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TOP SCHOLAR

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Scholarship 2015
Geography

9.30 a.m. Thursday 19 November 2015
Time allowed: Three hours
Total marks: 24

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

Pull out Resource Booklet 93401R from the centre of this booklet.

Carefully read the instructions on page 2 of this booklet.

Answer ALL three questions in this booklet. Each question is worth 8 marks.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–24 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

INSTRUCTIONS

The materials in Resource Booklet 93401R will enable you to become familiar with the theme and contexts of this examination: **Agriculture**.

Your answers to ALL three questions must incorporate a wide range of case studies from around the world, as well as information and ideas BOTH from the materials provided in the resource booklet and from your studies in geography.

Note: Key ideas should not be repeated in your answers to different questions.

Space for planning has been provided on pages 4, 10, and 16 of this booklet that will help you prepare your responses. These notes will not be marked. The questions on page 3 are repeated on their respective planning pages.

Begin your answer for Question One on page 5, for Question Two on page 11, and for Question Three on page 17.

QUESTION ONE (8 marks)

Discuss the importance of agriculture.

Your answer must include and refer to relevant, effective, original visuals.

Use page 4 to plan your ideas, and begin your answer to Question One on page 5.

QUESTION TWO (8 marks)

Justify the most significant challenges facing the agricultural industry today, with reference to different perspectives.

Your answer must include and refer to relevant, effective, original visuals.

Use page 10 to plan your ideas, and begin your answer to Question Two on page 11.

QUESTION THREE (8 marks)

Critically analyse the extent to which the future for agriculture in more economically developed countries (MEDCs), is similar to that for agriculture in less economically developed countries (LEDCs).

Use page 16 to plan your ideas, and begin your answer to Question Three on page 17.

QUESTION ONE (8 marks)

Discuss the importance of agriculture.

Your answer must include and refer to relevant, effective, original visuals.

PLANNING

IMPORTANT
- employs millions (~~[illegible]~~ 34% – 50% of pop.)
- population ↑, life expectancy ↑, poverty ↓ → food ↑
- food production intensity ↑?
- environmental damage, food ↓

NOT IMPORTANT
- progressive urbanization?
- number of farms ↓ in MEDCs
- cities are becoming more important } econ.
- world-wide employment in agr. decreasing
- less important to produce your own food
- culturally less vital
- small farms marginalized (Green Rev., subsidies) } cultural

MEDCs
urbanization
cities became more important

LEDCs
agr. still essential to econ.

Begin your answer for **Question One** here:

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Agriculture, one of the fundamental markers of human civilization, is becoming progressively less important in a world that is rapidly urbanizing. Yet it remains, as it has been for millennia, virtually humanity's only source of nourishment; as world population rises, as climate change begins to impact yield, one could also argue that it is more vital than ever that we begin to pay more attention to agriculture. A A

In 1800, 3% of the world's population were urban dwellers; in 2010 that figure has swollen to 50%, according to Table 2. Economically speaking, agriculture has become progressively less important. Urbanization over the past decades, in particular in LEDCs, has driven down the number of people employed in agriculture, as small-scale farming becomes progressively less profitable (after the Green Revolution of the 1930s – 60s, small farms were increasingly marginalized for they had poorer access to machinery and credit that would allow them to purchase inputs for farming, as was the new norm, rather than produce them themselves). The UN Habitat Report states that "cities are now key drivers of economic growth"; compared to 1800, when 85% of the global workforce was employed in agriculture, agriculture has certainly become economically less critical. R R A O O O R R R

Along with urbanization, an increase in world trade and globalization has helped to lower ~~rates of~~ the number of farmers across the world: compared to 3% in 1800, 27% of global GDP is now accounted for by world trade. The progressive increase in international trade has helped significantly lower the number of farmers in LEDCs that continue to depend upon their farms R R

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for income: as Fig. 10 indicates, for example, about 16% of the world's population was dependent upon trade for food in 2012, and many of these were in the poorest regions of the globe, although many MEDCs (like Japan) equally depended upon trade for food products. Small-scale farmers are increasingly being driven out of agriculture and quite often into cities by global trade: Haiti, for example, was once self-sufficient in rice, but after relaxing its tariffs its proportion of consumed rice that is imported has grown to 80%. The reason was largely due to an influx of subsidized, more-efficiently-produced rice from MEDCs like the USA, which created a downward pressure on prices that put many small-scale farmers out of business.

As agriculture has decreased in economic importance, then, it follows that it has also decreased in cultural importance. In a subsistence-farming situation farmers have an intimate relationship with their land, for they depend upon it for survival; after the Green Revolution, however, farming has increasingly been transferred to large scale farms, which are more efficient due to mechanization and high-yield techniques — as demonstrated, for instance, in Fig 17 and Fig 18 — and so continue to push small-scale farmers out of business. It follows, then, that as more farmers are driven to cities, the urban culture becomes increasingly prevalent, diminishing the importance of the knowhow and the values that allow small family farms to function.

At the same time, however, global demand for food is perpetually rising, thus rendering agriculture ever more critical. Table 2 shows that average global life expectancy has increased from

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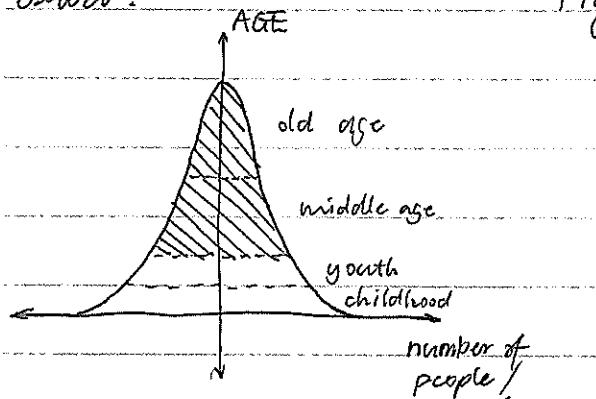
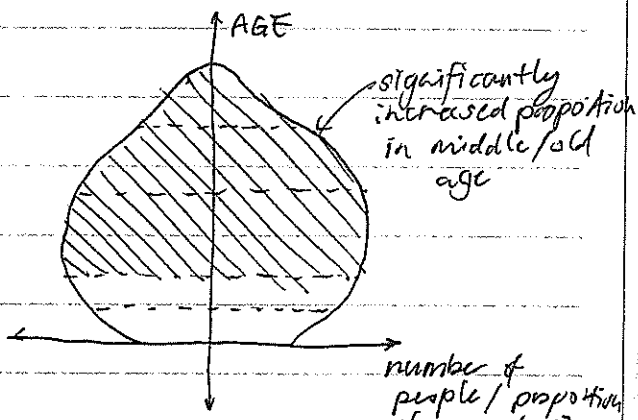
29 years in 1800 to ~~2010~~ 67 years in 2010, the world's population has also increased by over 600%. Due to ever-increasing ~~expanding~~ life expectancies and ever-decreasing birth rates, driven by a rise in global literacy and female education, many nations such as Japan, Germany and even China — have populations that are rapidly aging, as shown by the demographic graphs below: A.

Fig A.



NATION WITH A YOUNG POPULATION



NATION WITH AN AGEING POPULATION (e.g. JAPAN)

This means that fewer young labours will be available to work in agricultural pursuits, as made LEDs more in this direction, and meanwhile the number of ageing citizens that must be sustained by ~~the~~ global food production will forever be increasing. As such, agricultural efficiency is also becoming more and more critical — even as agriculture appears to diminish in economic and cultural importance.

Furthermore, per capita food consumption is increasing as the world develops economically and diets change, as shown by Fig B; average daily kilo-calories per person has increased ~~at~~ by ~~almost~~ ~~1,000s~~ more than 700 kCal/person/day since 1964, and is projected to increase about 300 kCal/person/day by 2030. At the same time, the amount of arable land ~~is shrinking~~ per capita is steadily decreasing, as shown by Table 5.

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Environmental factors, such as overpumping of water tables and climate change, are rendering many once fertile lands unfavorable; in China, for instance, in some areas near Beijing, farmers are now forced to pump water at a depth of more than 300 feet, which is so low that it is frequently uneconomical, forcing farmers to retreat to less efficient dry land farming. As per capita consumption increases and arable land per capita decreases, we may be faced with the warning signs of coming global food shortage; it is arguable, therefore, that agriculture is more critical than ever.

As can be seen, therefore, the world is faced with a paradoxical situation: at the same time that agriculture appears to decrease in economic and cultural importance, global demand for it is steadily rising, as shown by Fig B and Fig C:

Fig. B.

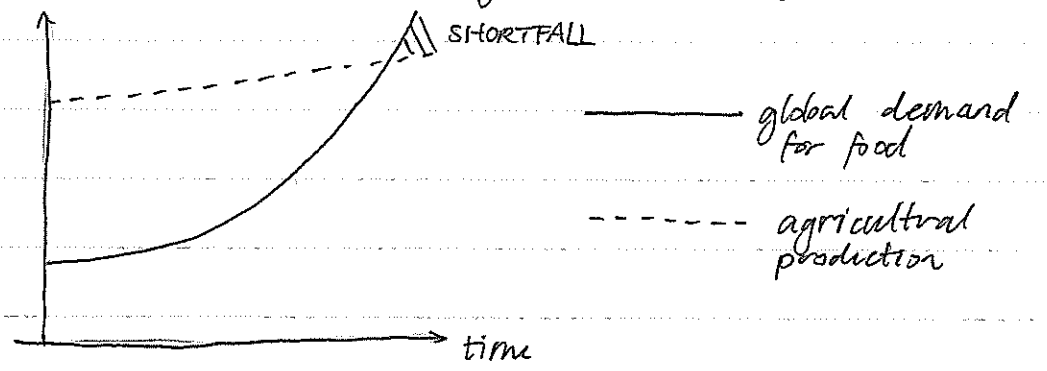
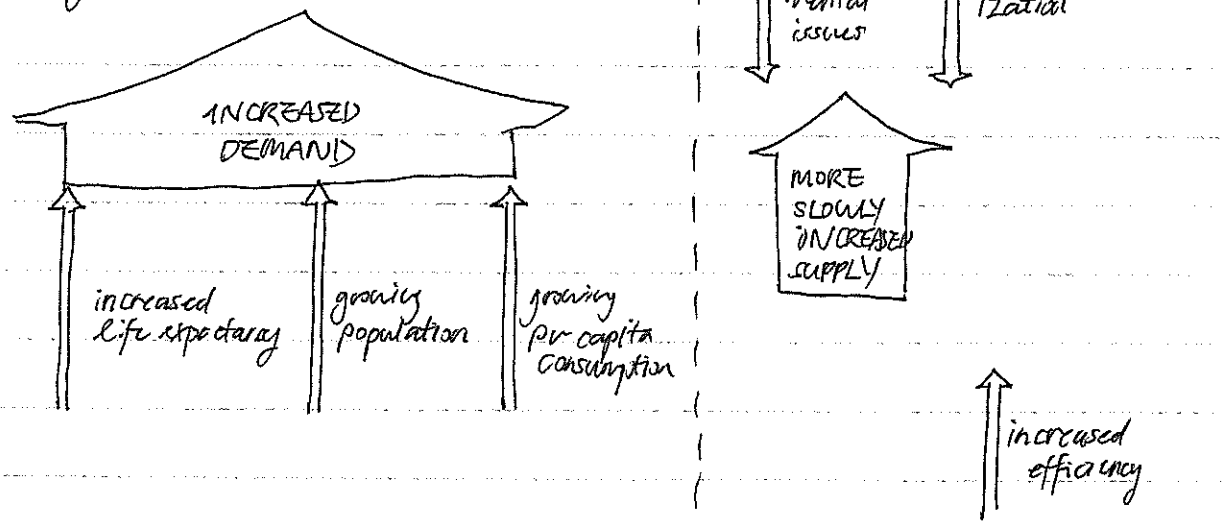


Fig. C.



Paradoxically, therefore, agriculture appears to be simultaneously becoming more critical and less important, which sets a dangerous precedent.

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A-

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QUESTION TWO (8 marks)

Justify the most significant challenges facing the agricultural industry today, with reference to different perspectives.

Your answer must include and refer to relevant, effective, original visuals.

PLANNING

Environmental issues ← sustainability perspective

Urbanization

Increasing production efficiency

Increased mechanization ← economic/financial perspective

Subsidies & tariffs

Increasing consumption, population

demographic

Urb → increasing corruption

Production efficiency → mechanization

Environmental → urban, production efficiency

Demographic issues → population, education

↓

tariffs, urbanization, consumption, ~~mechanization~~

Begin your answer for **Question Two** here:

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~~A multitude of issues face modern agriculture; ultimately, they are~~

Ultimately, all of the issues facing modern agriculture are interlinked; nevertheless, from different perspectives, different issues or facets of issues are more important than others. Based upon the evidence, however, some issues are more central and causal than others, and indeed often generate some of the other issues, and therefore it is likely appropriate to label these the most significant.

From a perspective that is concerned with sustainability, the environmental issues associated with agriculture, and the need to keep producing more in order to feed a growing population, are the most critical issues. Sustainability requires that an activity can be continued indefinitely without harm to future generations' abilities to meet their needs; agriculture, however, can very easily create unsustainable impacts, primarily on the environment. Civilisations have "risen and fallen throughout history due to how people manage the soil"; all over the world now, environmental issues are decreasing the availability of arable land and causing health concerns. China's total grain production, for example, fell 34 million tonnes from 1998 to 2003, a quantity larger than Canada's total grain output; the shortfall was due to many factors, but a primary one was the overpumping of water tables leading to the impossibility of irrigation.* From a sustainability perspective, environmental issues pose the greatest threat to the indefinite continuation of agriculture, and so sustainable solutions for increased efficiency, so that future generations can continue to use the land despite a growing world population, are also a primary concern.

*There is a water shortfall of 40 billion tons in the Hai river basin every year; if the basin is depleted, grain production will fall by the amount needed to feed 120 million Chinese.

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From an economic and financial perspective, mechanization, ~~in a capit~~ in which the primary concern is the maintenance of profit, increased mechanization and international trade barriers are the greatest threats, for they are making small-scale farming progressively less profitable. Large farms, meanwhile, that benefit from both these ~~factors~~ factors, would consider them favorable ~~circumstances~~; there is, therefore, a financial conflict of interest. The USA currently pays its farmers more than US$20 bn in subsidies annually; while this is ~~very~~ beneficial to US farmers in the short term, it can substantially harm developing-world farmers who do not have access to subsidies, for it makes their prices fundamentally unprofitable, and it also to some extent encourages inefficiencies and stifles competition in the long-run. Financially speaking, these are the most important issues that face agriculture, for therein arises a conflict of interest that appears to make maintaining profit on both sides very difficult, ~~as~~ as shown in Fig. D.

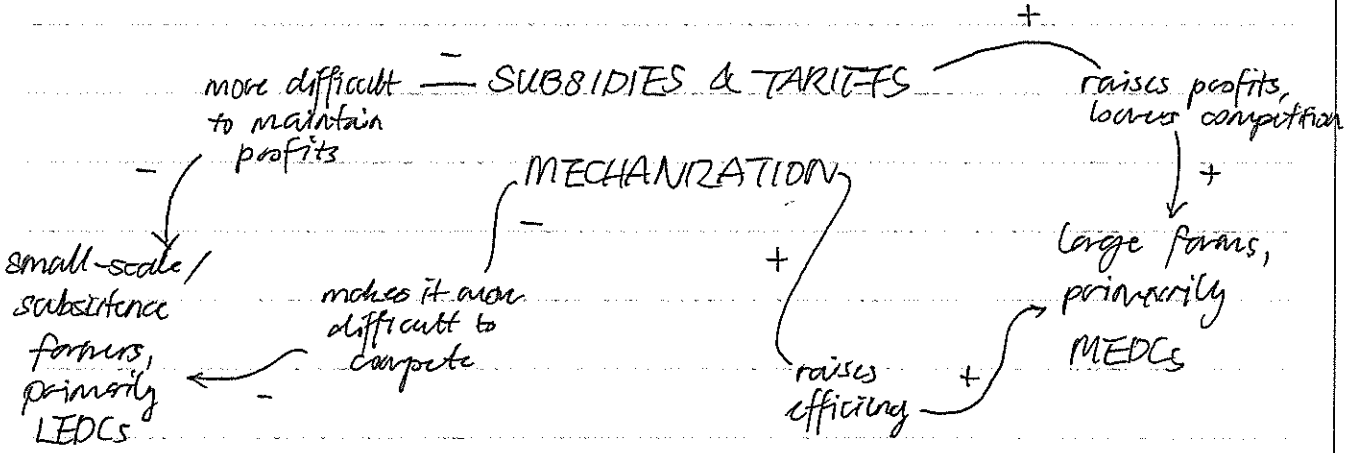

Fig. D. The financial perspective.

From a demographic perspective — which is primarily concerned with ~~maximizing~~ achieving the most optimal population proportions in terms of long-term growth — the most pressing issues are urbanization and the growing, aging world population. Table

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2 shows that the world population has increased more than 600% since 1800; the world's urban population ~~has also now 10 times bigger~~ has also increased almost 1700%, and the proportion engaged in agricultural activities has fallen from 85% to 34%. Driven by push factors such as decreasing income and poor living conditions and pull factors such as education (as shown in Fig. E), financial opportunity and improved quality of life, an accelerating exodus from rural areas to cities has been occurring, which has resulted in the massive drop in the percentage of the global workforce engaged in agriculture; coupled with a fast growing population that is also aging, these issues are highly concerning from a demographic perspective, for they ~~foretell~~ precurse of a world that may become increasingly demographically inclined towards food shortages.

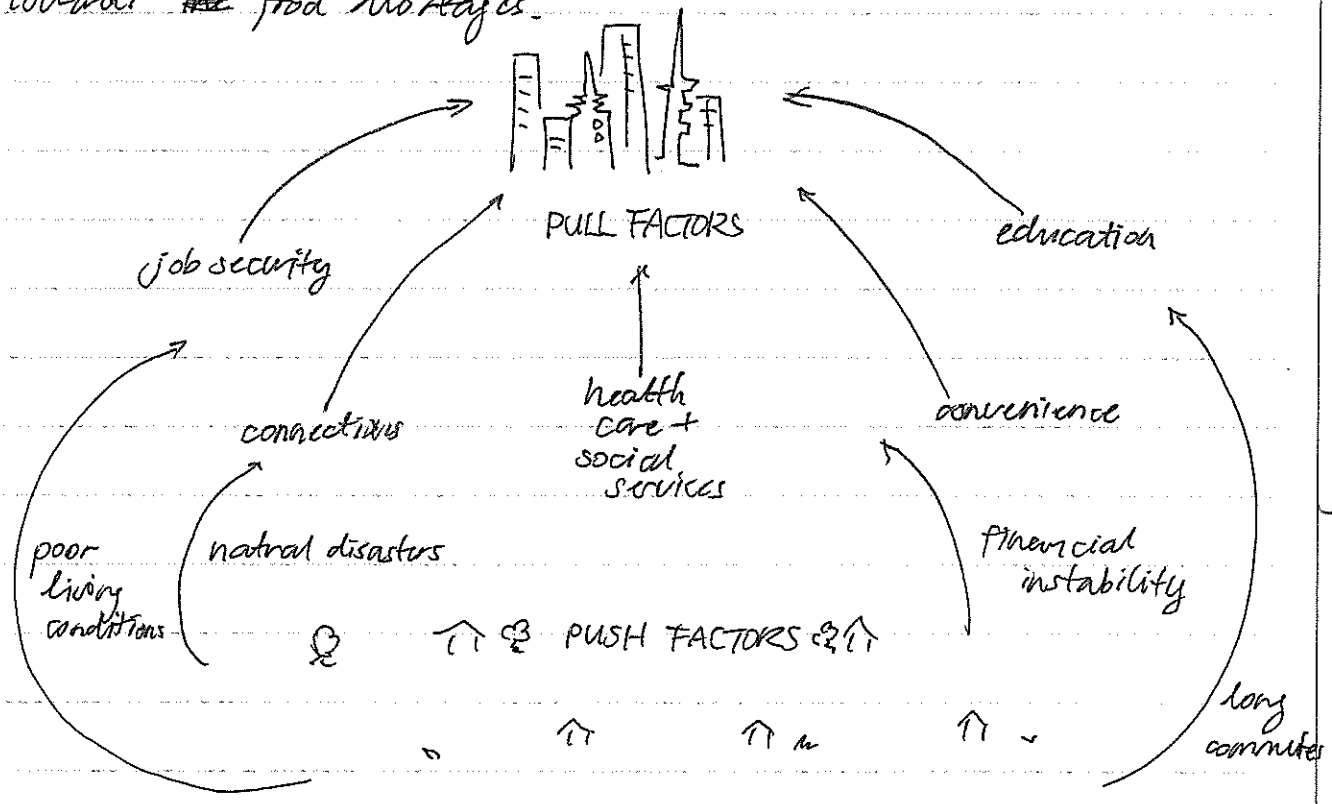

Fig E. Factors contributing to urbanization.

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Looking at the issues facing agriculture holistically, however, it is clearly evident that many of these symptomatic manifestations are in fact products of a few underlying issues:

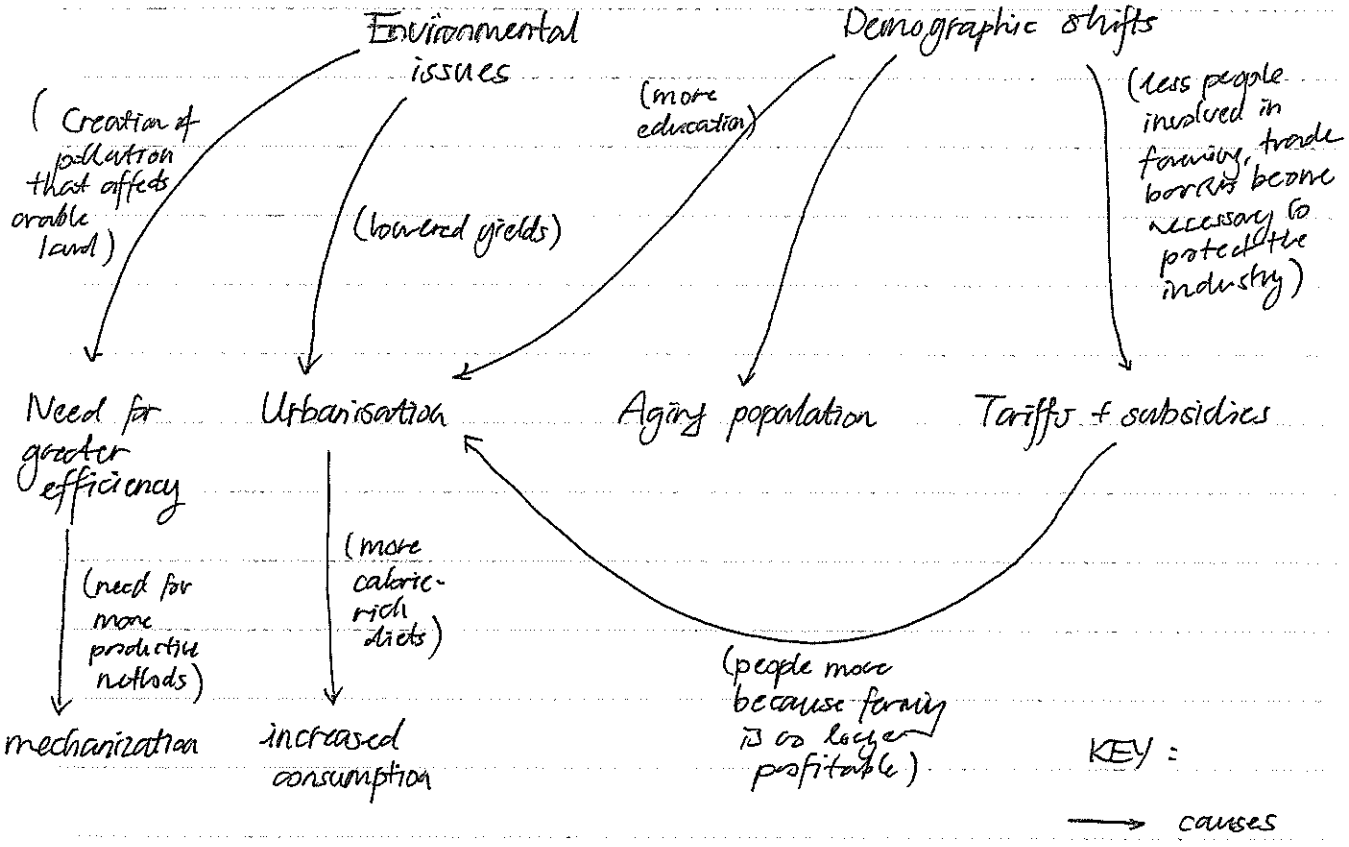

Fig. F.

As can be seen in Fig. F, all of the issues mentioned in the previous discussion can be linked to two major causal factors: environmental issues and demographic changes. Environmental factors can be linked directly to urbanization — in the case of China's falling water tables, for instance, where farmers have been migrating to cities in order to look for alternative economic opportunities — and a need for greater efficiency — such as, for example, the overpumping that has led to an increase in arid land. These two factors can in turn be linked to mechanization, which causes financial conflicts of interest, and increased consumption like that shown in Figure 8, due to changing diets. Demographic changes, meanwhile, brought about primarily by ~~the shift away~~

~~from agriculture~~ better education and increased lifespans as the world develops, contribute to urbanization — as people become more aware of financial opportunities and the value of education — an aging population, and tariffs and subsidies as the population shifts away from agriculture (Table B shows, for instance, that while in LEDCs such as countries in Africa, Oceania and China agriculture accounts for 52·1· of the workforce, in MEDCs on average the figure is only 4·2·(·)).

It can be concluded, therefore, that these two issues are the most significant ones facing agriculture today: while each different perspective is concerned with different issues, all or most of them can in fact be traced back to the root sources of environmental issues and demographic changes.

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QUESTION THREE (8 marks)

Critically analyse the extent to which the future for agriculture in more economically developed countries (MEDCs), is similar to that for agriculture in less economically developed countries (LEDCs).

PLANNING

SIMILAR
- LEDCs will ~~contribute~~ move in the direction of MEDCs Aastor; accelerating development
- Brazil becoming industrialized

NOT SIMILAR
- Mechanization, tariffs; unfair advantages
- USA's to new greenhouses
- LEDCs more affected by environmental / social issues (Africa)
- Sustainable devels. in back of booklet are all very expensive
- Haiti affected by subsidies

Begin your answer for **Question Three** here:

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The world's LEDCs are currently developing faster than many of the world's MEDCs ever did in their developing eras; there is strong evidence that the world is moving towards economic equality. Simultaneously, however, there is an abundance of evidence that MEDCs have an enormous advantage, agricultorally speaking, for a large variety of reasons.

CA. Am

Evidence from studies shows that global development is occurring at an ever-increasing rate; it took close to 200 years, for example, for the cities of Europe to attain a level of development that the cities of China have achieved in only the few decades since 1978, the beginning of China's GaiGe Kaifang movement and its economic boom. ~~There is data~~ Many believe that, within half a century, the US will no longer be the world's largest economy — China will be. The gap between LEDCs and MEDCs is closing with increasing speed: an examination of farming in Brazil, ~~for~~ for instance, shows a picture that is almost as "industrialized and scientific" as the West, with highly mechanized harvesting processes and battery techniques. ~~In short~~, There is certainly evidence to suggest that, given a few more centuries, if that, farming in LEDCs and MEDCs will not be so different at all.

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But does this evidence in fact present a perhaps superficial image of the speed at which development is occurring? Figure 17 and Figure 18 aptly demonstrate the ~~gaps~~ chasms that still exist between LEDCs and MEDCs; moreover, the unfair advantages afforded to farmers in MEDCs do not end with

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the obvious visual signs, but also exist in the forms of subsidies, which LEDC governments can ill afford. As evidenced by the struggles of farmers in Africa who must face "persistent food shortages compounded by climate change threats", as "many are not producing enough (...) to feed themselves, let alone to sell as surplus", LEDC agriculture is more heavily affected by social and environmental issues than MEDC agriculture. ~~The~~ US ~~farmer~~ farmers in Maine, meanwhile, have just completed a greenhouse stretching across 42 acres that produces a million tomatoes a week "even in the depths of winter". These sets of constructions are construction that LEDC governments like those of Africa can ill afford; meanwhile, LEDC farmers continue to be challenged by foreign "dumping" made possible by subsidies and exportation struggles due to tariffs. The real gap between farming in LEDCs and MEDCs may be less than the figures at first indicate.

*see p20 for additional paragraph

Will this technological and wealth gap increase in the near future? It seems highly possible: advanced technology that can vastly improve efficiency and yield, such as GPS guidance, "precision agriculture" and even 3D printing, which could well render traditional agriculture largely obsolete, remain a world away from farmers in LEDCs who, as Fig. 18 shows, still do much of their labour by hand. As technology brings ever-greater efficiency to MEDCs, LEDCs may well be neglected; farmers in these regions can ill-afford such technology.

In the further future, however, with developments such as 3D printing of food and other necessities becoming commonplace,

it is quite likely that food production will eventually become so cheap that even LEDCs will benefit vastly. Like cellphones, which have now become so inexpensive that 97% of the world owns one, and the Internet, which 30% of the world is now using, in the much farther future revolutionary technologies like 3D printing are likely to become cheaper ~~and therefore~~, to the point where the majority of the world, not merely those in MEDCs, can afford to utilize such technology. Ironically, therefore, the solution to the world's food-shortage issues may lie, in the long term, not with aiding LEDCs in becoming economically developed but relying on the superior capital of MEDCs to bring about and lead technological change.

It seems likely, therefore, that in the near future the wealth gap will remain stable or even increase, despite an accelerating rate of development in LEDCs, due to similarly accelerating technological developments in MEDCs (as predicted by laws such as Moore's Law and the law of accelerating returns); the near future, therefore, will likely be characterized by dissimilarities in agriculture between MEDCs and LEDCs, as MEDCs adopt sustainable practices while LEDCs continue to struggle with social issues that do not necessarily disappear as a result of economic growth. In the further future, however, technology that renders traditional agriculture obsolete, as characterized in Fig. 8D, may become so cheap and commonplace that the wealth gap becomes far easier to close. It may seem like a fantasy now, however, technological phenomena like ~~the~~ cellphones and the Internet show that it is indeed quite possible.

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* The aid that MEDCs are likely to receive from MEDCs while they develop, meanwhile, is insubstantial. Gussow aptly encapsulates the attitude of MEDC population towards those in remote areas who produce their food; while local MEDCs farmers are given attention due to their political lobbying power, the "invisibility of [remote farmers*] as the source of our food" continues to cloak the farmers of LEDCs, who are therefore unready to have the political appeal in MEDCs to receive aid. //

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