Feeding the 9 billion: Lesson 2 Resource sheet

Starter:

Executive Summary 'How to feed the world in 2050' United Nations

By 2050 the world's population is expected to reach 9.1 billion, 34 percent higher than today. Nearly all of this population increase will occur in developing countries. Urbanization will continue at an accelerated pace, and about 70 percent of the world's population will be urban (compared to 49 percent today). Income levels will be many multiples of what they are now.

In order to feed this larger, more urban and richer population, food production must increase by 70 percent. Annual cereal production will need to rise to about 3 billion tonnes from 2.1 billion today and annual meat production will need to rise by over 200 million tonnes to reach 470 million tonnes.

This UN report argues that the required increase in food production can be achieved if the necessary investment is undertaken and if policies that help agricultural production are put in place.

Total average annual net investment in developing country agriculture required to deliver the necessary production increases would amount to USD $83 billion. However, the global gap in what is required would need current investment levels (through both public and private investment) into rise by about 50%.

Achieving this would require a major reallocation in developing country budgets as well as in donor programmes. It will also require policies that support farmers in developing countries and encourage them to increase their investment.

In developing countries, 80 percent of the necessary production increases would come from increases in yields and cropping intensity and only 20 percent from expansion of arable land.

However, globally the rate of growth in yields of the major cereal crops has been steadily declining, it dropped from 3.2 percent per year in 1960 to 1.5 percent in 2000. The challenge for technology is to help reverse this decline. Although investment in agricultural R&D continues to be one of the most productive investments, with rates of return between 30 and 75 percent, it has been neglected in many low income countries. Currently, agricultural R&D in developing countries is dominated by the public sector, so it is likely initial additional investment will have to come from government budgets. Increasing private sector investment will require addressing issues of intellectual property rights while ensuring that a balance is struck so that smallholder farmers can get affordable access to the new technologies.

Hunger can still persist in the midst of adequate supplies if poor people do not have sufficient income to buy food. The experience of countries that have succeeded in reducing hunger and malnutrition shows that 'overall' economic growth does not automatically ensure success, the *source* of growth matters too. For example, growth originating in

agriculture, in particular the smallholder sector, is at least twice as effective in benefiting the poorest as growth from the non-agriculture sector.

This is not surprising since 75 percent of the poor in developing countries live in rural areas and their incomes are directly or indirectly linked to agriculture. The fight against hunger also requires targeted and deliberate action in the form of comprehensive social services, including food assistance, health and sanitation, as well as education and training; with a special focus on the most vulnerable.

Many countries will also continue to depending on international trade to ensure their food security. It is estimated that by 2050 developing countries' net imports of cereals will more than double from 135 million metric tonnes in 2008/09 to 300 million in 2050. That is why there is a need to move towards a global trading system that is fairer and more competitive; and that contributes to a dependable market for food. Reform of farm support policies in OECD countries is a welcome step. However, there is still room for improvement to help provide greater market access to developing country farmers so that they can compete on a more equal footing. Countries may also need to consider joint measures to be better prepared for future shocks to the global system, through coordinated action in case of food crises, reform of trade rules, and joint finance to assist people affected by a new price spike or localized disasters.

Climate change and increased biofuel production represent major risks for long-term food security. Although countries in the Southern hemisphere are not the main originators of climate change, they may suffer the greatest challenges in the form of potentially declining yields and greater frequency of extreme weather events. Studies estimate that the aggregate negative impact of climate change on African agricultural output up to 2080-2100 could be between 15 and 30 percent.

Biofuel production based on agricultural commodities increased more than threefold from 2000 to 2008 and presents a specific challenge. For example, increased use of food crops for biofuel production could have serious implications for food security. A recent study estimates that continued rapid expansion of biofuel production up to 2050 could lead to the number of undernourished pre-school children in Africa and South Asia being 3 and 1.7 million higher than would have been otherwise the case.

The world has the resources and technology to eradicate hunger and ensure long-term food security for all, in spite of many challenges and risks. It needs to mobilize political will and build the necessary institutions and markets to ensure that key decisions on investment and policies to eradicate hunger are taken and implemented effectively.

Source: Executive Summary 'How to feed the world in 2050' FAO, United Nations
http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf

CASE STUDIES

Print off the following summaries and provide each group with an information pack. Alternatively teach the lesson in the computer room and provide students with the links to carry out the research.

Scuba rice

http://r4d.dfid.gov.uk/PDF/Outputs/IRRI/DFID_impact_case_study_SUB1rice_FINAL%5B1%5D.pdf

Vaccination programme for cattle

http://r4d.dfid.gov.uk/PDF/Outputs/AnimalHealth/DFID_impact_case_study_Rinderpest_April2010%5B1%5D.pdf

Apple ring acacia (Faidherbia albida) trees

Print Section One Background only
http://r4d.dfid.gov.uk/PDF/Outputs/Forestry/ZF0173_-_Acacia_Book.pdf

Orange fleshed sweet potatoes

Print summary only
http://r4d.dfid.gov.uk/PDF/Outputs/Misc_Crop/HarvestPlus_OFSP_Brief_web_English_2012.pdf

Insect protein

http://www.dailymail.co.uk/news/article-2394246/Eat-Ento-Students-hope-break-prejudice-eating-bugs-opening-pop-restaurant.html

Feeding animals on food waste

The Pig Idea website has a range of useful pages and video links. An overview can be found at:
http://thepigidea.org/the-solution.html#facts