

## 8. FOOD SECURITY

### BUILD ROADS IN DEVELOPING WORLD TO BOLSTER FOOD SUPPLIES

Almost one-quarter of all food in the world is lost each year, from harvesting and storage to wastage in the consumer's kitchen.<sup>1</sup>

We can expect almost a doubling of demand for food until 2050.<sup>2</sup> This is both because the world will add another two billion mouths to feed, but also because of a surging new middle class will demand much more meat and dairy products, which again requires much more animal feed.

Fortunately, new analyses show that there are smart ways to reduce the world's enormous food waste. For every dollar spent we can end up doing \$13 of good ensuring more food security for the world. Interestingly, these solutions have little to do with the food waste campaigns heard through most of the rich world.

So, what is the best way to increase food security? This is a really vital issue because, if people aren't properly fed, they get sick more easily and can't work well, while children's growth is stunted, disadvantaging them for the rest of their lives. Avoiding waste in the food chain – in the field, during processing and storage and in people's houses – seems like a really good way to make the most of the crops a farmer grows.

In the rich world, the focus is mostly on food waste with the consumer. This makes sense, because more than half is lost in first world kitchens. But this is also because we can afford it – in the UK, the most wastage comes from salads, vegetables and fruits<sup>3</sup>, which are luxury goods compared to the cheapest calories like grains and tubers eaten throughout the poor world. Likewise, smaller households waste more per person, because it is harder to put everything to use, while richer

1 <http://dx.doi.org/10.1016/j.scitotenv.2012.08.092>  
2 Barrett, footnote 4, 70-100% increase.  
3 <http://rstb.royalsocietypublishing.org/content/365/1554/3065>

households waste more because they can afford the extra luxury of buying ‘just to be safe.’

The world’s poor lose little of their food, simply because they can’t afford to. In Africa, food waste loses 500 calories per person every day – but just 5% are lost with the consumers.<sup>4</sup> Instead more than three-quarters are lost in agricultural production, both when birds and rats eat them during harvesting and when pests spoil them in storage.

There are many smart solutions – from simple curing of roots, tubers and bulbs, to expensive refrigeration. All of these technologies are very good investments in industrialized countries, so why aren’t they adopted in the developing world? In a new report, a team of economists from the International Food Policy Research Institute pointed out the main problem is lack of infrastructure. Simply put, if there are no proper roads, farmers cannot easily sell their surplus produce, which may then spoil before it can be eaten. The researchers found that four key factors could make a real difference to losses in the food chain: an electricity supply, paved roads, rail capacity and road capacity. These mean that farm produce can be sent to market and other food supplies brought in, and that grains can be dried or vegetables kept cool.

They estimate the overall cost to approximately halve post-harvest losses in the developing world would cost \$239 billion over the next 15 years, but it would generate benefits of just over \$3,000 billion, generating \$13 of economic benefits for every dollar spent.

This has real-world impacts – it will bring down food prices to make food more affordable for poor people. By 2050, better infrastructure could mean that 57 million people – more than the current population of South Africa – would no longer be at risk of hunger. In particular, about 4 million children would no longer suffer from malnutrition. Most of these gains would be in sub-Saharan Africa and South Asia, the world’s most deprived regions.

But it turns out there is an even better food target. Per dollar spent, we can achieve thrice the economic benefits and larger reductions in the number of people at risk of hunger and the number of malnourished children by focusing on higher efficiency rather than on preventing food losses.

<sup>4</sup> Table 4S, <http://dx.doi.org/10.1016/j.scitotenv.2012.08.092>

Today, only about \$5 billion is spent each year on research to improve the seven major global food crops, and just 10% of that is targeted to help small farmers in Africa and Asia. Investing an extra \$88 billion in agricultural research and development over the next 15 years will increase yields by an additional 0.4% each year. This would reduce prices and improve food security to give nearly \$3 trillion worth of benefits, an enormous \$34 of good for every dollar spent.

We all want to help get a better world by 2030. If we listen to the economic evidence and pick the best targets, we can make sure, resources are spent doing the most good possible. The new research makes a strong case for including targets on yield research and agricultural waste to our promises.

| <i>Targets</i>                                     |                  | <i>Benefits (\$B)</i> | <i>Costs (\$B)</i> | <i>Benefit for Every \$ Spent</i> |
|--|------------------|-----------------------|--------------------|-----------------------------------|
| Reduce post harvest losses by 10 percentage points | Globally         | \$4,051               | \$299              | \$14                              |
|  | Developing World | \$3,072               | \$239              | \$13                              |
| Increase investment in agricultural R&D by 160%    |                  | \$2,961               | \$88               | \$34                              |

#### FOOD WASTE

|                                  | Calories wasted | Waste reduction could feed million people |
|----------------------------------|-----------------|---|
| Sub-Saharan Africa               | 21%             | 96  |
| Europe                           | 29%             | 133                                       |
| Industrialized Asia              | 25%             | 254                                       |
| Latin America                    | 25%             | 96  |
| North Africa & West Central Asia | 26%             | 72  |
| North America & Oceania          | 32%             | 117                                       |
| South & Southeast Asia           | 18%             | 216                                       |
| Global                           | 24%             | 984                                       |

Data from M. Kummu et al 2012

## 17. NUTRITION

### FEEDING PEOPLE IS SMART

The world faces many problems, and feeding a growing population adequately is certainly one of them. The good news is that we are well on track to halving the proportion of people suffering chronic hunger between 1990 and 2015. The bad news is that still leaves over 800 million people who go to bed hungry every night. Unfortunately, there are no easy ways to solve this problem quickly, but there are smart ways to use resources to do a lot of good both now and in the long term.

Both children and adults need a good quality diet, but feeding young children well makes a big difference for their entire lives. The first 1,000 days of a child's life – from conception to age two – are vital for proper development. Poorly nourished infants don't grow as tall as their peers, and measuring the proportion of stunting (being smaller than the expected height for age) is a simple way of checking for malnourishment. These children don't just fail to thrive physically; they also fall behind better-fed ones in developing cognitive skills. This lack of development has real long-term consequences. Stunted children do less well at school and lead poorer adult lives.

Although there are lots of factors to take into account, the best basis for comparing competing targets on a level playing field is an economic assessment of costs and benefits. Most people would feel that feeding people properly – particularly young children – is something we simply have to tackle. And it turns out that what looks like a good idea morally is also really good economically. Good nutrition helps children develop properly and produces people who are able to make the best of all the opportunities which come their way.

The difference is dramatic, and well illustrated by a follow-up to an experiment in Guatemala. Starting in 1969, preschool children in several villages were given a nutritionally enhanced diet and compared with similar children in neighboring communities, who got a less nutritionally useful diet. Going back to these same children 35 years later, when they were mature adults, showed some startling differences. The

well-nourished children were not stunted by age three, stayed in school longer and developed better cognitive skills as adults. They were more likely to be employed and earned higher wages; their better physical and mental development made them more suitable for both skilled manual and white-collar jobs. A study in Brazil, for example, showed that just a 1% increase in height raised average adult male earnings by 2.4%.

In Guatemala, the children who were better nourished, turned out to have a much higher income as adults, compared to the control group. They had a 66% higher household consumption, an impressive improvement in quality of life from simple interventions in childhood. Spending a small amount – just \$96 in total – on providing nutritional supplements, improving the balance of the diet and deworming pays back handsomely. Over a working life, between the ages of 21 and 50, we can expect that a dollar spent on early childhood nutrition will on average do about \$45 worth of good over a wide range of low- and middle-income countries. That makes it a truly phenomenal use of money.

The great thing about feeding infants well is that it starts a virtuous circle, with increasing benefits for succeeding generations. Good childhood nutrition produces people who can contribute more and help boost economic growth and can themselves bring up well-fed, healthy children. Healthy children grow up to be healthy, more productive adults who bring up the next generation to be even better fed, better educated and more productive.

Feeding people properly – and starting early – is not just a moral imperative; it also makes a lot of economic sense. That’s the message that the world’s governments and the UN will hear as they make their choice of targets for the post-2015 period.

| <i>Target</i>   | <i>Benefit Per Child</i> | <i>Cost Per Child</i> | <i>Benefit For Every \$ Spent</i> |
|---|--------------------------|-----------------------|-----------------------------------|
| Reduce by 40% the number of children who are stunted. | \$4,365                  | \$97                  | \$45                              |

**Attachment - 1**

**PREVALENCE OF CHILD MALNUTRITION  
 AND INTERVENTION BENEFITS**

|              | Stunted children<br>under age 5 |      | Social and economic<br>benefit per \$1 spent<br>on better nutrition |
|--------------|---------------------------------|------|---|
| Brazil       | 7%                              | 2007 |   |
| Chile        | 2%                              | 2008 |   |
| Colombia     | 13%                             | 2010 |   |
| Costa Rica   | 6%                              | 2008 |   |
| Ecuador      | 29%                             | 2004 |   |
| Guatemala    | 48%                             | 2009 |   |
| Mexico       | 14%                             | 2012 |   |
| Peru         | 28%                             | 2008 |   |
| Botswana     | 44%                             | 2011 | \$26  |
| Ethiopia     | 29%                             | 2008 |   |
| Ghana        | 35%                             | 2009 | \$41  |
| Kenya        | 39%                             | 2006 |   |
| Mali         | 43%                             | 2011 |   |
| Nigeria      | 36%                             | 2011 | \$59  |
| Rwanda       | 44%                             | 2010 |   |
| South Africa | 24%                             | 2008 |   |
| Tanzania     | 43%                             | 2010 | \$35  |
| Zambia       | 34%                             | 2011 | \$31  |
| Zimbabwe     | 46%                             | 2007 |   |
| Egypt        | 31%                             | 2008 |   |
| Iran         | 7%                              | 2004 |   |
| Turkey       | 16%                             | 2004 |   |
| Bangladesh   | 41%                             | 2011 | \$43  |
| China        | 9%                              | 2010 |   |
| India        | 48%                             | 2006 | \$93  |
| Indonesia    | 39%                             | 2010 | \$115   |
| Malaysia     | 41%                             | 2011 | \$31  |
| Nepal        | 43%                             | 2011 | \$70  |
| Pakistan     | 34%                             | 2011 | \$105   |
| Philippines  | 16%                             | 2006 |   |
| Thailand     | 23%                             | 2010 | \$85  |

Latest year available from The World Bank and 2015 data S Horton & J Hoddinott