

foreign national governments and local farmers who face growing food insecurity.

Activities

- 1 Referring back to the definition of food security on page 409, identify further examples of the physical and socio-economic factors that affect food security. Include a brief summary of the nature of the impact (is it positive or negative?).
- 2 What are the advantages and disadvantages of land acquisitions for target and investor countries? Relate your points to specific country examples and present your findings to the class.

Theoretical positions on food security

Thomas Malthus

Thomas Malthus based his 'Essays on the Principle of Population Growth' (first published in 1798) on the theory that an optimum population exists in relation to food supply and that any increase in population beyond this threshold will lead to 'war, famine and disease'. His two principles were:

- In the absence of checks, human population will grow at a geometric rate (i.e. 1, 2, 4, 8, 16, etc.). On such a basis population will double every 25 years.

- Yet food supply increases only at an arithmetic rate (i.e. 1, 2, 3, 4, etc.). Thus population growth would inevitably outstrip the growth in food supplies.

Malthus argued the 'natural checks' to population growth of famine, war and disease could be avoided only if people adopted 'preventative checks' such as abstinence and later marriage to control fertility.

However, Malthus's doom and gloom prophesy has proved inaccurate. In the past two centuries food production has increased massively thanks to new high-yielding crops (HYVs), new foods such as soya, the use of agrochemicals, greenhouses and polytunnels, and land reclamation (e.g. drainage of wetlands).

Esther Boserup

In 1965 Esther Boserup presented an alternative to Malthus's theory. She believed that although population growth would increase the demand for food, it would push up prices and incentivise farmers to raise production. This would be done by cultivating more land, using more advanced technology and intensifying production (e.g. by irrigation or multi-cropping).

Activity

Investigate recent events in relation to population and food supply, e.g. famines in East Africa, to assess the relevance of Malthus's theory.

Case study: Food security in India

Despite rapid economic growth in India in the past three decades, millions of Indians suffer poverty and hunger. Previously self-sufficient in wheat, India now imports vast quantities of grain because rapid population growth has led to 17 million extra people to feed each year.

India has a range of natural environments – mountains, deserts, grasslands, tropical and temperate forests. These give rise to a distinctive geography of agriculture (Figure 13.17). There are three major ecological zones: the Himalayan mountains to the north, the Indo-Gangetic Plain in the centre of the country and the Peninsular Plateau to the south.

The recent decline in food production in India is largely due to poor wheat harvests. The Punjab region in the northwest (Figure 13.18) occupies less than 2 per cent of the land area of the country yet produces two-thirds of its food grains (wheat and rice are the most common crops). Once called 'the bread basket of India', the Punjab

now faces a number of physical and human threats to food production.

Physical challenges

Water shortages

The Punjab's climate is semi-arid. Mean annual precipitation is around 630 mm and the annual temperature averages 21°C. The climate is divided into three seasons:

- Hot season (April–June).
- Rainy season (July–September, 70 per cent of the annual rainfall)
- Cold season (October–March)

Unreliable monsoon rains in the past sixteen years have caused frequent droughts. As a result, farmers have had to draw more groundwater to irrigate crops, accelerating decline in the water table. Eighty per cent of the groundwater sources are overexploited, with farmers having to drill ever-deeper wells. Expensive equipment

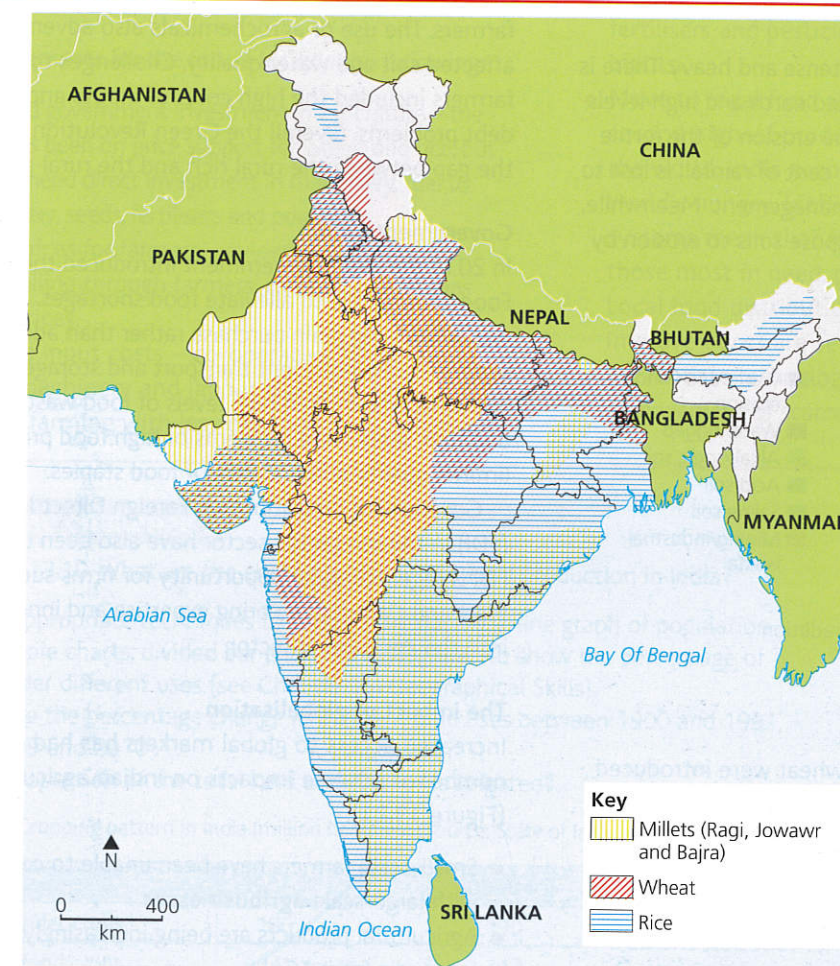


Figure 13.17 Map of food crops in India. Note overlap of crops in many areas (Source: www.mapsofindia.com)

has to be purchased to drill to such depths and the financial stress has led to high suicide rates among farmers and many leaving agriculture.

Increased temperatures due to climate change
Rising temperatures and more frequent

heatwaves have meant that wheat crops have reached their maximum heat tolerance. Vulnerability to short-term heat greatly reduces crop yields.

Extreme events such as floods and droughts are also occurring, exacerbating the fall in the water table across the region (Figure 13.19).

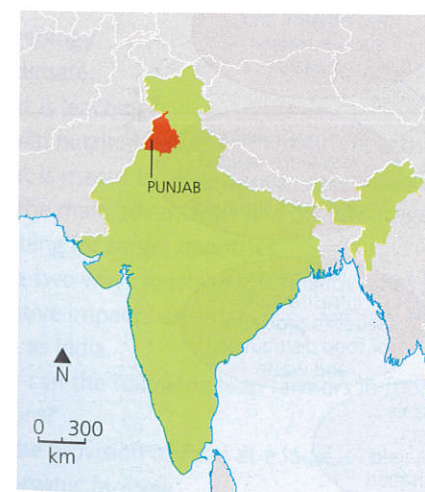


Figure 13.18 The Punjab region in northwest India



Figure 13.19 An Indian farmer in the Punjab carries a pitcher of water