Agriculture and Nutrition

Linkages and Complementarities

Inge D. Brouwer

Malnutrition remains a pervasive public-health concern in many low- and middle-income countries and has long-lasting and often irreversible consequences for health, cognitive ability, school performance and future earnings. To further reduce malnutrition, traditional nutrition-specific interventions should be aligned with so-called nutrition-sensitive activities in food security, agriculture, water and sanitation, and social protection/safety nets. Scientifically, there is still a large gap of evidence of efficacy of nutrition-sensitive agriculture, which emphasizes the need for well-designed, rigorous studies to test pathways and measure impact using valid, preferably simple indicators of food and nutrient intake.

Poor nutritional status and limited financial resources often compromise individual welfare in the developing world. In combination with a high concurrent disease load, a self-perpetuating cycle of poverty, malnutrition and mortality often arises. Adequate nutrition is a human right that underpins progress towards most of the UN’s Millennium Development Goals (MDG) in an attempt to reduce child mortality, improve maternal health and decrease the burden of malaria, HIV/AIDS and other diseases by 2015. It will also affect the achievement of future Sustainable Development Goals beyond 2015 if it is not addressed properly. Although the proportion of undernourished people in developing countries is decreasing, the reduction is modest and more than 800 m people are still undernourished (FAO 2013).

Maternal and child malnutrition remains a pervasive and damaging public-health concern in many low- and middle-income countries. To date, it is estimated that globally over 165 m children under five years of age are stunted (too short for their age) and about 52 m children are too thin (wasted) and thus require special treatment (Black et al. 2013). The prevalence of low BMI among adult women (<18.5 kg/m²), which is indicative of maternal undernutrition, remains higher than 10% in Africa and Asia (Black et al. 2013). Over the past fifteen years, rates of malnutrition have decreased but this improvement is stagnating, especially in Sub-Saharan Africa where the absolute number of undernourished people continues to rise (Stevens et al. 2012).
In addition to undernourishment, stunting and wasting, there is rising concern about the quality of diets in terms of adequate micronutrients in developing countries. Hidden hunger, which involves a lack of micronutrients, affects a far greater percentage of the world’s population than overt hunger due to a mere lack of food. Worldwide, the most common micronutrient deficiencies are of iron, zinc and vitamin A, but deficiencies of iodine, folate and B12 and other B vitamins are also widespread. Over a quarter of the world’s population is anaemic, including 293 m children younger than five years of age (47%) and 486 m non-pregnant women (30%) (Balarajan et al. 2011; McLean et al. 2008). Africa has the highest prevalence of anaemia: 65% and 44% of preschool children and non-pregnant women are anaemic (McLean et al. 2008). Iron deficiency is considered the major cause of anaemia, accounting for around 50% of cases (Ezzati et al. 2004) and has adverse health effects on the outcome of pregnancies, infant growth, cognitive performance, psychomotor development, immune status and work capacity. It also results in substantial economic costs related to impaired school performance and decreased productivity (Zimmermann & Hurrell 2007). Anaemia is a contributing factor in over 20% of all maternal deaths among pregnant women.

As iron and zinc are found in many of the same foods, high rates of iron deficiency in Sub-Saharan Africa suggest widespread cases of zinc deficiency in these populations. Zinc is required by about 50 enzymes in the body and many metabolic functions are affected by a deficiency in zinc, including physical growth, immune competence, reproductive function and neural development (Hess et al. 2009). Several supplementation trials among high-risk young children, including some carried out in Africa, have shown that an increased zinc intake reduces the burden of diarrhoea and acute lower respiratory infections (Zinc Investigators’ Collaborative Group et al. 1999, 2000) although the evidence from among populations in malaria-endemic areas in Africa has been inconsistent (Sazawal et al. 2007). Estimates suggest that 17% of the world’s population is at risk of zinc deficiency on the basis of an analysis of national diets. The figure ranges from 7.5% in high-income countries to 26% and 30% in Sub-Saharan Africa and Asia respectively (Wessels & Brown 2012). Young children in Sub-Saharan Africa in particular suffer from an inadequate intake of bioavailable zinc, which leads to zinc deficiency as assessed by plasma or serum zinc concentrations. A vitamin A deficiency can be seen in an estimated 190 m preschool-aged children (33%) and 19 m pregnant women (15%) worldwide (WHO 2009). Almost every third child – or about 56 m children – with a vitamin A deficiency lives in Sub-Saharan Africa. The health consequences of a vitamin A deficiency include mild to severe systemic effects on innate and acquired immunity, higher death rates from infectious diseases,