Centre for Development, Environment and Policy

P102

Agricultural Policy and Trade

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         Professor Andrew Dorward

In Units 3, 4, 5, 6, 7 and 8 the authors have drawn extensively on an earlier module, Agricultural Trade and Policy, prepared by Helen Bright and Jonathan Kydd. This in turn drew on earlier versions prepared Kay Sharp with Jonathan Kydd with revisions by Jamie Morrison.

Units 3, 4, 5, 6, 7 and 8: unit author Andrew Dorward
Units 1, 2, 9 and 10: unit author Julia Compton

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ABOUT THIS MODULE

Agriculture is the source of the vast majority of the world’s food and also provides industrial raw materials, producing and then moving large quantities of produce through complex webs of local, national, regional and global trade. Both agricultural and trade policies have profound effects on the evolution of agriculture and food systems, on the livelihoods of all who depend on these (both winners and losers from change), and on the natural resource environment. These effects are particularly important in poorer countries due to the larger shares of agriculture (and linked activities) in total employment and income, and because food expenditures form a higher proportion of the budgets of poor people. These countries are also strongly affected by the extent and terms of trade in agricultural products. Such trade is in turn affected by countries’ own domestic policies and by domestic policies in trading partners and in individual or groups of countries with a large influence on world trade.

This module starts by exploring the characteristics of the agriculture sector that make policy both especially important and especially challenging. It then introduces theories and tools for analysis of agriculture and trade policy, before going on to discuss real-world applications and current policy debates.

The module is aimed at people working (or intending to work) to promote agriculture and who are interested in how policies are developed, analysed and negotiated. Such people include staff and prospective staff in government departments, in international development agencies, in non-governmental organisations (NGOs), in the private sector, and in research organisations. The module contains a substantial component of agricultural economics, so unless prospective students are already familiar with basic economic theory, they are advised to take one of the CeDEP economics modules (Economics and Institutions for Development or Economic Principles) before this module.
STRUCTURE OF THE MODULE

Understanding agricultural policy and trade requires knowledge of:

- the special features of agriculture as regards its structure, potential and importance in different types of economy
- the nature of different policies affecting domestic agricultural production and trade and the welfare of domestic food and agriculture producers, intermediaries and consumers in agricultural value chains
- theories that can be used to analyse these issues
- analytical techniques for investigating subsidy or tax effects of different policies
- global agreements and organisations governing agricultural policy
- the major economic, political, welfare and environmental issues which interact with agricultural production and trade
- political influences and processes affecting policy development, implementation and outcomes in different countries and in regional and global markets.

The first part of the module provides an introduction to agriculture, trade and policy issues. Unit 1 sets the scene by presenting the special features of agriculture and agricultural trade as well as reviewing global trends in agricultural production and trade and presenting basic concepts in policy analysis. Unit 2 then introduces the concept of agricultural transformation, and shows how economic development leads to different sets of policy challenges in agriculture. It also discusses the policy challenges of promoting public and private investment in the agriculture sector.

The second part of the module then focuses on theoretical aspects and practical approaches to analysis of different agricultural and trade policies. Units 3, 4 and 5 introduce and critique theories of trade and domestic agricultural policies. Environmental impacts are also examined. Unit 6 then considers the major impacts of macroeconomic policy on agriculture and trade, and Unit 7 examines the theory and history of international and regional trade agreements and their effects. Unit 8 then introduces policy analysis tools for measuring and evaluating the effects of different domestic and trade policies.

The third part of the module pulls together and applies the previous parts. Unit 9 discusses the political economy of agricultural policies, contrasting the perspectives of economics and practical policy analysis. Unit 10 concludes the module and applies some of the tools and issues covered in earlier units to some ‘hot topics’ in agricultural policy — food prices, land and biofuels.
WHAT YOU WILL LEARN

Module Aims

- To introduce and critically discuss the major economic, political, welfare and environmental issues which interact with agriculture and the significance of these issues for agricultural policy, with particular reference to recent changes in agricultural and food systems, such as: high and volatile food prices; globalisation; climate change; increasing integration at many stages in the value chain; land tenure and ‘land grabbing’; biofuels; and fair, ethical and environmentally driven trade.

- To explain the key elements of major economic theories that can be used to analyse possible policy responses to these issues and the effects of policies on producers and consumers.

- To examine neoclassical trade theory, new trade theories and the theory and effects of common trade policy interventions, such as tariffs, with particular reference to domestic and trade impacts and to linkages between domestic economy-wide policies, agricultural policies, international agreements and trade.

- To set out the techniques, uses and limitations of indicators commonly used in agricultural policy analysis.

- To discuss the political economy of agricultural policy.

Module Learning Outcomes

By the end of this module, students should be able to:

- critically discuss how the special characteristics of the agriculture sector, including agricultural transformation, affect policy challenges and choices in the context of changing opportunities and threats facing the agriculture sector and stakeholders in different countries

- discuss the main macroeconomic, trade and sectoral policies and instruments used by governments to modify the behaviour of the agricultural sector and its impacts on different types of economies and stakeholders

- describe, critique, apply and interpret core theories and economic tools used for analysing the impacts of macroeconomic, trade and sectoral policies and instruments on different types of economies and stakeholders

- effectively employ political economy concepts and terms to critically analyse the political challenges posed in reforming agriculture and trade policies.

The module authors recommend that you work through the units in numerical order as they follow a logical progression in setting out and elaborating the principles of the study but, of course, you can move about between units and topics if this suits your way of studying better. Learning is an iterative process. It is often useful to go back to something studied earlier; you may also at times wish to read ahead if you want to quickly go beyond the introductory treatment of a topic in earlier units. It is always important to be clear about the aims and objectives of a particular unit.
What are you trying to achieve in completing the unit; what are you expected to accomplish? It is useful to check back with the Unit Learning Outcomes.

As you study, you may wish to make notes on the many linkages among the units. In this you may like to review notes on ‘unit interdependencies’ at the beginning of each unit, but do not let your thinking be limited by the examples of interdependencies noted there.
**ASSESSMENT**

This module is assessed by:

- an examined assignment (EA) worth 40%
- a written examination worth 60%.

Since the EA is an element of the formal examination process, please note the following:

(a) The EA questions and submission date will be available from the Virtual Learning Environment (VLE).
(b) The EA is submitted by uploading it to the VLE.
(c) The EA is marked by the module tutor and students will receive a percentage mark and feedback.
(d) Answers submitted must be entirely the student’s own work and not a product of collaboration.
(e) Plagiarism is a breach of regulations. To ensure compliance with the specific University of London regulations, all students are advised to read the guidelines on referencing the work of other people. For more detailed information, see the FAQ the VLE.
**STUDY MATERIALS**

There are two textbooks for this module.


  This is a general textbook on international trade economics. It has no particular emphasis on agriculture but provides valuable and accessible material on trade theories. It should be a useful resource if you need a greater understanding of trade theories and systems than is provided in this module.


  This is a stimulating book by a leading economist who argues that it is not possible to have both globalisation and democracy within individual states. This is not a book about agricultural trade, but a wider book about trade liberalisation. Agricultural trade liberalisation is an important part of this, but it also takes place in the context of wider negotiations covering other aspects of trade and globalisation. Rodrik provides a historical, empirical and theoretical critique of uncritical trade liberalisation. He argues (a) that the benefits of trade liberalisation are much more limited for developing countries than has been recognised by economists and policy analysts pushing for liberalisation, and (b) that too much liberalisation in financial market carries risks for all countries and is incompatible with democratic government in nation states. This book is pursuing a particular argument which means that (a) it does not follow the material in the same sequence or from the same perspective as the study materials and this, in turn, means (b) that you need to read it critically. Various sections appear in different units but you may find it helpful to read parts of the book through fairly early on in your study to give you an overview of wider issues and debates about international trade and globalisation.

  It may be helpful to note the main points that Rodrik makes for his central arguments that:

  - the pursuit of globalisation/trade liberalisation needs to be subordinate to the pursuit of legitimate domestic interests
  - globalisation and trade liberalisation have much to offer but are faced with diminishing returns and so should not be pursued too far
  - the benefits of globalisation and trade liberalisation vary with the development of different countries’ economies and therefore more equitable global development and the welfare of the poor are not best served by root and branch, doctrinaire systems of global trade rules.

  How convincing do you find these arguments? What are their main strengths and weaknesses?

  You will notice that neither of these books have a specific focus on agricultural policy or trade – and there is no up-to-date textbook that covers these topics in a way that would substantially support the study of this module. Units, or sections within units, which are concerned more with agriculture policy or specifically with agricultural trade are therefore supported by specially chosen key readings from academic or other papers.
For each of the module units, the following are provided.

**Key Readings**

These are drawn mainly from the textbooks, relevant academic journals and internationally respected reports. They are provided to add breadth and depth to the unit materials and are required reading as they contain material on which you may be examined. Readings are supplied as digital copies and ebooks via the SOAS Online Library. For information on how to access the Library, please see the VLE.

**Further Readings**

These texts and multimedia are not always provided, but weblinks have been included where possible. Further Study Materials are **NOT** examinable; they are included to enable you to pursue your own areas of interest.

**Multimedia**

Students are encouraged to look at these and use the VLE to discuss their implications with other students and the tutor.

**References**

Each unit contains a full list of all material cited in the text. All references cited in the unit text are listed in the relevant units. However, this is primarily a matter of good academic practice: to show where points made in the text can be substantiated. Students are not expected to consult these references as part of their study of this module.

**Self-Assessment Questions**

Often, you will find a set of **Self-Assessment Questions** at the end of each section within a unit. It is important that you work through all of these. Their purpose is threefold:

- to check your understanding of basic concepts and ideas
- to verify your ability to execute technical procedures in practice
- to develop your skills in interpreting the results of empirical analysis.

Also, you will find additional **Unit Self-Assessment Questions** at the end of each unit, which aim to help you assess your broader understanding of the unit material. Answers to the Self-Assessment Questions are provided in the Answer Booklet.

**In-text Questions**

This icon invites you to answer a question for which an answer is provided. Try not to look at the answer immediately; first write down what you think is a reasonable answer to the question before reading on. This is equivalent to lecturers asking a question of their class and using the answers as a springboard for further explanation.
**In-text Activities**

This symbol invites you to halt and consider an issue or engage in a practical activity.

**Key Terms and Concepts**

At the end of each unit you are provided with a list of Key Terms and Concepts which have been introduced in the unit. The first time these appear in the study guide they are **Bold Italicised**. Some key terms are very likely to be used in examination questions, and an explanation of the meaning of relevant key terms will nearly always gain you credit in your answers.

**Acronyms and Abbreviations**

As you progress through the module you may need to check unfamiliar acronyms that are used. A full list of these is provided for you at the end of the introduction.
**TUTORIAL SUPPORT**

There are two opportunities for receiving support from tutors during your study. These opportunities involve:

(a) participating in the Virtual Learning Environment (VLE)
(b) completing the examined assignment (EA).

**Virtual Learning Environment (VLE)**

The Virtual Learning Environment provides an opportunity for you to interact with both other students and tutors. A discussion forum is provided through which you can post questions regarding any study topic that you have difficulty with, or for which you require further clarification. You can also discuss more general issues on the News forum within the CeDEP Programme Area.
# Indicative Study Calendar

<table>
<thead>
<tr>
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<th>Unit title</th>
<th>Study time (hours)</th>
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<td>Unit 2</td>
<td>Agricultural Policy and Investment in a Changing World</td>
<td>10</td>
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<td>Unit 3</td>
<td>Introduction to Trade Theory and Countries’ Gains from Trade</td>
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<td>Challenges and Extensions to Neoclassical Trade Theory</td>
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<td>Sectoral Policy Instruments</td>
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<td>Unit 6</td>
<td>Effects of Economy-wide Policies on Agriculture</td>
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<td>Unit 7</td>
<td>International Trade Policies and Agriculture</td>
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<td>Unit 8</td>
<td>Applied Policy Analysis: Estimating Protection, Support and Comparative Advantage</td>
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<td>Unit 9</td>
<td>The Political Economy of Agriculture and Trade</td>
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<td>Unit 10</td>
<td>Current Issues in Agriculture and Trade Policy</td>
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**Examined Assignment**
Check the VLE for submission deadline

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<td>Jul–Sep</td>
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<tr>
<td>End-of-module examination</td>
<td>Late Sep–early Oct</td>
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# Acronyms and Abbreviations

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<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>ACP</td>
<td>African, Caribbean, and Pacific countries</td>
</tr>
<tr>
<td>ACS</td>
<td>agricultural capital stock</td>
</tr>
<tr>
<td>AGOA</td>
<td>African Growth and Opportunity Act</td>
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<tr>
<td>AMS</td>
<td>aggregate measure of support</td>
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<tr>
<td>ATPSM</td>
<td>agricultural trade policy simulation model</td>
</tr>
<tr>
<td>BOP</td>
<td>balance of payments</td>
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<tr>
<td>BOTE</td>
<td>back of the envelope</td>
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<tr>
<td>BP</td>
<td>budgetary payments to agricultural producers</td>
</tr>
<tr>
<td>BRICs</td>
<td>Brazil, Russia, India, China, and South Africa</td>
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<tr>
<td>cif</td>
<td>cost, insurance, freight</td>
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<tr>
<td>CAADP</td>
<td>Comprehensive Africa Agriculture Development Programme</td>
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<tr>
<td>CAP</td>
<td>Common Agricultural Policy</td>
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<tr>
<td>CBERA</td>
<td>Caribbean basin economic recovery act</td>
</tr>
<tr>
<td>CDM</td>
<td>clean development mechanism</td>
</tr>
<tr>
<td>CFA</td>
<td>Communauté financière d’Afrique</td>
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<tr>
<td>CGE</td>
<td>computable general equilibrium</td>
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<tr>
<td>cif</td>
<td>cost, insurance, freight</td>
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<tr>
<td>CITES</td>
<td>Convention on International Trade in Endangered Species</td>
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<td>CME</td>
<td>co-ordinated market economy</td>
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<tr>
<td>CPF</td>
<td>consumption possibility frontier</td>
</tr>
<tr>
<td>CPI</td>
<td>consumer price index</td>
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<tr>
<td>CSE</td>
<td>consumer subsidy equivalent</td>
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<tr>
<td>CSE</td>
<td>consumer support estimate</td>
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<tr>
<td>CSO</td>
<td>civil society organisation</td>
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<tr>
<td>CU</td>
<td>customs union</td>
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<tr>
<td>DDA</td>
<td>Doha Development Agenda</td>
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<tr>
<td>DFID</td>
<td>Department for International Development</td>
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<tr>
<td>DFQF</td>
<td>duty-free quota-free</td>
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<tr>
<td>DRC</td>
<td>direct resource cost</td>
</tr>
<tr>
<td>EBA</td>
<td>Everything But Arms</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EDT</td>
<td>environmentally driven trade</td>
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<td>EPA</td>
<td>economic partnership agreement</td>
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<td>Acronym</td>
<td>Full Form</td>
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<tr>
<td>EPC</td>
<td>effective protection coefficient</td>
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<tr>
<td>ER</td>
<td>exchange rate</td>
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<td>ETI</td>
<td>Ethical Trading Initiative</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<tr>
<td>FAPRI</td>
<td>Food and Agricultural Policy Research Institution</td>
</tr>
<tr>
<td>FDI</td>
<td>foreign direct investment</td>
</tr>
<tr>
<td>fob</td>
<td>free on board</td>
</tr>
<tr>
<td>FSC</td>
<td>Forest Stewardship Council</td>
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<tr>
<td>FISP</td>
<td>Farm Input Subsidy Programme, Malawi</td>
</tr>
<tr>
<td>FTA</td>
<td>free trade area</td>
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<tr>
<td>FTAA</td>
<td>free trade area of the Americas</td>
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<tr>
<td>GATT</td>
<td>general agreement on tariffs and trade</td>
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<td>GDP</td>
<td>gross domestic product</td>
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<tr>
<td>GE</td>
<td>general equilibrium</td>
</tr>
<tr>
<td>GHGs</td>
<td>greenhouse gases</td>
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<tr>
<td>GIZ</td>
<td>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH</td>
</tr>
<tr>
<td>GNP</td>
<td>gross national product</td>
</tr>
<tr>
<td>GSSE</td>
<td>general services support estimate</td>
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<td>GTAP</td>
<td>Global Trade Analysis Project</td>
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<tr>
<td>ha</td>
<td>hectare</td>
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<tr>
<td>HCDA</td>
<td>Horticultural Crop Development Agency, Kenya</td>
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<tr>
<td>H-O</td>
<td>Heckscher–Ohlin</td>
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<tr>
<td>HVAP</td>
<td>high value agricultural product</td>
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<tr>
<td>IBRD</td>
<td>International Bank of Reconstruction and Development</td>
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<tr>
<td>ICM</td>
<td>integrated crop management</td>
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<tr>
<td>ICTSD</td>
<td>International Centre for Trade and Sustainable Development</td>
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<tr>
<td>IDS</td>
<td>Institute of Development Studies</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>IIED</td>
<td>International Institute for Environment and Development</td>
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<tr>
<td>ILO</td>
<td>International Labour Organization</td>
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<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
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<tr>
<td>IPM</td>
<td>integrated pest management</td>
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<tr>
<td>LAO</td>
<td>limited access order</td>
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<tr>
<td>LDC</td>
<td>least developed country</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>LME</td>
<td>liberal market economy</td>
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<tr>
<td>MDGs</td>
<td>millennium development goals</td>
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<tr>
<td>MFN</td>
<td>most-favoured nation</td>
</tr>
<tr>
<td>MNC</td>
<td>multinational corporation</td>
</tr>
<tr>
<td>MPS</td>
<td>market price support</td>
</tr>
<tr>
<td>MSC</td>
<td>Marine Stewardship Council</td>
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<td>MSEs</td>
<td>micro and small enterprises</td>
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<td>MTID</td>
<td>Markets, Trade and Institutions Division, IFPRI</td>
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<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
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<tr>
<td>NEPAD</td>
<td>New Partnership for Africa’s Development</td>
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<td>NGO</td>
<td>non-governmental organisation</td>
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<td>NIE</td>
<td>new institutional economics</td>
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<td>NPC</td>
<td>nominal protection coefficient</td>
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<td>NRA</td>
<td>nominal rate of assistance</td>
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<tr>
<td>NTB</td>
<td>non-tariff barrier</td>
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<tr>
<td>OAO</td>
<td>open access order</td>
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<tr>
<td>ODA</td>
<td>official development assistance</td>
</tr>
<tr>
<td>ODI</td>
<td>Overseas Development Institute</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
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<td>OPEC</td>
<td>Organization of the Petroleum Exporting Countries</td>
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<td>PAM</td>
<td>policy analysis matrix</td>
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<tr>
<td>PC</td>
<td>profitability coefficient</td>
</tr>
<tr>
<td>PCR</td>
<td>private cost ratio</td>
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<tr>
<td>PE</td>
<td>partial equilibrium</td>
</tr>
<tr>
<td>PFIA</td>
<td>Policy Framework for Investment in Agriculture</td>
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<td>PNPB</td>
<td>National Programme on the Production and Use of Biodiesel, Brazil</td>
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<tr>
<td>PPF</td>
<td>production possibilities frontier</td>
</tr>
<tr>
<td>PPMs</td>
<td>processes and production methods</td>
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<td>PPP</td>
<td>purchasing power parity</td>
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<td>PSE</td>
<td>producer subsidy equivalent</td>
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<td>PSE</td>
<td>producer support estimate</td>
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<tr>
<td>R&amp;D</td>
<td>research and development</td>
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<tr>
<td>REM</td>
<td>remittances</td>
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<td>RIC</td>
<td>rural investment climate</td>
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<td>RRA</td>
<td>relative rate of assistance</td>
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<tr>
<td>RSPO</td>
<td>Roundtable on Sustainable Palm Oil</td>
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<td>RTA</td>
<td>regional trade agreement</td>
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<td>SAPRIN</td>
<td>structural adjustment participatory review international network</td>
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<tr>
<td>SDT</td>
<td>special and differential treatment</td>
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<td>SPS</td>
<td>sanitary and phytosanitary</td>
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<td>SRP</td>
<td>subsidy ration to producers</td>
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<td>SSA</td>
<td>sub-Saharan Africa</td>
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<td>TBT</td>
<td>technical barriers to trade</td>
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<td>TC</td>
<td>taxpayers’ transfers to consumers</td>
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<td>TCS</td>
<td>transaction costs</td>
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<td>TFP</td>
<td>total factor productivity</td>
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<td>Trade and Macroeconomics Division, IFPRI</td>
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<td>TNC</td>
<td>transnational corporation</td>
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<td>TPP</td>
<td>Trans-Pacific Partnership</td>
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<td>TRIMS</td>
<td>trade-related investment measures</td>
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<td>trade-related intellectual property rights</td>
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<td>Trans-Atlantic Trade and Investment Partnership</td>
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<td>US$</td>
<td>US dollar</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
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<tr>
<td>VER</td>
<td>voluntary export restraint</td>
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<td>VHLC</td>
<td>vegetable health local committees</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WTO AoA</td>
<td>WTO Agreement on Agriculture</td>
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UNIT INFORMATION

Unit Overview
This unit introduces the topic of agriculture and trade policy. It sets the scene by presenting the special features of agriculture and agricultural trade, and the global trends and challenges for the agriculture sector. It also introduces some basic concepts and terms used in policy analysis.

Unit Aim
- To provide an introduction to agriculture and trade policy issues for students coming from a variety of backgrounds.

Unit Learning Outcomes
By the end of this unit, students should be able to:
- describe what is special about the agriculture sector and agricultural trade, and what challenges this poses for policy-makers
- describe the main trends for world agricultural production and trade, and critically assess the main factors driving these
- define policy and describe and categorise some common agricultural and trade policy instruments, explaining the potential value of economic policy analysis.

Unit Interdependencies
This unit gives a quick taster of some topics that are discussed later in the module at more length, for example:
- Unit 2: agricultural transformation
- Unit 5: increasing concentration in global agricultural trade, fair trade
- Unit 7: globalisation
- Unit 9: the politics of agricultural policy
- Unit 10: land, biofuels and food price volatility.
**KEY READINGS**

**Section 2**


A thoughtful discussion of projections to 2050 and the drivers of trends in consumption and production. The second part of the document (from p. 14) is an optional further reading and discusses ways in which climate change might affect and be affected by agricultural changes.

**Section 3**


This reading takes a logical, technocratic approach to discussing the improvement of OECD agricultural policies. You don’t need to understand the details of all the policies discussed, we will return to them in other parts of the module. The reading however highlights several issues, including that: governments are often balancing a variety of policy objectives; that defining objectives very clearly is an essential part of (technocratic) policy design; and that many OECD countries are struggling to design agricultural policies without having unexpected negative effects (sometimes for future rather than current farmers). The reading often refers to ‘decoupling’ payments: this means moving from price support or subsidies for farm inputs or outputs to other forms of farm income support such as area-based payments.
**FURTHER READINGS**


This further reading also covers trends and projections in agricultural consumption, production and trade, but delves a bit more deeply into the challenges of getting and interpreting the data, with lots of interesting country-specific facts.


Available from: [http://www.fao.org/docrep/018/i3107e/i3107e03.pdf](http://www.fao.org/docrep/018/i3107e/i3107e03.pdf)

The text provides a good short summary of recent trends in agricultural production (2000–2010). Copiously illustrated; it is worth having a quick look through the graphs.


Available from: [https://mygeohub.org/resources/754/download/Global_Change_and_the_Challenges_of_Supporting_a_Growing_Planet.pdf](https://mygeohub.org/resources/754/download/Global_Change_and_the_Challenges_of_Supporting_a_Growing_Planet.pdf)

This section of the paper by Hertel discusses ways in which climate change might affect and be affected by agricultural changes.


For those students interested in the continent of Africa, this is a fascinating text about the factors that have turned the majority of African countries into net food importers.


This is an optional reading for advanced students who are already quite familiar with agricultural economics and interested in the history and evolution of the main actors and arguments.


Despite its age — it was published just before the major food and fuel price rises in 2007/2008 — this is a clear summary of the issues, packed with fascinating examples.
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Irene Scott/AusAID (2013) *A Group of Women from Aorigi (Santa Catalina) Carry Baskets Full of Pana on their Heads*. Reproduced under the Creative Commons Attribution 2.0 Generic license.


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MULTIMEDIA

Available from: http://www.youtube.com/watch?v=xEe0amqoA9w
This video is also referred to in Section 3.1. Please try to watch it before doing the exercise at the end of the section.

This short BBC news clip on CAP reforms discusses the tensions between different objectives for the Common Agricultural Policy of the European Union. It is referred to in Section 3.1.


Optional for interest only.
Available from: http://www.youtube.com/watch?v=uJhgGbRA6Hk
A basic introduction to global challenges around agriculture and the environment, with some interesting photos. The material in this video will be familiar to many students, but may be new to some. It raises some important questions, but is not so strong on solutions.

Optional, for interest only.
More photos from the book are available from: http://www.time.com/time/photogallery/0,29307,1626519_1373664,00.html
The actual lists of the individual foods eaten by each family photographed, and its costs and some radio interviews with the photographers are available from: http://www.npr.org/templates/story/story.php?storyId=5005952


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Available from: http://comtrade.un.org/
Database of trade and also data sheets on specific products and some interesting research from UN Comtrade labs.


Available from: https://www.youtube.com/watch?v=uKW5CGcfNT0

This news clip discusses price controls and food scarcity in Venezuela. If possible, watch it before doing the exercise in Section 3.1.
1.0 WHAT IS SPECIAL ABOUT AGRICULTURE AND AGRICULTURAL TRADE?

Section Overview

Agriculture is one of the most complex and challenging areas for policy-makers. This section starts from first principles, discussing what is special about agriculture and agricultural trade, and the policy implications. The section also provides a reminder of some basic economic concepts and terms that will be used throughout the module.

Section Learning Outcome

By the end of this section, students should be able to:

- describe what is special about agriculture and agricultural trade, and what challenges this poses for policy-makers.

1.1 What is special about agriculture?

'Agriculture is traditionally a baffling sector for policy planners in all parts of the world.'


Agriculture is one of the most complex and difficult areas for policy – which is also what makes it so interesting. This section starts from first principles and outlines some of the things that make agriculture a unique sector. Some of them might seem simple or obvious, but they have important implications for policy.

Take a few minutes to think what is special about agriculture before you read on. What makes agriculture so different from industrial production and manufacturing? Write down your ideas and then compare them with the list below.

(a) Agriculture is economically and politically important

Agriculture is our main source of food. Food is not just a commodity – it is culturally important and politically very sensitive. In theory, an urbanised country might be able to import most of its food – and some do. For example, the UK imports about 40% of its food (DEFRA, 2006). However, most countries are reluctant to depend too much on food imports. Imports require foreign exchange that is needed for other purposes. Moreover, there is a risk that harvest failures, war/civil conflict, or other factors may restrict food imports and/or raise their price. If this happens at short notice, it can cause major political upheavals, as happened in many countries when world food prices rose in 2007–2008 (Arezki & Brückner, 2011). Food prices are particularly important for the poor, who must spend a large proportion of their income on food. For this reason, most governments keep a close eye on domestic food production, and many promote policies to encourage it.
Agriculture is also the source of some important non-food commodities, for example, fibres, such as cotton and jute, industrial inputs, such as starch, and biopharmaceuticals. Non-food crops (often called industrial crops) have traditionally formed a small part of agricultural production and trade, but this is changing with the increasing production of biofuels and bioplastics.

In low-income countries, agriculture and related businesses (trade, processing and food preparation) are the main source of employment and economic activity. 'Agriculture provides a livelihood for more people worldwide than any other sector. In developing countries the sector employs 1.3 billion workers, representing around 50 per cent of total employment.’ (Cheong et al, 2013: p. 1, citing FAO, 2011a) Historically, agriculture has been one of the main drivers of economic growth and poverty reduction (Johnston & Mellor, 1961; de Janvry & Sadoulet, 2009). In some countries, agriculture is also a major source of foreign earnings.

Finally, many cultural and traditional aspects of agriculture are valued by the wider society, for example, traditional fruit varieties, a particular type of farm-made cheese, or the beauty of a landscape created by a patchwork of small farms. This gives farmers political clout even in high-income countries where agriculture contributes a relatively small amount to the economy. An example is France, where agriculture contributed less than 2% of GDP in 2010 (FAO, 2013a), but where farmers have a strong political voice (see 1.1.1).

1.1.1 French farmers protest agricultural policy in Paris in 2013

![Source: Croquant (2010)]
(b) Farms are highly diverse

Compare farming with industry, health, education or roads, and it immediately becomes apparent that agriculture is a much more complex sector. Agricultural policy must deal with everything from tiny irrigated plots of rice to extensive livestock rearing. Within a single farm, there may be a variety of farm enterprises – for example, a farm may produce both vegetables and sheep – with different needs. A blanket agricultural policy (such as a general subsidy for a particular crop) is a ‘blunt instrument’ which must be very carefully thought through if it is not to have unexpected effects on certain farmers or farm enterprises, or to benefit some farmers much more than others.

(c) The boundaries of the ‘agricultural’ sector are fuzzy

Agriculture is closely connected to agro-industries and other rural pursuits such as fishing and woodland management. In addition, many factors affecting agricultural production (for example, transport) are normally managed by other sectors.

Quick exercise: institutional boundaries of agricultural policy.

Look at the list of agriculture ministries in different countries in the Wikipedia link (it may not be completely up to date, but that does not matter for this exercise).

What policy areas are covered by the agriculture ministries in the list?

Answer

Land, forestry, fisheries, rural affairs/rural development, environment, water and co-operatives are areas commonly covered by Ministries of Agriculture. You may know of others.

From your previous knowledge, what policy areas that are important for agriculture are usually covered by other government ministries or departments?

Answer

Roads and transport, energy, communications, education, health, social services, finance, international trade and foreign affairs ... nearly all sectors have some knock-on effects on agriculture or are affected by agriculture and food. Many of these Ministries have their own (different) policy objectives, and Ministries of Agriculture may find themselves in conflict with their colleagues over policy (this is called lack of policy coherence). For this reason co-ordination between sectors is an important challenge.

In this course, we will normally limit the definition of agriculture to ‘farming’ (crop and animal production, processing and sales), while being aware of the fuzzy boundaries and the fact that many points are more widely applicable.
(d) Agricultural production depends on the individual decisions of large numbers of farmers

Agriculture is highly decentralised. Day-to-day decisions which have an effect on production and sales are made by individual farmers – for example, what crop to plant and how many hectares, what inputs to use and when to apply them, when to harvest, store and market. This means that agricultural policy must be designed in such a way as to influence the decisions of a large number of diverse people.

The importance of this point has been put very clearly in the following quote, which was written at a time when central government planning of agriculture was, or had recently been, the dominant paradigm in a number of countries (eg the Soviet Union).

'Agriculture is truly unique in that literally millions of individuals and households are making decisions themselves [so] influencing agricultural production decisions to increase food output is an entirely different process from changing decisions about how much steel or cement to produce. In [...] most countries a dozen or so individuals could take direct action which would lead to a 10 percent increase in steel output in a year or so. [...] Nowhere, not even in [state-planned economies], can a similar small group of individuals decide to raise food production by 10 percent. To be sure [...] the president and the cabinet can decide they want food production to rise by 10 percent. They can tell the food logistics agency, the ministry of agriculture, the newspapers, and agriculture extension agents that they want food production to rise by 10 percent. But they cannot increase food production 10 percent by themselves. They must also convince the millions of farmers in their country to want to increase food production by 10 percent, and make it in their self-interest to do so.'


(e) Farms are geographically dispersed and rural

Because land and water are essential inputs into agricultural production, most farms are located in the countryside, where land is cheaper. So in comparison with industry, farms are geographically very dispersed.

Very few farmers in the world are completely self-sufficient subsistence producers – most farmers sell at least some of their produce and buy some of their inputs. The agricultural market system (Section 1.2 below) therefore plays a crucial role in getting inputs – such as seeds, fertiliser and veterinary medicines – into farms, and in getting outputs (agricultural produce) out of farms to where they are needed, for example, to processing factories or directly to consumers in urban areas. This can be challenging and costly, especially in low-density countries with scattered small farms (1.1.2 and 1.1.3).

High transport costs not only reduce the share of profits going to the farmer and ‘drive a wedge’ between farmgate and consumer prices, they may also decrease competition among traders or result in markets being altogether absent (de Janvry et al, 1991; Suzuki & Sexton, 2005).
1.1.2 Many productive farms are remote: time needed to reach market


1.1.3 Transport of inputs and outputs is a major issue for many farmers

(a) ‘Headloading’ the crop in the Solomon islands: in many countries this is a women’s job

(source: Irene Scott/AusAID (2013))
(b) Trains carry wheat long distances across the plains (Nebraska, USA)

Source: Ammodramus (2011)

The transaction costs (costs of doing business with) dispersed farms are often high. Information constraints may prevent the private sector from providing certain services – for example, individual farm insurance for crop failure – because it is too expensive for the insurance company to get out to the farmers’ fields to check the state of the crops and farmers may cheat (moral hazard) or they may be tempted to take additional risks, such as not taking preventative measures to control an expected pest attack if they know that they are insured against loss (adverse selection). In low-income, low-density countries, the information problem may be severe. For example, a farmer may sell her maize to a passing trader for a low price, and not be aware that she could get a much higher price in the market only a few villages away. (You will recall that neoclassical economic models assume that both producers and consumers have perfect information on prices.) However, improvements in communications, particularly mobile phones, are gradually overcoming the information barrier.

A longer-term implication of a rural location is that people have more limited day-to-day choices and opportunities than people in urban areas. Nearly all agricultural jobs are hard and low paid, and there are fewer alternative occupations in the countryside than in towns. Shopping, education and health facilities, transport and communications, and cultural diversity also tend to be more limited in rural areas. For these reasons, many people in all parts of the world – especially young people – tend to move to towns when they get the chance, and away from farming. Although a minority of people in all countries do deliberately choose and appreciate the pleasures of farming and rural life, worldwide the move is towards urbanisation, and towards reduced – and older – populations in the countryside. The move towards urbanisation has long-term implications for agricultural policy (Satterthwaite et al, 2010).
(f) **Agriculture depends on biology and ecology**

Agriculture depends on the growth of living plants or animals, and their interaction with their environment. For this reason, a farmer typically has a lot less control over his/her production levels than a factory owner. While it is possible in some circumstances to exercise a degree of control over agricultural production – think for example, of heated glasshouses, or chickens raised in a highly controlled environment – the vast majority of farming is greatly affected by external conditions, including interactions with soil, water, competing species (weeds), pests and diseases. This has a number of implications, including seasonality, time sensitivity and risk, and effects on the natural environment.

(g) **Agriculture is seasonal and time sensitive**

There are few cases where agricultural production can be continuous all the year round, like a factory. Most of the world’s farming is dependent on natural cycles of temperature and rainfall, and there are ‘normal’ seasons for planting, growing and harvesting in a particular area. Seasonality has a number of important implications:

- **Synchronisation of cropping and harvests** causes (semi-)predictable variability in availability and price for a particular crop in a particular area. (As you would expect, prices are usually at their lowest after harvest and at their highest just before the next harvest.)

- Related to this, **storage of agricultural products** can be as important as production. For example, the harvest period for maize might only last for a month or so, while consumers and processors will require the maize year round. Storage fills this gap. Price expectations, including those caused by agricultural policy and other factors can have a huge effect on farmer and trader decisions on what and how long to store. At the same time, decisions on storage can have a huge effect on availability and demand. An extreme example was presented by Timmer who calculated that a decision by millions of consumers to buy extra rice to keep in the kitchen cupboard was enough to explain the huge short-term spikes in world rice prices (Timmer, 2009).

- **Input supply can be time critical.** In a factory, a 2-week delay in delivering a key input might mean a 2-week delay in production. In rain-fed agriculture, a 2-week delay in the delivery of seeds could mean an entire year’s harvest lost, in the worst-case scenario. One of the concerns of agricultural policy is to foster efficient **supply chains**.

- **Labour requirements vary dramatically over the year** for many farm enterprises. Land preparation/planting, weeding, harvesting and processing require relatively high amounts of labour over limited periods of time. This provides a (low) income for the poorest people, but a headache for farm managers who have to recruit and manage temporary labour. This is an important economic reason why **family farms** – where the family helps out at peak periods – **have remained the predominant form of farm organisation**, even in wealthy countries such as the United States of America (Allen & Lueck, 1998; Eastwood et al, 2010). Agricultural policy must also take into account the **divergent effects** on farm owners/managers and farm labour. To take a simple example, a policy to subsidise tractors is likely to be popular with farm managers, but may put farm labourers out of work. It is also...
common for farmers to take **off-farm employment** in a variety of enterprises to maintain year-round income, which means that **links between agricultural and other labour markets** are important.

**(h) Agriculture is highly risky**

‘Farmers the world over talk primarily about two topics, the weather and prices. On these two variables ride the rewards for the whole year’s effort in farming.’


Particularly in rainfed agriculture, which accounts for about 80% of the world’s agriculture (FAO, 2011b), annual variability in crop yields due to **weather** can be tremendous. As an example, 1.1.4 shows national average yields and average annual producer prices for maize in Malawi, a crop produced primarily by smallholders. These huge swings can hurt both producers and consumers, if agricultural policy – crucially, including trade – is not capable of stabilising the markets. In 1992, 2002 and 2005 Malawi experienced famines and received substantial food aid; in 2007, conversely, the country had a bumper harvest and exported maize. The policy story is complex, and weather was not the only influence on yields and prices in Malawi, but for now, just note the large swings in crop yields per hectare and the opposing swings in prices.

### 1.1.4 Average annual yields and producer prices for Malawi maize, 1991–2008

Producer prices not available prior to 1996

![Graph showing average annual maize yield and producer prices for Malawi from 1991 to 2008](image)

*Source: unit authors, based on data from FAOSTAT (n.d. b)*
**Pests and diseases** are also a major risk for many crops and farm animals. An attack of an animal disease such as foot and mouth (cattle) or Newcastle disease (chickens), or the loss of an ox needed for ploughing, can potentially bankrupt a smallholder when insurance is not available.

Most farmers also face huge **uncertainty regarding price**. The majority of farmers are **price-takers** in economic terminology – that is, they are too small scale to influence the market price they receive for their produce. The prices of agricultural inputs and labour may also vary in an unpredictable way.

Many agricultural products are faced by **inelastic demand** – that is, a drop in price does not call forth an equivalent surge in demand. In the absence of any external policy intervention, this means that a good year with a **bumper harvest** (very large harvest) may lead to a crash in prices and a lower income for the farmer than in a poor year.

Moreover, in an **increasingly globalised** world, both input and output prices may be influenced by factors well outside the knowledge and experience of any individual farmer – for example, a sudden increase in the global oil price, a change in a domestic subsidy paid to farmers in a major production area like the European Union, a bumper harvest of the same crop in a far-away country, or a rise in the exchange rate of the national currency or the dollar.

Finally, a variety of other external **risks** and uncertainties can affect agricultural production and markets.

**Can you think of other (non-price and weather) risks and shocks that may affect agricultural production and markets, especially on small farms?**

**Answer**

*Here are some – you might think of others:*

- **Ill-health** is one of the main risks on family farms in all parts of the world. It can lead to the loss of labour (both of the sick person and their carers) at a key moment in the cropping season, as well as expenditure on health care, which would have otherwise been used for investment in the farm. Malaria, for example, can cause major losses in agricultural production in some areas (Asenso-Okyere et al, 2009).

- **Disasters large and small** such as fire, floods, breakdowns and destruction by wild animals – both on the farm itself and also for key infrastructure (such as a bridge washed out).

- **Theft of animals, stores or tools**, for example.

- **Social obligations to family members and neighbours** (for example, a funeral) can also deplete funds and time – although this may be reciprocated later.

- **The government itself may be a source of shocks in some countries, through grabbing land, forced labour, unexpected taxes, etc.**

Bad weather, poor prices and (often) pests and diseases are called **covariate risks**, meaning that they tend to strike most or all of the farms in an area at around the same time. Risks to individual farms and households – such as illness – are called **idiosyncratic risks**.
**Decision-making in the face of uncertainty:** Farmers must make investment and management decisions – what crops, how much and when to plant, what inputs to use, how much to sell and store – based on their **expectations of prices, costs and risks.** Many farmers are **risk-averse,** and therefore invest less than would be optimal to maximise production and profits. For example, a farmer may fail to apply fertiliser due to fearing a risk of drought (when fertiliser would be wasted).

The aggregate effect of all these individual farmer decisions – as well as the risks themselves – can have huge implications for a nation’s food supply, economic growth and balance of payments, and consequently, for the survival of the government in power. For this reason, reducing uncertainty for farmers is often a high-priority task for national policy-makers.

**(i) Agriculture has two-way linkages with the natural environment**

This module does not go into detail on environmental issues. However, there are clearly important two-way linkages between agriculture and the natural environment, which must be taken into account by policy-makers. Agriculture is estimated to account for nearly 40% of land use and 70% of freshwater use worldwide (FAO, 2013a). Agricultural production may contribute to climate change and equally may be affected by climate change (Nelson et al, 2009; Hertel, 2013).

The economic concept of **externalities** refers to benefits or losses incurred by the wider society or environment that are not directly reflected in private financial costs or profits. For example, pouring old pesticides into the river may not affect a farmer’s profits, but it will have costs to others (a negative externality). One of the challenges for agricultural policy-makers is to design policies which will align the market signals (economic incentives) for farms and agroindustries in order to promote positive externalities and minimise negative externalities.

---

**Question:** From your previous knowledge, can you think of ways in which agriculture might potentially harm the environment?

**Answer**

*Agriculture, if not well-managed, may have a harmful effect through:*

- Increasing use of land and water, reducing the amount of forest and wild land in the world and the ecosystem services that they provide.
- Reduction in biodiversity.
- Soil erosion and loss of topsoil from poor soil management.
- Salinisation (increasing salt levels in soil), eg from poor irrigation management.
- Soil and water pollution, from manures and slurries, fertilisers and pesticides, which damages ecosystems and human health.
- Air pollution and emissions of greenhouse gases, for example, methane from livestock digestion and nitrous oxide from burning and deforestation.
- Development of pests and diseases resistant to pesticides and antibiotics.
- Propagation of disease, either from livestock (eg brucellosis) or by creating conditions which favour disease vectors (eg malarial mosquitoes).
- Use of non-renewable fossil fuels.
Supporting increased human populations that have other negative effects on the environment (eg through urbanisation).

You may think of others.


(j) Gender and social issues are important in agriculture

Farming is not only a job but a way of life, often involving the whole family (even in wealthy countries), and it usually provides a home as well as a workplace. The farming household is sometimes treated by economists as a single economic firm (the unitary household model). However, there is ample evidence (eg Udry, 1996) that men and women frequently control different assets and make decisions about different parts of the farming work.

Women represent about half the labour force in agriculture in Africa, Eastern and South-eastern Asia and over a third in south Asia (FAO, 2011a). Agricultural and trade policy must take into account gender role differences and differential effects on men and women. Women often face extra constraints in farming, including lower access to assets, agricultural inputs, education and information, than male farmers. In many cultures, women traditionally have the primary responsibility for tasks such as food processing and preparation, child rearing and collecting fuel and water – all activities which are essential to the rural household economy, although they are often not defined as ‘economically active employment’ in national accounts (FAO, 2011a). Women make trade-offs in time between these activities and farming, which means that time-saving investments in other sectors (eg water supply, child care) may have pay offs in terms of agricultural production.

Another important aspect of family farming is that households may consume or store much of their own production, and many factors may influence their decisions to store or sell the surplus. There may be a fine line between a household being a net producer (selling more food than it buys) and a net consumer (buying more food than it sells) (Aksoy & Isik-Dikmelik, 2008). The poorest farmers may need to sell straight after harvest, to get money for immediate needs such as school fees for their children. Farmers with a surplus, on the other hand, may hang on to their production to get better prices later in the year. This can make it difficult for national policy-makers to predict levels of marketed production.
Going back to 1.1.4, how variable, relatively, do you think the annual quantity of maize marketed by smallholders (the majority of producers in Malawi) would be, in comparison with the annual maize yield per hectare? More variable, less variable or not possible to tell from this information?

Answer

In theory, if part of the production is consumed at home, then the marketed surplus should be more variable (in percentage terms, not absolute amounts) than annual yields.

Finally, the social nature of farming distinguishes it from many other industries. For example, land is not just an economic input but may have an important social and cultural value, as well as providing a place to live and a fall-back occupation for family members if other jobs fail them. (Optional: you could watch the Farm On video from the United States of America listed in the Multimedia section (farmon.com, 2014).)

A study of English farmers says ‘There is strong evidence from a wide range of studies that there are distinct behavioural categories [of farmers], some driven more by business and economic motives, others more by environmental or family objectives, with varying degrees of interaction among them.’ (Garforth & Rehman, 2006: p. 3). Do you think this is true where you live? What mainly drives farmers’ decisions?

(k) In lower-income countries, much of agriculture is outside the formal economy

Finally, many small farms (and small-scale agricultural traders) operate outside the formal economy, which means that they are not registered, taxed and there is poor-quality – if any – information available on their production, trade and use of inputs including labour. Over 60% of the global agricultural work force is estimated to be informally employed (Bacchetta et al, 2009). In poor rural areas, most commercial transactions (such as sales or hiring labour) go unrecorded; in fact, many deals take place outside the money economy.

[A note on terminology: international statistics on the informal economy traditionally have not included small-scale farms and people who work on them, although this may be changing (Chen, 2007), so it may be safer to use the less-precise term ‘outside the formal economy’ in relation to agriculture.]

This has two main implications for agricultural policy planners:

- First, policy measures aimed at the formal agricultural economy may have little – or a negative – effect on those outside it. For example, it has been claimed that trade liberalisation in South Africa did not reduce poverty among the unskilled and rural poor, partly because ‘the poor are largely disconnected from the formal sector’ (Sandrey et al, 2011: p. 6).
• Second, policy-planners (ideally, at least) base their decisions on data. With some exceptions (for example, India, according to Mishra and Shankar (2013: p. 19), there are little or no data on small-scale farmers and agricultural traders available in many government systems, and the dispersed and remote nature of farms makes data collection costly. This means that policy-planners and economic modellers may be operating in a ‘data vacuum’ in comparison with some other sectors, for example, with regard to data on production, sales, and labour.

1.2 What is special about agricultural trade and markets?

'Agricultural policy is inexorably linked to trade.’


Trade can take place at all levels from the farm to the consumer (in the same or different countries). In this module we will be using the word trade mainly to mean international trade between countries. If we are using the term trade to refer to exchange at the local or domestic level we will make that explicit (for example, by describing it as domestic or local trade). The term regional trade will be used to describe international trade between different countries within the same region (such as Latin America or Southern Africa). For simplicity, we will usually consider related functions such as processing and storage together with trade.

What is special about agricultural trade and markets?

Take five minutes to think what might be special about specifically agricultural trade and markets before you read on.

The agricultural market system reflects many of the characteristics of farming already described, including:

(a) Important source of employment and economic activity, especially for the poor. The agricultural market system is a major source of employment, particularly in low-income countries. (Bacchett et al, 2009) estimate that globally around one out of five jobs is related to international trade. The majority of these are related to agricultural trade.

(b) Large number of farms, geographically dispersed. Many crops are high-volume, relatively low-value (per kilo) products, so transport costs are high. In the absence of cold chains (linked-up refrigeration systems), perishables such as meat and vegetables may not be able to travel far. Although cold chain capacity has increased rapidly in the last decade, there is ‘still very little or none in many regions of the developing world’ (Yahia, 2010).

(c) Seasonal and time-sensitive (both inputs and outputs). Storage is therefore an important part of the overall agricultural market system.
(d) **Risky.** Traders share some of the risks inherent in agriculture – for example, a bad harvest may mean that a wholesaler is not able to collect enough produce from regular suppliers. Traders also have risks of their own. The buyer may fail to pay them, the truck they have rented to collect the produce may break down, or the farmer may sell them a sack of potatoes which are rotten underneath. Some of the risks of cross-border trade include changes in the currency exchange rate and, in some countries, informal payments (bribes) demanded at the border.

In the absence of insurance (rare in low-income countries), the degree of risk taken by traders is usually reflected in increased marketing margins.

(e) **In some countries, trade may be largely or partly outside the formal economy.** In low-income countries in particular, much of the agricultural market system takes place outside the formal economy, although there are some indications that formalisation is increasing (ILO, 2013).

\[
\text{In countries where statistics were available – six in Africa, three in Asia – informal traders [...] represent a very high proportion (73 to 99 per cent) of employment in trade and a significant share (50 to 90 per cent) of gross domestic product (GDP) from trade. [With the exception of India and Tunisia, where social norms restrict women’s mobility outside the home] women accounted for between 50 and 90 per cent of informal traders and between 20 and 65 per cent of the value added in informal trade.’}
\]


The relative size of informal agricultural trade across national borders can also be very significant in some countries. For example, it has been estimated that informal trade accounted for 43% of agricultural exports from Uganda to its five neighbouring countries in 2006 (Lesser & Moisé-Leeman, 2009), although this proportion has since declined (Government of Uganda, 2012). Surveys across South-eastern Africa in 2006–2007 found that about one-third of total cross-border trade in maize was informal (Lesser & Moisé-Leeman, 2009). Many other countries have also recorded significant informal trade across borders (1.2.1).
1.2.1 Informal agricultural trade across borders: the Benin-Niger border

![Image](image_url)  
**Source:** Russavia (2011)

(f) **Affected by gender and other social issues.** Women traders – the majority in many countries – face particular challenges, including poor access to **working capital** for trading, less privileged trading locations and sexual harassment (Manfre *et al.*, 2012; ILO, 2013).

**Market concentration**

A final important characteristic of many agricultural markets – domestic and global – is **market concentration** (the existence of relatively few firms/players) in part of the value chain. This issue is shown in a stylised fashion in 1.2.2.
1.2.2 A stylised diagram of market concentration

Credit: IAASTD/Ketill Berger
Source: UNEP/Grid-Arendal (2008)

The figure in 1.2.3 shows an example of concentration in the domestic market for wheat in Bangladesh in the 1990s. You don’t need to understand every bit of the diagram, but note the differences in scale in the numbers of actors involved in some key parts of the system (circled in red). The authors comment:

‘Between 60 and 120 large-scale wheat wholesalers handle about 50 percent of all wheat marketed, leading to tight geographic and industrial concentration. Wheat millers, who produce refined flour and atta [whole wheat flour], likewise congregate in Bangladesh’s four largest urban centers, where demand is concentrated and 75 percent of their milling capacity is located. The largest and most modern mills dominate urban major and compact millers process 48 percent of all milled wheat.’

1.2.3 Bangladesh wheat market subsector map, 1992–1993

Source: Chowdhury and Haggblade (2000) p. 91. (circled in red by unit author)

Notes: Figures for volume of wheat (0.6 from farms, for example) are in million metric tons. The number of final consumers is not stated, but is in the tens of millions (the population of Bangladesh was estimated at around 120 million people in 1992 (Farid et al, 2011) with the 20% living in urban areas accounting for 50% of national wheat consumption (Chowdhury & Haggblade, 2000).

Similar concentration has been noted in many other domestic agricultural value chains, for example, in maize milling in Mexico (Government of Mexico, 2012) and in warehousing and urban wholesaling in maize in Malawi (Jayne et al, 2010). Market concentration has become a major issue in global value chains in recent years, with the dominance of most aspects of input and output markets – for example, seeds, fertilisers, grains – by a few giant transnational companies.

? Having read through this section, can you think of some reasons why the nature of the agricultural market/trade system makes it more difficult for policy-makers to intervene successfully in agriculture than in some other sectors?
Answer

(a) The length, dispersion and complexity of market chains, and high marketing margins, may mean that changes in consumer prices – or wholesale prices of inputs – are not well, or quickly, reflected in changes in prices paid to and by farmers (i.e. price transmission is poor). For example, a rise in the price of maize in the capital city may take a long time to cause a rise in the price of maize in a remote farm (if ever). This is one of the (many) reasons that the supply response to a price increase is often poor and slow (Rao, 1989).

(b) Concentration in key parts of value chains – for example, input supply or wholesaling – may mean that markets are thin and uncompetitive. If agricultural policies are not well-designed, then their benefits may be captured by other actors in the market chain instead of by the farmers as intended. For example, if a fertiliser subsidy is not well-designed, then most of the benefits may be captured by a few big traders, and the farmer may not notice much of a price difference.

(c) Governments often invest in research and extension to promote higher production in agriculture. However, in many cases, technical change involves new inputs (for example, seed varieties) which depend on the input market system to get to the farmer.

You may think of other reasons – please share them on the virtual learning discussion board.
Section 1 Self Assessment Questions

Question 1

Supply missing words (increase/decrease/stay the same):
A bumper crop will _______ supply and _______ the price of the crop. If demand for this crop is inelastic, producers’ incomes will _______.

Question 2

What is the approximate proportion of women in the agricultural labour force in both sub-Saharan Africa and East Asia?

(a) 1/5
(b) 1/3
(c) 1/2
(d) 2/3
(e) 4/5

Question 3

When the price of (wheat) bread doubles, in theory, farmers might be incentivised to plant more wheat. Why might the farmers’ ‘supply response’ be slow or lacking? Use economic terminology in your answer.
2.0 TRENDS AND CHALLENGES IN AGRICULTURAL PRODUCTION, CONSUMPTION AND TRADE

Section Overview

This section presents trends and future challenges in agricultural production, consumption and trade.

Section Learning Outcomes

By the end of this section, students should be able to:

- describe the main trends for world agricultural production and trade
- critically assess the main factors driving these trends, and some of the challenges facing world agriculture as a whole.

2.1 Trends in production and trade

We will start by looking at broad trends in production and trade. Please focus on the overall trends, rather than exact figures. The international databases mainly depend on country statistics (not always reliable) and trying to aggregate across different commodities can be tricky – adding apples and oranges! You can look at any of the source databases for detailed explanations and caveats on how the numbers are calculated.

(a) Most of agriculture is used to produce food

At global level, food supply has increased in line with population over the past 50 years.

The figure in 2.1.1 shows trends in food production and population between 1966 and 2009 (indexed to 1966=100), as calculated from FAO data. World population increased from 3392 million in 1966 to 6817 million (nearly 7 billion people) in 2009. Total world cereal production rose from 461 to nearly a thousand million tonnes annually, while meat production was much smaller in tonnage terms, rising from 87 to 285 million tons per year. Per capita cereal production rose from about 135 kg/person/year to a peak of about 150 kg/person/year in 1999, since when it has declined slightly, and was about 146 kg/person/year in 2009. Total world meat production has risen by an astonishing three-fold over the same period and per capita about 1.5 times, from around 26 kg/person/year to 42 kg/person/year.
2.1.1 Index of world population and production of cereals and meat, 1966–2009

Source: unit authors, calculated from FAOSTAT data on Total Population and Per capita Production, FAOSTAT (n.d. a) 1966 set to 100

Have a quick look at the FAOSTAT website (FAOSTAT, n.d. a) which was the source of the data in 2.1.1. Click on ‘Browse data’ to look at trends and maps. The underlying data are explained under the ‘Methods’ tab.

(b) However, production levels vary widely across the world

The map in 2.1.2 shows Food and Agriculture Organization of the United Nations (FAO) estimates of per-capita dietary energy produced from crops.

2.1.2 Food supply in crops primary equivalent (kcal/cap/day, 2009)

Bearing in mind that mean dietary energy requirements have been calculated in the range of 2300–2800 kcal/cap/day (FAO/WHO/UNU, 2005), and that some allowance should be made for losses and wastage, consider which countries appear to be the surplus ‘breadbaskets’ and which are in food-supply deficit. (Are there any surprises? You can bring comments to the virtual learning discussion board.)

Trade of course can move agricultural commodities from surplus to deficit areas. However, trade only responds to **effective demand** (ability and willingness to pay), rather than need, and there may be other factors such as high transport and transaction costs which prevent commodities moving to where they are demanded.

(c) Trade has risen proportionally more than production

There have been very large increases in global agricultural trade over the past 30 years, as shown in 2.1.3, and increases in trade have outpaced increases in production. Agricultural trade has fallen as a share of overall global trade (from nearly 25% in the 1960s to under 10% in 2011) but this must be seen in the context of phenomenal increases in trade overall – according to WTO (2012: Chart 3), the average annual percentage increase 1950–2011 was 3.5% for agriculture, 7.5% for manufactures and 6.0% for all trade. There are some downwards ‘blips’ in exports in 2.1.3 (can you think what might have caused these?), but the overall trend is strongly upwards. According to Hawkes and Murphy (2010: p. 28), ‘In developing countries, food import bills as a share of GDP more than doubled between 1974 and 2004, and between 1971 and 2003, the share of agricultural production exported increased from 19 to 40%.’

2.1.3 World Trade Organization (WTO) indices of world production and trade of agricultural products by volume (1950 = 100)

![Graph of agricultural production and exports indices](image)

Source: unit authors, based on data in WTO (2012) Table A1a.
Cereals used to dominate international food trade, but they now constitute a minor share of overall value, while higher-value exports such as meat and vegetables have been increasing rapidly since the turn of the century (FAO, 2013a).

(d) Country patterns of imports and exports are changing

A regional overview of net trade is shown in 2.1.4. However the picture varies by commodity and country.

2.1.4 Net exports of food by region, 2000—2012

![Graph showing net exports of food by region, 2000–2012.](image)

Source: FAO (2012) Figure 33, p. 104.

Notes: Net exports (= exports − imports) of crops and livestock evaluated at 2004–2006 constant international reference prices.

Look at 2.1.4. To the nearest $10 billion, what was the value of Asia’s net exports in 2011/12? How would you interpret this number?

Try using the international databases listed in the Multimedia section (FAOSTAT, n.d. b; Comtrade, n.d. and/or USDA, n.d.) to look at trends in agricultural imports and exports for a country or region and product (eg wheat, coffee) that interests you. Please use the virtual learning discussion board to share any surprising findings.

China and other rapidly growing parts of Asia have both increased home production and imported more food (World Bank, 2014a). The continent of Africa has also made very large increases in net food imports (Rakotoarisoa et al, 2011). Among commodities, wheat is the ‘largest deficit item in the developing country food basket’ (FAO, 2013a).

(e) World food prices have become higher and more volatile over the last decade

High and volatile food prices (2.1.5) have hit the headlines in most countries over the last few years, with continuing debates regarding longer term changes and trends.
2.1.5 World Bank global food price indices 2000–2013

Source World Bank (2013)

Notes: The Global Food Price Index weighs export prices of a variety of food commodities around the world in nominal U.S. dollar prices, 2010 = 100. Note these are nominal prices, ie not adjusted for inflation. The latest figures can be found on the World Bank Food Price Watch webpage (World Bank, n.d.).

(f) The rise of agribusiness

Large agribusinesses are increasingly dominant in production in many countries, and in particular in world trade. Focusing on Latin America, Hecht (2010) says that:

‘... the last 15 years has seen an explosion in mechanized landscapes, where powerful, technically sophisticated agroindustrial farming (mostly for soy, corn sunflower and other oil crops) oriented to global markets has transformed vast areas of production in Mexico, Argentina, Colombia and especially Brazil... focused on international commodities and global markets with international quality controls, using modern methods of capital generation, firm organizations and information flows.’


The figure in 2.1.6 illustrates this. Similar changes are taking place elsewhere.
2.1.6 Expansion of soya beans and location of main agroindustries in Brazil, 1990 and 2008

Source: Sauer and Pereira Leite (2012) Fig 1, p. 880.

Note: Shading indicates the amount of soya produced annually, from no production (white) to over 500 000 tonnes (black). Agroindustries with soya processing plants are also shown; one company (Amaggi) is Brazilian while the other four are the giant ‘ABCD’ international grain companies (Murphy et al, 2012). The authors comment that the share of international capital in the agro-industrial grain-processing sector was 16% in 1995 and 57% in 2005.

World trade in both agricultural inputs and products is increasingly dominated by a few large companies (Dalle Mulle & Ruppanner, 2010; Hawkes & Murphy, 2010; Murphy et al, 2012), while supermarkets increasingly dominate the retail sector (Reardon & Timmer, 2007).

2.2 Factors driving these trends

The figure in 2.2.1 shows a simplified schema of the factors affecting trends in production and trade. Farmers and traders take decisions on what products and how much to plant, harvest, trade and store depending on their expectations of costs, prices and risks. The actual conditions experienced (weather, price shocks, etc) – combined with the quality of their management – then results in the quantities finally produced, traded and stored that year.
2.2.1 Simplified schema of factors driving trends in agricultural production and trade

Taking the factors in turn:

**(a) Trends in demand-side factors**

Agricultural production responds (eventually) to consumer demand. Aggregate demand is influenced by population levels and is also strongly affected by income/living standards. As shown earlier in 2.1.1 Error! Reference source not found., world population has more than doubled since the late 1960s, to just over 7 billion people in 2014, but growth is levelling off: the latest ‘medium fertility’ scenario population projections are about 9.5 billion people by 2050 and 10.9 billion by 2100 (UNDESA, 2014).

In general, as countries become richer, they consume more food (kcal) overall and also consume more processed foods, meat, fats and oils, and sugar, as illustrated in 2.2.2 and 2.2.3.
2.2.2 Changing diets with increased prosperity: a week’s food in Ecuador and the United States of America

Source: Menzel and D’Aluisio (2005)

Notes: See Multimedia section for details and (larger) photos of diets from a range of countries.

2.2.3 Estimated consumption of selected food groups (g/capita/day): all developing countries

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>375</td>
<td>392</td>
<td>427</td>
<td>430</td>
<td>414</td>
<td>454</td>
<td>21</td>
</tr>
<tr>
<td>Meat</td>
<td>27</td>
<td>30</td>
<td>41</td>
<td>58</td>
<td>77</td>
<td>99</td>
<td>267</td>
</tr>
<tr>
<td>Refined sugars</td>
<td>19</td>
<td>25</td>
<td>33</td>
<td>36</td>
<td>44</td>
<td>51</td>
<td>168</td>
</tr>
<tr>
<td>Oils and fats</td>
<td>8</td>
<td>11</td>
<td>19</td>
<td>22</td>
<td>30</td>
<td>45</td>
<td>463</td>
</tr>
</tbody>
</table>

Source: Extracted by unit authors from Kearney (2010) Supplementary table 11.

What do you think might be the underlying causes of these dietary changes?

Answer

Underlying trends driving these changes include (Kearney, 2010):

- increased urbanisation, with a number of effects including increased consumption of food away from home
- increased economic growth and household wealth
- increased openness of global markets to trade
- an overall trend over many decades towards food being cheaper in relationship to incomes (even though prices have risen in recent years)
- women have more opportunities to work, so that the opportunity cost of time spent obtaining and preparing food is higher
– advances in storage and handling technologies (such as refrigeration) which make possible long product shelf-life, availability of foods year-round and increased marketing of fresh products such as meat and fish
– globalisation of food production and marketing and the rise of global brands
– increased power of the media and advertising to influence tastes.

Increased global consumption of animal products has increased the use of grains and legumes – particularly maize, wheat and soya – as animal feed.

‘Cereals are shifted from the direct consumption (of the poor) to the indirect consumption (of the middle-income classes) by feeding them to a rather inefficient protein converter, the animal stomach. A ‘shrinkage’ of cereals occurs in the process. The relevant calorie-equivalent grain-meat conversion ratios vary from 2:1 for poultry to 7:1 for feedlot-fed beef.’

More grain is currently used for feed than for food, even in developing countries (OECD/FAO, 2012). This trend is set to increase, particularly if livestock production continues to move towards industrialised units and away from open pastures and small family farms which feed their animals on by-products (FAO, 2012).

Demand for non-food uses of agricultural products – in particular biofuels – is also increasing (Singh, 2010). During the 2007–2009 period biofuels accounted for a significant share of global use of several crops – 20% for sugar cane, 9% for vegetable oil and coarse grains and 4% for sugar beet (FAO/OECD, 2011). Much of the demand for biofuels was originally driven by regulation – so-called ‘mandates’ and subsidies – but now that the supply chains are in place, high oil prices can feed demand for biofuels even in the absence of mandates.

The combination of increasing population, higher incomes, changing diets and demands for energy has been estimated by Alexandratos & Bruinsma (2012) to result in global demand for agricultural products growing at 1.1% per year from 2005/2007 to 2050.

At the same time, according to the FAO, ‘842 million people in 2011–13, or around one in eight people in the world, were estimated to be suffering from chronic hunger, regularly not getting enough food to conduct an active life’ (FAO, 2013b: p. i). Apart from the ethical questions this raises, it also points to a large amount of unsatisfied consumer demand. There is a concern that rising world demand for food crops for other uses – in particular biofuels – may increasingly price the poorest consumers out of the market (Huang et al, 2012).
(b) Trends in supply-side factors

For crops, total annual harvest is equal to the crop yield per hectare multiplied by the area planted and the \textit{intensity of cropping}. All three factors have played a part in past production increases, although overall the most important factor has been improved yields per hectare, which according to calculations by the Organisation for Economic Co-operation and Development (OECD) and FAO (2012) accounted for 78\% of the increase between 1961 and 1999 (see also 2.2.5).

\textbf{Land:} Use of land for agriculture has expanded in some parts of the world, mainly by opening up previously uncultivated areas of forest. Deininger & Byerlee (2012) calculate that from 1990–2007, the land cultivated expanded by 1.9 million hectares per year, concentrated in sub-Saharan Africa, South-east Asia, Latin America and the Caribbean, mainly to produce vegetable oils (especially palm oil), soya, sugarcane, rice and maize.

\textbf{Water:} According to FAO (2011b), agriculture currently accounts for 70\% of global freshwater use, varying from an average of 90\% in low-income countries to 42\% in industrialised countries where irrigation must compete with municipal and industrial uses. WTO (2013) projects that this will lead to an increase in agricultural trade, as water-deficient regions are increasingly forced to import food.

\textbf{Infrastructure:} Advances in transport and refrigeration infrastructure have reduced travel times and costs and considerably facilitated trade, particularly for perishable products such as meat, fruit and vegetables. For example, air transport costs (measured in terms of revenue per ton-kilometre) dropped by 92\% between 1955 and 2004 (WTO, 2008: p. 84). Sea freight, road and rail also decreased in cost and increased in speed to varying extents (WTO, 2013).

\textbf{Fertilisers:} Use of mineral fertilisers has exploded since the 1960s, particularly in Asia; however, use in Africa is still very low (2.2.4). Pollution from fertiliser and other agrochemical runoff is a serious and widespread problem (FAO, 2011b).
2.2.4 Trends in mineral fertiliser use 1961–2001

![Graph showing trends in mineral fertiliser use 1961–2001](image)

Source: FAO (2011b) Fig 3.3, p. 117.

Energy: The price of energy from fossil fuels directly affects farm input prices, for example, fertiliser and diesel for tractors and irrigation, as well as the cost of transport and trade. The price of fossil fuels also feeds into demand for biofuels – and potentially vice versa. World energy prices have risen considerably (with some ups and downs) since 2000, but the ‘fracking revolution’ (new sources of fossil fuels and extraction technologies) poses questions as to whether the world will have a new era of cheap fossil fuel energy, or whether prices will go on rising. For this reason, Hertel (2013) describes energy prices as the ‘wildcard’ (source of major uncertainty) in the future of global agriculture.

Technology, skills and knowledge: The figure in 2.2.5 is taken from a modelling study by Fuglie (2012) shows the main supply-side sources of growth in global agricultural production. Take note of the main sources of growth and the definition of Total Factor Productivity (TFP). A companion modelling study (Evenson & Fuglie, 2010) highlights ‘technology capital’ – a combination of research and development with education and extension – as the main force driving TFP. Fuglie’s conclusion is
optimistic: that there is still room for TFP to grow to support increases in agricultural production to match demand in the world as a whole, even if investments in machinery and inputs don't keep pace. However, productivity gains have varied dramatically across countries, and other authors (e.g., Ray et al., 2013) are much more pessimistic about the ability of technology-driven productivity to keep up with global demand.

2.2.5 Sources of growth in global agriculture, 1961–2007

![Graph showing sources of growth in global agriculture, 1961–2007.](image)

Source: Fuglie (2012) Figure 4.2, p. 86.

(c) Risks and uncertainties

Risks and uncertainties are very important not only for their direct effects, but also for the effect they have on farmer and trader decision-making. **Ceteris paribus** the expectation of higher risks is likely to reduce investment and production, as discussed in Section 1.

**Price risks** due to food price volatility in international markets (see 2.1.5) have increased over the past twenty years (FAO/OECD, 2011). This is an important topic which we will return to later in the course.

**Weather risks** are likely to increase with climate change, although it is still difficult to predict exactly how and where. One recent modelling exercise forecast increases in the real price of maize of 40–45% in 2050 and in the price of wheat and rice of 20–25% under climate change, relative to a no climate change scenario (Rosegrant et al., 2014). Climate change may also increase **human health risks**.
Pest and disease risks have increased and are likely to go on increasing, due to the globalisation of agriculture. This is not a minor technical point, as diseases such as wheat rust or banana sigatoka can wipe out crops over large areas and pose a major threat to food security (Strange & Scott, 2005). First, many crops are cultivated far from their centres of origin and have a narrow gene pool which can increase susceptibility to pests and diseases (Marshall, 1977). The movement of pests and diseases around the world (often without the natural enemies that keep them in check at home) has been seriously increased by the globalisation of food trade. Finally, the increasing concentration in the global seed production market – the top three corporations now supply about a third of the market (Dalle Mulle & Ruppanner, 2010) – means inter alia that more and more farmers and consumers depend on a few crop varieties with a narrow genetic base more susceptible to unexpected pests and diseases.

2.3 Global challenges for world agricultural and trade policy

As described in Section 1, many things are demanded of agriculture and agricultural trade. The agricultural sector is expected to feed the world, produce fuel and other industrial products, while at the same time protecting the environment and a range of other social and economic objectives. Hertel (2013) discusses the variety of projections – optimistic and pessimistic – for future global supply and demand of agricultural commodities. One of these is shown in the figure in 2.3.1. However, as even the optimists admit, an adequate global supply does not mean that every country will be able to produce or import all the commodities it needs.

2.3.1 Projected world production and use, major products (million tonnes)

Purely on a technical level, there is still much scope to increase productivity and production of most agricultural commodities (FAO, 2012). However, the factors described in Section 1 make this much more than a technical question: can high production also be ecologically and socially sustainable? Agricultural and trade policies will have a major role in shaping the future.
Section 2 Self Assessment Questions

Question 4
List the main sources of risk that affect the quantities of agricultural produce harvested and marketed.

Question 5
Which regions of the world have increased their net imports of food commodities over the past ten years?
(a) North America
(b) Latin America
(c) Eastern Europe and Central Asia
(d) Asia
(e) Middle East and North Africa
(f) Sub-Saharan Africa.

Question 6
According to the models by Fuglie (2012), which of these factors was the most important in increasing global crop production in (i) the 1960s and 1970s and (ii) the last two decades?
(a) increasing land area
(b) increasing irrigated area
(c) increasing use of machinery and inputs
(d) increasing knowledge and technology.

Question 7
Why do pests and diseases pose more of a threat to world agriculture than in the past? (list all that apply)
(a) Movement of crops around the world increases their genetic variability and therefore susceptibility to disease.
(b) Natural enemies of pests don’t always move with them, so pests can cause more devastation in a new location.
(c) Global seed production is increasingly dominated by a few companies.
3.0 **INTRODUCTION TO AGRICULTURAL POLICY**

**Section Overview**

This section provides a brief introduction to policy and policy instruments, and highlights the value of applying economics to policy analysis.

**Section Learning Outcomes**

By the end of this section, students should be able to:

- define policy, and describe and categorise some common agricultural and trade policy instruments
- explain the role and importance of economic policy analysis, giving examples of where ignoring economic incentives has caused trouble for governments.

3.1 **Introduction to policy and policy instruments**

Policy

(1) ‘a high-level overall plan embracing the general goals and acceptable procedures, especially of a governmental body’

*Source: Merriam-Webster (n.d.) definition 2b.*

(2) ‘a course of action adopted by a government to induce certain changes in the decisions and behaviour of actors in that society in order to achieve certain goals’


The term **policy** has a variety of definitions. When many people think of a policy, the first thing they visualise is something akin to the first definition given above (1) – a high level plan, on paper, which defines (often vaguely) some general goals and ideas for reaching them. Such policy papers may come and go, often having little operational impact. There is often a ‘disconnect’ between what is written in the policy paper and what the government or agency actually does.

The second definition above (2) is the one we will use for this module. The definition has several components that are worth looking at in a bit more detail:

(a) **A course of action**: we will distinguish wherever possible between ‘official’ or ‘written’ policy and **policy in practice**, which is what is actually operationalised and implemented.

(b) **A government**: this module focuses on government and international (multi-governmental) policies, unless otherwise specified. However, clearly there are other actors and institutions whose policies can be important.
Can you think of another type of institution (apart from government) whose own policies may have an important effect in agriculture?

Answer

Private sector policies can be very important, especially the buying and pricing policies of large agricultural input and trading companies, including retailers. For example, the decision of large supermarkets in the UK to pull out of buying bananas from several small islands in the Caribbean, following price wars in the UK, has nearly bankrupted thousands of farmers. UK civil society organisations are pressuring supermarkets to have corporate social responsibility policies which include buying bananas at a ‘fair price’. (Sources: DFID, 2004; Fairtrade Foundation, 2014). The ‘sustainability’ policies of the large candy manufacturer Mars (Mars Corporation, 2014) are another example.

(c) To induce certain changes in the decisions and behaviour of actors: Section 1 outlined some of the particular challenges for policy-making in changing the behaviour of actors in agriculture and agricultural trade.

(d) To achieve certain goals: policy-makers often face difficulties in defining and getting agreement on clear goals for agricultural policy, due to the multiplicity of potential goals for agriculture and the different objectives of different stakeholders (people and groups with an interest in policy outcomes).

Watch the video on European agriculture policy in the Multimedia section (BBC, 2013). What are the different goals listed for agriculture policy in Europe? Think about your own country, what are the main goals that policy-makers have for agriculture? Do all stakeholder groups agree with these policies?

Brief introduction to policy instruments for agriculture and trade

Governments (and other actors) have a variety of approaches, mechanisms and methods available to them to promote behaviour change. These are collectively called policy instruments.

Policy instruments can be conceptually categorised in a number of ways and you will probably come across different divisions in your reading, for example, some authors divide instruments into those directed at input markets and those for output markets. The table in 3.1.1 summarises the way we have classified them in this module: by sectoral focus and by the mechanism of delivery.
3.1.1 Classification of policy instruments affecting the agricultural sector

<table>
<thead>
<tr>
<th>Mechanism of delivery</th>
<th>Primary sectoral focus of policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agriculture sector specific</td>
</tr>
<tr>
<td></td>
<td>Other sectors</td>
</tr>
<tr>
<td></td>
<td>Economy wide</td>
</tr>
<tr>
<td>Regulatory instruments</td>
<td></td>
</tr>
<tr>
<td>Voluntary instruments</td>
<td></td>
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<tr>
<td>Economic instruments</td>
<td></td>
</tr>
<tr>
<td>Public investments</td>
<td></td>
</tr>
</tbody>
</table>

Source: unit author

**Sectoral focus**

**Agricultural sector-specific policies** may affect specific agricultural inputs (eg fertiliser subsidies) or commodities (for example, maize or cotton). They may include:

- domestic price policies such as crop subsidies and taxes on particular commodities
- tariffs and other non-tariff barriers to international trade
- regulations such as price controls and environmental restrictions.

**Other sectoral policies** for example, health, transport, education, industry, labour, water and sanitation policies, can affect agriculture and trade, for example, health or education policies can affect labour productivity in agriculture, and transport policies can affect agricultural marketing costs.

**Economy-wide policies** are established nationally (normally by the Ministry of Finance or its equivalent), and affect all sectors, including agriculture. They may include, for example:

- fiscal policies such as spending limits on sector budgets
- monetary policies such as inflation targets or national bank interest rates
- exchange rate policies
- policies on tenure and use of land and natural resources such as water
- labour policies, such as a minimum wage.

**Mechanism of delivery**

**Regulatory instruments** are those which use the legal system, enforced by the government or its agents. They may include, for example, setting obligatory standards (eg for food quality), outlawing certain practices (eg dumping out-of-date pesticides in the nearest river) or fixing minimum and maximum (also called floor and ceiling) prices for a commodity.
Voluntary instruments are – as implied – voluntary agreements between actors in the private sector (e.g., producers and supermarkets) or more commonly, between the government and particular private sector actors. Sometimes these are ad hoc and informal: for example, when international food prices went up in 2008, governments in some West African countries called in large grain traders to make an arrangement to keep their prices down for a limited period (Wiggins et al., 2010). Formal voluntary agreements are often used in the environmental field in higher-income countries, for example, written agreements may be made between a government and a group of farmers to reduce emissions of greenhouse gases through adopting appropriate technology (OECD, 2013).

Economic instruments are those which provide economic incentives to change behaviour. In agriculture, the most commonly used economic instruments by the government are taxes, tariffs and subsidies and the allocation of property and use rights (e.g., for land and water).

- **Market-based instruments** are a subset of economic instruments in which government sets the parameters to encourage private sector policy solutions. For example, instead of setting floor and ceiling prices for a commodity, a government might encourage the development of private sector trading of market futures.

Public investment policies in a wide range of sectors may affect agriculture and trade, for example, in roads or education. Lack of co-ordination between ministries may lead to investment choices which do not favour agriculture.

<table>
<thead>
<tr>
<th>What factors might lead you to choose one mechanism of delivery over another?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answer</strong></td>
</tr>
<tr>
<td>The factors to consider are often complex and the choice of instrument depends on the specific policy objective. The difficulties and costs of implementation (for example, of collecting information, inspection and enforcement) are major concerns. For example, setting a legal maximum retail price for maize may not attain its (official) objectives if there is only a small and/or corrupt inspectorate and police force – this will simply lead to development of a black market in maize. Voluntary agreements are most likely to be successful with a small and/or well-organised group who have some incentive of their own to follow the agreement (for example, businesses that want to promote themselves as ‘environmentally friendly’ to customers).</td>
</tr>
</tbody>
</table>

The above divisions are not hard and fast – and some instruments may overlap.

### 3.2 The importance of economics in agricultural policy

The preceding sections point out many of the practical problems faced by policymakers in managing agriculture and trade. You might then ask: with all this complexity, is the study of economics really that important for agricultural policy? The answer is **yes**. Agriculture is very responsive to economic incentives.
'A heated and frequently sterile debate has been waged over the incentives needed to induce change in farmers. The elements range from pretty ribbons to raising political consciousness, from basic literacy to the availability of consumer goods for purchase in rural markets. However, the evidence is overwhelming that farmers make economic calculations in considering their agricultural decision. The tendency toward economic rationality in farm household decision-making justifies the use of basic economic models to help analysts judge the efficacy of policy interventions designed to change the decision-making environment of rural households.'


The figure in 3.2.1 shows an example of how economic policy incentives can shape the agricultural landscape. It is a satellite photo of the straight-line border between Canada (top) and the state of Montana in the United States of America (below the central horizontal white line). You don’t need to understand the details, but you can see from the photo that Montana has many more small farms, while Canada has much more grazing and forest land. The major factor influencing these differences is US government subsidies for wheat production.

'[The border] remained invisible until the 1930s, when [US] federally subsidized wheat made it real. The [color] that dominates Canada represents grassland that once covered the Great Plains. But the American side is tiled by colors representing various harvesting stages of just one crop: wheat. Politics created the border; subsequent differences in agricultural policy created the two landscapes.'

Source: Manning (1996) p. 64.

3.2.1 How agricultural policies can shape landscapes: a composite satellite image of the Canada–US border, 2000, showing the effect of US wheat subsidies

The two examples which follow use basic economic theory to predict the likely effects of recent food and agriculture policies in two countries: Venezuela and Thailand. Of course, the full stories are more complex than illustrated here, but the examples do show that ignoring or trying to bypass basic economic incentives may be tempting to politicians – but can be dangerous.

Please watch the two short videos listed in the Multimedia section, regarding Venezuela price controls and scarcity of food in shops (VOA video, 2010) and the Thai rice mountain (AFP News Agency, 2012). These cover two examples from the last few years where populist politicians have attempted to intervene in food supply markets. You will also find the article by Neuman (2012) relevant in relation to the Venezuelan food shortages.

In one of the cases shown (VOA video, 2010), low maximum food prices set by the government led to empty shops and long queues for food. Although some food was still available, much of this was on the ‘black’ (illegal) market, at up to four times the official price. The government arrested some large-scale traders who are being blamed for hoarding food and causing the shortages.

What has basic economic theory got to say about the Venezuela example? Below is a familiar "P–Q" (price–quantity) graph. With no government intervention, the price of a given food (e.g. rice) would be PM and the quantity supplied would be QM (M stands for market price, where supply = demand).

If the government now sets a maximum (ceiling) price at Pc (c stands for ceiling), what will happen to the quantity supplied and the quantity demanded? Take a piece of paper and sketch the effect on the graph.

![P–Q graph](image-url)
Basic economic theory gives us an explanation for the empty shops. With a price ceiling set at a lower-than-market price, the quantity demanded is higher ($Q_D$) and the quantity supplied is lower ($Q_S$). The arrow shows the extent of excess demand, which is equal to $Q_D - Q_S$.

The other video (AFP News Agency, 2012) shows the Thai government taking the opposite approach, and underwriting high prices for rice farmers. This led to a production glut, a budgetary crisis, huge stocks and problems for the government in disposing of its rice stocks on the national and international market.

Nearly all governments have set compulsory price floors and/or price ceilings for food at some time. Can you think of/find out the most recent time this was done in your own country? What sparked off this policy?

Economic objectives of agricultural policy

From an economic perspective, the main objective of government intervention in free markets is to alleviate market failure and promote efficiency. Market failure occurs when the free market does not allocate scarce resources optimally and/or efficiently (at least cost) to achieve maximum social welfare.

Additional economic objectives may include:
- **equity**: a ‘fair’ distribution of income among regions or types of people
- **stability**: minimising unexpected changes for farmers, business and consumers, along with the costs of adjusting to changes
- other specific food security, health/nutrition, social and environmental aims.
How maximum social welfare is defined in practice depends on the particular society and decision-makers. There are often trade-offs to be made between different social objectives, for example, the objective of maximising income for farmers and the objective of minimising food prices for urban consumers. Economists themselves do not decide on the priorities and trade-offs to be made – that is usually the job of politicians. However, economists can estimate the potential size of costs and benefits to different groups in society of different policy choices, look at the effect of assigning different weights to different policy objectives, and ultimately can potentially help decision-makers make better choices.

You may have noticed that policy-makers often don’t seem to pay a lot of attention to economic analysis. Why might this be?

Answer

Policy-makers must balance a large number of considerations and the views of many stakeholders. Many of these are not amenable to economic analysis. Economic advice is a useful tool in the policy-makers toolbox, but economists need to be realistic and not assume that policy-makers always seek to optimise welfare according to economic criteria.

A note on economic models

A final point is that policy economists use models and data which may or may not be a reasonable representation of the complex reality of agriculture and trade described in Section 1 (for example, a model may ignore vital gender issues, or data may exclude a large part of trade due to informality, or simply be of poor quality). Over the past 10 years or so, new insights from other disciplines (psychology, sociology, etc) have enriched economic analysis, in the form of behavioural economics, and models incorporating behavioural economics are starting to be applied to the analysis of public policy (Bernheim & Rangel, 2005; World Bank, 2014b). This does not mean that a complex model which tries to represent every aspect of reality is always best: in many cases a simple model can lead to important and non-obvious inferences about the likely effects of a policy. However, it is always important to look carefully at the assumptions underlying a model and the data used.
Section 3 Self Assessment Questions

Question 8

To help poor workers, the government of Eastlandia (a rice-producing country) has established a legal maximum price at which rice can be sold by retailers in the capital city. This is likely to result in:

(a) excess supply of rice
(b) excess demand for rice
(c) neither of these.

Question 9

Put these policy instruments into the correct boxes in the table:

<table>
<thead>
<tr>
<th>Regulatory instruments</th>
<th>Agriculture-sector-specific policies</th>
<th>Economy-wide policies</th>
<th>Other sectoral policies affecting agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Voluntary instruments</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>Economic instruments</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>Public investment</td>
<td>J</td>
<td>K</td>
<td>L</td>
</tr>
</tbody>
</table>

(a) a national minimum wage
(b) national price controls on bread and wheat flour
(c) building of a new agricultural college
(d) increasing the interest rate of the national bank
(e) construction of a new road to connect two cities and crossing the main agricultural production area of the country
(f) an export tax on maize
(g) giving women the legal right to own land
(h) a fair trade agreement for the inspection and certification of banana production.
UNIT SUMMARY

This unit provides an introduction to agriculture, trade and policy. We start from first principles by looking at the special features of agriculture and agricultural trade that make this a challenging sector for policy-makers. This also provides an opportunity, if needed, to review some basic economic concepts that will be used in the rest of the module. We then go on to discuss trends in global agricultural production and trade, the factors that have driven those trends over the past half-century, and touch on some of the policy challenges for global agriculture. Finally, we introduce the main categories of policy instruments and give some examples of the importance of economics in shaping policy outcomes.
UNIT SELF ASSESSMENT QUESTIONS

Question 1

What special characteristics of agriculture might make it difficult for policy-planners in a Ministry of Agriculture to design policies to increase production?

Question 2

Has global cereal production over the past 50 years kept pace with world consumption needs?

Question 3

What are the main factors influencing global food consumption trends?

Question 4

The concept of ‘multifunctionality of agriculture’ was introduced into world trade negotiations to describe and try to quantify the functions that agriculture provides to society, outside its core purpose of production. What are these other functions of agriculture? List at least four.
Question 5

The video on Thailand (AFP News Agency, 2012) shows the government paying a higher-than-market price for rice producers (see Section 3.2). Using the P–Q graph below as a basis, sketch what basic economic theory predicts will happen (for this exercise, please ignore the difference between the retail price paid by consumers and the wholesale price paid to farmers). $P_M$ is the market clearing price and $P_F$ is the new price floor set by the government.

![Graph showing supply and demand curves with market clearing price $P_M$ and new price floor $P_F$.](image)
## Key Terms and Concepts

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>adverse selection</td>
<td>A phenomenon that makes it hard to develop a private business in insurance or credit, because the provider does not know the likely risks of potential customers, and the highest-risk customers are most likely to take up the offer</td>
</tr>
<tr>
<td>biodiversity</td>
<td>The degree of variation and diversity among living organisms in a particular habitat (often an indicator of a healthy ecosystem)</td>
</tr>
<tr>
<td>biofuel</td>
<td>Fuel derived from biomass</td>
</tr>
<tr>
<td>bioplastics</td>
<td>A plastic is a type of synthetic polymer; polymerisation, capable of being moulded, extruded, cast into various shapes and films, or drawn into filaments and then used as textile fibres. Bioplastics are similar to plastics but derived completely or partially from biomass resources (OECD)</td>
</tr>
<tr>
<td>cold chain</td>
<td>A linked up set of refrigeration facilities to store, transport and market perishable products such as meat along a supply chain</td>
</tr>
<tr>
<td>covariate risk</td>
<td>Risk of a shock which tends to occur at the same time to many individuals or households in a community or area, e.g. drought</td>
</tr>
<tr>
<td>ecosystem services</td>
<td>Benefits for people generated by ecosystems, such as clean water, timber, waste absorption, landscapes, recreation, etc</td>
</tr>
<tr>
<td>effective demand</td>
<td>The level of demand that represents a real intention to purchase by people with the means to pay (Business Dictionary)</td>
</tr>
<tr>
<td>equity</td>
<td>A ‘fair’ distribution of income or other benefits among regions or types of people</td>
</tr>
<tr>
<td>externalities</td>
<td>Effects on society from an activity whose costs (for negative externalities) or benefits (for positive externalities) are not fully captured by market incentives for engaging in that activity</td>
</tr>
<tr>
<td>farm enterprise</td>
<td>A ‘business’ within a farm – for example, a farm may produce both chickens and maize; each can be considered as an enterprise</td>
</tr>
<tr>
<td>firm</td>
<td>A profit making business, treated as a single entity in neoclassical economic modelling</td>
</tr>
<tr>
<td>formal economy (or formal sector)</td>
<td>The part of an economy that is regulated, taxed, and monitored by government</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------------</td>
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<tr>
<td>greenhouse gases</td>
<td>also known as GHGS, gases that contribute to the earth’s greenhouse effect, such as water vapour, carbon dioxide, methane, nitrous oxide, and ozone</td>
</tr>
<tr>
<td>idiosyncratic risk</td>
<td>risk of a shock incurred by an individual or household, eg ill health or unemployment, which does not usually occur to other individuals/households at the same time</td>
</tr>
<tr>
<td>inelastic demand</td>
<td>economic demand where the percentage increase (or decrease) in purchase price is greater than the resultant percentage decrease (increase) in quantity demanded (typical of staple foods for example)</td>
</tr>
<tr>
<td>informal economy (or informal sector)</td>
<td>the part of an economy that is not regulated, taxed, or monitored by government</td>
</tr>
<tr>
<td>intensity of cropping (or cropping intensity)</td>
<td>the percentage of the cultivated area which is planted with crops. Normally used to indicate when there is more than one crop in the year, for example if a field is sown three times, the cropping intensity is 3 or 300%</td>
</tr>
<tr>
<td>market concentration</td>
<td>the existence of only a few firms(players in part of a value chain (qv)</td>
</tr>
<tr>
<td>market futures</td>
<td>in its simplest form, a future is a contract to buy a commodity at a specified price at a specified time in the future, therefore reducing price risk. (Futures trading can get considerably more complex with the development of complex financial instruments.)</td>
</tr>
<tr>
<td>market system</td>
<td>a network of different players and the institutions that govern and link them in the buying and selling of a good, service, commodity or factor</td>
</tr>
<tr>
<td>moral hazard</td>
<td>the situation or condition where an individual or organisation lacks incentives to guard against risk and engages in more risky behaviour because another individual or organisation will bear some or all of the potentially harmful consequences of that risk, normally as a result of some contract or financial arrangement such as an insurance contract</td>
</tr>
<tr>
<td>opportunity cost</td>
<td>the value of the best available alternative. Opportunity cost arises when one is forced to choose between two or more scarce goods or between two different uses of scarce resources</td>
</tr>
<tr>
<td>policy coherence</td>
<td>policies (usually from different government departments) working together and not having conflicting effects</td>
</tr>
<tr>
<td>policy instruments</td>
<td>approaches, mechanisms and methods used by policy-makers (usually in government) to promote behaviour change (for example, a tax or subsidy). Discussed in Section 3.1</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>----------------------------------</td>
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</tr>
<tr>
<td>price transmission</td>
<td>the degree to which a change in one price results in a change in another price (for example, the price of a different product, or the price of the same product in another location)</td>
</tr>
<tr>
<td>price war</td>
<td>a period of intense price competition in which businesses cut prices in an attempt to increase their market share and force others out</td>
</tr>
<tr>
<td>price-taker</td>
<td>a business or farm whose purchases and sales have no significant effect on overall market prices</td>
</tr>
<tr>
<td>risk-averse</td>
<td>reluctant to take risks, for example, in investment. Poor farmers tend to be more risk-averse because they cannot afford to make losses</td>
</tr>
<tr>
<td>risks</td>
<td>shocks (qv) which occur with some degree of knowledge of the probability of occurrence (for example, droughts)</td>
</tr>
<tr>
<td>supply chains</td>
<td>activities that start with raw materials and result in goods being delivered to customers. The supply chain focuses on the costs and efficiency of supply, where efficient supply chains reduce costs</td>
</tr>
<tr>
<td>supply response</td>
<td>the change in the total amount of a good, service, commodity or factor supplied, usually in response to a price change</td>
</tr>
<tr>
<td>total factor productivity (TFP)</td>
<td>total factor productivity (TFP) represents that part of production growth that is not explained by increased use of inputs such as land, labour, machinery, livestock, chemical fertilisers and pesticides, but by other things such as technological progress, human capital development, improvements in physical infrastructure and government policies, as well as unmeasured factors such as improvements in input quality or depletion of natural resources (definition from FAO)</td>
</tr>
<tr>
<td>transaction costs</td>
<td>the deadweight losses due to costs of making a transaction, including the costs of reducing and guarding against the risks of transaction failure</td>
</tr>
<tr>
<td>unitary household model</td>
<td>economic models that treat each household as a single economic unit that works together for the benefit of the entire household (rather than as men and women who have their own motivations)</td>
</tr>
<tr>
<td>working capital</td>
<td>the capital of a farm or business which is used in its day-to-day operations</td>
</tr>
</tbody>
</table>