



Investing in rural people

Do agricultural support and cash transfer programmes improve nutritional status?

by

Seth R. Gitter

Associate Professor of Economics at Towson University in Towson, Maryland

James Manley

Associate Professor of Economics at Towson University in Towson, Maryland

Jill Bernstein

Independent Consultant in Washington, D.C.

Paul Winters

Associate Vice-President, ad interim, Strategy and Knowledge Department and Director, Research and Impact Assessment Division at the International Fund for Agricultural Development in Rome

18 IFAD
RESEARCH
SERIES



The IFAD Research Series has been initiated by the Strategy and Knowledge Department in order to bring together cutting-edge thinking and research on smallholder agriculture, rural development and related themes. As a global organization with an exclusive mandate to promote rural smallholder development, IFAD seeks to present diverse viewpoints from across the development arena in order to stimulate knowledge exchange, innovation, and commitment to investing in rural people.

The opinions expressed in this publication are those of the authors and do not necessarily represent those of the International Fund for Agricultural Development (IFAD). The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of IFAD concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The designations “developed” and “developing” countries are intended for statistical convenience and do not necessarily express a judgement about the stage reached in the development process by a particular country or area.

This publication or any part thereof may be reproduced for non-commercial purposes without prior permission from IFAD, provided that the publication or extract therefrom reproduced is attributed to IFAD and the title of this publication is stated in any publication and that a copy thereof is sent to IFAD.

Authors:

Seth R. Gitter, James Manley, Jill Bernstein, Paul Winters

© IFAD 2017

All rights reserved

ISBN 978-92-9072-790-3

Printed November 2017

Do agricultural support and cash transfer programmes improve nutritional status?

by

Seth R. Gitter

Associate Professor of Economics at Towson University
in Towson, Maryland

James Manley

Associate Professor of Economics at Towson University
in Towson, Maryland

Jill Bernstein

Independent Consultant in Washington, D.C.

Paul Winters

Associate Vice-President, ad interim, Strategy and Knowledge
Department and Director, Research and Impact Assessment
Division at the International Fund for Agricultural Development
in Rome

Acknowledgements

This work was supported by the International Fund for Agricultural Development (IFAD). All views in this paper are those of the authors and do not necessarily reflect the views of IFAD.

We would like to thank Alex Bush and Savannah Wilhelm for research assistance, and anonymous reviewers at IFAD for helpful suggestions.

About the authors

Seth Gitter is an Associate Professor of Economics at Towson University. His research focuses on a variety of issues in Latin American countries, including early childhood development, cash transfers, schooling, migration, fair trade coffee and quinoa. He has received research grants from the Inter-American Development Bank and the United Kingdom's Department for International Development to study the effects of conditional cash transfers on early childhood development. He has also worked for a variety of international organizations, including the World Bank, the United Nations and Evidence Action. He holds a PhD from the Agricultural and Applied Economics Department at the University of Wisconsin-Madison and a BA in economics from Grinnell College.

James Manley has been an Associate Professor of Economics at Towson University in Maryland since 2008. His research centres on assessing the impact of environmental stimuli and social protection programmes on human health. He has been hired as a consultant by the World Bank, the Inter-American Development Bank, the International Fund for Agricultural Development, Save the Children UK, the United Kingdom's Department for International Development, and 3ie. He has been an invited researcher in Chile, Mexico and Peru. He obtained his PhD in agricultural and resource economics from the University of California at Berkeley, and an MS in applied economics and a BA in social psychology and computer science from the University of Nevada.

Jill Bernstein is an independent consultant based in Washington, D.C. Among her clients are the International Food Policy Research Institute, the World Bank and the International Fund for Agricultural Development. She specializes in issues related to agriculture, food security and nutrition in the developing world. Since 2015, she has served as the data coordinator for the Global Hunger Index, and co-authored the 2015, 2016 and 2017 Global Hunger Index reports. Previously, she worked for the fair trade organization Equal Exchange. She holds an MA in law and diplomacy from the Fletcher School at Tufts University, with concentrations in development economics and international trade, and a BA in government from Cornell University.

Paul Winters is the Associate Vice-President, ad interim, of the Strategy and Knowledge Department and Director of the Research and Impact Assessment Division at IFAD. From 2004 to 2015, he was a professor in the Department of Economics at American University in Washington, D.C., where he taught courses on impact evaluation, development economics and environmental economics. He also worked at the International Potato Center in Lima, Peru, the University of New England in Australia, and the Inter-American Development Bank in Washington, D.C. He holds a PhD in agricultural and resource economics from the University of California at Berkeley, an MA in economics from the University of California at San Diego, and a BA in non-western studies from the University of San Diego.

Oversight: Paul Winters, Director of Research and Impact Assessment Division, and Ashwani Muthoo, Director of Global Engagement, Knowledge and Strategy Division.

Advisory Board: Fabrizio Bresciani, Shirley Chinien, Edward Heinemann, Bruce Murphy, Richard Pelrine, Lauren Phillips, Tomas Rosada and Abdelkarim Sma.

Editorial Management Team: Rui Benfca, Helen Gillman and Anja Lesa.

Abstract

Cash transfer and agricultural support programmes are both used to improve nutrition outcomes in developing countries. Previous reviews of these programmes have examined their ability to improve both food consumption and anthropometric outcomes, but none has compared the evidence between the two. We update previous reviews, more than doubling the number of studies on each programme type based on an additional literature search of over 13,000 articles in eight databases. We find: (i) although there are about the same number of programmes of each type, many more papers have been written about the cash transfer programmes than the agricultural programmes; (ii) both programme types improved the quality of food consumption though evidence on quantity is more mixed; and (iii) both programme types show weak evidence of improvements in anthropometric outcomes.

Table of contents

Acknowledgements	2
Abstract	4
Introduction	6
Causal pathways and previous reviews	9
Literature search.....	12
Quantity, methods and location of evaluations	15
Impact on food consumption.....	19
Impact on anthropometrics and micronutrients.....	21
Further analysis: Nutrition information and publication bias	22
Conclusions	23
References.....	25
Appendix 1: Agricultural programme studies.....	28
Appendix 2: Cash transfer programme evaluations	32

Introduction

Achieving the second Sustainable Development Goal (SDG2) to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture, and particularly the second target to end all forms of malnutrition by 2030, will require a range of policies, including broad-based policies to facilitate economic growth, policies to enhance agricultural productivity, health care policies and nutrition education. Along with these general policies, there is a need to target particularly vulnerable populations in an effort to improve their nutritional outcomes. Improving nutritional outcomes can reduce mortality, increase educational attainment and improve productivity, yet typically studies of the benefit-to-cost ratio of nutrition programming suggest that there is underinvestment in nutrition (Alderman et al., 2017). Among the policies targeting the chronically poor and food-insecure, particularly in rural areas, are the social protection programmes, predominantly cash transfer programmes, and productive programmes. Cash transfers and direct agricultural support programmes both have the potential to help achieve SDG2. But this raises the question asked by Banerjee et al. (2015): “Is it better to deliver physical assets and support, rather than pure cash transfers?”

Today, these two broad types of targeted programmes dominate the landscape of development assistance. Cash transfer programmes are of two types: one group, such as Give Directly, provides only an unconditional cash transfer, while the other type, such as Brazil’s *Bolsa Familia* programme, provides cash conditional on recipients carrying out tasks like getting health check-ups or keeping children in school. Alternatively, agricultural programmes provide assets, livestock, agricultural inputs, technical support or other support to enhance production with the hypotheses that this will, among other things, lead to improve nutrition. One example is Helen Keller International’s Enhanced Homestead Food Production, which seeks to improve nutrition through the production of nutritious foods in home gardens. Another is the attempt that the International Fund for Agricultural Development (IFAD) is making to improve nutrition through broader production pathways.

Of course, there is a third option that combines the two. The programme Targeting the Ultra Poor (TUP) provides a cash or food transfer, along with an asset transfer and technical assistance (often agricultural in nature), access to savings accounts, and health and life-skills training. Agricultural support programmes are generally not as holistic as the TUP, although they often include a gender component and sometimes include nutrition education, while some cash transfer programmes also provide additional nutrition education or have conditions that might improve nutrition.

Cash transfers clearly play an important role in achieving the SDG goals, as they now cover 750 million to 1 billion people across the globe (Arnold et al., 2011). Income from transfers has the potential to improve access to food and therefore nutrition. Agricultural support

programmes enhance income and food access through increasing agricultural production. Recent estimates by Hoddinott et al. (2013) suggest that an additional US\$8 billion per year investment could improve world crop yields and reduce the number of hungry people by 200 million by 2050. Targeted investments in agricultural production, particularly home gardens or dairy production with direct links to nutrition, may further improve the nutritional value of a household's food basket. Agricultural interventions that increase the production of cash crops may do so via increasing a household's food budget. In considering how to allocate scarce resources to support SDG2, the question remains: do targeted investments in agricultural production improve nutritional status as much as cash transfers?

This review takes a first step at comparing nutritional outcomes for these types of programmes by synthesizing the nutritional impacts shown in over 200 studies of about 100 different agricultural support and cash transfer programmes. In particular, we focus on two sets of nutrition outcomes.

The first set of outcomes are the programme effects on the quantity and quality of the food consumed by programme recipients. While an increase in the quantity of food consumed may seem obvious, we will see that it is not so simple. As Banerjee (2016) notes, increasing spending on food does not necessarily mean nutrition improves. Further, increases in food consumption may not be sufficient to improve child nutrition; as Arimond and Ruel (2004) show, dietary diversity is key to child nutrition, so we track quality as well as quantity of consumption.

The second set of outcomes are nutrition indicators, including anthropometric measures (e.g. height-for-age and weight-for-age and the prevalence of stunting and wasting) and micronutrient indicators (e.g. serum retinol concentrations and rates of anaemia), which are related to food consumption as well as the body's ability to utilize nutrients based on physical health.

Cash transfers have been particularly well studied and are the subject of several comprehensive reviews in terms of their impacts on nutrition. These reviews suggest that cash transfers can increase total food consumption and dietary diversity (Bastagli et al., 2016); however, the impacts on anthropometric outcomes are modest and often not statistically significantly different from zero (Bastagli et al., 2016; Manley et al., 2013). Reviews of the impacts of agricultural programmes on dietary diversity and quality of food mirror those of cash transfer programmes. In general, these programmes improve dietary diversity and the quality of food (Masset et al., 2012; Webb and Kennedy, 2014), though few study the changes in total food consumption or calories. Like cash transfers, there is weak evidence that these programmes affect micronutrient status or anthropometric outcomes (Masset et al., 2012; Webb and Kennedy, 2014).

This paper makes its main contributions by expanding the evidence base and contrasting the two types of studies. First, we provide an updated summary of the growing evidence base from evaluations of agricultural programmes and cash transfers. For agriculture, as Webb and Kennedy (2014) predicted, the number of studies has grown in recent years. Furthermore, compared to previous cash transfer reviews, our search yielded roughly two to four times the number of total studies, depending on the outcome, and it increases the geographical reach of the evidence base as well. Second, by combining reviews of both cash transfer and agricultural programmes, we can compare the evidence for each programme type's ability to improve factors that influence nutritional status.

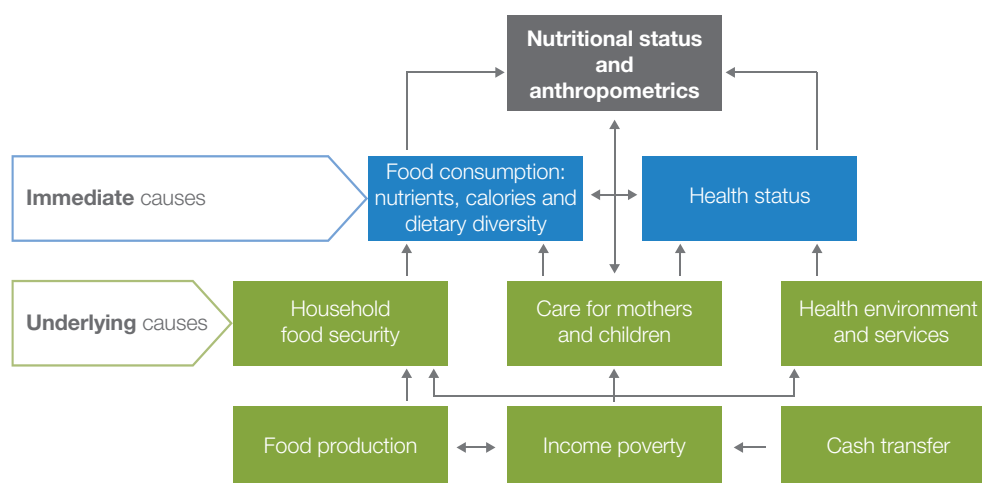
Three key takeaways emerge from our literature search. First, cash transfers have a broader evidence base in terms of their impact on food consumption and nutrition outcomes than agricultural programmes. We find over twice as many studies on cash transfer programmes as agricultural programmes, and for almost all variables of interest there were more analyses for cash transfer programmes than agricultural programmes. This is a reflection of multiple studies on the same programmes, as there are only 20 per cent more cash transfer programmes evaluated than agricultural programmes in our dataset. Second, the evaluations often, though not always, show that cash transfers and agricultural programmes have the ability to improve dietary diversity and consumption of food in key categories (e.g. protein, fruits and vegetables). A substantially larger number of cash transfer studies evaluate the effect on the value of total food consumption compared to studies of agricultural programmes. Cash transfer programmes only increased food consumption in roughly two thirds of the cases; we discuss the reasons (small transfers, irregular payments and educational requirements) that were responsible for the null findings. Unfortunately, our third takeaway is that these evaluations have not found conclusive evidence regarding either cash transfer or agricultural programmes' ability to improve anthropometric or micronutrient outcomes reliably. This non-finding is not proof of their inability to influence these outcomes, but it is in line with other reviews of the subject, such as Headey et al. (2017) who emphasize "the need for multidimensional nutritional strategies involving a broad range of nutrition-sensitive sectors".

The remainder of this paper is organized as follows. In section 2, we discuss the potential pathways for both cash transfers and agricultural support programmes to influence nutrition in terms of food consumption, anthropometric and micronutrient indicators. This section also summarizes the findings of the previous reviews discussed above. Section 3 discusses our search, which included a snowball of previous reviews and a search of eight major databases using a combination of keywords yielding 13,596 results. Section 4 discusses the methods and types of evaluations included in this review, and highlights our first takeaway that the evidence base linking cash transfers to nutrition is stronger than the evidence base for agricultural programmes' links to nutrition. Section 5 summarizes the evidence of both types of programmes on food consumption, in terms of quantity and quality, in order to demonstrate that both improve the quality of food consumed, though cash transfers seem to do better. Section 6 highlights our third takeaway on the lack of evidence on anthropometric or micronutrient outcomes. Finally, section 7 offers some areas for further analysis and section 8 the conclusions.

Causal pathways and previous reviews

While it would make analysis much easier if the link between income and nutritional status were simple and direct, things are somewhat more complicated. Several prior works have diagrammed this complex link between income and nutrition status (UNICEF, 1990; Black et al., 2008; Smith and Haddad, 2015). We have created our own diagram (Figure 1) based on these prior works and adapt it to highlight the relationships of interest to this paper. Figure 1 illustrates the relationship between poverty, consumption and nutritional status and can be used to contrast how cash transfers and agricultural support programmes may work through different pathways.

Figure 1: Factors affecting nutritional status



Source: Based on UNICEF, 1990; Black et al., 2008; Smith and Haddad, 2015.

Discussing the determinants of child nutritional status, Smith and Haddad (2015) describe the immediate importance of dietary intake and health status, which interact to produce healthy development. Bhargava (2014) points to four factors that influence nutrition: food intake, health and environmental services, dietary diversity, and food availability. These factors combine with behavioural influences, including care for children such as feeding, health-seeking behaviours and cognitive stimulation, and care behaviours for women such as adequate food, health care, rest and support for mental health including protection from abuse. When pregnant women are not healthy, effects are sure to be transmitted to the child they carry, and after birth the mother's health affects children dependent on her as caretaker.

Given this model for the production of good nutrition, how do cash transfers and agricultural interventions hope to achieve their aims? First, and most obviously, both interventions ought to increase access to food and to an increased variety of food through either increased income or food production. This is necessary, but not sufficient: for increases in consumption to translate into improved child health, they must be accompanied by security, safety and wisdom of the child's caretaker. Further, they must occur in a safe environment. Thus, programmes that ensure the provision of these other goods are most likely to see improved health among beneficiaries.

Leroy et al. (2009) list mechanisms by which cash transfers can affect nutrition, while Carletto et al. (2015) link agriculture to nutrition status. We adapt both into three pathways by which either mechanism might be effective. First, interventions should improve household food consumption and diet quality by enabling households to produce and/or purchase more and better food. (Some programmes also improve the diet quality of children, in particular by providing nutritional supplements.) Again, Figure 1 shows that increased income is not a sufficient condition for improved nutrition, but it is certainly helpful. Second, programme targeting may educate and empower women. Providing women with income is directly useful and may also improve their standing for intrahousehold bargaining over household resources. Programmes with educational components may further increase awareness and knowledge of child-feeding and caretaking practices. On the down side, programmes may also cost time to comply with programme requirements. Third, programmes may improve the home environment and/or the child's access to health care. Increased income from transfers or from better agricultural productivity can be used in some cases to improve shelter, sanitation and access to water. In cases when parental and community support is also part of the programme, the benefits can extend to improved parental skills and a safer and more stimulating environment in which to develop (Britto et al., 2017). On the other hand, an increase in agricultural activity may increase exposure to pathogens associated with animal waste, which has been linked to undernutrition (Headey et al., 2016).

The specifics of how the various agricultural programmes affect nutrition vary, though most increase food availability by targeting nutritious food production. Home gardens can mean more and a greater diversity of food is produced, and that food may be more likely to be under women's control. Biofortification can mean that the same level of food production increases household consumption of micro- or macronutrients. Livestock programmes also can improve the quality of household consumption or lead to increases in income from the sales of animal products (Carletto et al., 2015).

Previous reviews show that both cash transfer and agricultural programmes tend to improve food consumption and dietary diversity, but have limited evidence in their ability to improve anthropometric outcomes. The most recent comprehensive review of cash transfer programmes, Bastagli et al. (2016), covers programmes across 19 countries. In terms of food consumption, the evidence suggests that cash transfers improved both the quantity and the quality of food. There were 25 of 31 studies that directly tested the changes in food expenditures and found statistically significant impacts, with 23 finding positive results and only two finding negative impacts, perhaps due to a reduction in labour supply. There is more limited evidence for dietary diversity, with 7 of 12 studies finding statistically significant and positive impacts and the rest not finding statistically significant results.

Despite two thirds of cash transfer studies finding that the total value of food consumption increased, the evidence linking these programmes to anthropometric outcomes is weak. Transfers seem to have "very little impact on micronutrient status", according to Leroy et

al. (2009). As Banerjee (2016) suggests, this could be related to findings that suggest poor households use additional income to purchase higher quality, though not necessarily more nutritious, food. Also, other factors besides diet are necessary to improve nutrition outcomes, as suggested by Bhutta et al. (2008): "Nutritional status results from a complex interaction between food intake, access to safe water and sanitation, nutritional knowledge of caretakers, and access to care and medical services. Higher income and the ability to finance food expenditures are therefore only two of many determinants of nutritional status." Bastagli et al. (2016) find that "just five out of 13 studies for stunting, one of five for wasting and one out of eight for underweight show statistically significant impacts." Manley et al. (2013), in a review focused on cash transfers and height-for-age, specifically that covered 17 cash transfer programmes, found results consistent with Bastagli et al. (2016). Using a meta-analysis, they find that on average cash transfers increase height-for-age z-scores by 0.02 and this change is not statistically significant from zero.

The results for the links between agricultural programmes and nutrition mirror those of the cash transfer programmes, though with a more limited evidence base. In a meta-analysis of the effects of agricultural programmes on nutrition, Masset et al. (2012) found most studies (19 of 23) show positive and statistically significant effects on dietary diversity or consumption of food in key categories (e.g. protein, vegetables). The authors point out, though, that this may not necessarily represent an improvement in diet if there are substitution effects. This may be particularly an issue for programmes such as vegetable gardens, dairy or fisheries, which focus on consumption of a specific category of food. Interestingly, no studies measured changes in total food consumption and only one tested changes in income. Ruel et al. (2013) discuss similar findings for home-gardening programmes, although they find more promising results in newer biofortification projects. Webb and Kennedy's (2014) review of 10 previous literature reviews on the subject is also consistent with Masset's findings. Furthermore, Webb and Kennedy (2014) point to a lack of current completed research at the time to address these questions, but remain optimistic based on the large amount of research being conducted at the time they wrote the article.

Masset et al. (2012) summarize the 13 studies where anthropometric data were collected for agricultural interventions, with only one reporting z-scores. Of the eight studies on anthropometric outcomes, only one showed a statistically significant reduction in stunting, three in underweight and two in wasting. They find "little support" for the ability of these interventions to improve anthropometric outcomes. However, they caution this could be due to the limited sample size since these outcomes are typically measured in children under 5 years old, which would mean only a subset of households would have observations. In terms of micronutrients there are even fewer studies, identified by Masset et al. (2012), with two covering iron intake of children and finding no statistically significant impact, four covering vitamin A, which all had positive impacts, and a meta-analysis showing a positive impact on average.

This paper takes Bastagli et al. (2016) and Masset et al. (2012) as jumping-off points. Our search, described in the next section, increases the number of studies by a factor of two to four relative to those included in these previous reviews in terms of the questions of interest. It is worth noting that Bastagli et al. (2016) was not necessarily meant to be systematic for all issues because it covers a wide range of issues (poverty, savings, employment and empowerment). We also believe it is important to follow up on Masset's work, as that search was performed in 2010. As Webb and Kennedy (2014) note at that time, there was a large pipeline of over 150 planned research studies on the link between agriculture and nutrition.

Literature search

Before beginning the literature search, we established the cut-off date for publication and chose to include only papers published in 1997 or after to coincide with the creation of PROGRESA, Mexico's well-known cash transfer programme. We also established the criteria for which types of programmes to include. We only include studies published in English and utilizing a clearly defined comparison group (control). For cash transfer programmes, we elected to include both conditional and unconditional cash transfers, and excluded programmes that provided cash on the condition of work. Provision of opportunities for wage labour might simply reduce regular, market wage labour, making impacts on nutrition unlikely. For agricultural programmes, we targeted multiple types based on previous reviews. We included six types of programmes: (i) support for inputs such as fertilizer; (ii) free provision or help with livestock or other productive assets; (iii) irrigation; (iv) aquaculture; (v) home gardens; and (vi) biofortification. We excluded other types of programmes such as credit or land tenure, as the impacts to food production are not as direct. It is important to note that we only examined articles where an actual agricultural intervention took place. Therefore, a study that used a natural experiment of, for example, fertilizer prices on outcomes of interest would be excluded.

To be included in the analysis, the cash transfer or agricultural programme had to examine at least one of the variables of interest for either food consumption or anthropometrics. In terms of food consumption, we examined four variables: total food value, calories, food categories and diversity. Total food value was any measurement of either total consumption or expenditures on all foods in the household. Calories include any measure of total calories consumed by the household, typically based on food intake recall. The make-up of the diet is also important, so we included an indicator of whether the programme increased consumption of any specific food category (e.g. milk, meat or vegetables) and another for whether programme impacts were noted on "food diversity", usually measured by the number of unique foods consumed or dietary diversity scores. We also included standard measures of anthropometrics (weight-for-age, height-for-age, height-for-weight, stunting and wasting). Finally, we included micronutrient changes, both when measured by medical tests (e.g. hemoglobin) and when measured by food intake.

Note that an individual paper may include multiple studies if the analysis includes multiple programmes (e.g. Baird et al., 2013), which includes a comparison of conditional and unconditional cash transfers. Further, some programmes such as PROGRESA have multiple papers studying the same data. In order to address this, we summarize some results by using the mean of all studies of the programme for the variable of interest. Finally, some programmes such as Targeting the Ultra Poor have been evaluated in multiple countries. We consider each programme and country combination a unique programme reflective of differences in the context of running a programme in different countries.

To begin the search, we examined the citations in all the reviews mentioned above for potentially relevant studies (Bastagli et al., 2016; Manley et al., 2013; Masset et al., 2012; Ruel et al., 2013). This also included a sub-search of eight of the reviews included in Webb and Kennedy, 2014: Arimond et al., 2011; Berti et al., 2004; Bhutta et al., 2008; Kawarazuka, 2010; Leroy and Frongillo, 2007; Ruel, 2001; World Bank, 2007; and Masset et al., 2011, which is an earlier version of the Masset et al. (2012) review. We reviewed the references in each of the studies listed in this paragraph, and based on the title reviewed any potentially relevant studies for possible inclusion.

The next step was to search literature databases with key words. There are always trade-offs in terms of time and exhaustiveness of these searches. Given these trade-offs, we selected a total of eight terms for programmes and two terms for outcomes. Each search was a combination of one programme term and one outcome term, yielding 16 total searches per database (see Table 1 for the terms). We planned to search all of the same databases that Masset et al. (2012) used for their search; however, we were only able to search 8 of the 10 potential databases (Agris, Econlit, Eldis, International Bibliography of Social Sciences [IBSS], IDEAS, International Food Policy Research Institute [IFPRI], PubMed and World Bank).¹ Therefore, we searched 128 combinations of terms. To make the searches manageable, we followed a simple four-step process. We first entered only the programme term, and if the result was less than 100 articles we searched all articles; if it was more, we used the combination of the programme term and each of the two outcome terms (nutrition and food consumption). Finally, in nine cases where there were more than 500 results, we added the words “women or children” to the search since, like most relevant studies of nutrition, we chose to discuss impacts on one of these subgroups. So, for example, articles showing the effects of programme participation on adult body mass index were not included.

Overall, the search yielded 13,596 titles and abstracts to review, which is almost double the number in Masset et al. (2012). Of these, 133 papers that had not been found in the snowball of previous reviews were identified as possibly relevant for inclusion, and 36 were ultimately included (27 evaluations of agricultural programmes and 9 of cash transfers) based on our established criteria. The fact that we found more agricultural papers is likely a reflection of the existence of more recent and numerous reviews of cash transfers, which meant that most papers were caught in the initial snowball.

Table 1: Search terms

Term 1: Programme types	Term 2: Outcomes
Fertilizer	Nutrition
Livestock	Food consumption
Irrigation	
Aquaculture	
Home garden	
Biofortification	
“Asset transfer”	
“Cash transfer”	

1. We were unable to access Scopus. Jolis was not used due to the overwhelming number of results for the programme terms combined with food consumption alone (10,000).

In total, we found 142 cash transfer and 63 agricultural programme studies, which covered 52 cash transfer and 44 agricultural programmes. In other words, there were 2.8 studies per programme for cash transfers, which is double the 1.4 studies per agricultural programme. Even eliminating PROGRESA with its 25 studies, there are still on average almost 2.4 studies per cash transfer programme.

Once the papers were identified, one of the authors of this paper coded the results based on the food and nutrition indicators of interest (e.g. total food consumption, height-for-age or total calories consumed). The indicator was coded as 1 if a positive statistically significant result at the 5 per cent level was found for any analysis. An independent research assistant then coded the articles without knowledge of how they had been previously coded. The codes were compared and any non-matching results were reconciled by the authors.

Programme types are shown in Table 2 as the total number of studies and unique programmes. Seventeen studies (13 programmes) involved improving plant production, 10 studies (7 programmes) involved livestock or aquaculture, 16 studies (14 programmes) had multiple components, and 5 studies (3 programmes) were focused on nutrition, (i.e. primarily educational). We found 15 studies (7 programmes) analysing Targeting the Ultra Poor, a programme type that involves a variety of support given to recipients. Among the studies of cash transfer programmes, 78 were studies of 21 programmes that gave cash conditionally, while the remaining 64 studies of 31 programmes gave unconditional grants.

As in any study, there are some potential biases to our approach. First, we are only able to document programmes that were evaluated. If the presence of an evaluation is linked to the quality of the programme, then our results may be biased toward finding positive results. Furthermore, individual evaluations will likely omit either measuring or reporting some outcomes. This may be because of the costs associated with the survey, particularly for anthropometrics or nutrient measures. Studies may also omit outcomes that show no impact. For example, the Manley and Slavchevska (2016) review of 12 African cash transfer programmes shows that eight omit anthropometric analysis. Our decision to code any paper by its most positive and significant result may bias the results upwards, as we do not correct for multiple hypothesis testing.

Table 2: Programme types

Programme type	No. of studies	No. of programmes
Horticulture	17	13
Livestock	10	7
Mixed	16	14
Nutrition	5	3
Targeting the Ultra Poor	15	7
Conditional cash	78	21
Unconditional cash	64	31

Quantity, methods and location of evaluations

In our searches (snowball and database search), we found over twice as many studies of cash transfers and nutrition (142) as we did studies of agricultural programmes and nutrition (63), though, as mentioned above, this is reflective of more studies per cash transfer programme. The full list of studies included in the analysis and their citations is available in Appendix 1 (Agricultural Programmes) and Appendix 2 (Cash Transfer Programmes). Trends suggest that the gap between the number of studies in agriculture and cash programmes is widening; see Figure 2. In the period 2008-2016, cash transfers averaged 16 studies per year compared to slightly under five per year for agricultural programmes. Additionally, the spike in 2015 in agricultural programmes is reflective of the Banerjee et al. (2015) paper that has the studies of the Targeting the Ultra Poor programme in six countries, which we categorize as six unique studies.

The number of programmes evaluated is much closer when comparing the total number of cash and agricultural programmes, 52 and 44, respectively. We plot the cumulative number of programmes observed by the two programme types to compare trends in the quantity of programmes (Figure 3). For programmes with multiple studies, the programme year is based on the year of the oldest paper. The trends for the number of programmes are similar over the last four years.

Figure 2: Studies by year

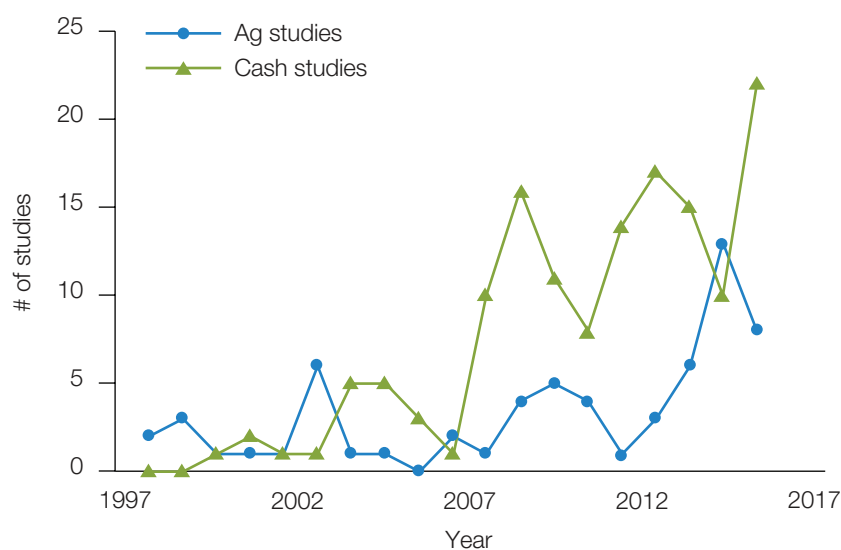
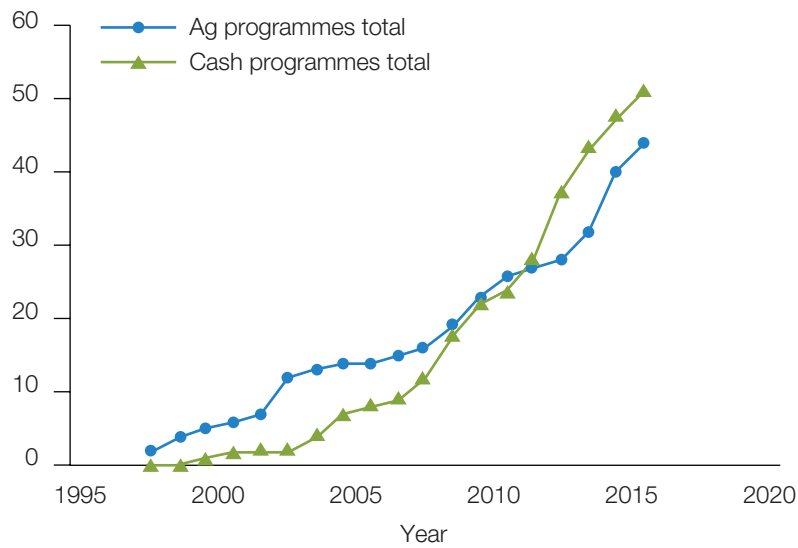


Figure 3: Quantity of programmes by year of first study



There are roughly the same number of countries represented in cash transfer (30) and agricultural programmes (24), as shown in Table 3. Bangladesh has the most combinations of studies and unique agricultural programmes with 11 different programmes. Malawi is also well studied, with four cash transfer programmes and six agricultural programmes. No other country has more than four programmes represented in either programme type. There is also regional variation, shown in Table 2, which may reflect the influence of regional development banks or that countries may look to their neighbours when creating new programmes. Latin America includes nearly all cash transfer programmes with the exception of the TUP studies in Honduras and Peru. On the other hand, Asia has nearly twice as many agricultural programmes as cash transfer programmes, while the number of each programme is roughly equivalent in Africa.

Studies of cash transfer programmes have sample sizes that are two to three times those of agricultural programmes, as seen in Table 4, with the exception of Targeting the Ultra Poor studies. We do not find substantial differences between unconditional and conditional cash transfer programmes in terms of sample sizes. Sample sizes are even smaller for horticultural or biofortification programmes. The larger sample sizes for cash transfer programmes increase the chances of finding statistically significant results.

Table 3: Number of programmes by country, region and programme type

	Ag	Cash		Ag	Cash		Ag	Cash
Benin	1		Bangladesh	11	2	Bolivia		1
Burkina Faso	1	1	Cambodia	1	1	Brazil		2
Ethiopia	3	1	India	1	1	Colombia		1
Ghana	1	1	Indonesia	1	2	Ecuador		3
Kenya	1	3	Iran	1		Honduras	1	3
Lesotho		1	Kazakhstan		1	Mexico		3
Malawi	6	4	Lao PDR	1		Nicaragua		2
Mali	1		Nepal	2	2	Paraguay		1
Mozambique	2	1	Pakistan	1	1	Peru	1	1
Niger		2	Philippines		1			
Rwanda	1		Thailand	1				
South Africa	1	2	Vietnam	1				
Tanzania		1						
Uganda	1	2						
Zambia	2	4						
Zimbabwe		1						
Africa	21	24	Asia	21	11	Latin America	2	17
Number of programmes							44	52
Number of countries							24	30

Note: Ag = agricultural programme; Cash = cash transfer programme.

Table 4: Sample sizes by programme type

Programme type	No. of studies	Median	25th percentile	75th percentile
Horticulture	18	422	331	827
Livestock	9	1 000	369	1 102
Mixed	15	720	639	2 160
Nutrition	4	214	112.5	281
Targeting the Ultra Poor	15	1 600	925	4 000
Conditional cash	70	2 100	1 000	6 519
Unconditional cash	61	2 000	1 200	2 900

Note: sample size was missing for some studies.

Early cash transfer programmes such as Mexico’s PROGRESA and Brazil’s *Bolsa Familia* used clustered randomized control trials (RCTs) as part of their evaluations. Table 5 also documents the trends in methodical approaches where we separate studies by propensity score matching, RCTs/double difference and other methods. Four out of the five cash transfer studies used RCT and double differences compared to around two thirds of agricultural studies included in our set of studies. For cash transfers, 6 of the 13 studies with other methods are regression discontinuity design. Agricultural studies are more likely to rely on other methods, with eight using single differencing and three employing instrumental variables. This has been a consistent trend, as the breakdown by methods is similar for the periods 2000-2007 and 2008-2016.

Table 5: Study methods

Programme type	Matching (%)	Double difference (%)	Other (Instrumental variable, single difference) (%)	Total no. of studies
Agricultural	17	60	23	48
Targeting the Ultra Poor	13	80	7	15
Cash	13	78	9	142

Impact on food consumption

One key part of the causal pathway between cash transfer or agricultural programmes and nutrition is to improve both the quantity and the quality of food that is consumed. We see that, when measured, cash transfers and agricultural programmes have the ability to improve dietary diversity and consumption of food in key categories (e.g. protein, fruits and vegetables). The results are less clear for total food consumption or calories. Only two thirds of cash transfer programmes increased total food consumption, and most agricultural programmes did not measure changes in the total value of food consumption.

In Table 6, we break down the per programme average of our measure of changes in food consumption. The studies we surveyed looked at food consumption in different ways: some considered impacts on the value of food consumed, while others used calories rather than dollar values as their metric of choice. There was also heterogeneity in ways of considering changes in the quality of food: some used a measure of variety of foods consumed (“dietary diversity”), while others tracked increased consumption of categories of food such as dairy or orange-fleshed sweet potatoes. The measures reflect the percentage of studies with any positive and statistically significant result at the 5 per cent level. The per programme average is calculated by taking the mean of the outcomes of all studies of a programme. It is worth noting we do not observe these outcomes in all studies and, in many cases, in the entire programme.

The change in the measure of the value of food is a good example of the relationship between the programme type and what is measured. Only 9 of the 37 studies of the agricultural programmes (excluding TUP) measured changes in the value of total food consumption, compared with all seven TUP programmes, and 43 of the 52 cash transfer programmes. For non-TUP agricultural programmes, less than half showed increases in the value of food consumption compared to almost all of the TUP studies and two thirds of the cash transfer programmes.

For agricultural programmes, increased production of one nutritious good may decrease the production of another less nutritious good, thereby improving the diet but not changing total consumption. The null result for one third of cash transfer programmes was more surprising, since cash transfers typically target households where relaxing the budget constraint increases food purchases, though one programme – “Bota” in Kazakhstan – targeted households seeming already to have sufficient food supply. We examined each of the 13 cash transfer programmes that had null results for changes in food consumption and a few common reasons occurred. In 6 of the 13 cases, the authors discussed that the transfer was potentially too small, with the extreme example of Nepal’s Child Grant Programme making a monthly payment insufficient to purchase one pound of chicken meat.² Three programmes

2. These programmes are Programa de Asignacion Familiar (PRAF), Honduras; Bono de Desarrollo Humano (BDH), Ecuador; Child Grants Programme, Nepal; Education Sector Support Project, Cambodia; Pantawid Pamilyang, Philippines; and Primary Education Stipend, Bangladesh.

(Livelihood Empowerment Against Poverty, or LEAP, in Ghana, Child Grants Programme in Lesotho, and Monze in Zambia) pointed to problems with the disbursement of payments. The third reason, seen in three programmes, was that households spent money on other important things. For example, recipients of Tanzania’s Social Action Fund spent money on health services.

Total calories was the least likely food indicator to be measured, probably due to the difficulty of measuring caloric intake in a survey. Calories were roughly as likely to be measured in agricultural and cash transfer programmes, with around 30 per cent of programmes measuring calories compared to just one of the seven in the TUP.

Not only does the total food matter, but also the types of food. Over half of the agricultural and cash transfer programmes measured changes in at least one specific food category. The percentage of average positive programme effects was quite high in cash transfers (80 per cent). This result was 100 per cent in non-TUP agricultural programmes, which is a reflection of many programmes measuring a food category related to the intervention (e.g. fish consumption for aquaculture or sweet potato consumption for biofortified sweet potato programmes). Under 60 per cent of cash programmes that measured diversity showed improvements. Finally, it is worth noting that, although all of the TUP programmes measured changes in the value of food consumption, only one programme looked at each total calories and specific food categories and only two measured diversity.

Table 6: Changes in consumption

Programme type	Variable	Value of food	Total calories	Food categories	Dietary diversity
Agriculture	% showing positive effect	44.4	90.9	100	84.6
	programmes (no. out of 37)	9	11	20	13
Targeting the Ultra Poor	% showing positive effect	95.2	100	100	50.0
	programmes (no. out of 7)	7	1	1	2
Cash transfers	% showing positive effect	66.0	70.4	80.4	58.0
	programmes (no. out of 52)	43	14	34	25

Note: Percentages are the share of studies showing a positive effect among those that considered the outcome in question.

Impact on anthropometrics and micronutrients

The reviews of cash transfers and agricultural programmes discussed in Section 2 have suggested that there is not strong evidence that either type of programme can improve anthropometric outcomes (e.g. height-for-age, stunting, wasting). Our collection of studies is consistent with these previous reviews (see Table 7). Overall, we find that, when measured, the majority of studies do not find statistically significant impacts of cash transfer or agricultural programmes on anthropometric outcomes. For example, only a little over one third of cash transfer and agricultural programmes that measured height found a statistically significant impact. Furthermore, the height-for-age z-score, the most common anthropometric variable, is measured only 40 per cent of the time for cash transfers and 30 per cent for agricultural programmes. This highlights another major contrast between the two types of programmes: cash transfer programmes have almost twice as many programme studies on height-for-age (HAZ) compared to agricultural programmes and similar differences exist for weight and height-for-weight measurements.

Micronutrient measures such as measures of iron and vitamin A, like anthropometrics, can reflect the nutrition level of an individual. As with the results on the consumption of specific categories of food, agricultural evaluations are less likely to test for changes in specific micronutrients, but when they do they are more likely to find positive effects. There were 20 total studies of micronutrients for agricultural programmes. Of those, 10 specifically found a positive impact on vitamin A measures. Nine of these were programmes that promoted vitamin-enhanced sweet potatoes. Among the cash transfer studies, 26 considered micronutrient outcomes with 16 (roughly 60 per cent) showing a positive impact. Most of the impacts were on iron, hemoglobin and anaemia.

Table 7: Programme impacts on anthropometrics

Programme type	Variables	HAZ	Stunting	WAZ	WHZ	Wasting	BMIZ
Agriculture	% showing positive effect	35.7	27.3	44.4	25	36.4	0
	programmes (no. out of 44)	14	11	9	4	11	2
Cash transfers	% showing positive effect	37.0	15.0	22.2	12.5	33.3	34.6
	programmes (no. out of 52)	25	20	18	16	18	13

Note: TUP included with other agricultural programmes, as only one TUP programme was examined.

Effects were found on HAZ, stunting and wasting.

HAZ = height-for-age; BMIZ = body mass index; WAZ = weight-for-age; WHZ = weight-for-height.

Further analysis: Nutrition information and publication bias

In a previous meta-analysis of cash transfers, Manley et al. (2013) found that studies published in peer-reviewed journals were more likely to find statistically significant results. This finding suggested the potential for publication bias where programmes or variables with statistically significant results were more likely to be published. We examine in Table 8 the potential for publication bias by examining the variables in Table 6 and Table 7 for published and unpublished studies for both cash transfers and agricultural programmes. We find that among cash transfer studies, published results are more likely to show an impact on most anthropometric outcomes. Among agricultural studies, there are insufficient data to make a strong conclusion.

Table 8: Investigating publication bias

Programme type	Published or not	Consumption	Diet diversity	HAZ	Stunting	Wasting	WAZ
Agricultural	Published	81.3%* (16)	100% (13)	36.4% (11)	27.3% (11)	20% (10)	40% (10)
	Not published	63.6% (11)	60% (5)	33.3% (3)	100% (1)	100% (1)	0 (0)
Cash	Published	85.7% (28)	88.9% (9)	57.9% (19)	33.3% (9)	33.3% (3)	50% (6)
	Not published	70.7% (41)	62.5% (16)	16.7% (24)	8.33% (12)	37.5% (8)	10% (10)

*Percentage of studies with positive results 81.3 per cent in a total of (16) studies may contain multiple studies on a single programme.

Note: HAZ = height-for-age; WAZ = weight-for-age.

Conclusions

Making the decision of how to target scarce resources to achieve SGD2 among particularly vulnerable populations should be based on the evidence on what works. The synthesis of the literature in this paper provides a starting point to answering the particular question of whether it is better to deliver physical assets and support for agriculture rather than pure cash transfers. We draw three main conclusions. First, the evidence base on cash transfers is substantially larger with almost three times as many articles examining nutrition, although this is mostly due to multiple studies on the cash transfer programme. There were only slightly more cash transfer programmes than agricultural programmes, with 52 and 44 programmes, respectively. The multiple studies do present one advantage in that they result in a great number of variables being covered for any one programme. It is not clear why there are more studies per programme for cash transfers than agricultural programmes. One possible explanation is that cash programmes have lower implementation and overhead cost than agricultural programmes, which could free up costs for longer surveys that include more detailed nutrition-related questions. It could also be that cash transfers require paying more attention to political acceptability and therefore must take greater care to make data publically available for researchers leading towards multiple papers.

Second, we show that both agricultural programmes and cash transfers can improve consumption of specific food categories and dietary diversity. The evidence is mixed in terms of the ability of cash transfers to improve the total value of food consumption with only two thirds of programmes showing positive and statistically significant impacts, although null results may be explained by small transfers or irregular payments. For agricultural programmes, a vast majority do not measure the value of food consumption, and when they do they are often unsuccessful. TUP shows strong impacts on total value of food consumption, but little in the way of improving dietary diversity or consumption of specific food categories. Third, we find weak evidence in terms of the ability of these programmes to improve anthropometric outcomes. This is not to say that there is no effect; it could be that the effects are small or studies are underpowered.

One limitation of the analysis of the agricultural programmes is the larger heterogeneity among programmes than of cash transfers. Agricultural support programmes range from seeds for home gardens to large asset transfers, which likely have different effects in terms of both pathways that influence nutrition and expected outcomes. One clear advantage of cash transfers is that, other than transfer size and conditionality, the programmes generally function similarly. In that sense, the cash transfer programme results may be more comparable with each other.

This analysis has the limitation of only being able to report on the outcomes and studies that we find. Outcomes with no impact may not be reported, and programmes that fail may not produce studies. In this case, we may be overestimating the extent to which these programmes are able to improve nutrition. A second limitation of this study is that we do not provide cost-benefit estimates of these programmes in terms of nutrition outcomes. Sulaiman et al. (2016) compare lump-sum transfers, livelihood programmes and graduation programmes (TUP) and find that lump-sum transfers provide the highest benefit to cost, although the authors caution that the number of lump-sum transfers is small and evidence of long-term impacts in all programmes is scant. However, to our knowledge, there is not a cost-benefit comparison of the programmes discussed in Sulaiman and traditional cash transfer programmes that pay regular small benefits. Banerjee et al. (2015) attempts to compare their cost-benefit analysis of the Targeting the Ultra Poor programme to the well-known cash transfer programme Give Directly; however, they note the difficulty in making a direct comparison due to the different evaluation lengths and the potential for impacts to vary by time. That said, a future review could potentially create cost-benefit measures using these evaluations and matching it to cost data, which is often not provided within evaluations.

From a policy perspective, it appears that both cash transfer and targeted agricultural support programmes can improve diet; however, the impacts on anthropometrics are not large enough to regularly yield statistically significant results. Returning to Figure 1, this suggests that either the improvement in food consumption is not sufficient to result in dramatic changes in anthropometric outcomes or that food may not be sufficient to result in these changes and that other factors such as sanitation might be considered.

The evidence on which approach might be better overall to achieve SDG2 cannot be clearly determined until more evidence is generated. The evidence is insufficient and quite mixed. It may be the case that under certain conditions one approach may be superior to another and more evidence is needed on the conditions under which programmes tend to be successful in achieving nutritional outcomes. As these programmes are scaled up nationally, representative groups can be analysed to measure programme impacts over the long term; for example, see the Andersen et al. (2015) study of the Peruvian cash transfer programme using the Young Lives Survey. Furthermore, in countries with both agricultural and cash transfer programmes there is the potential for comparison of different programme types.

Future research should also look to programmes such as Targeting the Ultra Poor to see if a combination of interventions (agriculture, cash and sanitation) is the final piece to improving anthropometric outcomes. There is great potential to grow the evidence base, as these programmes have been expanded to 50 locations in over 40 countries and are approaching the global reach of cash transfers (Fahey and Loiseau, 2016). Finally, the limitations to good nutrition vary from place to place, thus conducting a preliminary analysis or diagnosis of the factors that affect nutritional status can help to illuminate which programme elements are required in each environment.

References

- Alderman, H., J.R. Behrman, and C. Puett. 2017. Big Numbers about Small Children: Estimating the Economic Benefits of Addressing Undernutrition. *World Bank Research Observer*, 32 (1): 107-125.
- Andersen, C.T., S.A. Reynolds, J.R. Behrman, B.T. Crookston, K.A. Dearden, J. Escobal, S. Mani, A. Sanchez, A.D. Stein, and L.C. Fernald. 2015. Participation in the Juntos Conditional Cash Transfer Programme in Peru Is Associated with Changes in Child Anthropometric Status but Not Language Development or School Achievement. *The Journal of Nutrition*, 145 (10): 2396-2405.
- Arimond, M., C. Hawkes, M.T. Ruel, Z. Sifri, P.R. Berti, J. Leroy, J.W. Low, L.R. Brown, and E.A. Frongillo. 2011. Agricultural Interventions and Nutrition: Lessons from the Past and New Evidence. In: B. Thompson and L. Amoroso, eds. *Combating Micronutrient Deficiencies: Food-based Approaches*. FAO, Rome. pp. 41-75.
- Arimond, M., and M.T. Ruel. 2004. Dietary diversity is associated with child nutritional status: evidence from 11 demographic and health surveys. *The Journal of Nutrition*, 134 (10): 2579-2585.
- Arnold, C., T. Conway, and M. Greenslade. 2011. *Cash Transfers: Evidence Paper*. London: Department for International Development.
- Baird, S.J., E. Chirwa, J. de Hoop, and B. Özler. 2013. *Girl Power: Cash Transfers and Adolescent Welfare. Evidence from a Cluster-randomized Experiment in Malawi*. Working Paper 19479. Cambridge, MA: National Bureau of Economic Research.
- Banerjee, A.V. 2016. Policies for a Better-fed World. *Review of World Economics*, 152 (1), 3-17.
- Banerjee, A., E. Duflo, N. Goldberg, D. Karlan, R. Osei, W. Parienté, ... and C. Udry. 2015. A Multifaceted Program Causes Lasting Progress for the Very Poor: Evidence from Six Countries. *Science*, 348 (6236): 1260799.
- Bastagli, F., J. Hagen-Zanker, L. Harman, V. Barca, G. Sturge, T. Schmidt, and L. Pellerano. 2016. *Cash Transfers: What Does the Evidence Say? A Rigorous Review of Programme Impact and the Role of Design and Implementation Features*. London: Overseas Development Institute.
- Berti, P.R., J. Krusevec, and S. FitzGerald. 2004. A Review of the Effectiveness of Agriculture Interventions in Improving Nutrition Outcomes. *Public Health Nutrition*, 7 (05): 599-609.
- Bhargava, A. 2014. Diet Quality, Child Health, and Food Policies in Developing Countries. *World Bank Research Observer*, 30 (2).

- Bhutta, Z.A., T. Ahmed, R.E. Black, S. Cousens, K. Dewey, E. Giugliani, ... and M. Shekar. 2008. What Works? Interventions for Maternal and Child Undernutrition and Survival. *The Lancet*, 371 (9610): 417-440.
- Black, R.E., Allen, L.H., Bhutta, Z.A., Caulfield, L.E., De Onis, M., Ezzati, M., C. Mathers, and J. Rivera. 2008. Maternal and Child Undernutrition Study Group. Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences. *The Lancet*, 371 (9608): 243-260.
- Britto, P.R., S.J. Lye, K. Proulx, A.K. Yousafzai, S.G. Matthews, T. Vaivada, and H. MacMillan. 2017. Nurturing Care: Promoting Early Childhood Development. *The Lancet*, 389 (10064): 91-102.
- Carletto, G., M. Ruel, P. Winters, and A. Zezza. 2015. Farm-level Pathways to Improved Nutritional Status: Introduction to the Special Issue. *Journal of Development Studies*, 51 (8): 945-957.
- Fahey, Allison, and Justin Loiseau. 2016. Ending Extreme Poverty: New Evidence on the Graduation Approach. Washington, DC: Consultative Group to Assist the Poor. www.cgap.org/blog/ending-extreme-poverty-new-evidencegraduation-approach.
- Headey, D., J. Hoddinott, and S. Park. 2017. Accounting for Nutritional Changes in Six Success Stories: A Regression-decomposition Approach. *Global Food Security*.
- Headey, D., P. Nguyen, S. Kim, R. Rawat, M. Ruel, and P. Menon. 2016. Is Exposure to Animal Feces Harmful to Child Nutrition and Health Outcomes? A Multicountry Observational Analysis. *The American Journal of Tropical Medicine and Hygiene*, 16-0270.
- Hoddinott J., M. Rosegrant, and M. Torero. 2013. Investments to Reduce Hunger and Undernutrition. In: B. Lomborg, ed. *Global Problems, Smart Solutions: Costs and Benefits*. Cambridge, UK: Cambridge University Press.
- Kawarazuka, N. 2010. *The Contribution of Fish Intake, Aquaculture, and Small-scale Fisheries to Improving Food and Nutrition Security: A Literature Review*. WorldFish Center Working Paper 2106.
- Leroy, J.L., and E.A. Frongillo. 2007. Can Interventions to Promote Animal Production Ameliorate Undernutrition? *The Journal of Nutrition*, 137 (10): 2311-2316.
- Leroy, J.L., M. Ruel, and E. Verhofstadt. 2009. The Impact of Conditional Cash Transfer Programmes on Child Nutrition: A Review of Evidence Using a Programme Theory Framework. *Journal of Development Effectiveness*, 1 (2): 103-129.
- Manley, J., S. Gitter, and V. Slavchevska. 2013. How Effective Are Cash Transfers at Improving Nutritional Status? *World Development*, 48: 133-155.
- Manley, J., and V. Slavchevska. 2016. *Are Cash Transfers the Answer for Children in Sub-Saharan Africa? A Literature Review*. Towson University Working Paper 2016-12.
- Masset, E., L. Haddad, A. Cornelius, and J. Isaza-Castro. 2011. *A Systematic Review of Agricultural Interventions That Aim to Improve Nutritional Status of Children*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Masset, E., L. Haddad, A. Cornelius, and J. Isaza-Castro. 2012. Effectiveness of Agricultural Interventions That Aim to Improve Nutritional Status of Children: Systematic Review. *BMJ*, 344, d8222.

Ruel, M.T. 2001. Can Food-based Strategies Help Reduce Vitamin A and Iron Deficiencies? A Review of Recent Evidence (Vol. 5). *Intl Food Policy Res Inst.*

Ruel, M.T., H. Alderman, and Maternal and Child Nutrition Study Group. 2013. Nutrition-sensitive Interventions and Programmes: How Can They Help to Accelerate Progress in Improving Maternal and Child Nutrition? *The Lancet*, 382 (9891): 536-551.

Smith, L.C., and L. Haddad. 2015. Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. *World Development*, 68: 180-204.

Sulaiman, M., N. Goldberg, D. Karlan, and de A. Montesquiou. 2016. *Eliminating Extreme Poverty: Comparing the Cost-Effectiveness of Livelihood, Cash Transfer, and Graduation Approaches*. Access to Finance FORUM Reports by CGAP and Its Partners No. 11. Available at: www.cgap.org/sites/default/files/Forum-Eliminating-Extreme-Poverty-Dec-2016.pdf.

UNICEF. 1990. *Strategy for Improved Nutrition of Women and Children in Developing Countries*. A UNICEF Policy Review. New York: UNICEF.

Webb, P., and E. Kennedy. 2014. Impacts of Agriculture on Nutrition: Nature of the Evidence and Research Gaps. *Food and Nutrition Bulletin*, 35 (1): 126-132.

World Bank. 2007. *From Agriculture to Nutrition: Pathways, Synergies and Outcomes*. Agriculture and Rural Development Department. Washington, D.C.: World Bank.

Appendix 1: Agricultural programme studies

Ahmed, A.U., Rabbani, M., Sulaiman, M., Das, N.C. (2009). The impact of asset transfer on livelihoods of the ultra poor in Bangladesh. BRAC Research Monograph Series 39. BRAC and IFPRI. Dhaka, Bangladesh: BRAC.

Alaofè, H., Burney, J., Naylor, R. and Taren, D. (2016). Solar-powered drip irrigation impacts on crops production diversity and dietary diversity in Northern Benin. *Food and Nutrition Bulletin*, 37(2), 164-175.

Bandiera, O., Burgess, R., Das, N., Gulesci, S., Rasul, I. and Sulaiman, M. (2013). Can basic entrepreneurship transform the economic lives of the poor? Working Paper. London School of Economics. London, UK: LSE.

Banerjee, A., Duflo, E., Goldberg, N., Karlan, D., Osei, R., Parienté, W. and Udry, C. (2015). A multifaceted program causes lasting progress for the very poor: Evidence from six countries. *Science*, 348(6236), 1260799.

Banerjee, A.V., Duflo, E., Chattopadhyay, R. and Shapiro, J. (2011). Targeting the hardcore poor: An impact assessment, mimeo MIT. Cambridge, MA: MIT.

Basu, K. and Wong, M. (2015). Evaluating seasonal food storage and credit programs in east Indonesia. *Journal of Development Economics*, 115, 200-216.

Bauchet, J., Morduch, J. and Ravi, S. (2015). Failure vs. displacement: Why an innovative anti-poverty program showed no net impact in South India. *Journal of Development Economics*, 116, 1-16.

Darrouzet-Nardi, A. F., Miller, L. C., Joshi, N., Mahato, S., Lohani, M. and Rogers, B. L. (2016). Child dietary quality in rural Nepal: Effectiveness of a community-level development intervention. *Food Policy*, 61, 185-197.

Das, N. C. and Misha, F. A. (2010). Addressing extreme poverty in a sustainable manner: Evidence from CFPR programme. BRAC CFPR Work. Pap. 19. Dhaka, Bangladesh: BRAC.

de Brauw, A., Eozenou, P. and Moursi, M. (2015). Programme participation intensity and children's nutritional status: Evidence from a randomised control trial in Mozambique. *The Journal of Development Studies*, 51(8), 996-1015.

de Brauw, A., Eozenou, P., Gilligan, D., Hotz, C., Kumar, N. and Meenakshi, J. V. (2015). Biofortification, crop adoption and health information: Impact pathways in Mozambique and Uganda. Harvest Plus Working Paper No. 21. Washington, DC: Harvest Plus.

Dillon, A. (2011). The effect of irrigation on poverty reduction, asset accumulation, and informal insurance: Evidence from Northern Mali. *World Development*, 39(12), 2165-2175.

Emran, M. S., Robano, V. and Smith, S. C. (2014). Assessing the frontiers of ultrapoverty reduction: evidence from challenging the frontiers of poverty reduction/targeting the ultra-poor, an innovative program in Bangladesh. *Economic Development and Cultural Change*, 62(2), 339-380.

- English, R. and Badcock, J. A. (1998). A community nutrition project in Viet Nam: Effects on child morbidity. *Food, Nutrition and Agriculture* 22, 15-21.
- Faber, M., Phungula, M. A., Venter, S. L., Dhansay, M. A. and Benadé, A. S. (2002). Home gardens focusing on the production of yellow and dark-green leafy vegetables increase the serum retinol concentrations of 2–5-y-old children in South Africa. *The American Journal of Clinical Nutrition*, 76(5), 1048-1054.
- Gibson, R. S., Yeudall, F., Drost, N., Mtitimuni, B. M. and Cullinan, T. R. (2003). Experiences of a community-based dietary intervention to enhance micronutrient adequacy of diets low in animal source foods and high in phytate: a case study in rural Malawian children. *The Journal of Nutrition*, 133(11), 3992S-3999S.
- Gilligan, D. O., Hoddinott, J. and Taffesse, A. S. (2009). The impact of Ethiopia's productive safety net programme and its linkages. *The Journal of Development Studies*, 45(10), 1684-1706.
- Hagenimana, V., Anyango Oyunga, M., Low, J., Njoroge, S. M., Gichuki, S. T. and Kabira, J. (1999). Testing the effects of women farmers' adoption and production of orange-fleshed sweet potatoes on dietary vitamin A intake in Kenya. *ICRW/OMNI Research Report Series*, (3). Washington, D.C.: ICRW.
- Hallman, K., Lewis, D. and Begum, S. (2003). An integrated economic and social analysis to assess the impact of vegetable and fishpond technologies on poverty in rural Bangladesh. Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Haseen, F. (2006). Change in food and nutrient consumption among the ultra poor: Is the CFPR/TUP programme making a difference? CFPR/TUP Working Paper Series No. 11. Dhaka, Bangladesh: BRAC.
- Helen Keller International. (2003). HKI's Homestead Food Production program sustainably improves livelihoods of households in rural Bangladesh. Homestead Food Production Program Bulletin No 1. New York, NY: HKI.
- Helen Keller International. (2003). Integration of animal husbandry into home gardening programs to increase vitamin A intake from foods: Bangladesh, Cambodia and Nepal. Special issue 2003.
- Hossain, M., Asadullah, M. N., Hossain, M. A. and Ara, J. (2015). Rising food price, asset transfers, and household food security. (No. 205680). Agricultural and Applied Economics Association.
- Hotz, C., Loechl, C., de Brauw, A., Eozenou, P., Gilligan, D., Moursi, M. and Meenakshi, J. V. (2011). A large-scale intervention to introduce orange sweet potato in rural Mozambique increases vitamin A intakes among children and women. *British Journal of Nutrition*, 1(1), 1-14.
- Hotz, C., Loechl, C., Lubowa, A., Tumwine, J. K., Ndeezi, G., Masawi, A. N. and Gilligan, D. O. (2012). Introduction of β -carotene-rich orange sweet potato in rural Uganda resulted in increased vitamin A intakes among children and women and improved vitamin A status among children. *The Journal of Nutrition*, 142(10), 1871-1880.
- Jodlowski, M., Winter-Nelson, A., Baylis, K. and Goldsmith, P. D. (2016). Milk in the data: food security impacts from a livestock field experiment in Zambia. *World Development*, 77, 99-114.
- Johnson, N., Njuki, J., Waithanji, E., Nhambeto, M., Rogers, M. and Kruger, E. H. (2013). The gendered impacts of agricultural asset transfer projects: lessons from the Manica Smallholder Dairy Development Program (Vol. 115). Washington, D.C.: International Food Policy Research Institute (IFPRI).

- Kafle, K. (2014). Is There More than Milk? The impact of Heifer International's Livestock Donation Program on rural livelihoods: What we learned from a field experiment in Zambia. Agricultural and Applied Economics Association.
- Kafle, K., Winter-Nelson, A. and Goldsmith, P. (2016). Does 25 cents more per day make a difference? The impact of livestock transfer and development in rural Zambia. *Food Policy*, 63, 62-72.
- Kerr, R. B., Berti, P. R. and Shumba, L. (2010). Effects of a participatory agriculture and nutrition education project on child growth in northern Malawi. *Public Health Nutrition*, 14(8), 1466-1472.
- Khamhoung, K., Bodhisane, N., Pathammavong, C., Ouenvilay, S., Senthavisouk, B., Pongpaew, P. and Schelp, F. P. (1999). Nutritional status of pre-school children and women in selected villages in the Suvannakhet Province, Lao PDR – an intervention trial. *The Southeast Asian Journal of Tropical Medicine and Public Health*, 31, 63-74.
- Kumar, N. and Quisumbing, A.R. (2010). Access, adoption, and diffusion: Understanding the long-term impacts of improved vegetable and fish technologies in Bangladesh. IFPRI Discussion Paper 00995, Washington, DC: International Food Policy Research Institute.
- Low, J. W., Arimond, M., Osman, N., Cunguara, B., Zano, F. and Tschirley, D. (2007). A food-based approach introducing orange-fleshed sweet potatoes increased vitamin A intake and serum retinol concentrations in young children in rural Mozambique. *The Journal of Nutrition*, 137(5), 1320-1327.
- Low, J. W., Arimond, M., Osman, N., Cunguara, B., Zano, F. and Tschirley, D. (2007). Ensuring the supply of and creating demand for a biofortified crop with a visible trait: lessons learned from the introduction of orange-fleshed sweet potato in drought-prone areas of Mozambique. *Food and Nutrition Bulletin*, 28(2), S258-S270.
- Marsh, R. (1998). Building on traditional gardening to improve household food security. *Food Nutrition and Agriculture*, 4-14.
- Miller, L. C., Joshi, N., Lohani, M., Rogers, B., Loraditch, M., Houser, R. and Mahato, S. (2014). Community development and livestock promotion in rural Nepal: Effects on child growth and health. *Food and Nutrition Bulletin*, 35(3), 312-326.
- Murshed-E-Jahan, K. and Pemsil, D. E. (2011). The impact of integrated aquaculture–agriculture on small-scale farm sustainability and farmers' livelihoods: Experience from Bangladesh. *Agricultural Systems*, 104(5), 392-402.
- Nkhata, R. (2014). Does irrigation have an impact on food security and poverty: Evidence from Bwanje Valley Irrigation Scheme in Malawi (Vol. 4). Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Olney, D. K., Dillon, A., Ruel, M. T. and Nielsen, J. (2016). Lessons learned from the evaluation of Helen Keller International's enhanced homestead food production program. In *Achieving a nutrition revolution for Africa: The road to healthier diets and optimal nutrition*. Covic, N. and Hendriks, S. L. (Eds.). 67-81. Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Olney, D. K., Talukder, A., Iannotti, L. L., Ruel, M. T. and Quinn, V. (2009). Assessing impact and impact pathways of a homestead food production program on household and child nutrition in Cambodia. *Food and Nutrition Bulletin*, 30(4), 355-369.
- Osei, A. K., Pandey, P., Spiro, D., Adhikari, D., Haselow, N., De Morais, C. and Davis, D. (2015). Adding multiple micronutrient powders to a homestead food production programme yields marginally significant benefit on anaemia reduction among young children in Nepal. *Maternal and Child Nutrition*, 11(S4), 188-202.

- Osei, A., Pandey, P., Nielsen, J., Pries, A., Spiro, D., Davis, D. and Haselow, N. (2017). Combining home garden, poultry, and nutrition education program targeted to families with young children improved anemia among children and anemia and underweight among nonpregnant women in Nepal. *Food and Nutrition Bulletin*, 38(1), 49-64.
- Ragasa, C., Mazunda, J. and Mapila, M. (2016). The impact of agricultural extension services in the context of a heavily subsidized input system: The case of Malawi. (Discussion Paper 01498). Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Rawlins, R., Pimkina, S., Barrett, C. B., Pedersen, S. and Wydick, B. (2014). Got milk? The impact of Heifer International's livestock donation programs in Rwanda on nutritional outcomes. *Food Policy*, 44, 202-213.
- Ricker-Gilbert, J. and Jayne, T. S. (2010). What are the dynamic effects of fertilizer subsidies on household well-being?: Evidence from Malawi. African Association of Agricultural Economists.
- Roos, N. (2001). Fish consumption and aquaculture in rural Bangladesh: Nutritional contribution and production potential of culturing small indigenous fish species (SIS) in pond polyculture with commonly cultured carps. Ph.D. Thesis, Department of Human Nutrition, The Royal Veterinary and Agricultural University, Denmark.
- Schreinemachers, P., Patalagsa, M. A. and Uddin, N. (2016). Impact and cost-effectiveness of women's training in home gardening and nutrition in Bangladesh. *Journal of Development Effectiveness*, 8(4), 473-488.
- Sheikholeslam, R., Kimiagar, M., Siasi, F., Abdollahi, Z., Jazayeri, A., Keyghobadi, K. and Eslami, F. (2004). Multidisciplinary intervention for reducing malnutrition among children in the Islamic Republic of Iran. *Eastern Mediterranean Health Journal*, 10(6), 844-52.
- Smitasiri, S. and Dhanamitta, S. (1999). Sustaining behavior change to enhance micronutrient status: Community and women-based interventions in Thailand. Research Report No. 2, International Center for Research on Women (ICRW)/Opportunities for Micronutrients Interventions (OMNI). Washington, D.C.: ICRW.
- Smitasiri, S., Sa-Ngobwarchar, K., Kongpunya, P., Subsuwan, C., Banjong, O., Chitchumroonechokchai, C. and Dhanamitta, S. (1999). Sustaining behavioural change to enhance micronutrient status through community- and women-based interventions in north-east Thailand: vitamin A. *Food and Nutrition Bulletin*, 20(2), 243-251.
- Swanson, R. (2009). Final evaluation of Land O'Lakes Zambia Title II Development Assistance Program, Dairy Development FFP DAP for Vulnerable Populations in Zambia. Washington, D.C.: Food for Peace.
- Yeudall, F., Gibson, R. S., Cullinan, T. R. and Mtimuni, B. (2005). Efficacy of a community-based dietary intervention to enhance micronutrient adequacy of high-phytate maize-based diets of rural Malawian children. *Public health nutrition*, 8(07), 826-836.
- Zeweld, W., Huylenbroeck, G. V., Hidgot, A., Chandrakanth, M. G. and Speelman, S. (2015). Adoption of small-scale irrigation and its livelihood impacts in Northern Ethiopia. *Irrigation and Drainage*, 64(5), 655-668.

Appendix 2: Cash transfer programme evaluations

Adhikari, T. P., Thapa, F. B., Tamrakar, S., Magar, P. B., Hagen-Zanker, J. and Babajanian, B. (2014). How does social protection contribute to social inclusion in Nepal? Evidence from the child grant in the Karnali region. ODI Report. London, UK: ODI.

Agüero, J.M. Carter, M.R. and Woolard, I. (2009). The impact of unconditional cash transfers on nutrition: The South African child support grant. Cape Town: Southern Africa Labour and Development Research Unit.

Aker, J.C., Boumnijel, R., McClelland, A. and Tierney, N. (2014). Payment mechanisms and anti-poverty programs: evidence from a mobile money cash transfer experiment in Niger. Tufts University (mimeo). Medford, MA: Tufts.

Akresh, R., de Walque, D. and Kazianga, H. (2016). Evidence from a randomized evaluation of the household welfare impacts of conditional and unconditional cash transfers given to mothers or fathers. World Bank Policy Research Working Paper 7730. Washington, DC: World Bank.

Alatas, V. (2011). Program Keluarga Harapan: Main findings from the impact evaluation of Indonesia's Pilot Household Conditional Cash Transfer Program. Jakarta, IDN: World Bank.

Ambler, K. (2016). Bargaining with grandma: The impact of the South African pension on household decision-making. *Journal of Human Resources*, 51(4), 900-932.

American Institutes for Research. (2013). Zambia's child grant program: 24-month impact report. Washington, DC: AIR.

American Institutes for Research. (2014). Zambia's child grant program: 36-month impact report. Washington, DC: AIR.

American Institutes for Research. (2016). Zambia's child grant program: 48-month impact. Washington, D.C.: AIR.

Andersen, C. T., Reynolds, S. A., Behrman, J. R., Crookston, B. T., Dearden, K. A., Escobal, J. and Fernald, L. C. (2015). Participation in the Juntos Conditional Cash Transfer Program in Peru is associated with changes in child anthropometric status but not language development or school achievement. *The Journal of Nutrition*, 145(10), 2396-2405.

Angelucci, M. and Attanasio, O. (2009). Oportunidades: program effect on consumption, low participation, and methodological issues. *Economic Development and Cultural Change*, 57(3), 479-506.

Angelucci, M., Attanasio, O. and Di Maro, V. (2012). The impact of Oportunidades on consumption, savings and transfers. *Fiscal Studies*, 33(3), 305-334.

- Asfaw, S., Carraro, A., Davis, B., Handa, S. and Seidenfeld, D. (2016, September). Cash transfer programmes for managing climate risk: Evidence from a randomized experiment in Zambia. In 2016 AAAE Fifth International Conference, September 23-26, 2016, Addis Ababa, Ethiopia (No. 246280). African Association of Agricultural Economists (AAAE).
- Asfaw, S., Davis, B., Dewbre, J., Handa, S. and Winters, P. (2014). Cash transfer programme, productive activities and labour supply: evidence from a randomised experiment in Kenya. *The Journal of Development Studies*, 50(8), 1172-1196.
- Assis, A. M., Costa, P. R., Santana, M. L., Pitanqueira, J. C., Fonseca, N. S., Pinheiro, S. M. and Santos, S. M. (2014). Effectiveness of the Brazilian conditional cash transfer program – Bolsa Alimentação – on the variation of linear and ponderal increment in children from northeast of Brazil. *Nutr Hosp*, 31(2), 689-97.
- Attanasio, O. P. and Lechene, V. (2014). Efficient responses to targeted cash transfers. *Journal of Political Economy*, 122(1), 178-222.
- Attanasio, O. and Mesnard, A. (2006). The impact of a conditional cash transfer programme on consumption in Colombia. *Fiscal Studies*, 27(4), 421-442.
- Attanasio, O., Battistin, E. and Mesnard, A. (2012). Food and cash transfers: evidence from Colombia. *The Economic Journal*, 122(559), 92-124.
- Attanasio, O., Battistin, E., Fitzsimons, E. and Vera-Hernandez, M. (2005). How effective are conditional cash transfers? Evidence from Colombia. Institute for Fiscal Studies Briefing Note No. 54. London, UK: IFS.
- Attanasio, O., Gomez, L. C., Heredia, P. and Vera-Hernandez, M. (2005). The short-term impact of a conditional cash subsidy on child health and nutrition in Colombia. The Institute for Fiscal Studies Report Summary: Familias 03. London, UK: IFS.
- Baird, S., McIntosh, C. and Ozler, B. (2016). When the money runs out: do cash transfers have sustained effects on human capital accumulation? World Bank Policy Research Working Paper 7901. Washington, DC: World Bank.
- Baird, S.J., Chirwa, E., de Hoop, J. and Özler, B. (2013). Girl power: cash transfers and adolescent welfare. Evidence from a cluster-randomized experiment in Malawi. Working Paper 19479. Cambridge, MA: National Bureau of Economic Research.
- Barber, S. L. and Gertler, P. J. (2010). Empowering women: how Mexico's conditional cash transfer programme raised prenatal care quality and birth weight. *Journal of Development Effectiveness*, 2(1), 51-3.
- Barham, T., Macours, K. and Maluccio, J. A. (2013). Boys' cognitive skill formation and physical growth: Long-term experimental evidence on critical ages for early childhood interventions. *The American Economic Review*, 103(3), 467-471.
- Barrera-Osorio, F., Bertrand, M., Linden, L. L. and Perez-Calle, F. (2008). Conditional cash transfers in education design features, peer and sibling effects evidence from a randomized experiment in Colombia. National Bureau of Economic Research Working Paper No. 13890. Cambridge, MA: NBER.
- Baulch, B. (2011). The medium-term impact of the primary education stipend in rural Bangladesh. *Journal of Development Effectiveness*, 3(2), 243-262.

- Bazzi, S.A. (2013). It's all in the timing: cash transfers and household expenditures in a developing country. In S.A. Bazzi, *Essays in Development Economics*. PhD thesis. University of California, San Diego.
- Behrman, J. and Hoddinott, J. (2001). An evaluation of the impact of PROGRESA on pre-school child height. FCND Discussion Paper No. 104. Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Benedetti, F., Ibararán, P. and McEwan, P. J. (2016). Do education and health conditions matter in a large cash transfer? Evidence from a Honduran experiment. *Economic Development and Cultural Change*, 64(4), 759-793.
- Berhane, G., Devereux, S., Hoddinott, J., Hoel, J., Roelen, K., Abay, K., Kimmel, M., Ledlie, N. and Woldu, T. (2015). Evaluation of the Social Cash Transfers Pilot Programme: Tigray region, Ethiopia (Endline Report). Washington D.C.: International Food Policy Research Institute (IFPRI).
- Bhalla, G., Handa, S., Angeles, G. and Seidenfeld, D. (2016). The effect of cash transfers and household vulnerability on food insecurity in Zimbabwe. Office of Research - Innocenti Working Paper. WP-2016-22. Florence, IT: UNICEF.
- Braido, L.H.B., Olinto, P. and Perrone, H. (2012). Gender bias in intrahousehold experiment. *Review of Economics and Statistics*, 94(2), 552–565.
- Brugh, K. N., Angeles, G., Mvula, P. and Tsoka, M. Impacts of an unconditional cash transfer on household food and nutrition security in Malawi. In 2015 Fall Conference: The Golden Age of Evidence-Based Policy, APPAM. Washington, DC: APPAM.
- Case, A. (2001). Does money protect health status? Evidence from South African pensions. National Bureau of Economic Research Working Paper 8495. Cambridge, MA: NBER.
- Chaudhury, N., Friedman, J. and Onishi, J. (2013). Philippines conditional cash transfer program: impact evaluation 2012. World Bank Report Number 75533-PH. Washington, D.C.: World Bank.
- Cheema, I., Farhat, M., Hunt, S., Javeed, S., Pellerano, L. and O'Leary, S. (2014). Benazir income support programme: first follow-up impact evaluation report. Oxford, UK: Oxford Policy Management.
- Coetzee, M. (2013). Finding the benefits: Estimating the impact of the South African child support grant. *South African Journal of Economics*, 81(3), 427-450.
- Cruz, M. and Ziegelhofer, Z. (2014). Beyond the income effect: impacts of conditional cash transfer programs on private investments in human capital. World Bank Policy Research Working Paper Series 6867. Washington, D.C.: World Bank.
- d'Agostino, G., Scarlato, M. and Napolitano, S. (2016). Do cash transfers promote food security? The case of the South African child support grant. MPRA Paper No. 69177.
- Daidone, S., Davis, B., Dewbre, J., González-Flores, M., Handa, S., Seidenfeld, D. and Tembo, G. (2014). Zambia's Child Grant Programme: 24-month impact report on productive activities and labour allocation. Rome: FAO.

- Dammert, A. C. (2009). Heterogeneous impacts of conditional cash transfers: Evidence from Nicaragua. *Economic Development and Cultural Change*, 58(1), 53-83.
- Davis, B., Handa, S., Ruiz Arranz, M., Stampini, M. and Winters, P. (2002) Conditionality and the impact of programme design on household welfare: comparing two diverse cash transfer programmes in rural Mexico. Working Paper 02-10. Rome: FAO.
- de Brauw, A., Gilligan, D., Hoddinott, J., Moreira, V. and Roy, S. (2012). The impact of Bolsa Familia on child, maternal, and household welfare. Working Paper. Washington DC: International Food Policy Research Institute (IFPRI).
- Devereux, S., Mvula, P. and Colette Solomon. (2006). After the FACT: An evaluation of Concern Worldwide's food and cash transfers project in three districts of Malawi, 2006. Lilongwe, Malawi: Concern Worldwide.
- Duflo, E. (2003). Grandmothers and granddaughters: Old-age pensions and intrahousehold allocation in South Africa. *The World Bank Economic Review*, 17(1), 1-25.
- Esteva, A.A. (2012) The medium-term impact of a conditional cash transfer program on child physical and cognitive development: evidence from Progresá. In A.A. Esteva, Essays in development and labor economics. PhD. Cambridge, MA: Harvard University.
- Evans, D. K., Hausladen, S., Kosec, K. and Reese, N. (2012). Community-based conditional cash transfers in Tanzania, Results from a Randomized Trial. Washington, D.C.: World Bank.
- Evans, D.K., Hauslade, S., Kosec, K. and Reese, N. (2014). Community-based conditional cash transfers in Tanzania: results from a randomized trial. Washington, DC: World Bank.
- FAO (Food and Agriculture Organization). (2015). Zimbabwe's harmonized social cash transfer programme: impacts on productive activities and labour allocation. Research Brief. Rome: FAO.
- Fernald, L. C., Gertler, P. J. and Neufeld, L. M. (2008). Role of cash in conditional cash transfer programmes for child health, growth, and development: an analysis of Mexico's Oportunidades. *The Lancet*, 371(9615), 828-837.
- Fernald, L. C., Gertler, P. J. and Neufeld, L. M. (2009). 10-year effect of Oportunidades, Mexico's conditional cash transfer programme, on child growth, cognition, language, and behaviour: a longitudinal follow-up study. *The Lancet*, 374(9706), 1997-2005.
- Fernald, L.C.H. and Hidrobo, M. (2011). Effect of Ecuador's cash transfer program (Bono de Desarrollo Humano) on child development in infants and toddlers: a randomized effectiveness trial. *Social Science and Medicine*, 72(9), 1437-1446.
- Ferré, C. and Sharif, I. (2014). Can conditional cash transfers improve education and nutrition outcomes for poor children in Bangladesh? Evidence from a pilot project. World Bank Policy Research Working Paper 7077. Washington, D.C.: World Bank.
- Fiszbein, A., Schady, N. R. and Ferreira, F. H. (2009). Conditional cash transfers: reducing present and future poverty. World Bank Publications. Washington, D.C.: World Bank.
- Gajate-Garrido, G. (2014). Assessing the differential impact of 'Juntos' conditional cash transfer on indigenous people. Population Association of America, 2014 Annual Program Meeting, Boston, MA.

- Gertler, P. (2004). Do conditional cash transfers improve child health? Evidence from PROGRESA's control randomized experiment. *The American Economic Review*, 94(2), 336-341.
- Gilligan, D.O., Margolies, A., Quiñones, E. and Roy, S. (2013). Impact evaluation of cash and food transfers at early childhood development centres in Karamoja, Uganda. Final impact report. Washington, D.C.: International Food Policy Research Institute (IFPRI).
- Gitter, S. R. and Barham, B. L. (2008). Women's power, conditional cash transfers, and schooling in Nicaragua. *The World Bank Economic Review*, 22(2), 271-290.
- Gitter, S. R. and Caldes, N. (2010). Crisis, food security, and conditional cash transfers in Nicaragua. Working Paper No. 2010-07. Towson, MD: Towson University.
- Gitter, S. R., Manley, J. and Barham, B. L. (2011). The coffee crisis, early childhood development, and conditional cash transfers. Inter-American Development Bank Working Paper IDB-WP-245. Washington, D.C.: IDB.
- Gitter, S. R., Manley, J. and Barham, B. L. (2013). Early-childhood nutrition and educational conditional cash transfer programmes. *The Journal of Development Studies*, 49(10), 1397-1411.
- Handa, A., Angeles, G., Abdoulayi, S., Mvula, P. and Tsoka, M. (2015). Malawi social cash transfer program midline impact evaluation report. Chapel Hill, NC: Carolina Population Center.
- Handa, S., Natali, L., Seidenfeld, D., Tembo, G. and Davis, B. (2016). Can unconditional cash transfers lead to sustainable poverty reduction? Evidence from two government-led programmes in Zambia. Innocenti Working Paper 2016-21. Florence, IT: UNICEF.
- Handa, S., Park, M., Darko, R. O., Osei-Akoto, I., Davis, B. and Daidone, S. (2013). Livelihood empowerment against poverty program impact evaluation. Chapel Hill: University of North Carolina, Carolina Population Center. Available at: www.unicef.org/ghana/gh_resources_LEAP_Quant_impact_evaluation_FINAL_OCT_2013.pdf.
- Handa, S., Peterman, A., Davis, B., Stampini, M. (2009). Opening up Pandora's box: the effect of gender targeting and conditionality on household spending behavior in Mexico's ProgresA programme. *World Development*, 37(6), 1129-1142.
- Haushofer, J. and Shapiro, J. (2013). Household response to income changes: Evidence from an unconditional cash transfer program in Kenya. Cambridge, MA: MIT.
- Haushofer, J. and Shapiro, J. (2013). Policy brief: Impacts of unconditional cash transfers. Cambridge, MA: MIT.
- Haushofer, J., Reisinger, J. and Shapiro, J. (2015). Your gain is my pain: negative psychological externalities of cash transfers. Princeton University (mimeo). Princeton, NJ: Princeton Univ.
- Heinrich, C., Hoddinott, J., Samson, M., Mac Quene, K., van Nikerk, I. and Renaud, B. (2012). The South African child support grant impact assessment. Pretoria, ZA: UNICEF South Africa.
- Hidrobo, M., Hoddinott, J., Peterman, A., Margolies, A. and Moreira, V. (2014). Cash, food, or vouchers? Evidence from a randomized experiment in northern Ecuador. *Journal of Development Economics*, 107, 144-156.
- Hoddinott, J. and Skoufias, E. (2004). The impact of PROGRESA on food consumption. *Economic Development and Cultural Change*, 53(1), 37-61.

- Hoddinott, J. and Wiesmann, D. (2008). The impact of conditional cash transfer programs on food consumption in Honduras, Mexico, and Nicaragua. Working paper, available at SSRN.
- Hoddinott, J., Skoufias, E. and Washburn, R. (2000). The impact of PROGRESA on consumption: A final report. Washington, DC. International Food Policy Research Institute (IFPRI).
- Hou, X. (2010). Can drought increase total calorie availability? The impact of drought on food consumption and the mitigating effects of a conditional cash transfer program. *Economic Development and Cultural Change*, 58(4), 713-737.
- Kandpal, E., Alderman, H., Friedman, J., Filmer, D., Onishi, J. and Avalos, J. (2016). A conditional cash transfer program in the Philippines reduces severe stunting. *The Journal of Nutrition*, 146(9), 1793-1800.
- León, M. and Younger, S. D. (2007). Transfer payments, mothers' income and child health in Ecuador. *The Journal of Development Studies*, 43(6), 1126-1143.
- Leroy, J. L., Gadsden, P., de Cossío, T. G. and Gertler, P. (2013). Cash and in-kind transfers lead to excess weight gain in a population of women with a high prevalence of overweight in rural Mexico. *The Journal of Nutrition*, 143(3), 378-383.
- Leroy, J. L., Gadsden, P., Rodríguez-Ramírez, S. and De Cossío, T. G. (2010). Cash and in-kind transfers in poor rural communities in Mexico increase household fruit, vegetable, and micronutrient consumption but also lead to excess energy consumption. *The Journal of Nutrition*, 140(3), 612-617.
- Leroy, J. L., García-Guerra, A., García, R., Dominguez, C., Rivera, J. and Neufeld, L. M. (2008). The Oportunidades program increases the linear growth of children enrolled at young ages in urban Mexico. *The Journal of Nutrition*, 138(4), 793-798.
- Leveré, M., Acharya, G. and Bharadwaj, P. (2016). The role of information and cash transfers on early childhood development: Evidence from Nepal. NBER Working Paper No. 22640. Cambridge, MA: NBER.
- Lopez-Arana, S., Avendano, M., Forde, I., van Lenthe, F. J. and Burdorf, A. (2016). Conditional cash transfers and the double burden of malnutrition among children in Colombia: a quasi-experimental study. *The British Journal of Nutrition*, 115(10), 1780-1789.
- Lopez-Arana, S., Avendano, M., van Lenthe, F. J. and Burdorf, A. (2016). The impact of a conditional cash transfer programme on determinants of child health: evidence from Colombia. *Public Health Nutrition*, 1-14.
- Macours, K. and Vakis, R. (2009). Changing households' investments and aspirations through social interactions. World Bank Policy Research Working Paper No. 5137. Washington, DC: World Bank.
- Macours, K., Premand, P. and Vakis, R. (2012). Transfers, diversification and household risk strategies: Experimental evidence with lessons for climate change adaptation. World Bank Policy Research Working Paper No. 6053. Washington, DC: World Bank.
- Macours, K., Schady, N. and Vakis, R. (2012). Cash transfers, behavioral changes, and cognitive development in early childhood: Evidence from a randomized experiment. *American Economic Journal: Applied Economics*, 4(2), 247-273.

- Maluccio, J. (2005). Coping with the “coffee crisis” in Central America: The role of the Nicaraguan Red de Protección social. FCND Discussion Paper, No. 188. Washington, DC: IFPRI.
- Maluccio, J. (2010). The impact of conditional cash transfers on consumption and investment in Nicaragua. *The Journal of Development Studies*, 46(1), 14-38.
- Maluccio, J. and Flores, R. (2005). Impact evaluation of a conditional cash transfer program: The Nicaraguan Red de Protección Social. IFPRI Research Report 141. Washington, DC: IFPRI.
- Manley, J., Fernald, L. and Gertler, P. (2015). Wealthy, healthy and wise: does money compensate for being born into difficult conditions? *Applied Economics Letters*, 22(2), 121-126.
- Martinez, S. (2004). Pensions, poverty and household investments in Bolivia. Berkeley, CA: University of California at Berkeley.
- Martins, A. P. B. and Monteiro, C. A. (2016). Impact of the Bolsa Família program on food availability of low-income Brazilian families: a quasi experimental study. *BMC Public Health*, 16(1), 827.
- McBride, L. (2015). Evaluation of targeting methods and impact of the cash transfer pilot in Niger. In C. del Ninno and B. Mills (Eds.) *Safety Nets in Africa, Effective Mechanisms to Reach the Poor and Most Vulnerable*. Washington, DC: World Bank.
- Merttens, F., Hurrell, A., Marzi, M., Attah, R., Farhat, M., Kardan, A. and MacAuslan, I. (2013). Kenya Hunger Safety Net Programme monitoring and evaluation component. Impact evaluation final report: 2009 to 2012. Oxford, UK: Oxford Policy Management.
- Merttens, F., Pellerano, L., O’Leary, S., Sindou, E., Attah, R., Jones, E. and Martin, S. (2015). Evaluation of the Uganda social assistance grants for empowerment (SAGE) Programme: impact after one year of programme operations 2012–2013. Evaluation Report. Oxford: Oxford Policy Management and Kampala: Department of Anthropology and Sociology, University of Makerere.
- Miller, C. M., Tsoka, M. and Reichert, K. (2011). The impact of the Social Cash Transfer Scheme on food security in Malawi. *Food policy*, 36(2), 230-238.
- Miller, C., Tsoka, M. and Reichert, K. (2008). Impact evaluation report external evaluation of the Mchinji Social Cash Transfer Pilot. UNICEF Malawi.
- Morris, S. S., Olinto, P., Flores, R., Nilson, E. A. and Figueiro, A. C. (2004). Conditional cash transfers are associated with a small reduction in the rate of weight gain of preschool children in northeast Brazil. *The Journal of Nutrition*, 134(9), 2336-2341.
- O’Brien, C., Marzi, M., Pellerano, L. and Visram, A. (2013). Kazakhstan: external evaluation of BOTA programmes: the impact of BOTA’s conditional cash transfer (CCT) programme 2011-2012. Oxford, UK: Oxford Policy Management.
- Ospina, M. (2010). The indirect effects of conditional cash transfer programs: an empirical analysis of Familias En Acción. PhD Dissertation. Atlanta, GA: Georgia State University.
- Paes-Sousa, R., Santos, L. M. P. and Miazaki, É. S. (2011). Effects of a conditional cash transfer programme on child nutrition in Brazil. *Bulletin of the World Health Organization*, 89(7), 496-503.

- Palermo, T., Alvia, C., Davis, B., Handa, S., Hurrel, A., Hussein, A., Musemb, D., Ochieng, S., Pearson, R., Pellerano, L., Visra, A. and Ward, P. (2012). The impact of the Kenya Cash Transfer Program for Orphans and Vulnerable Children on household spending. *Journal of Development Effectiveness*, 4(1), 9–37.
- Paxson, C. and Schady, N. (2010). Does money matter? The effects of cash transfers on child development in rural Ecuador. *Economic Development and Cultural Change*, 59(1), 187-229.
- Pellerano, L., Jakobsen, M., Moratti, M., Bajgar, M. and Barca, V. (2014). Lesotho Child Grants Programme impact evaluation. Maseru: UNICEF-Lesotho, and Oxford: Oxford Policy Management.
- Pérez-Lu, J. E., Cárcamo, C., Nandi, A. and Kaufman, J. S. (2016). Health effects of ‘Juntos’, a conditional cash transfer programme in Peru. *Maternal and Child Nutrition*, 2016.
- Perova, E. and Vakis, R. (2009). Welfare impacts of the “Juntos” Program in Peru: Evidence from a non-experimental evaluation. Washington, DC: World Bank.
- Perova, E. and Vakis, R. (2012). 5 years in Juntos: New evidence on the program’s short and long-term impacts. *Economía*, 35(69), 53-82.
- Ramirez-Silva, I., River, J.A., Leroy, J.L. and Neufeld, L.M. (2013). The Oportunidades Program’s fortified food supplement, but not improvements in the home diet, increased the intake of key micronutrients in rural Mexican children aged 12–59 months. *The Journal of Nutrition*, 143(5), 656–663.
- Ribas, R.P., Soares, F.V., Teixeira, S.C., Silva, E. and Hirata, G. (2010). Beyond cash: assessing externality and behaviour effects of non-experimental cash transfers. Working Paper 65. Brasilia: International Policy Centre for Inclusive Growth.
- Rivera, J. A., Sotres-Alvarez, D., Habicht, J. P., Shamah, T. and Villalpando, S. (2004). Impact of the Mexican program for education, health, and nutrition (Progresa) on rates of growth and anemia in infants and young children: a randomized effectiveness study. *JAMA*, 291(21), 2563-2570
- Romeo, A., Meerman, J., Demeke, M., Scognamillo, A. and Asfaw, S. (2016). Linking farm diversification to household diet diversification: evidence from a sample of Kenyan ultra-poor farmers. *Food Security*, 8(6), 1069-1085.
- Rubalcava, L., Teruel, G. and Thomas, D. (2009). Investments, time preferences and public transfers paid to women. *Economic Development and Cultural Change*, 57(3), 507.
- Ruiz-Arranz, M., Davis, B., Handa, S., Stampini, M. and Winters, P. (2006). Program conditionality and food security: the impact of PROGRESA and PROCAMPO transfers in rural Mexico. *Revista Economía*, 7(2), 249–278.
- Salinas Rodríguez, A., Manrique-Espinoza, B., Moreno-Tamayo, K., Torres Pereda, P., De la Cruz-Góngora, V., Ángeles Tagliaferro, G. and Téllez-Rojo Solís, M.M. (2014). Impact evaluation of the non-contributory social pension programme 70 y más in Mexico. 3ie Impact Evaluation Report 5. New Delhi: International Initiative for Impact Evaluation (3ie).

- Samson, M., Heinrich, C. J., Hoddinott, J., Laryea-Adjei, G., Buthelezi, T., Cluver, L. and Nyokangi, E. (2016). The Impact of a Promise Realized: South Africa's child support grant. In B. Davis, S. Handa, N. Hypher, N. Winder Rossi, P. Winters and J. Yablonski, (Eds.) From evidence to action: the story of cash transfers and impact evaluation in sub Saharan Africa. Oxford, UK: Oxford University Press.
- Schady, N. (2012). Cash transfers and anemia among women of reproductive age. *Economics Letters*, 117(3), 887–890.
- Schady, N. and Rosero, J. (2008). Are cash transfers made to women spent like other sources of income? *Economics Letters*, 101(3), 246-48.
- Seidenfeld, D. and Handa, S. (2011). Results of the three-year impact evaluation of Zambia's cash transfer programme in Monze District final report. Washington, DC: American Institutes for Research.
- Seidenfeld, D., Dumba, L., Handa, S., Muwoni, L., Reeves, H. and Sammon, E. (2016). Zimbabwe: Using evidence to overcome political and economic challenges to starting a national unconditional cash transfer programme. In B. Davis, S. Handa, N. Hypher, N. Winder Rossi, P. Winters and J. Yablonski, (Eds.) From evidence to action: the story of cash transfers and impact evaluation in sub Saharan Africa. Oxford, UK: Oxford University Press.
- Sinha, N. and Yoong, J. (2009). Long-term financial incentives and investment in daughters: Evidence from conditional cash transfers in North India. The World Bank Policy Research Working Paper 4860. Washington, DC: World Bank.
- Skoufias, E., Unar, M. and Gonzalez de Cossio, T. (2013). The poverty impacts of cash and in-kind transfers: experimental evidence from rural Mexico. *Journal of Development Effectiveness*, 5(4), 401-429
- Soares, F. V. and Teixeira, C. (2010). Impact evaluation of the expansion of the food subsidy programme in Mozambique. Center for Inclusive Growth. International Policy Research Brief 17. Brasilia, IPC-IG.
- Strobbe, F. and Miller, C. M. (2011). Cash transfers in an epidemic context: the interaction of formal and informal support in rural Malawi. World Bank Policy Research Working Paper 5824. Washington, DC: World Bank.
- Tembo, G., Chimai, B., Freeland, N. and Mulenga, B.P. (2014). Welfare effects of social cash transfers in Chipata and Kazungula Districts of Zambia. *Business and Economic Research*, 4(1), 289.
- Tiwari, S., Daidone, S., Ruvalcaba, M. A., Prifti, E., Handa, S., Davis, B. and Seidenfeld, D. (2016). Impact of cash transfer programs on food security and nutrition in sub-Saharan Africa: A cross-country analysis. *Global Food Security*, 11, 72-83.
- Todd, J.E., Winters, P. and Hertz, T. (2010). Conditional cash transfers and agricultural production: lessons from the Oportunidades experience in Mexico. *Journal of Development Studies*, 46(1), 39–67.
- Zembe-Mkabile, W., Ramokolo, V., Sanders, D., Jackson, D. and Doherty, T. (2016). The dynamic relationship between cash transfers and child health: can the child support grant in South Africa make a difference to child nutrition?. *Public Health Nutrition*, 19(02), 356-362.

The IFAD Research Series

01. **Agricultural and rural development reconsidered**
A guide to issues and debates
By Steve Wiggins
02. **Migration and transformative pathways**
A rural perspective
By David Suttie, Rosemary Vargas-Lundius
03. **Fostering inclusive outcomes in sub-Saharan African agriculture**
Improving agricultural productivity and expanding agribusiness opportunities
By David Suttie, Rui Benfica
04. **The effects of smallholder agricultural involvement on household food consumption and dietary diversity**
Evidence from Malawi
By Rui Benfica, Talip Kilic
05. **Rural-urban linkages and food systems in sub-Saharan Africa**
The rural dimension
By Karim Hussein, David Suttie
06. **Why food and nutrition security matters for inclusive structural and rural transformation**
By Steven Were Omamo
07. **Measuring IFAD's impact**
Background paper to the IFAD9 Impact Assessment Initiative
By Alessandra Garbero
08. **Fostering inclusive rural transformation in fragile states and situations**
By Karim Hussein
09. **Social protection and inclusive rural transformation**
By Carolina Trivelli, Silvana Vargas, Jhonatan Clausen
10. **Inclusive Finance and Inclusive Rural Transformation**
By Calum G. Turvey
11. **Food safety, trade, standards and the integration of smallholders into value chains**
A review of the literature
By John Humphrey
12. **An evidence-based assessment of IFAD's end of project reporting**
By Bia Carneiro, Alessandra Garbero
13. **Graduation models for rural financial inclusion**
By Khalid El Harizi, Xinjia Yan
14. **Disbursement performance of the International Fund for Agricultural Development (IFAD)**
An in-depth analysis of drivers and trends
By Tim Balint, Daniel Higgins, Paola Mallia, Silvana Scalzo, Paul Winters
15. **Remittances, growth and poverty reduction in Asia**
A critical review of the literature and new evidence from cross-country panel data
By Katsushi S. Imai, Bilal Malaeb, Fabrizio Bresciani
16. **Getting the most out of impact evaluation for learning, reporting and influence**
Insights from piloting a Participatory Impact Assessment and Learning Approach (PIALA) with IFAD
By Edward Heinemann, Adinda Van Hemelrijk, Irene Guijt
17. **Population age structure and sex composition in sub-Saharan Africa**
A rural-urban perspective
By Ashira Menashe-Oren, Guy Stecklov
18. **Do agricultural support and cash transfer programmes improve nutritional status?**
By Seth R. Gitter, James Manley, Jill Bernstein, Paul Winters



International Fund for Agricultural Development

Via Paolo di Dono, 44 - 00142 Rome, Italy

Tel: +39 06 54591 - Fax: +39 06 5043463

Email: ifad@ifad.org

www.ifad.org

 ifad-un.blogspot.com

 www.facebook.com/ifad

 instagram.com/ifadnews

 www.twitter.com/ifadnews

 www.youtube.com/user/ifadTV

ISBN 978-92-9072-790-3



9 789290 727903

