D1 to D4 as shown in Figure 1. At the original price P1, there is a shortage of vegetables instead and this will result in an upward pressure on price. Hence there is a rise in price of vegetables from P1 to P4.

OR

If consumers consider vegetables as a normal luxury good (YED>1), the fall in incomes may cause a larger extent of fall in demand for vegetables, where demand falls from D1 to D3 in Figure 1. The fall in price would be by a larger extent from P1 to P3.

OR

Since time is required to harvest the vegetable crops, this suggests that the price elasticity of supply is less than one i.e. PES<1. This implies that a rise in price will lead to a less than proportionate rise in quantity supplied, ceteris paribus. Thus, an inelastic supply, coupled with a rise in demand, means that the price will increase by more than proportionately.

Requirement 2: Link to supply factor

Bad weather would cause the supply of vegetables to fall. Adverse weather conditions like flooding or drought may destroy crops and hence negatively affect the harvest for vegetables. If farmers take preventive measures to avoid the effects of bad weather, this may add on to their cost of growing vegetables. This increases the unit cost of producing vegetables, leading to a fall in potential profits. Either way, supply falls, ceteris paribus and supply curve shifts from S1 to S2, resulting in a shortage at the original price. Hence

the prices of vegetables would rise higher than P1 as seen in Figure 2. Assuming vegetables are necessities where demand for vegetables are price inelastic (0<|PED|<1), the rise in price would be by a larger extent from P1 to P1i in order to clear the shortage.

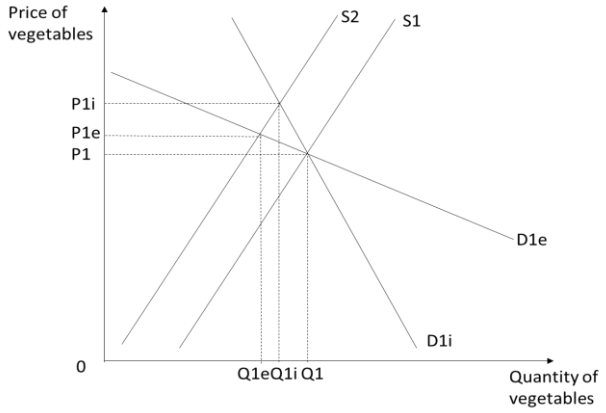

Figure 2

Explore the different impacts of change in supply on prices

If consumers do not consider vegetables as necessities and hence demand for vegetables tend to be price elastic (|PED|>1), the rise in price would be by a smaller extent from P1 to P1e to clear the shortage.

Conclusion

Overall effect on prices of vegetables

Given that the fall in supply of vegetables due to bad weather would cause the prices to rise, coupled with falling consumer incomes, in which it may cause the prices to fall or rise, the overall effect of both changes in demand and supply on the prices of vegetables depends on consumers' perception of vegetables. If consumers view vegetables as necessities, the larger rise in prices due to the fall in supply may outweigh the fall in prices due to the small decrease in demand, hence overall the prices of vegetables rise. However, if consumers view vegetables to be normal luxury or even inferior goods, the impacts on prices would be different.

Mark Scheme

Level	Knowledge, Application, Understanding, Analysis	Marks
L3	• Analytical explanation of reasons that cause different impacts on the prices of vegetables • A rigorous explanation of both demand and supply factors must be evident. • To enter L3, candidates are expected to explain the different impacts on prices with reference to both the demand curve and the supply curve.	8-10

	• To access the top of L3, a comment linked to PED/YED concepts is expected to address the portion on <u>different impacts</u> on prices.	
L2	• Limited rigour in analysing reasons that cause changes in prices • An explanation of both demand and supply factors is evident but with gaps in analysis or some inaccuracies. • Unbalanced analysis e.g. only 1 requirement is explained	5-7
L1	• Largely descriptive • Smattering of points that demonstrate some knowledge • Some knowledge of demand and supply factors	1-4

b) Discuss the effectiveness of different measures that might ensure stability of food prices to consumers. [15]

(b)
Requirement (1): Effectiveness of measure #1 to ensure stability of food prices to consumers

Requirement (2): Effectiveness of measure #2 to ensure stability of food prices to consumers

Suggested answer

Introduction

Question interpretation:

- As seen in (a), bad weather and falls in consumer incomes could cause vegetable prices to be unstable. Especially with the on-going problems of global warming and uncertainty in economic outlook, the above situation of unstable vegetable prices is going to be more prevalent, directly causing unstable food prices as well. Hence there is a need for governments to look for ways to stabilise prices to maximise society's welfare.

Body/ Development

Requirement (1): Singapore government's 30 by 30 plan to ensure stability of food prices to consumers

Step (1): What the policy is about

One measure that governments can undertake is to ensure a more stable supply of food crops that may not be easily affected by bad weather. An example is the '30 by 30' plan that the Singapore government is implementing to address any sharp increase in food prices especially when there is severe disruption in the food supply chain, which could be due to adverse weather affecting food crops harvest.

Step (2): How the policy works

The '30 by 30' plan aims to produce 30% of Singapore's nutritional needs by 2030. For instance, it seeks to develop sustainable environmental and aquaculture solutions to enhance food supply. This means that it aims to increase supply of food crops in a highly productive, climate-resilient, and resource-efficient way, such as using Internet of Things (e.g. IoT) or automation to increase production of food. This could be done via subsidies given by the government to employ a more resource-efficient way to raise food supply.

The '30 by 30' plan will lead to a fall in unit cost of production, leading to a rise in potential profits and hence an increase in supply of food crops, ceteris paribus. With reference to Figure 2 in (a), instead of supply curve falling from S1 to S2, the increase in supply due to the '30 by 30' plan helps to cushion the fall in supply, creating a smaller shortage. The increase in prices of food crops like vegetables may thus be less significant, hence could help to stabilise food prices. **[Link back to question]**

Step (3): How well the policy works

[Criterion: Certainty in outcome] Whether the measure is effective depends on certainty in outcome as a criterion. ***[Reasoning]*** '30 by 30' plan requires the agricultural industry to transform into a highly productive, climate-resilient, and sustainable industry using innovated and technology upscaling. However, such technological transformation via R&D does not mean that success is guaranteed as it has an uncertain outcome, which may reduce the effectiveness of this measure in reducing price. ***[Opinion]*** If R&D fails, then the '30 by 30' plan is ineffective. ***[EV]*** In addition, if it fails, it will only serve to result in a greater misallocation of resources and a worsening of government budget, leading to greater allocative inefficiency and opportunity costs incurred. This will be worse off for countries where the government is already suffering from a budget deficit. Moreover, since R&D is costly, suggesting that producers e.g. farmers may pass on rise in cost of production in the form of higher prices, worsening consumer surplus and defeating the objective of stabilising food prices.

[Criterion: Characteristic of country] Whether the measure is effective depends on the characteristic of the country. ***[Reasoning]*** Singapore has been reliant on imported food crops due to her comparative disadvantage in food and agricultural production due to scarce land i.e., she could import food more cheaply than producing it herself. Turning to domestic food production could imply higher costs and prices of food instead of reducing or stabilising the prices of food especially in the immediate term when Singapore has not acquired the technology and expertise to produce food crops more efficiently or cheaply than food-exporting countries. ***[Opinion]*** Hence in recognition of her land constraint, the '30 by 30' measure may be less effective for Singapore as compared to a country with abundance of land and has comparative advantage in food and agricultural production. ***[EV]*** However, in the longer run, the '30 by 30' plan may become more effective as Singapore has been exploring the use of vertical spaces for agricultural production. Once the land constraint problem can be addressed, Singapore would be able to stabilise the supply of food crops more effectively and hence better ensure stability in food prices for consumers.

Bridging statement:

Alternatively, governments can consider implementing price controls to stabilise food prices directly.

Requirement (2): Other policy to ensure stability of food prices to consumers

Step (1): What the policy is about

Another measure that governments can undertake to ensure stability of food prices and maintain affordability to consumers would be the implementation of price ceiling. A price ceiling refers to the maximum price that a producer can charge for a good legally. If food prices are found to have increased significantly, a price ceiling would be necessary to stabilise prices and prevent the prices from rising further. In addition, for it to be effective, it must be set below the equilibrium price so that the prices cannot rise to equilibrium price, which is deemed to be too high and unstable for consumers. If it is set above equilibrium, the price can still fall to the equilibrium price, rendering a price ceiling ineffective.

Step (2): How the policy works

With reference to Figure 3, the free market equilibrium price and quantity of food are 0Pe and 0Qe respectively. If a price ceiling of 0Pc (below 0Pe) is imposed on food, the quantity demanded will rise to 0Q2 and quantity supplied will fall to 0Q1. An excess demand of Q1Q2 results. The excess demand will remain because the market is prevented from readjusting itself i.e. permanent shortage occurs. Hence even if supply of food were to fall further due to bad weather affecting food crops harvest, the prices of food will not be allowed to increase but remain at the maximum price of 0Pc. This means that the prices are now lower than before as Pc<Pe. Thus, price ceiling could help to stabilise food prices and make it affordable for consumers **[Link back to question]**

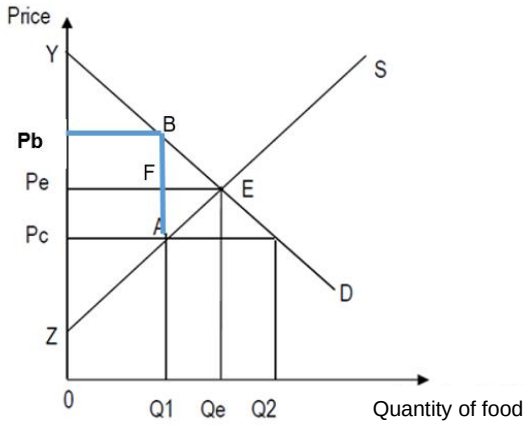

Figure 3

Examples of countries that implemented price ceiling on food:

- *Sri Lanka – food crisis in mid-2021, hence a price ceiling on rice and sugar was imposed on 2 September 2021*
- *Philippines – pork supply crunch resulted in high pork prices and also kept prices of chicken elevated as demand increased, hence a price ceiling on pork and chicken was implemented on 1 Feb 2021*
- *Indonesia – accelerated increase of rice price, hence a price ceiling on rice was imposed on 28 August 2017*

Step (3): How well the policy works

[Criterion: rationing mechanisms] Whether the measure is effective depends on type of rationing mechanism used. (explain 1)

- ***[Reasoning]*** Excess demand for the good implies that some method will have to be used to ration the limited supply of the product to the consumers. One way of distributing the limited supply is on a "first come first serve" basis. This will lead to queues developing and is inefficient because they waste buyers' time. ***[Opinion]*** Hence if the government's aim of implementing food price ceiling is to improve consumers' welfare when prices are stable and affordable, it may not be so effective as buyers' time wasted lower consumers' welfare.
- ***[Reasoning]*** The suppliers could also ration the goods according to their own personal biases, selling only to their friends and relatives. This method is inefficient because the good does not go to the buyers who value it most. In contrast, the rationing mechanism in a free market is both efficient and impersonal. When the market reaches the equilibrium, anyone who wants to pay the market price can get the good. ***[Opinion]*** Hence even though government is able to stabilise the price, consumers may not have sufficient food to enjoy.

[EV] If government wants to prevent the above problems of rationing due to shortages created when price ceiling is implemented, the government will need to try to source for food to make up for the shortfall. If the government can make up for the shortfall and sell food at Pc, there would be sufficient food for all consumers to enjoy and at a stable price.

[Criterion: possibility of black market arising] Whether the measure is effective depends on the possibility of black market arising. ***[Reasoning]*** The excess consumer demand is likely to lead to the development of black market, where some producers are tempted to sell above the price ceiling at Pb (Figure 3) – the black market price. Some consumers will be prepared to pay higher price in order to ensure their own consumption of the good. ***[Opinion]*** This outcome will defeat the government objective of ensuring stable food prices and an equitable distribution of the scarce product. ***[EV]*** If government could do close monitoring to ensure there is no black market, this measure may be effective in stabilising and making prices of food affordable to consumers.

Synthesis & Evaluative Conclusion

Overall, which measure(s) is/are likely to be more/most effective in stabilising food prices for consumers depends on:

[Criterion: root cause(s) of the problem & time period] [Reasoning] The '30 by 30' plan aims to address the supply side problem that causes unstable food prices while price ceiling is a quick and definite response to stabilise food prices. These measures will not be effective on their own as the unstable food prices is due to various reasons. While price ceiling can help to lower and hence stabilise food prices immediately, it alone is not sustainable as it may hurt the producers or may increase the financial burden on government if they need to do constant monitoring of black markets or to make up for the shortfall. This may serve to be costly and inefficient i.e. the latter may arise because of deadweight losses that occur in the implementation of price ceiling. Therefore, there is a

need to complement this quick measure with a more sustainable one that helps to increase supply of food into the longer term. However, we know that consumers also play a large part in affecting prices in the market hence it would be best if consumers are given information via awareness and educational campaigns on some possible alternatives in the event that certain food see significant rise in prices. For example, when there were disruptions in the egg supplies and prices rose tremendously, some countries turn to liquid egg cartons to tide over the period. With more information on some possible alternatives that consumers can turn to, this may help to ease the pressure on food prices as the demand may become relative less inelastic. ***[Opinion]*** Hence with the above 3 measures working together, we should be able to see greater effectiveness in ensuring stability in food prices.

[Recommendation] Overall, to ensure effective and sustained stabilisation of food prices, countries should consider sustainable measures to ensure food security. For example, countries with limited land like Singapore, the government can consider further diversification of food sources, whether is to import food from different countries or to consider tapping on regional markets as a broader aspect of its '30 by 30' plan i.e. work with small scale regional farmers to increase supply of food to address the uncertainty of food crops harvest due to bad weather so as to ensure a more steady supply of food. This would ensure stability in prices of food for consumers in the long run.

Note: Students can also choose any other criterion/ criteria to elaborate, as long as it is relevant and appropriate.

Mark Scheme

Level	Knowledge, Understanding, Application, Analysis	Marks
L3	For a good analytical assessment of at least 2 measures to achieve stability in food prices for consumers (e.g. how the measures work and both strengths and limitations linking explicitly to effectiveness of measure).	8-10
L2	For a correct but underdeveloped explanations. For 1 measure that is thoroughly analysed with mentions of strengths and/or limitations -- Cap at 6m (i.e. only fulfills 1 requirement).	5-7
L1	Ability to identify one or two policies that seek to achieve stability in food prices for consumers. Answer lacks depth and content. Smattering of points.	1-4
Evaluation		
E3	Clear and sound justification on which measure(s) is/are effective to achieve stability in food prices for consumers.	4-5
E2	Some justification on whether the measure(s) is/are effective to achieve stability in food prices for consumers.	2-3
E1	Mainly unexplained judgments. *OR* Assertive evaluative statements without justification.	1