



ANALYSING THE ECONOMICS OF FARMING:

What Every Rural Social Scientist Should Know

Dr Keith Howe, Centre for Rural Policy Research, University of Exeter

Seminar: Byrne House & on-line, 7 October 2026

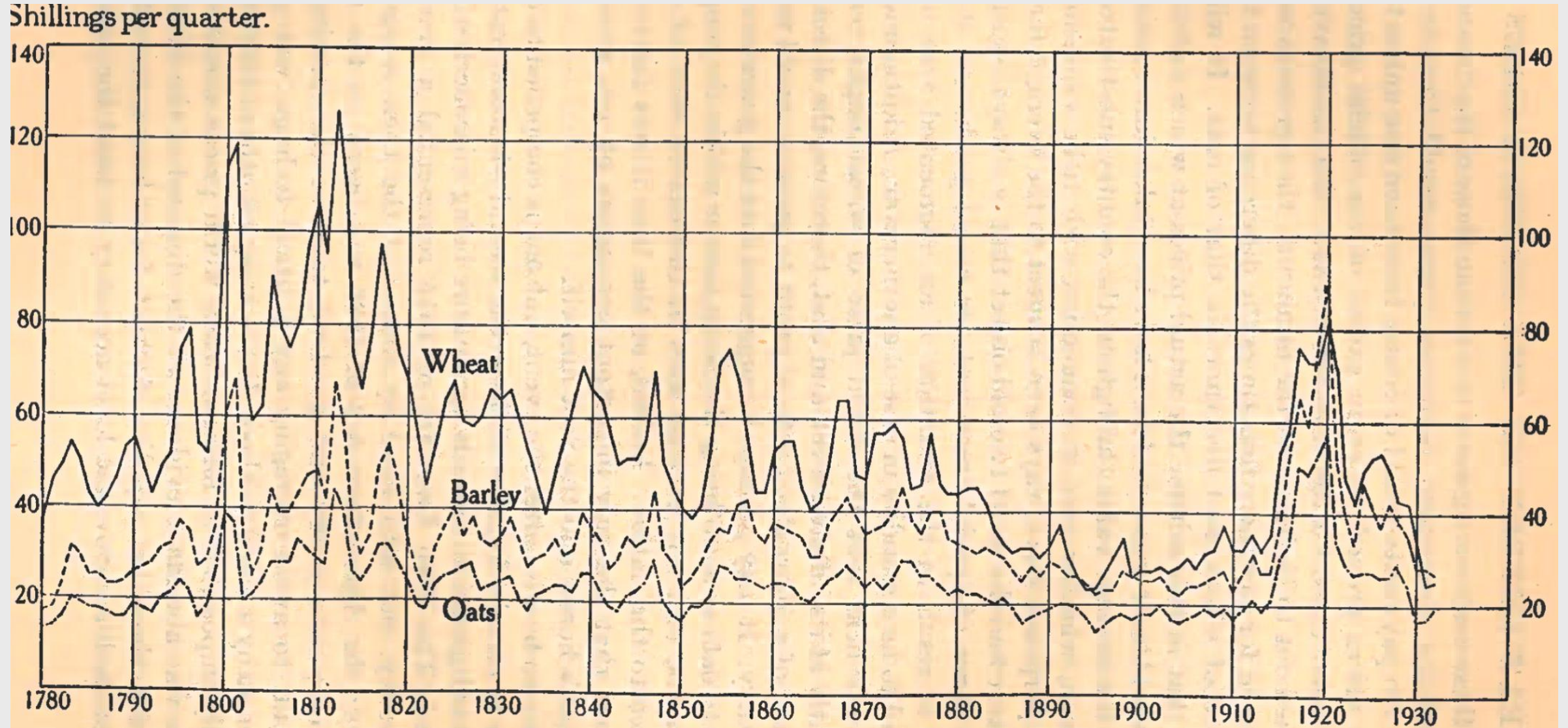
OUTLINE

- **Why** this seminar?
- Origins and definition of **‘The Farm Problem’**
 - A world transformed: Europe and North America since the mid-19th century
 - Policy responses to low net farm incomes
- Building **capacity to analyse and advise (Stage 1), late 19thC to WW2**
 - British institutions for farm data collection & analysis
 - Towards a Farm Management Survey (for England and Wales)
 - International perspectives + governments’ increasing role
- Building **capacity to analyse and advise (Stage 2), since WW2**
 - Alfred Marshall’s economics comes of age for agriculture
 - E.O. Heady’s revolution – the ‘Golden Age of Agricultural Economics’?
 - Decline and fall - and **why revival is needed NOW!**

ORIGINS OF 'THE FARM PROBLEM'

A story of supply and demand

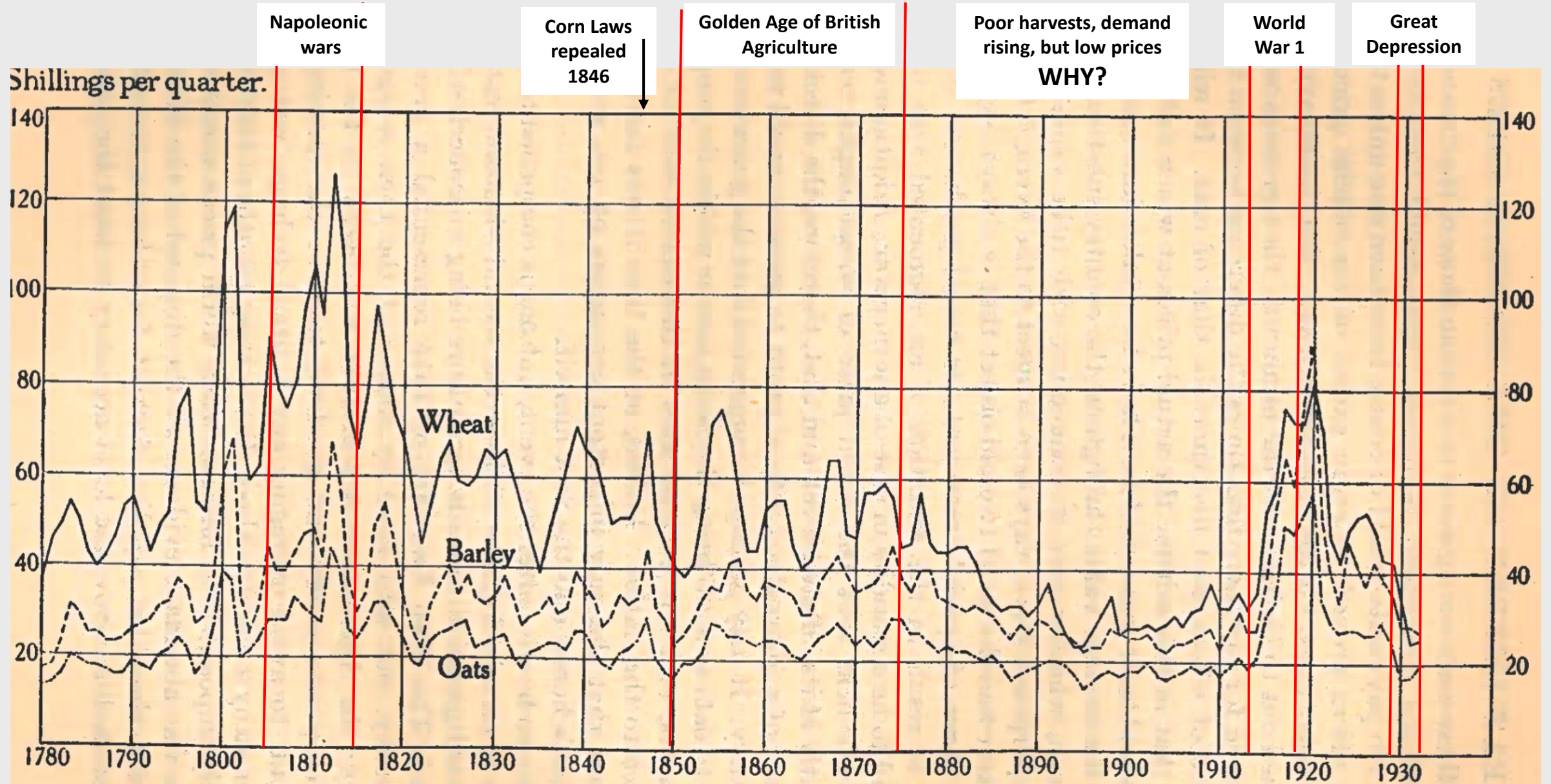
Average prices of wheat, barley and oats in England and Wales, 1780 to 1933



Source: J.A. Venn, *The Foundations of Agricultural Economics*, CUP, 1933, p. 387; For 1930s, See H.T. Williams, 1960, pp. 26-31

ORIGINS OF 'THE FARM PROBLEM'

A story of supply and demand



Source: J.A. Venn, *The Foundations of Agricultural Economics*, CUP, 1933, p. 387; For 1930s, See H.T. Williams, 1960, pp. 26-31

ACCOUNTING FOR 'THE FARM PROBLEM'

Building capacity to analyse and advise (Stage 1): Institutions

- American Farm Management Association, founded at Iowa State University, 1910 (renamed American Farm Economics Association, 1919)
- GB wartime Corn Production Act repeal, 1921, provided £1 million* specifically for agricultural education and research, enabling establishment of Provincial Agricultural Advisory Centres
*£43.7 million, June 2026, Bank of England Inflation Calculator
- By 1923, 'Advisory Economists' appointed at Wye College, Reading, Cambridge, then Aberystwyth, Bristol, Newcastle & Manchester Universities, + Sutton Bonnington, Harper Adams, and Seale-Hayne agricultural colleges
- Agricultural Economics Society founded, Oxford University, 1926
- The first Farm Management Survey for England and Wales, 1926
- International Association of Agricultural Economists founded, Dartington Hall, Devon, 1929

(MIS?)UNDERSTANDING 'THE FARM PROBLEM'

Building capacity to analyse and advise (Stage 1): Data – and birth of a myth?

Evidence from the Great Depression, 1929-33

USA Manufacturing output as a whole declined by more than a third, while iron and steel output declined by 70% and machinery, 60%.

In 1932, farm output was actually higher than in 1929.

In 1933, agricultural output was only 6% below its 1929 level, and that decline was in substantial part due to poor weather in the Great Plains area.

Source: D. Gale Johnson, 'The Nature of the Supply Function for Agricultural Products', *American Economic Review*, Vol. XL, No.4, September 1950, pp. 539-564

UK In the UK, farm output increased by around 10%

Source: P. Brassley, 'Output and technical change in twentieth century British agriculture', *Agricultural History Review*, Vol. 48, No. 1, 2000, pp. 60-84

Conclusion: Farmers are irrational – they do not respond to normal economic incentives
(No wonder farm net incomes are relatively low!)

UNDERSTANDING 'THE FARM PROBLEM'

Building capacity to analyse and advise (foundation for Stage 2): Economics and farming

1. In general, what *is* economics?

- ✓ “The science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”

Lionel Robbins, *An Essay on the Nature and Significance of Economic Science*, 1932.

- ✓ “The study of mankind in the ordinary business of life.”
(NB: Marshall’s ground-breaking contribution: **marginal analysis**)

Alfred Marshall, *Principles of Economics*, 1890

- ✓ Fundamentally, economics is about the wellbeing of people

Sources: many, especially contemporary

2. Specifically, what is *agricultural* economics?

- ✓ **Economics applied to problems of individual farm and agricultural sector production**, also the wider food industry, related resources, and international trade in agricultural and food products

ANALYSING 'THE FARM PROBLEM'

Building capacity to analyse and advise (Stage 2): Economics and farming

3. (See text highlighted, previous slide): Economics applied to problems of individual farm and agricultural sector production defines

Agricultural production economics

Indelibly associated with **Professor E.O. Heady (1916-1987)**, Iowa State University



"Writing in longhand—working until 2 a.m. every night—he produced 26 books and about 800 journal articles, research bulletins, and monographs. Best known was his textbook, ***Economics of Agricultural Production and Resource Use (1952)***, better known as "the Bible of Agricultural Economics," which was translated into languages that spanned the globe.

In 1982, a new economics building at Iowa State University (ISU) was dedicated as Heady Hall, and its bronze plaque proclaimed, "Few have done so much to improve the well-being of so many throughout the world."

Source: The Biographical Dictionary of Iowa, Iowa State University

HEADY

ECONOMICS
of
AGRICULTURAL
PRODUCTION
and
RESOURCE
USE

PRENTICE-HALL



ANALYSING 'THE FARM PROBLEM'

Building capacity to analyse and advise (Stage 2): Economics and farming

3. (See text highlighted, previous slide): Economics applied to problems of individual farm and agricultural sector production defines

Agricultural production economics

Indelibly associated with **Professor E.O. Heady (1916-1987)**, Iowa State University

is, above all, about **solving real world problems** in agricultural production

Problems defined

“ 1. A problem is manifest in terms of doubt, confusion, or uncertainty that faces individuals in society, usually by expression of felt difficulties by individuals or groups.

2. A problem can be said to exist in terms of a departure from ideal or optimum conditions.”

Source: E.O. Heady, Implications of particular economics in agricultural economics methodology, *Journal of Farm Economics*, 31:4, Part 2, 1949



ANALYSING 'THE FARM PROBLEM'

Lesson 1.

The general economic system



ANALYSING 'THE FARM PROBLEM'

Lesson 1.

The general economic system



Production

The process of transforming resources into products

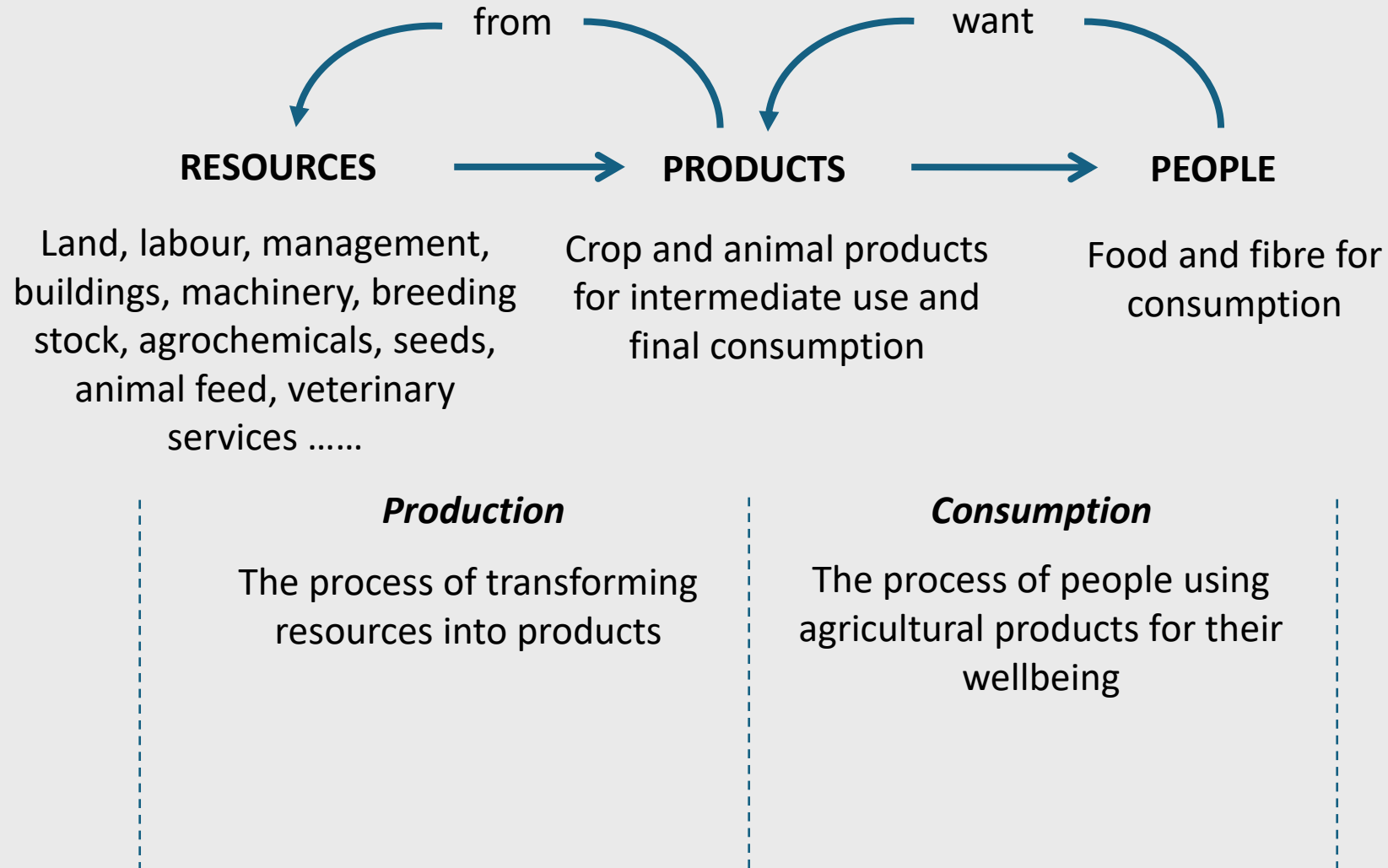
Consumption

The process of people using products for their wellbeing

ANALYSING 'THE FARM PROBLEM'

Lesson 2.

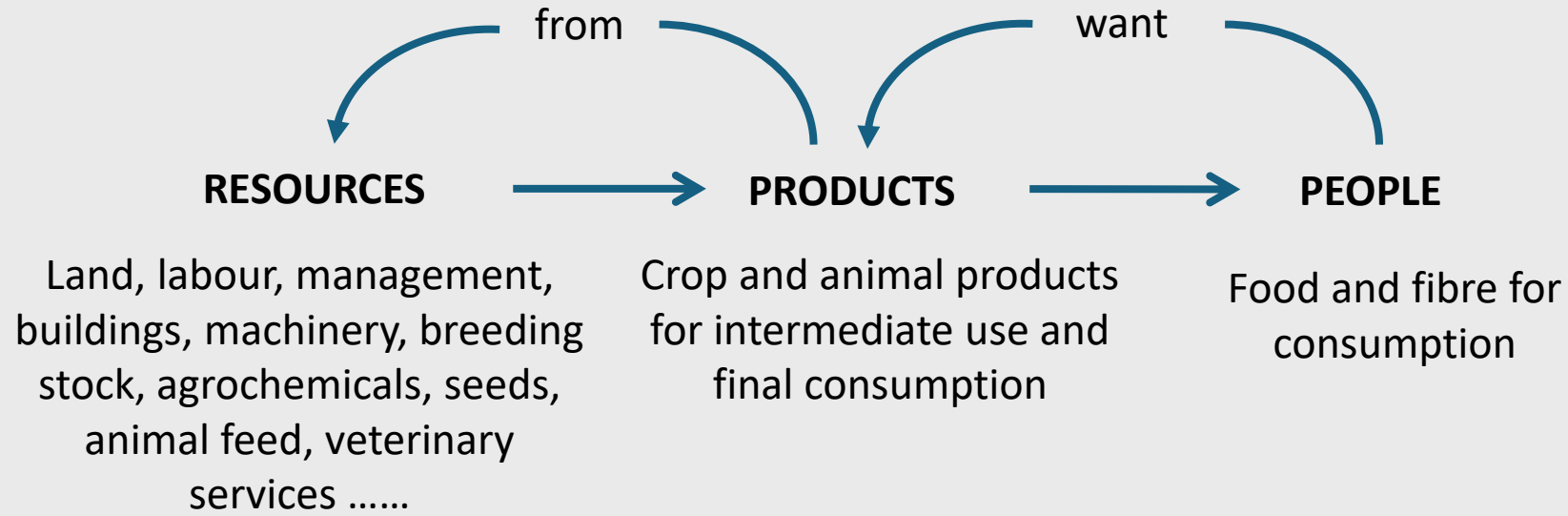
The agricultural economic system



ANALYSING 'THE FARM PROBLEM'

Lesson 2.

The agricultural economic system



Production

The process of transforming resources into products

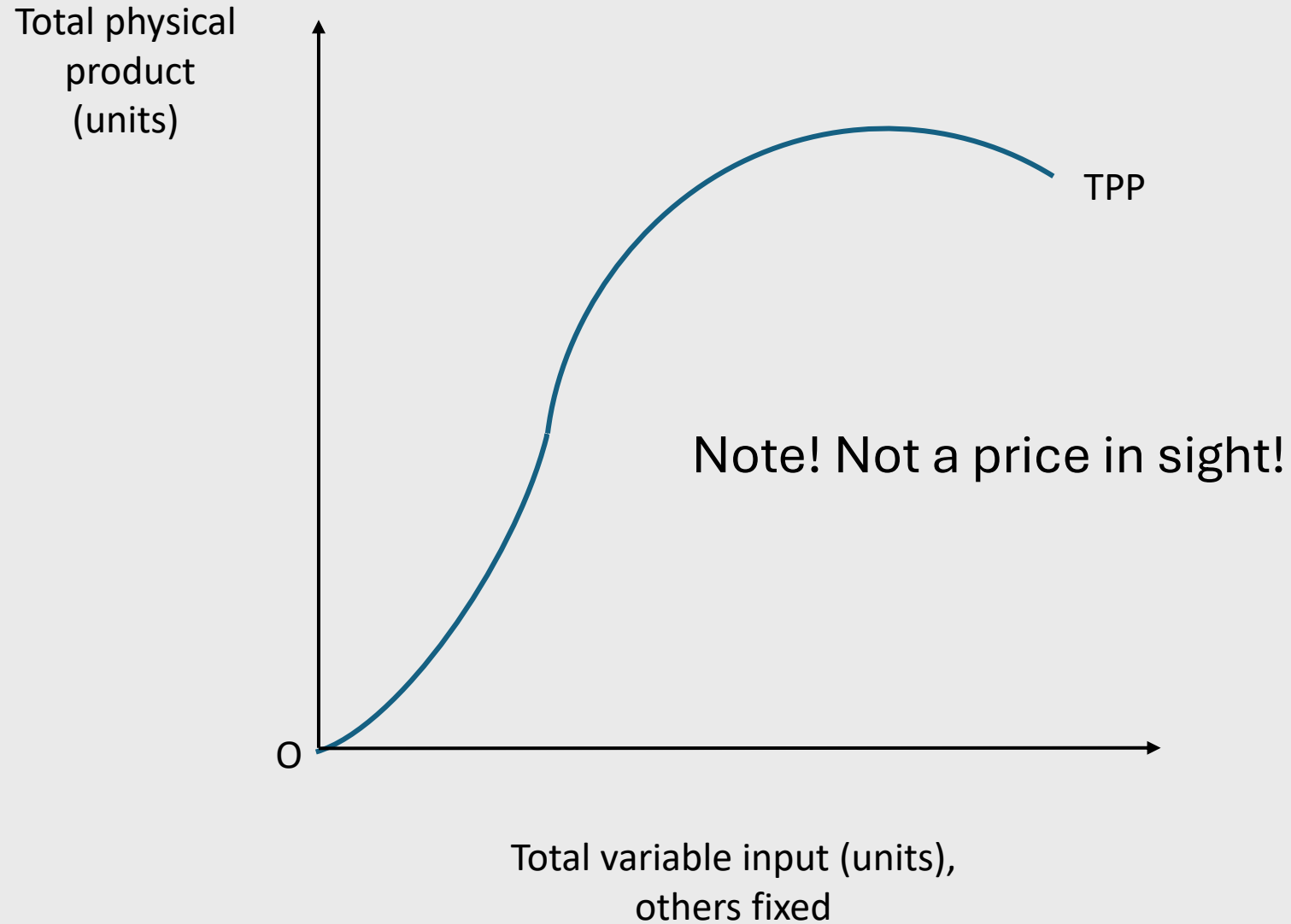
**AGRICULTURAL
PRODUCTION ECONOMICS**

Consumption

The process of people using agricultural products for their wellbeing

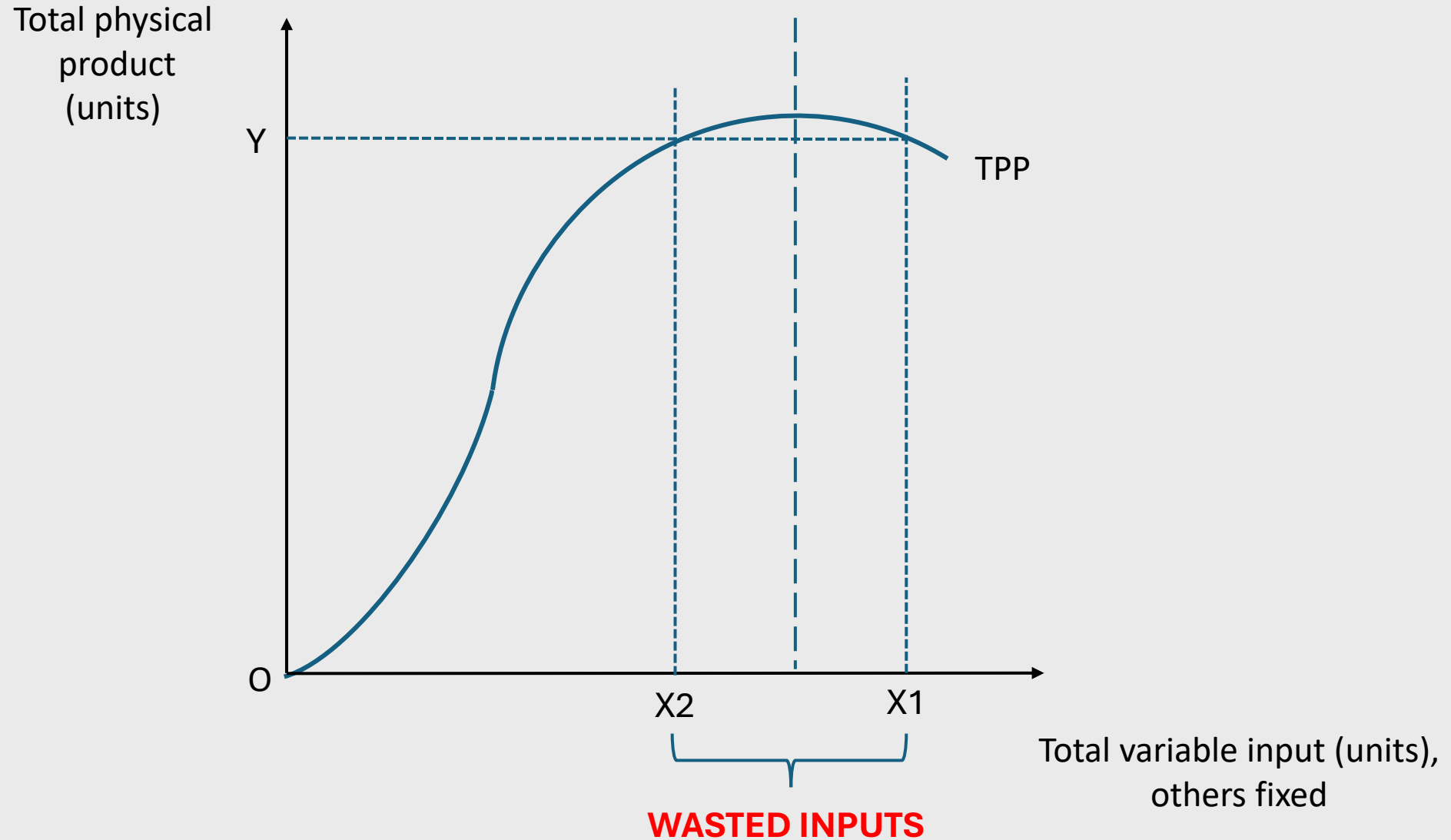
Lesson 3.

The logic of economic decisions in agricultural production



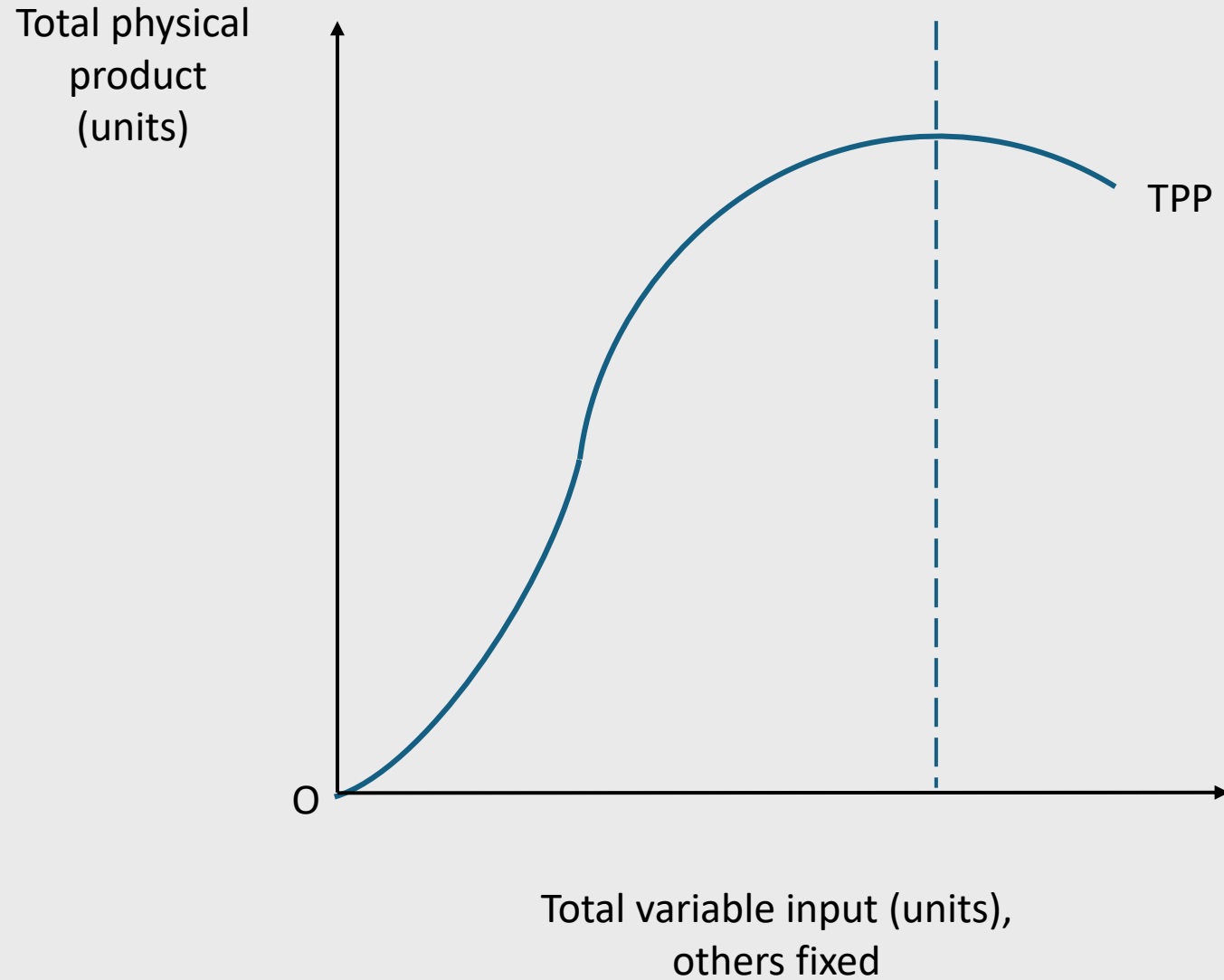
Lesson 3.

The logic of economic decisions in agricultural production



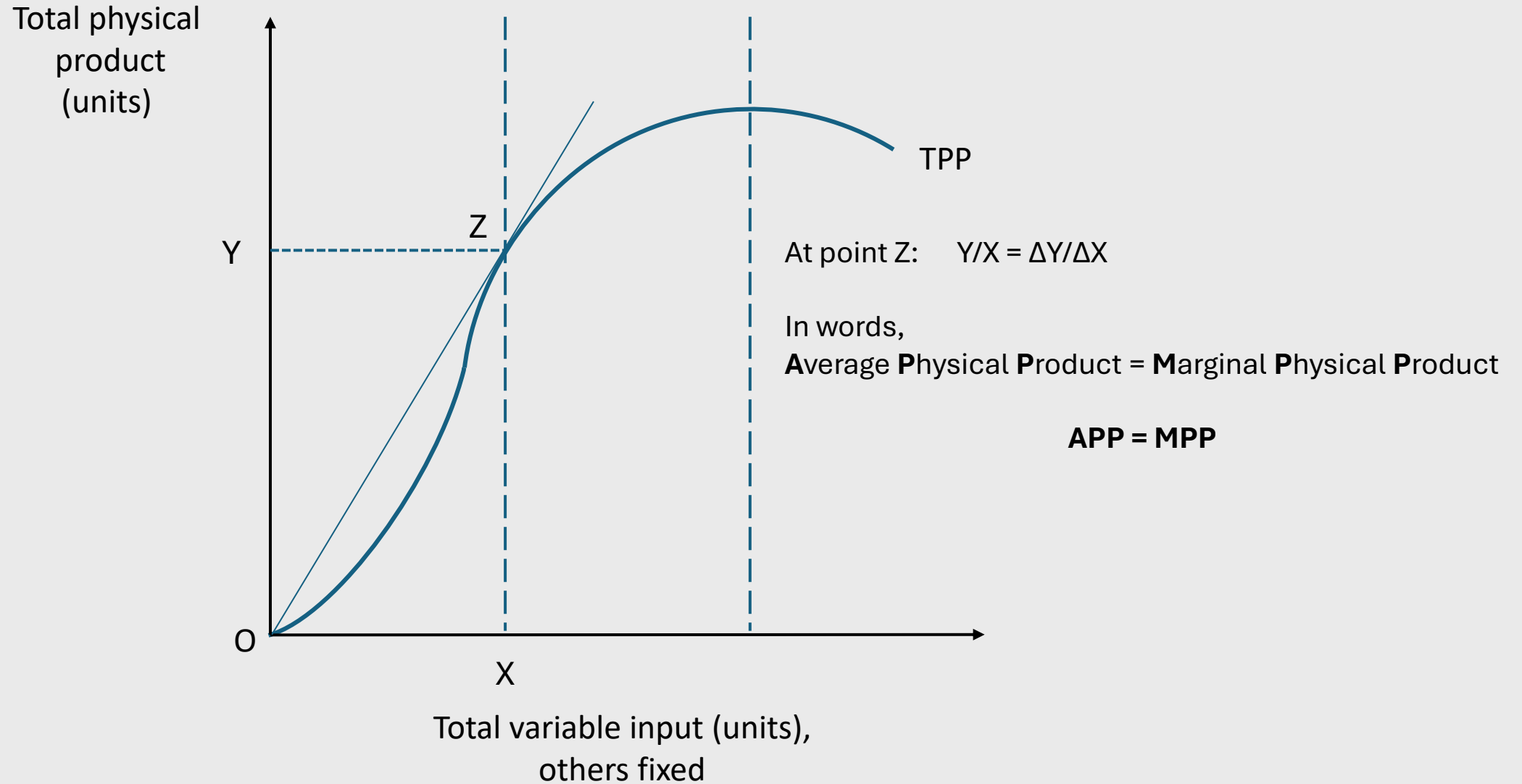
Lesson 3.

The logic of economic decisions in agricultural production



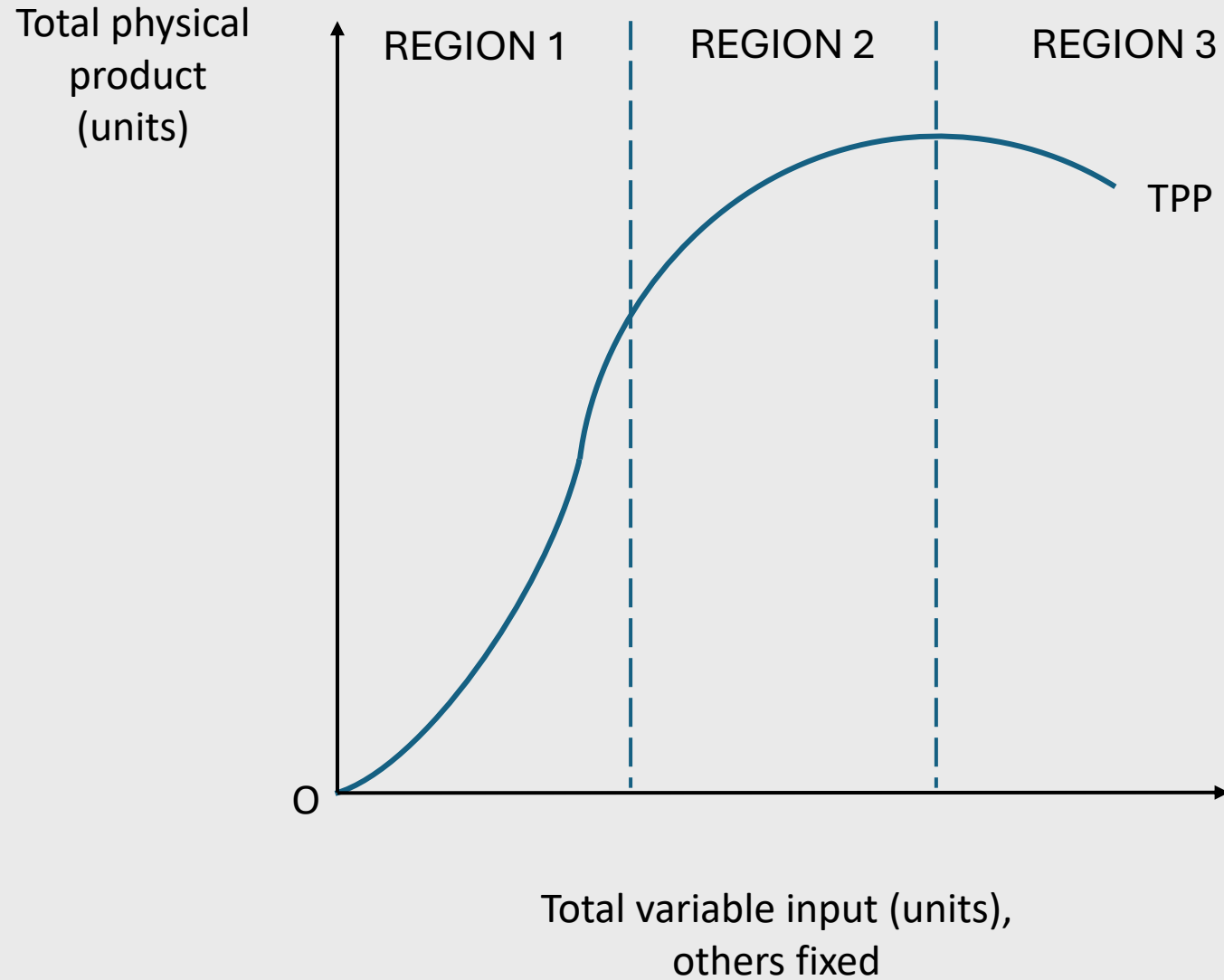
Lesson 3.

The logic of economic decisions in agricultural production



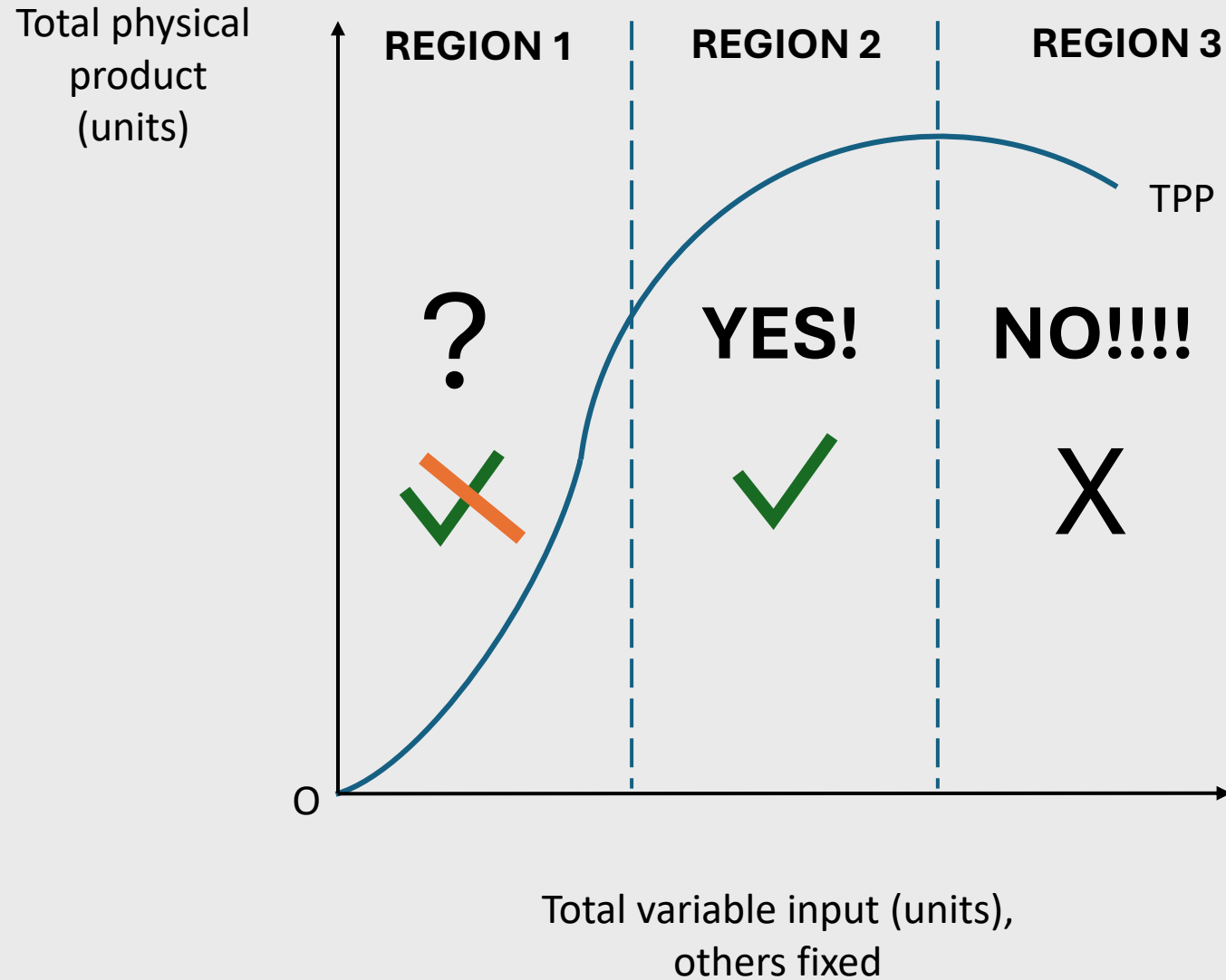
Lesson 3.

The logic of economic decisions in agricultural production



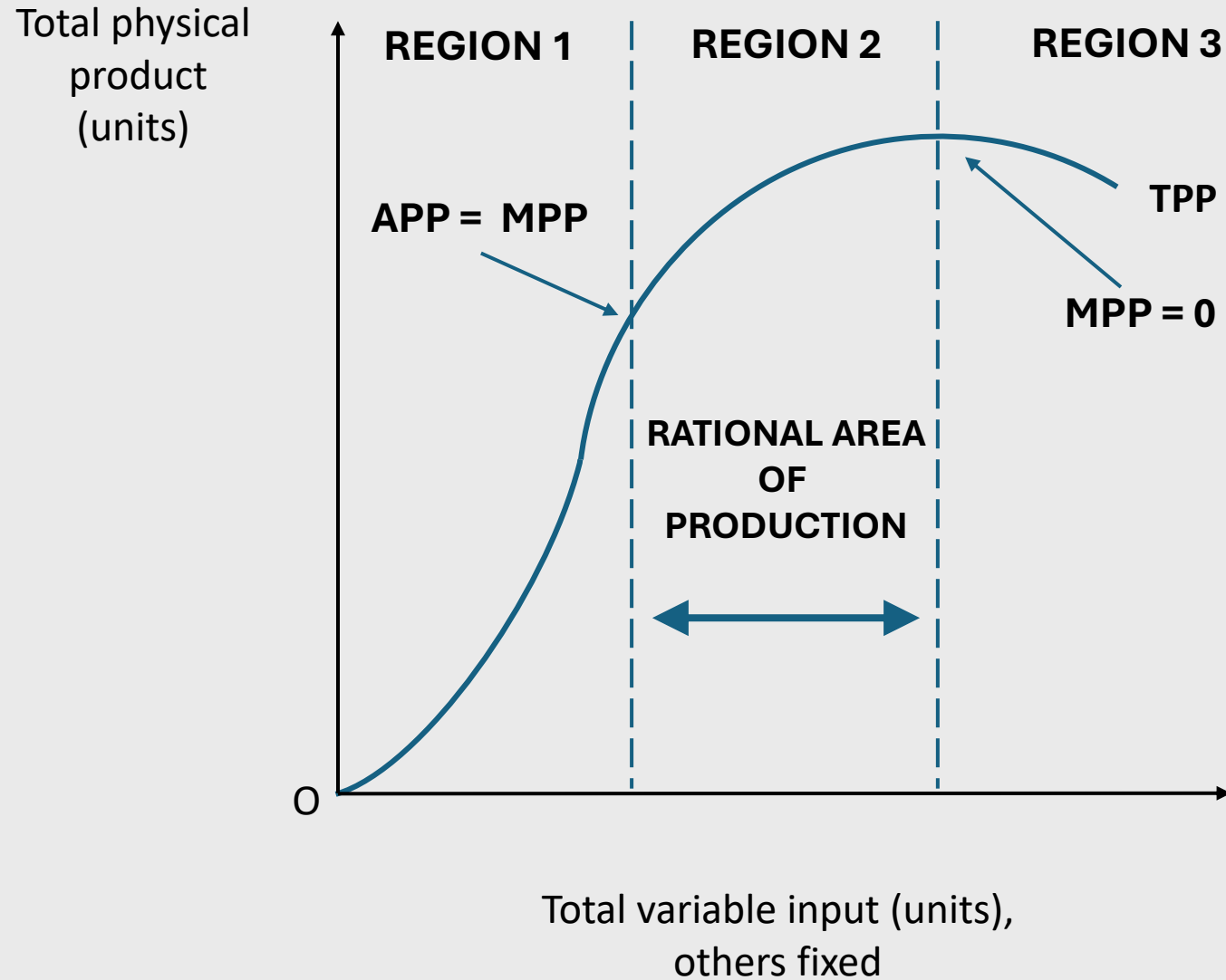
Lesson 3.

The logic of economic decisions in agricultural production



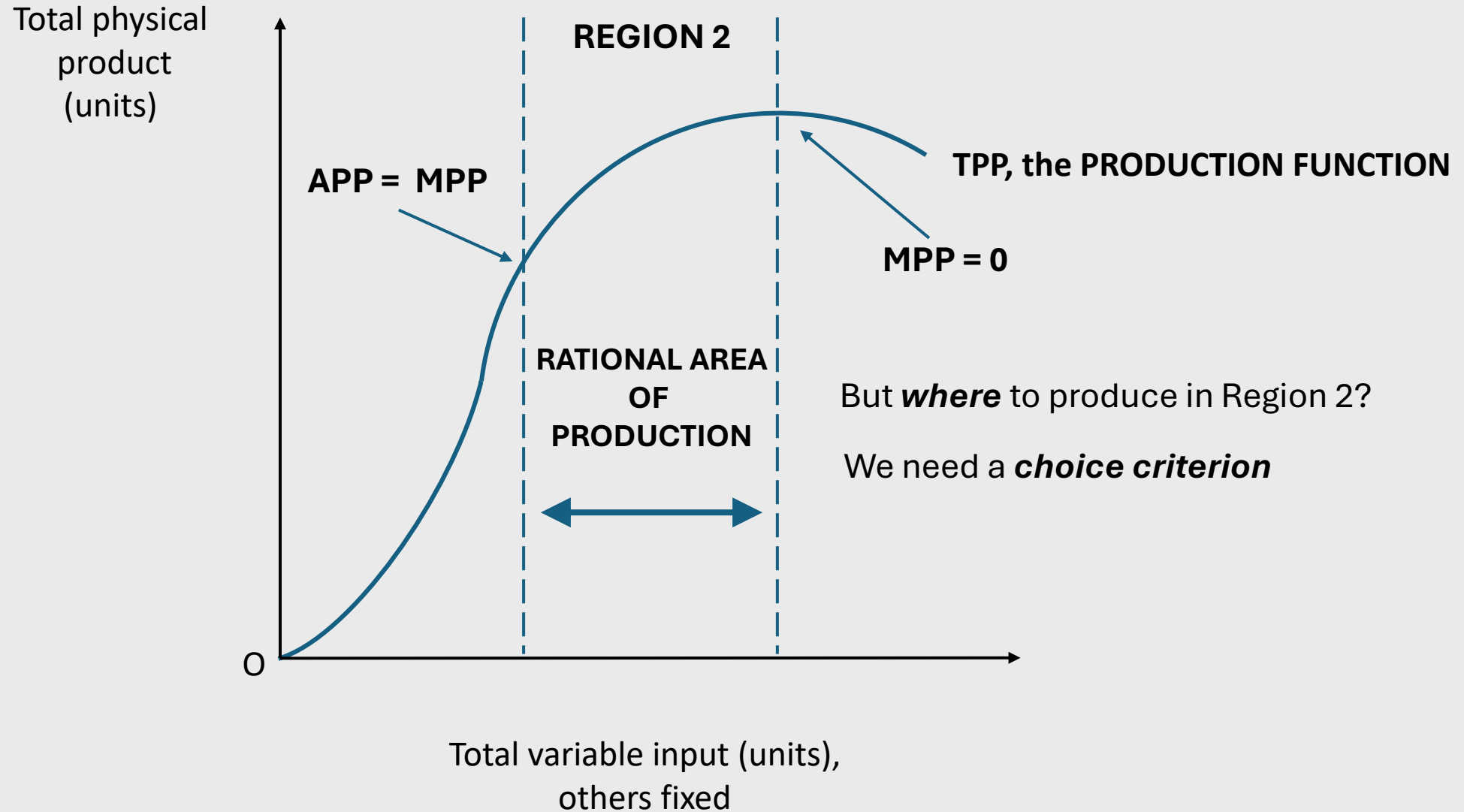
Lesson 3.

The logic of economic decisions in agricultural production



Lesson 3.

The logic of economic decisions in agricultural production



Lesson 3.

The logic of economic decisions in agricultural production

NOTATION

(outputs and inputs are in physical units)

Y	total output
ΔY	increment change in output
P_Y	price per unit output
X	total input
ΔX	increment change in input
P_X	price per unit input
(called marginal factor cost to distinguish from marginal cost per unit output, MC)	

CHOICE CRITERION

(for optimal economic efficiency)

$$\frac{P_X}{P_Y} = \frac{\Delta Y}{\Delta X}$$

In words, the **F**actor/**P**roduct **p**rice ratio = **M**arginal **P**hysical **P**roduct

$$\mathbf{FPPR = MPP}$$

or

$$P_X = P_Y \cdot \left[\frac{\Delta Y}{\Delta X} \right]$$

In words, **M**arginal **F**actor **C**ost = **M**arginal **V**alue **P**roduct

$$\mathbf{MFC = MVP}$$

If $MFC < MVP$ use more input to produce more output

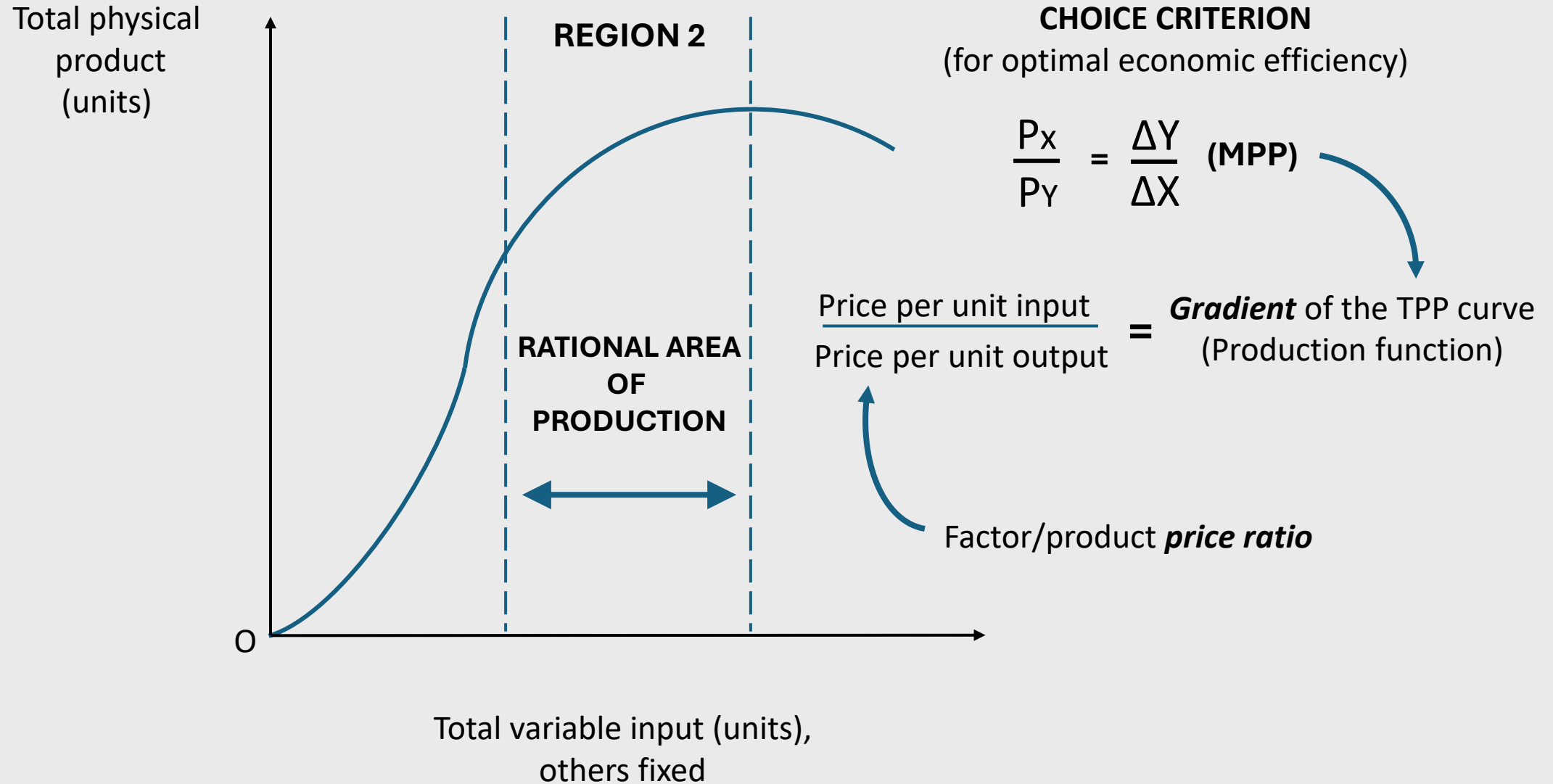
If $MFC > MVP$ use less input to produce less output

If $MFC = MVP$, optimal input use, total net margin from production maximised

Remember! The sum of marginal amounts = total amount

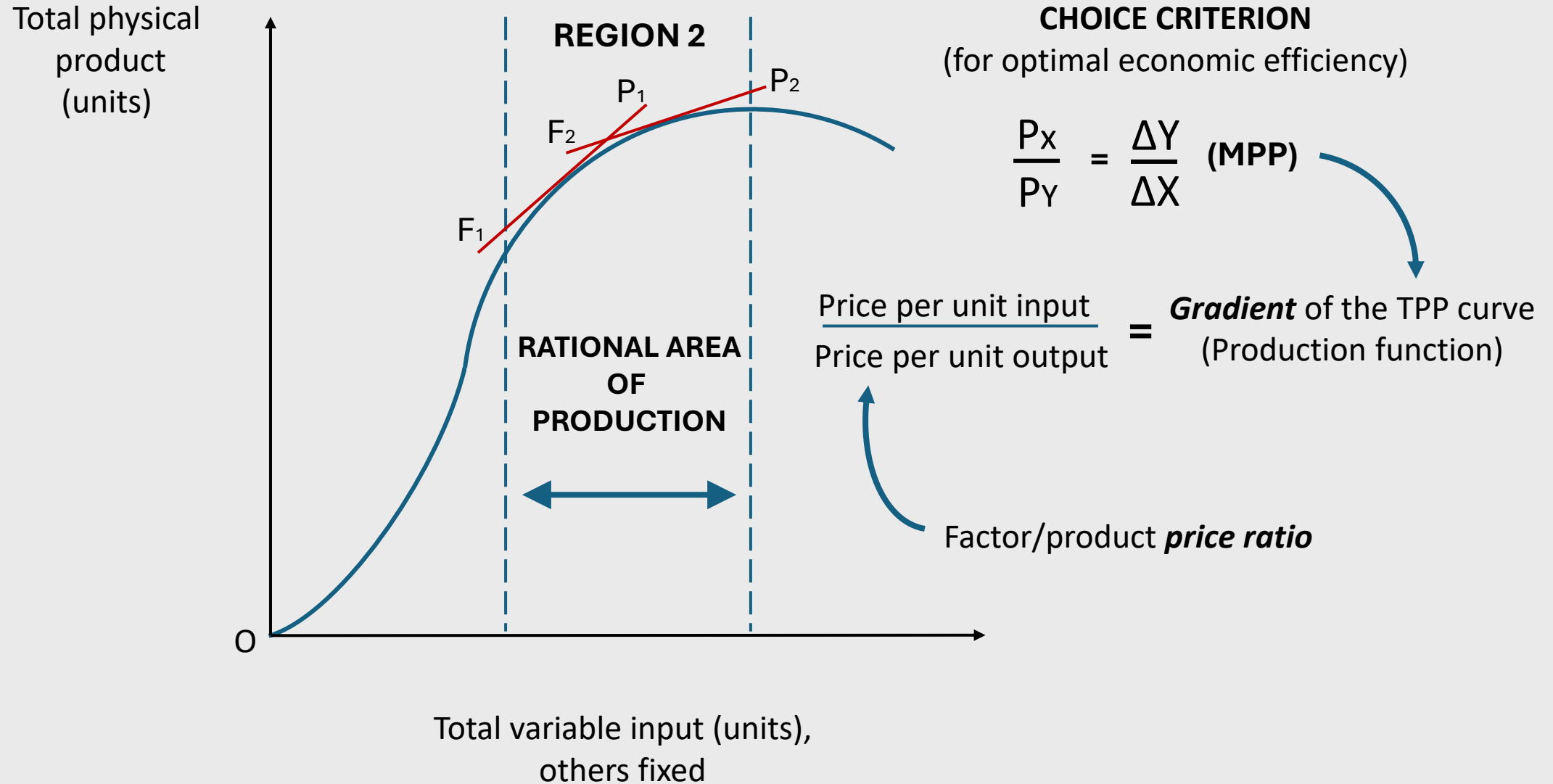
Lesson 3.

The logic of economic decisions in agricultural production



Lesson 3.

The logic of economic decisions in agricultural production



Lesson 3.

The logic of economic decisions in agricultural production

QUESTION

In what circumstances should a farmer aim to maximise output?

(Clue: There are at least two)

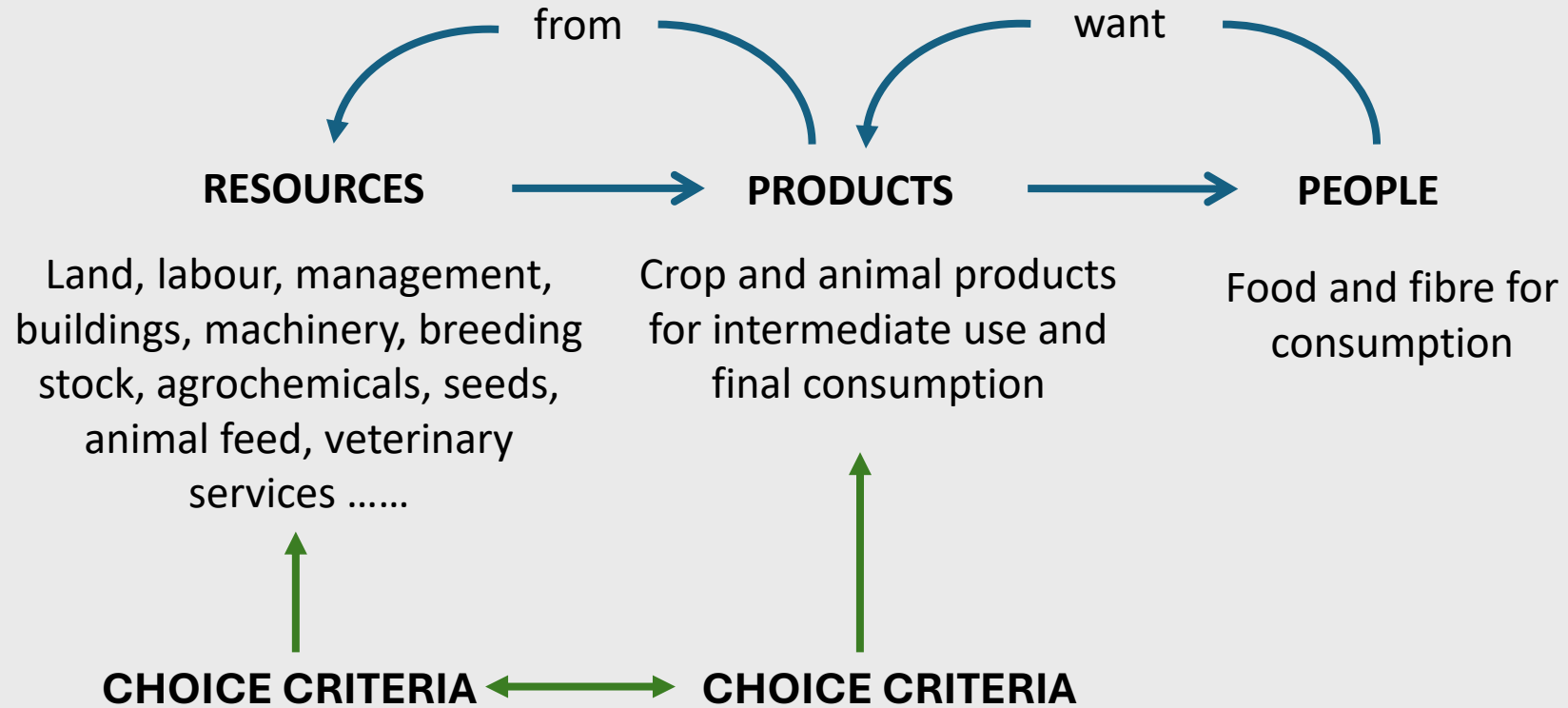
Answers:

- If the variable input is free
- If the production function is linear (i.e. no diminishing returns) and $MFC < MVP$
- If the farmer is very wealthy or has alternative sources of income, and economic inefficiency doesn't matter

ANALYSING 'THE FARM PROBLEM'

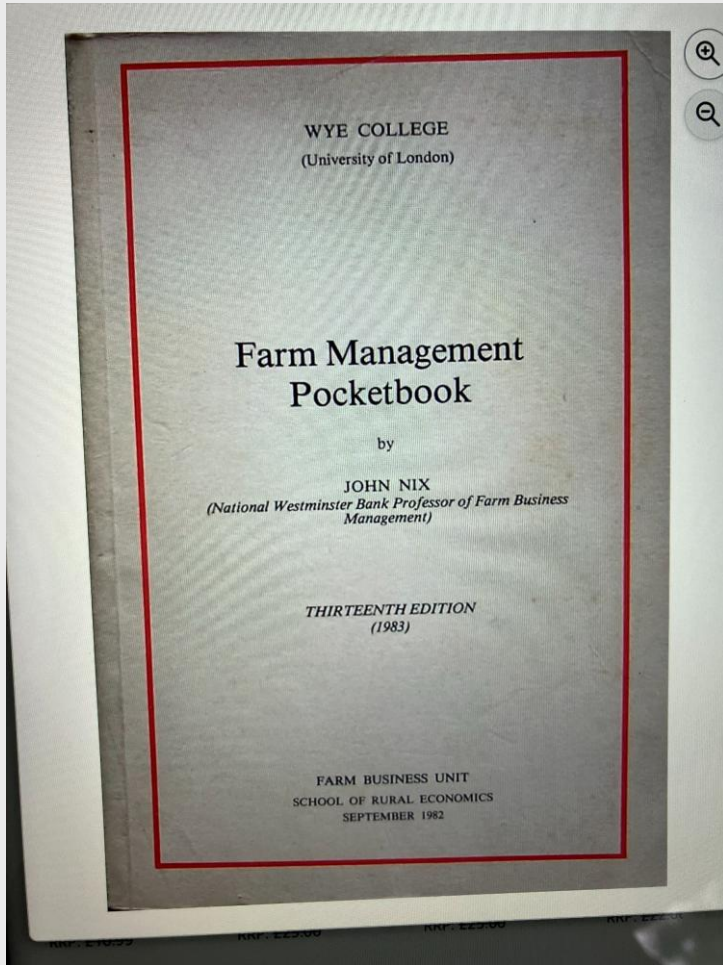
Lesson 2.

The agricultural economic system



Lesson 4.

From principles to practice

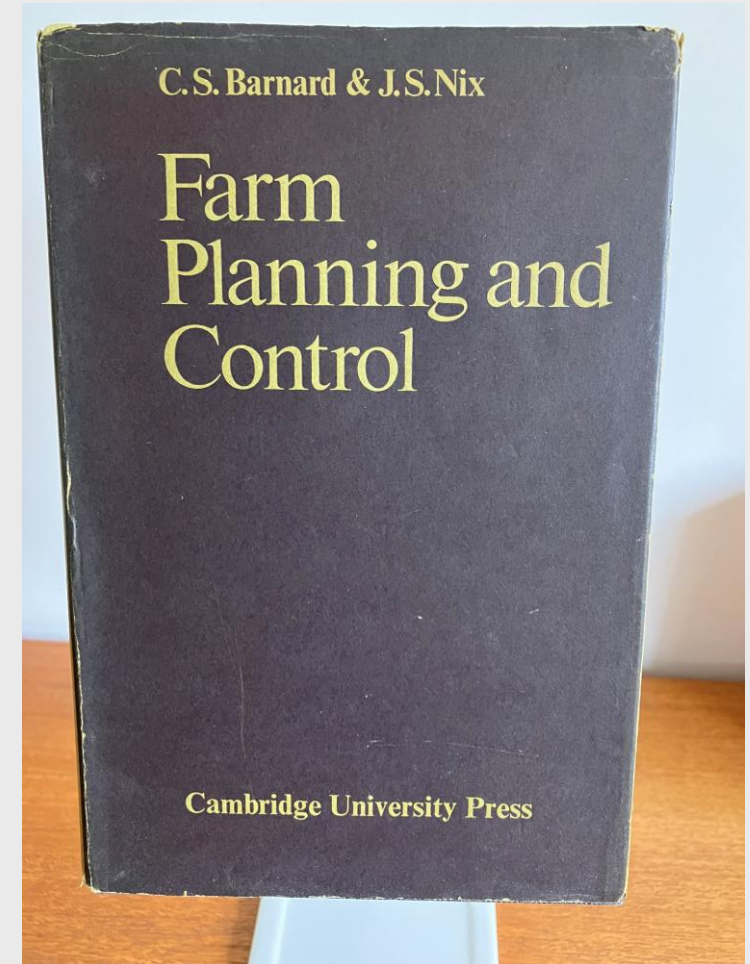


First edition 1966, sales estimated at 250,000 copies by the time he retired in 1989. 57th edition in 2026, now known as the *Nix Pocketbook for Farm Management*, published by The Anderson Centre.

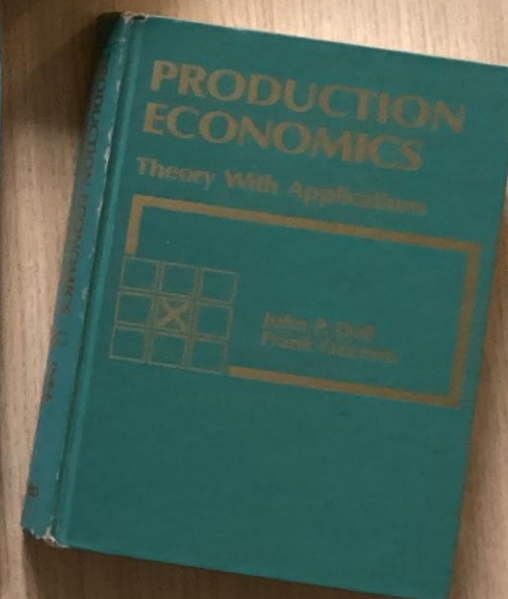
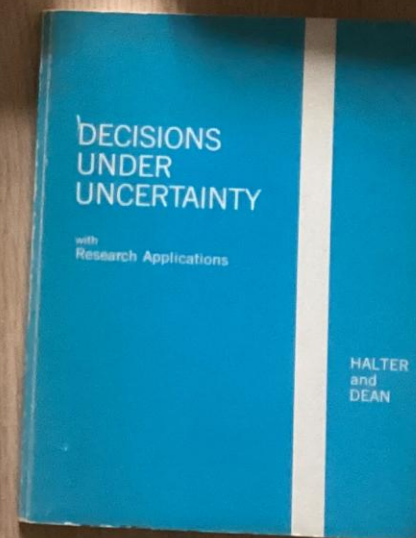
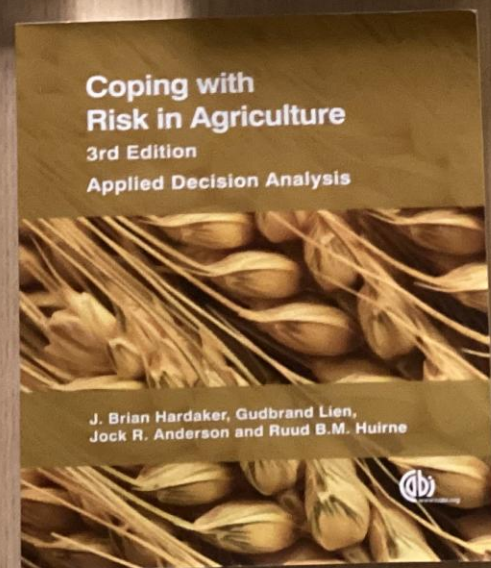
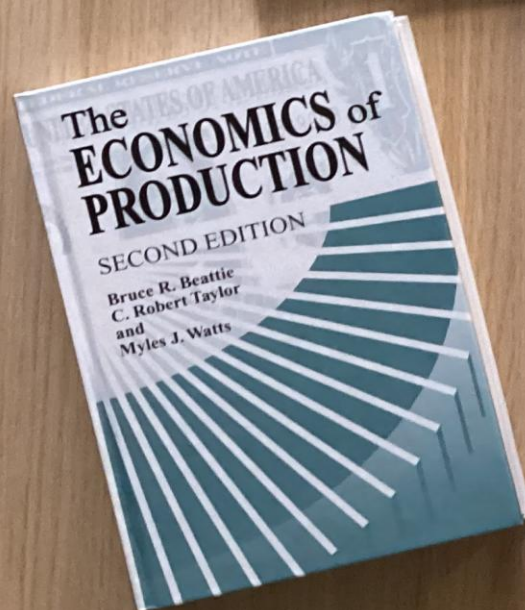
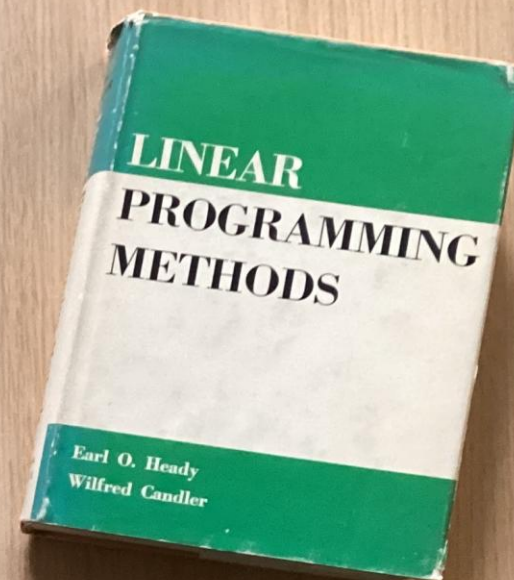
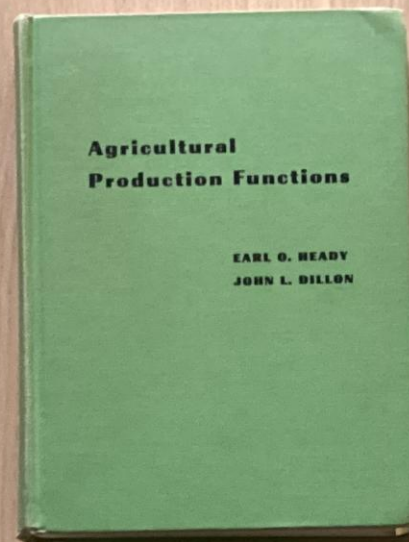
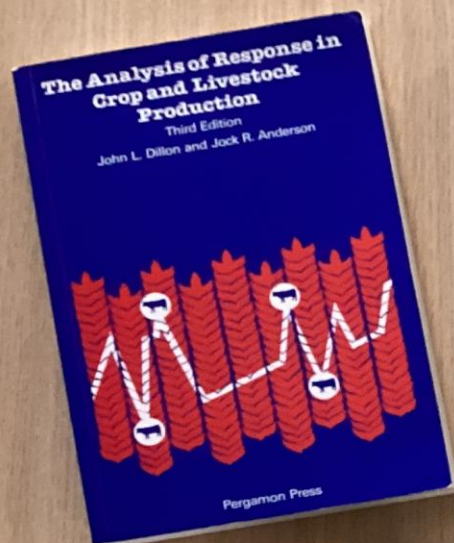


**John Nix
(1927 -2018)**

Professor of Farm Business Management,
Wye College, University of London



Published 1973. Chapter 2. 'Basic principles and concepts of planning' covers principles outlined in this presentation, and more.



ADDRESSING 'THE FARM PROBLEM'

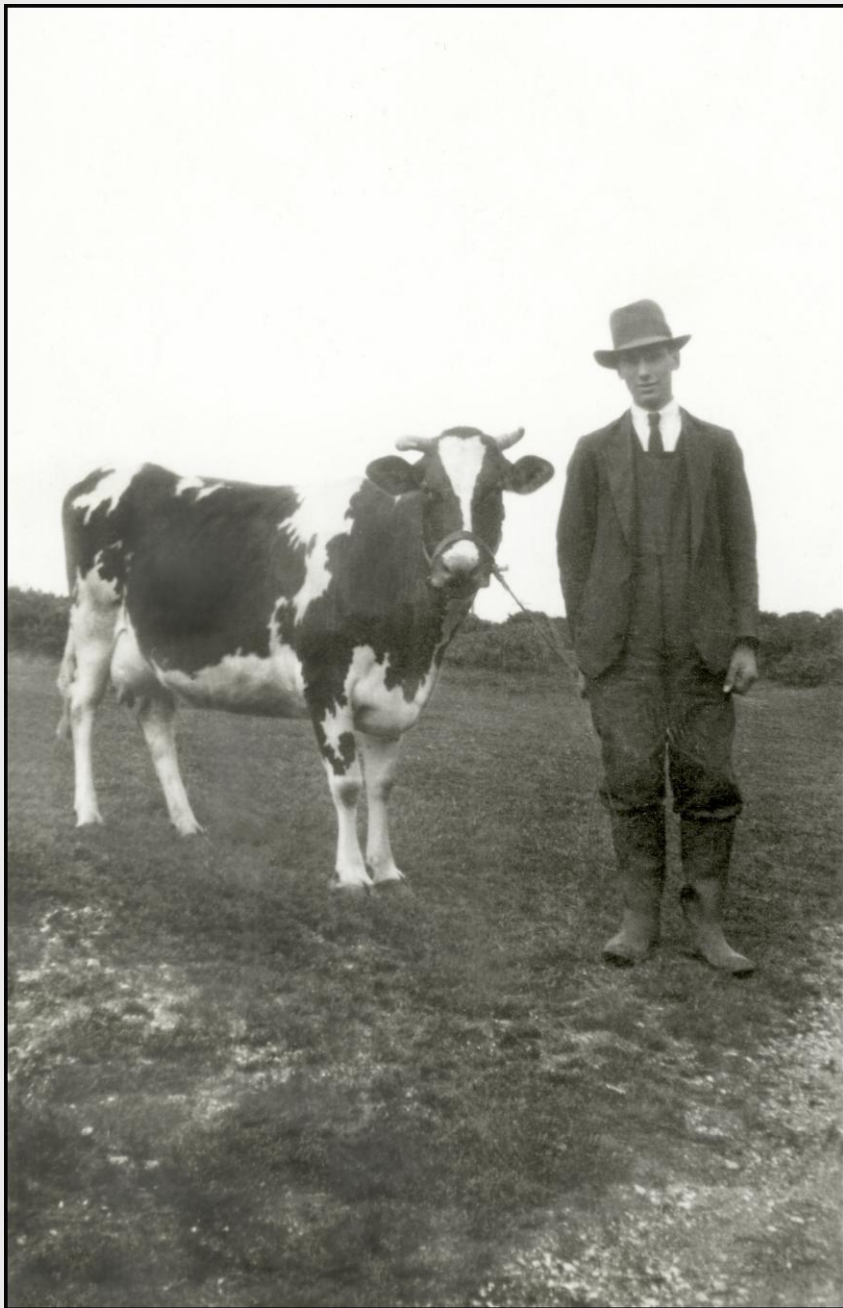
Building capacity to analyse and advise (Stage 2) – and solve the problem?: Institutions

- **1946 National Agricultural Advisory Service (NAAS)** begins. *Purpose:* accelerate post-war food production, improve food security, and ensure the widespread adoption of modern agricultural technology. *Method:* free-of-charge scientific and technical advice to farmers
- **Provincial Agricultural Economics Service (PAES).** Extension of pre-war arrangements to a) liaison with NAAS, b) “training NAAS officers in farm management and in the use of economic tools for measuring production and efficiency of the farm”. Integrated with universities/colleges which conduct FMS/FBS + special studies.
- **1947 Agriculture Act.** *Purpose:* provision of guaranteed prices and assured markets for produce; “a stable and efficient agricultural industry capable of producing such part of the nation's food and other agricultural produce as in the national interest it is desirable to produce in the United Kingdom; producing it at minimum prices consistently with proper remuneration and living conditions for farmers and workers in agriculture and an adequate return on capital invested in the industry.” *Method:* Guaranteed Prices and Deficiency Payments for main agricultural products (not horticulture)
- **1971 NAAS becomes Agricultural Development and Advisory Service (ADAS).** Focus becomes on group rather than individual farm advice. Privatised 1997. Part of RSK Group 2016
- **1973 UK joins European Communities (EC), adopts Common Agricultural Policy (CAP), and quits 2016**

WHERE ARE WE NOW? - A NEW 'FARM PROBLEM' WITH 21ST CENTURY CHARACTERISTICS

- Agricultural economic analysis identifies and measures the financial and economic costs of price support mechanisms. End of agricultural price supports for farm output, free trade agreements with third countries. Risk and uncertainty reintroduced to farming by climate change & price levels depending on global demand determined by population, income growth and distribution, peace and war.
- Farm Business Survey now under Defra contract with Promar, environment supersedes agricultural commodity price support, becomes ADAS focus within RSK, separate and complementary to the Society of Agriculture (came into existence 1/1/2026), a merger of The Institute of Agricultural Management (IAgrM) and British Institute of Agricultural Consultants (BIAC)
- ELMS – public expenditure for public goods, problems of valuing non-market goods and services (a focus for environmental economics), need to recognise that farmers rationally look at business decisions in terms of the best combinations of agricultural and environmental products for in the light of financial remuneration.
- Where are the analysts to help them? Agricultural economics – notably production economics – hardly exists in the UK today. Where shall we find its practitioners?
- Until we do, policy objectives will remain unachievable aspirations.

DISCUSS!



THE END!



APPENDIX 1

STRUCTURE OF UK FOOD & AGRICULTURE – PRODUCERS & RETAILERS

Farmers are price-takers, they lack market power. Why?

Number of farm holdings, 2025	212,000	c50% < 20 ha
Number of agricultural & forestry machinery manufacturing industries, UK	731	
- of which major global conglomerates for 'high-end tractors and combines'	10 to 15	
Number of animal feed manufactures and compounders	360	
Supermarkets and major grocery retailers	85-90% of all sales	
- of which Tesco, Sainsbury's, Asda, Morrisons	65-67% of all sales	

Sources: Defra via GOV.UK, Companies House

APPENDIX 2

THE LIMITS TO THE AGGREGATE DEMAND FOR FOOD

In a celebrated quote, Adam Smith noted that people's total demand for food inevitably must be limited. A modern, more nuanced, equivalent is to say that in high income market economies, the aggregate price elasticity of demand for people's food consumption in total is low. We may substitute *between* individual food items but cannot consume more in *total* volume than our bodies allow. That is a problem when technological progress increases the productivity of agricultural resources (see Appendix 3)

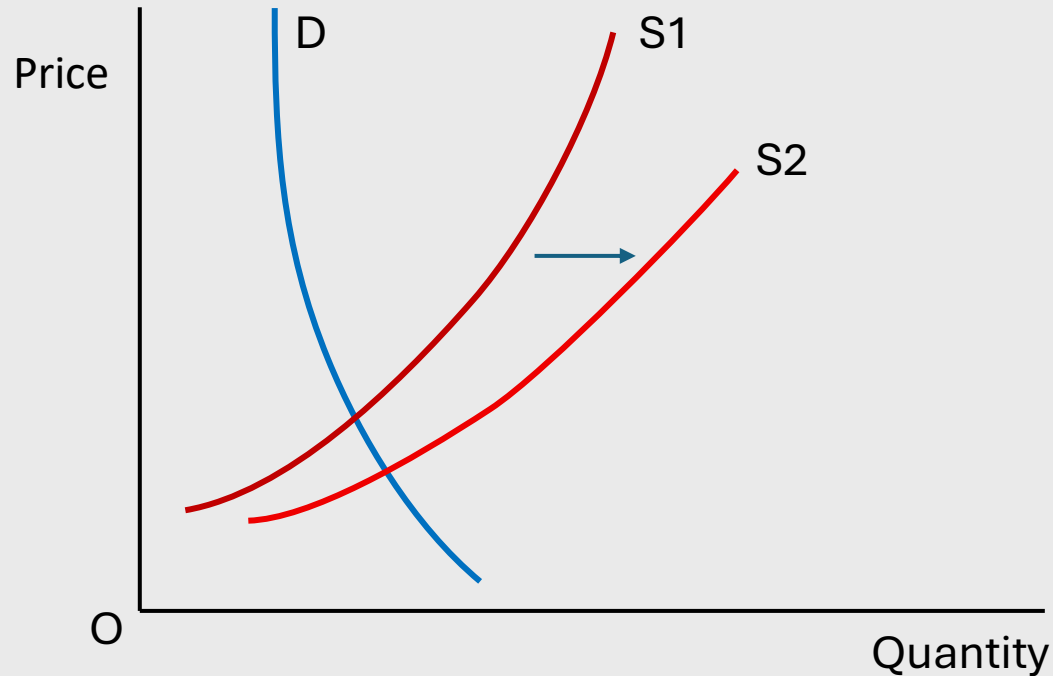
“The rich man consumes no more food than his poor neighbour. In quality it may be very different, and to select and prepare it may require more labour and art; but in quantity it is very nearly the same.**The desire of food is limited in every man by the narrow capacity of the human stomach; but the desire of the conveniences and ornaments of building, dress, equipage, and household furniture, seems to have no limit or certain boundary.**

Source: Adam Smith, *The Wealth of Nations*, Everyman's Library, Book 1:XI,1991, page 149 (first published 1776)

APPENDIX 3

TECHNOLOGY AND THE SUPPLY OF AGRICULTURAL PRODUCTS

Formally, a production function (see slide 15 and on) is defined for a given technology. Technological progress increases productivity, the ability to produce more output from a given quantity of inputs. The effect is to shift **production functions upwards**, and because market supply is the aggregate of individual (farm level) effects, it can be shown that the **market supply curve shifts rightwards**.



Market diagram for an agricultural product
subject to technological progress

- D demand curve for the product
- S1 supply curve before technological progress (TP)
- S2 supply curve after technological progress (TP)

Exercise

1. What is the consequence of TP for a) market price, b) quantity produced and consumed?
2. What is the consequence of government introducing a policy instrument which maintains post-TP price at the pre-TP price level?

FURTHER READING

Barnard, C.S. & Nix, J.S. 'Farm Planning and Control', Cambridge University Press, 1973

Bishop, C.E. & Toussaint, W.D. 'Introduction to Agricultural Economic Analysis', John Wilkey & Sons, 1958

Cochrane, W.W., 'The Development of American Agriculture: A Historical Analysis',
University of Minnesota Press, 1981 (second printing)

Heady, E.O., 'Economics of Agricultural Production and Resource Use', Prentice-Hall inc., 1952

Howe, K.S., 'Farming Myths and Reality', *Exmoor Review*, Volume 62, 2021

Jensen, H.R., 'Farm Management and Production Economics', in *A Survey of Agricultural Economics Literature*, Martin, L.R. (ed.), Volume 1, 1977

Ministry of Agriculture & Fisheries, 'Report on the National Agricultural Advisory Service: The First Eight Years, 1946-1954', Her Majesty's Stationery Office, 1955

Tracy, M. 'Government and Agriculture in Western Europe 1880-1988', New York University Press, 1989 (Third Edition)

Venn, J.A. 'The Foundations of Agricultural Economics', Cambridge University Press, 1933 (Second Edition)

Williams, H.T. (ed.) 'Principles for British Agricultural Policy', Oxford University Press, 1960