



## Food security and public agricultural spending in Bolivia: Putting money where your mouth is?

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### ABSTRACT

This paper explores the reduction of food insecurity in Bolivia, adopting a supply-side approach that analyzes the role of agricultural spending on vulnerability to food insecurity. Vulnerability to food insecurity is captured by a municipal-level composite indicator for all 327 municipalities in 2003, 2006, and 2007. Econometric analysis indicates that levels of public agricultural spending are positively associated with high or very high vulnerability—especially investments in infrastructure and research and extension. The authors interpret this to indicate that agricultural spending allocation is driven by high or very high vulnerability levels, but has small effects on reducing high vulnerability.

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### Introduction

Recent food price increases and volatility have created a sense of urgency to better understand and address food security across developed and developing countries. Food security is a complex phenomenon that was originally measured by the ability of a country to access enough food to meet the dietary energy requirements of its population (Pinstrup-Andersen, 2009, 5). However, since that original definition, the term “food security” has been used in different ways, until a definition was widely accepted at the 1996 World Food Summit (FAO, 1996): “food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life”. This consensus definition brings individuals and households into the limelight, but, more importantly, it also acknowledges that there are multiple factors affecting an individual's ability to easily access food that adequately satisfies his or her needs. Also, because of this multiplicity, a single, “silver bullet” policy for addressing food insecurity is likely to have a limited impact. As a result, food security interventions in practice span several sectors, including agriculture, rural development and infrastructure, health, education, and social protection. They also represent a continuum of short-term mitigation actions and longer-term strategic

investments. Because of this complexity, a rigorous attempt to assess the impact of the different food security-related interventions is challenging in terms of both data availability and addressing counterfactual and endogeneity issues.

This paper takes a supply-side approach by examining the association of agricultural spending (broadly defined to include rural development) and food security. The study delimits the analysis of food security in the following dimensions: first, it focuses on specific supply-side sectoral policies, that is, agricultural interventions, programs, and policies. Although it is widely acknowledged that other sectoral interventions on health, education, and safety nets are needed to effectively reduce malnutrition (Bryce et al., 2008; Black et al., 2008), there is growing attention to the specific role that agriculture plays in improving food security and nutrition. A recent review by Masset et al. (2012) shows that agriculture interventions typically improve the production of agriculture goods promoted, but they fail to increase households' total incomes, improve their dietary diversity, increase absorption of macronutrients, or reduce malnutrition prevalence. Horton et al. (2008) report that biofortification—plant breeding for high micronutrient content—remains promising in terms of reducing child mortality, but with large differences in cost-effectiveness. In any case, this growing evidence suggests that agricultural decisions on spending, composition, and regional allocation may all influence critical policy choices potentially affecting food security. Second, the analysis does not focus on *observed* indicators of food security, such as calorie intake, dietary diversity, or malnutrition

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levels as traditionally measured. Rather, this analysis concentrates on the vulnerability dimension of food insecurity, which allows for a more comprehensive approach that captures the exposure to risk factors that cause food insecurity and the availability of strategies, assets, or resources (at individual, household, community, and municipal levels) to combat such factors.<sup>1</sup> In a recent study linking agriculture to nutritional outcomes in India, Gulati et al. (2012) acknowledge that an exhaustive analysis based on observed indicators would require factors such as dietary quality, food intake, institutional interventions, national food availability, and political and economic structure to fully integrate all relevant dimensions of food security. Third, households are no longer at the center stage of the analysis in this study, but they remain critical agents as members of municipalities. This analytical scope does not overlook the individual nature of food insecurity, but it aggregates individual-specific risks and exposure with truly collective risks at the municipal level (such as, for example, altitude and rainfall in the community where the individual resides). This is also consistent with public spending decisions (in agriculture and other sectors) being made at national, departmental, municipal, and community levels rather than at the individual level. Adopting this macro approach is common when analyzing the role of agriculture research and innovation in reducing hunger and malnutrition (Bouis, 2000) or when discussing issues of institutional capacity or scale of interventions in nutrition and food security (Bryce et al., 2008).

The empirical analysis concentrates in Bolivia, one of the poorest countries in the western hemisphere, with dismal rates of extreme poverty in the rural sector and an ambitious strategy of food sovereignty. In Bolivia, challenges to ensure food security could arise from a number of factors (Ormaechea, 2009; Cuesta et al., 2009; World Bank, 2010b)—from reduced cultivated land area and increased land fragmentation to structural factors, such as the geography of the country or its limited road coverage. Not surprisingly, food security and sovereignty have been brought to the center stage of Bolivia's development agenda and are key elements of several government programs currently under implementation.

Agricultural spending alone in Bolivia—totaling about 13% of the gross domestic product (GDP) in 2008—captures a large portion of the public money being allocated toward food security in the country. As such, although providing a partial perspective, this percentage of GDP is a good indicator of public interventions that aim at reducing vulnerability to food insecurity. To the best of the authors' knowledge, this analysis is the first attempt to make inferences about the relationship between sectoral spending in agriculture and food security in Bolivia. This has been made possible by the use of a disaggregated data set on public expenditures in agriculture and rural development over the period 1996–2008 at the municipal level.

"Agriculture and food security in Bolivia" succinctly presents the Bolivian food security policy, while "Analyzing the effects of agricultural spending on food insecurity" and "Vulnerability analysis and mapping methodology" discuss the food security index used in the analysis and expenditure data sources. "Public agricultural expenditure in Bolivia: Data and trends" describes the analytical technique used in the paper and key results. "Analyzing the effects of agricultural spending on VAM" discusses the results

and main conclusions. The analysis provides several key findings on the extent to which public agricultural spending is associated with levels and changes in vulnerability and how the composition of public expenditure is important in Bolivia.

### Agriculture and food security in Bolivia

There is no consensus on the causes and severity of food insecurity in Bolivia. Ormaechea (2009) reports that according to the government of Bolivia, the country did not undergo a food crisis at the time of the global food price crisis. Two claims support the official argument: wheat is the only foodstuff for which domestic production is structurally in deficit, and shocks and politically motivated speculation are behind what otherwise are fundamentally short-term food shortages. In stark contrast, other analysts talk of a fundamental structural problem (Ormaechea, 2009), where food vulnerability in Bolivia is the result of a number of trends developing over time: (i) a reduction in cultivated land; (ii) the strengthening of export oriented agriculture by large scale producers that are geographically concentrated in detriment of small traditional producers; (iii) the increase of food imports (and subsequent increase in dependence on international markets); (iv) the transition of *campesinos* from self-subsistent food producers to increasingly net food demanders – itself the result of a process of increasing urbanization and resulting greater supply of labor in urban areas in expense of rural areas, and dependence on remittances); (v) dietary changes from traditional foodstuffs like potato to manufactured agricultural food; (vi) environmental shocks – La Niña 2008–2009 and, more recently, floods, – (vii) other structural factors, such as the rigid geography of the country and limited road coverage, which have made domestic market integration difficult and have stimulated localized production of food stuffs.

Interestingly, before the onset of the global food price crisis—which has been estimated to have strongly impacted the country (Cuesta et al., 2009<sup>2</sup>)—Bolivia had already brought food security and sovereignty issues to the center stage of its developmental agenda: "Bolivia's National Development Plan 2006–2010" already referenced food security and sovereignty as components of both its developmental and its sovereignty axes (Government of Bolivia, 2006). Those policy guidelines materialized in the *Plan de Apoyo a Seguridad Alimentaria*, which has become a key pillar of the Morales administration's *Revolucion Agraria* (Government of Bolivia, 2006). Recently, food security and sovereignty also became visible elements of the Government Plan 2010–2015 (Government of Bolivia, 2010).

In its fight against food insecurity, Bolivia has undertaken a broad policy approach centered on the following activities: (i) land redistribution; (ii) promotion of production (and exports) of foodstuffs and potatoes through state-owned enterprises EMAPA and SEPA (Empresa de Apoyo a la Produccion de Alimentos and Semilla de Papa, respectively); (iii) food security-related programs (Program for Support to Food Security [PASA] and *Sistema Nacional de Seguridad Alimentaria y alerta Temprana* [SINSAAT II]) including support to communities and small producers based on traditional and indigenous technologies (*Desarrollo Económico Local para la Seguridad Alimentaria* [DELSA], *Proyecto de apoyo directo para la creación de iniciativas agroalimentarias rurales* [CRIAR]); (iv) nutritional programs for children, pregnant women, and lactating mothers with infants; and (v) school programs such as the Zero Hunger Program and the National Program of School Meals.<sup>3</sup>

<sup>1</sup> This shift of focus from nutrition to food security vulnerability is unlikely to alter any key message on the role of agriculture and food security because it is well known that food security is just one of the factors contributing to good nutritional status at the individual, household and community levels (WFP, 2010). For Bolivia, Vulnerability Analysis Mapping (VAM) 2008 shows that there are substantial differences in the incidence of chronic, acute, and global malnutrition rates among municipalities with high and low levels of food security vulnerability or by the level of macronutrients ingested between high and low vulnerable municipalities (UPB, 2008, 256–57).

<sup>2</sup> Bolivia saw food prices increase above the Latin America and Caribbean average; had a negative food balance trade, and had a very large proportion of household expenditures on food. The *simulated* direct impact on poverty—without private and public response—due to the food price increases between January 2006 and December 2008 was estimated to reach 6 percentage points.

<sup>3</sup> Appendix A has a complete list of programs as well as brief descriptions.

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