



# Sufficient nourishment worldwide via transfer payments

Markus Lips

*Agroscope FAT Tänikon, Swiss Federal Research Station for Agricultural Economics  
and Engineering, 8356 Ettenhausen, Switzerland*

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## Abstract

The paper illustrates an unconventional approach to providing adequate nourishment worldwide. Regions with an insufficient calorie supply receive transfer payments in order to increase their food budgets. The transfer payments are financed by a flat income tax in OECD countries. A general equilibrium model, which contains this transfer payment mechanism as well as information about nutrition, is applied for the analysis. The resulting tax rate is 0.55% of OECD countries' income or a required total transfer of 112 billion USD. With the money allocated the receiver regions boost their domestic production as well as increasing their food imports. This in turn affects agriculture in OECD countries by promoting production.

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## Introduction

Several international declarations, among them the Universal Declaration of Human Rights, include the right to adequate food and nutrition for everyone (WHO, 2000). Between the mid-1960s and the late 1990s the world food situation made

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*E-mail address:* [markus.lips@fat.admin.ch](mailto:markus.lips@fat.admin.ch).

significant progress (Bruinsma, 2003). Nevertheless, about 800 million people in developing countries are undernourished (FAO, 2002a). The results are disease, loss of human potential and death from starvation. For example, 49% of the 10.7 million child deaths under the age of five in the developing world each year are associated with malnutrition (WHO, 2000).

In view of this situation several initiatives have been launched. The goal of the International Food Policy Research Institute (IFPRI) *2020 Vision* is sufficient food for everyone (IFPRI, 1995). At the Food Summit 2002 in Rome the governments in attendance renewed their commitment to halving the number of hungry people in the world by 2015 (FAO, 2002b). The annual costs of implementing this resolution are estimated at approximately 24 billion USD (FAO, 2003). This figure is a calculation of several amounts to be spent on direct food assistance, investment aid for small farmers, improving infrastructure (mainly rural roads), research programs as well as development and conservation of natural resources. On a national level, several transfer payment programs aimed at improving food security have been established, such as Progresá in Mexico (Hoddinott and Skoufias, 2003).

This paper goes one step further by simulating the global removal of hunger. In other words, what are the costs of adequate nourishment all over the world? The analysis is an attempt to figure out the dimension of such an undertaking. We assume that regions with a prevalence of food shortages receive transfer payments. These are financed through a flat income tax in all the member countries of the Organization for Economic Co-operation and Development (OECD). Accordingly, the analysis aims to figure out the magnitude of the necessary flat tax for OECD countries.

The transfer payments may cause substantial changes in the food markets within receiver regions as well as outside. To analyse these changes the general equilibrium model of the Global Trade Analysis Project is applied (GTAP; Hertel, 1997). In the literature, several studies of food security issues are carried out by means of a general equilibrium model. Bach and Matthews (1999, 2001) also use the GTAP model to study different food aid strategies. Arndt and Tarp (2001) employ a single-region general equilibrium model to evaluate alternative food aid distribution schemes for Mozambique. Coady and Harris (2001) evaluate the welfare effect of a domestically financed transfer program with a single-region general equilibrium model for Mexico.

The remaining sections of the paper are organized as follows: section two includes a short description of the GTAP model as well as the necessary modifications. In the third section the data used and the simulation specifications are outlined. All the results are included in section four, while the simplistic assumptions of the approach are discussed in section five. The last section draws conclusions.

## Modifications to the GTAP model

### *The GTAP model*

The GTAP model is a comparative static multi-sector multi-region general equilibrium model. A detailed description is provided in Hertel (1997). Each region is

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