Feeding India’s growing millions

By Mike Brown

Synopsis

India is expected to become the world’s most populous country by 2025, and have a population of 1.6 billion by 2050. However, feeding its present population of 1.2 billion is a concern for the government. It is estimated 270 million people are living in poverty. One in three malnourished child on the planet lives in India. How will India feed the extra 400 million people that are forecast to be living in India by 2050?

Malnutrition currently affects many of India’s poor and 40% of children in India are malnourished. Child malnutrition limits physical and mental development. It may lead to increase disease risk and early death in adulthood.

The increase in food demand comes from:

- Rise in population
- Increase urbanisation
- Changing diets, people eating a more varied diet.

The government of India has a food security policy that entitles 800 million people to subsidised food. The government gives farmers a guaranteed price for many of their products and subsidises farm inputs.

Food production could be increased by:

- Wasting less food by improving the supply chain
- Increase the use of technology and chemicals for farming
- Better water management and irrigation techniques.

Key terms

Crop yields, malnutrition, diet, food supply chain, farm subsidies, price guarantee, urbanisation, food security.

Learning objectives

This Geofile is about food security in India. This will help you to understand some of the issues that affect many developing countries with regard to food production, including:

- Malnutrition and its effects
- How governments can increase food supply and meet demand
- Changing demand for food as people’s life styles change
- How farmers can increase yields using new technology and new methods.

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Feeding India’s growing millions

Introduction
India’s current population of 1.2 billion makes it the second most populous country after China. However, as China’s fertility rate (number of children per woman) is lower than India’s, India’s population will continue to rise and will pass China’s by about 2025. By 2050 India’s population is expected to reach 1.6 billion (Figure 2). Every year adds approximately 15 million to India’s population. Meanwhile, poverty and malnutrition are high and the demand for food is increasing not just because of the population rise but also because of changing diets. Will India be able to feed its growing millions?

Malnutrition
- Globally, one in three malnourished child lives in India
- India has more malnourished children than sub-Saharan Africa.
- In urban areas 33% of children are malnourished.
- In rural areas 46% are malnourished
- In tribal areas this figure is 55%.

Malnutrition in childhood limits physical and mental growth. The child is less likely to do well in school and they are at greater risk of disease and early death when they become adults. This produces a vicious cycle where malnourished mothers give birth to underweight babies making them vulnerable to malnutrition and disease. Malnutrition affects females more than males as females have a lower social standing in a family.

Vitamin and mineral deficiencies are another consequence of malnutrition.
- Anaemia, lack of iron, affects 74% of children under three.
- Lack of iodine leads to learning difficulties
- Vitamin A deficiency causes blindness in children

Food security is a major issue for the country. 276 million people were below the poverty line in 2012. The government attempts to help

Figure 1 A rural farm in India
Source: Alison Tamlyn

Figure 2 India’s growing population, 1990–2050
Feeding India’s growing millions

Increase in food consumption

Population growth
As stated above, the population growth alone will create and extra 400 million people to feed by 2050. However, food production is increasing at a faster rate than population growth, which should lead to more food per person being available. Malnutrition will therefore decrease per person in the future.

Increased prosperity
Over the last 20 years India’s has been one of the world’s fastest growing economies with an average of 6.6% per year in real gross domestic product although in the past few years the growth rate has slowed as in the rest of the world.

Increased income levels have led to Indian’s eating a more diverse diet (Figure 3). In the last 20 years, food consumption has risen by 6% to 2300 calories per day; men need about 2500 and women 2000 calories per day. Cereal consumption has fallen slightly but there has been a rise in the consumption of oils and fats, fruits and vegetables and dairy products. Meat consumption is relatively low at about 17 calories per person per day compared to 462 calories person per day in China. Many Hindus do not eat meat.

Urbanisation
Urbanisation is the increase in the proportion of a country’s population living in cities. Incomes for people in urban areas are double those living in rural areas. In 1990 only 26% of India’s population lived in urban areas. By 2050 it is predicted that 52% will live in urban areas (Figure 4). Higher average incomes in urban areas mean that people spend more on food. In 2005 urban dwellers spent on average 32% more on food than people in rural areas. Urban people also have a more varied diet as they eat less grain but consume more milk, dairy products and other foods than rural people (Figure 3).

Agricultural production
65% of the Indian population are farmers. There is a powerful farming lobby that looks after the farmers’ interests. Politicians
often make promises to farmers at election times to buy their vote. Consequently farmers enjoy a lot of subsidies including free electricity and water, and cheap fertilisers. Farming productivity has been improving mainly due to research and development and the adoption of new technologies, for example better irrigation methods and modern machinery.

Most farms in India are small. 85% are less than 2 hectares.

Land degradation, a reduction in soil quality, is a major issue. Around 44% of India’s total farming area is damaged. The three main reasons are:

- water erosion, where soil is washed away
- waterlogging, when the soil contains too much water
- soil acidity.

This soil degradation is mainly due to farming practices that include poor crop rotation, over-use of fertilisers and lack of soil conservation measures.

The farmers get their water supply cheaply. There are few costs and no incentives for farmers to use the water wisely or in moderation, which leads to waterlogging and increased soil erosion.

In the Punjab region north west of Delhi, which is a major wheat-growing area, there are serious concerns about the falling level of the water table. Farmers are removing too much water from the ground. The water table in the Punjab decreased by an average of 75 cm per year between 2002 and 2006.

**Monsoon rains**

60% of planted agricultural areas rely on rainfall not irrigation water. The SW monsoon brings 80% of this rainfall. This monsoon is a moist air mass from over the Indian Ocean, providing most of the year’s rain between May and September. Figure 5 shows the relationship between rainfall totals and crop production. The highlighted years, with below-normal rainfall, show lower rice and wheat yields.

The state of Punjab has been teaching farmers to use soil moisture content instruments. These instruments have lead to a reduction in water use of 12–15%. In Gujarat, wheat farmers are testing a new type wheat grain that requires less water.

**Crop yields**

Crop yields in India are well below those of China (Figure 6). By using better farm technologies, it should be possible for India to increase its production of food:

- improved crop varieties and livestock genetics
- better use of fertiliser and feed
- mechanisation, more tractors for example
- chemicals to protect crops and animal health.

<table>
<thead>
<tr>
<th>Year</th>
<th>Status of monsoon</th>
<th>Production of rice (million tons)</th>
<th>Production of wheat (million tons)</th>
</tr>
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<tbody>
<tr>
<td>2002–03</td>
<td>Below normal</td>
<td>71.82</td>
<td>65.76</td>
</tr>
<tr>
<td>2003–04</td>
<td>Normal</td>
<td>88.28</td>
<td>72.11</td>
</tr>
<tr>
<td>2004–05</td>
<td>Below normal</td>
<td>83.13</td>
<td>68.64</td>
</tr>
<tr>
<td>2005–06</td>
<td>Normal</td>
<td>91.97</td>
<td>69.35</td>
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<tr>
<td>2006–07</td>
<td>Normal</td>
<td>92.76</td>
<td>74.89</td>
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<tr>
<td>2007–08</td>
<td>Normal</td>
<td>96.69</td>
<td>78.57</td>
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<tr>
<td>2008–09</td>
<td>Normal</td>
<td>99.18</td>
<td>80.68</td>
</tr>
<tr>
<td>2009–10</td>
<td>Below normal</td>
<td>89.09</td>
<td>80.80</td>
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<tr>
<td>2010–11</td>
<td>Normal</td>
<td>95.98</td>
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<tr>
<td>2011–12</td>
<td>Normal</td>
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</tbody>
</table>

**Figure 5** Monsoon status and crop yields

<table>
<thead>
<tr>
<th>Year</th>
<th>Wheat tonnes/ha</th>
<th>Maize tonnes/ha</th>
<th>Soybeans tonnes/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>China</td>
<td>India</td>
<td>China</td>
</tr>
<tr>
<td>1990</td>
<td>3.2</td>
<td>2.1</td>
<td>4.5</td>
</tr>
<tr>
<td>2000</td>
<td>3.7</td>
<td>2.8</td>
<td>4.6</td>
</tr>
<tr>
<td>2010</td>
<td>4.7</td>
<td>2.8</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Figure 6** Crop yields in India and China

Source: FAO
Agriculture and food policies

There are three main objectives of India’s agriculture and food policies:
- food security
- food self-sufficiency
- income support for farmers.
These policies keep food prices high for farmers while keeping prices low for consumers, and protect domestic farmers from foreign competition.

Support for the farmer

The government buys the farmers’ produce at a guaranteed price and stores the food in large warehouses. The farmer sells as much as he can to the government even if the government has enough food in storage already. The food is often stored badly and rots.

The government subsidises fertilisers for the farmers, who often use too much in their fields. Much of the fertiliser put on the field is wasted and washed away. The government also reduces cost for other inputs such as water, electricity, diesel and seeds.

Import tariffs

Taxes on food imports to India remain among the highest in the world, keeping domestic food prices above world level (Figure 7).

Food subsidies

There are 492,000 fair price shops throughout India that sell grain to consumers at subsidised prices. The prices are set for three years at 3p per kilogram for rice, 2p per kilogram for wheat, and 1p per kilogram for coarse grains.

Costs and benefits of government policy

Both producers and consumers benefit. Agriculture production is high and there is reduced food insecurity. However, there is over-production of cereals at the expense of fruit, vegetables and dairy products.

Subsidies on agricultural inputs such as water, electricity and diesel lead to wastage and inefficiency. Fertilisers are not used correctly and together with over-pumping of groundwater and poor irrigation, lead to soil degradation. This has also led to a lack of investment in more sustainable and long-term irrigation methods.

At the World Trade Organisation India has been heavily criticised for its trade-distorting farm subsidies and import tariffs. Despite the efforts of the government, 46% of children are still malnourished. 40% of the food is lost to government corruption.

Problems in the food supply chain

As soon as the crop is harvested the farmer needs to get the produce to market. The road network is poor, transport is rarely cooled and storage facilities inadequate. The Food and Agriculture Organisation estimates that 40% of India’s fruit and vegetables perish before reaching the consumer.

Investment is needed in a modern supply chain with cold storage units, refrigerated trucks and modern logistics.

Foreign food retailers, for example Tesco and Walmart, are keen to invest in India but the government prefers to protect local industries from foreign competition. Only 3% of India’s food is bought in modern supermarkets.
Focus questions

1. Study Figure 1. The photograph shows a rural farmer. What does this suggest about the size and technology of many farms?
2. Study Figure 4. What have been the major changes in diet of rural and urban dwellers in India between 1993 and 2010?
3. What does the Indian government do to help the countries farmers?
4. What schemes are in place to help provide food for the poor?
5. In your opinion, will India be able to feed its growing millions? Explain your answer.

Learning checkpoint

How many more people will there be in India by 2050? What happens to the production levels of rice and wheat when there is a poor monsoon?

Why is malnutrition a problem? How could the farmers increase their yields?

Apart from population growth, what other reasons are there for an increasing demand in food? What could be done to reduce food wastage?

What are the problems faced by farmers?