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Impact of India's Food Security Policy across Household Types

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Introduction

With global population expected to reach 9 billion by 2050 (UN, 2009), achieving food security for all, while addressing competing priorities for land and other resources, is a key challenge of the 21st century. Most of the growth in demand for food is expected to come from the developing countries (D'Odorico et al., 2014). The rural-urban divide in terms of food security, among the poor households, in these countries is often found to be considerable (Smith et al., 2005; Maxwell, 1999; Garret and Ruel, 1999). India is a key global player, as a leading emerging economy, with a strong impact it had on the World Trade Organization's (WTO) latest negotiations, in the food security context. Despite surplus production of food in India, achieving food security at the micro level has been a continual challenge. Until 2013, India followed a welfare based approach of distributing food grains to its low income group at an *issue price* which is much lower than its *market price* or *procurement price*. Then, the Government of India passed the National Food Security Act 2013 (NFSA, also called the Right to Food Act due to its rights based approach). The NFSA entails providing subsidized food grains to nearly 75% of the rural population and 50% of the urban population. There is a disconnect in the literature between two sets of hypotheses – household-type-level differences in food security to be addressed by policies such as NFSA and the distortions arising from it. In this study, we attempt to bridge this gap by examining the economy wide and household level implications of India's NFSA within the context of global food security challenges.

The use of computable general equilibrium (CGE) modeling provides an appropriate analytical framework for developing a fuller understanding of interactions in the global food market and repercussions on the rest of the economy. Global CGE models are helpful in understanding the complex linkages across food, energy, and land use sectors and have been used in many applications to analyses of climate change, trade policy, biofuels expansion, among other policies and programs. However, the majority of these models consider economic activities at level too aggregated to answer some of the key questions for food security, which require more disaggregated information to identify how impacts vary across household types and income levels. The purpose of this paper is to analyze food security impacts for multiple household types

in a global CGE framework. Specifically, we will build on "MyGTAP" model (Walmsley and Minor, 2013), a comparative static CGE model based on the standard Global Trade Analysis Project (GTAP) model (Hertel, 1997), which offers a unique strength by focusing on a single country of interest and classifying its households into more detailed segments (e.g., rural and urban) within the global model. This classification of private households is helpful to analyze the distributional impacts of a policy such as NFSA.

Further, MyGTAP accounts for transfers between households and government, among other features. The disaggregation into various households is based on India's Social Accounting Matrix for 2007-08 (Pradhan et al., 2013) and National Sample Survey (NSSO, 2013, 68^{th} round, 2011-12) dataset. It is important to note that in order to preserve the global economic consistency, we use the shares implied in the SAM to split GTAP values for India. This extra layer of detail will complement the dynamic simulations agnostic of the rural-urban divide, even for results aggregated from such analyses. We will demonstrate implications of implementing NFSA by introducing equivalent food consumption subsidies in India in the place of any existing subsidies. Our analysis may help addressing global debate on subsidizing food consumption, particularly in the context of concerns articulated mainly by India on behalf of the developing countries, on the Trade Facilitation Agreement (TFA) clauses on food subsidies. This study helps in understanding how providing selected food grains at extremely low prices to the most vulnerable households would impact their consumption pattern across rural and urban India. The results also provide better understanding on the consequences of India's NFSA on inflation, GDP, and change in trade pattern of food commodities.

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Figure 1. Distribution of Rural and Urban Households in India

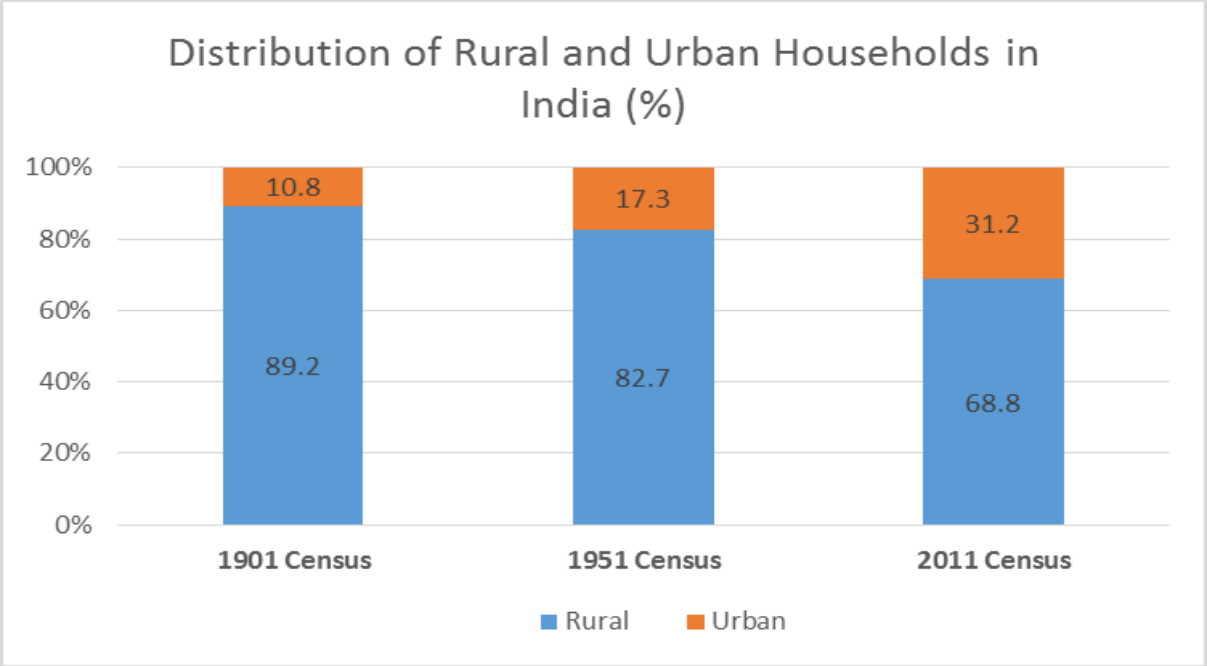

Figure 1. Distribution of Annual Household Income in India

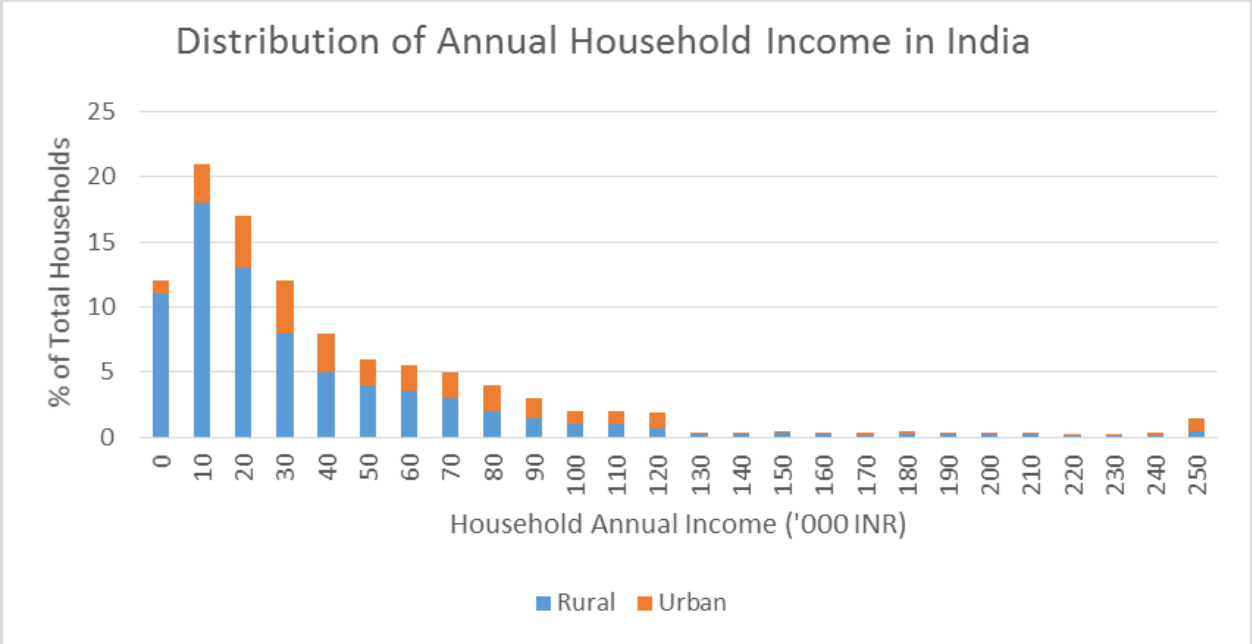

Table A1. Aggregation of Regions in the Model

	Regions	Description	Comprising GTAP regions
1	India	India	ind
2	USA	United States of America	usa
3	EU27	European Union 27	aut bel cyp cze dnk est fin fra deu grc hun irl ita lva ltu lux mlt nld pol prt svk svn esp swe gbr bgr rou
4	China	China and Hong Kong	chn hkg
5	RoSEAsia	Rest of South & East Asia	jpn kor mng twn xea khm idn lao mys phl sgp tha vnm xse bgd npl pak lka xsa
6	MENA	Rest of Middle East & N Africa	irn isr kwt omn qat sau tur are xws egy mar tun xnf
7	SSAfrica	Sub-Saharan Africa	cmr civ gha nga sen xwf xcf xac eth ken mdg mwi mus moz tza uga zmb zwe xec bwa nam zaf xsc
8	Brazil	Brazil	bra
9	LatinAmerica	Latin America	mex xna arg bol chl col ecu pry per ury ven xsm cri gtm hnd nic pan slv xca xcb
10	RestofWorld	Rest of World	aus nzl xoc can che nor xef alb blr hrv rus ukr xee xer kaz kgz xsu arm aze geo bhr xtw

Table A2. Aggregation of Sectors in the Model

No.	Sectors	Description	Comprising GTAP sectors
1	PaddyRice	PaddyRice	pdr
2	Wheat	Wheat	wht
3	CrGrains	Cereal Grains	gro
4	VegsFruits	Vegetables & Fruits	v_f
5	Oilseeds	Oilseeds	osd
6	SugarCrops	Sugar Crops	c_b
7	OthAgri	Other Agri Crops	pfb ocr
8	Ruminant	Ruminant Livestock	ctl wol
9	NonRumnt	Non Ruminants	oap
10	Dairy	Dairy & its Products	rmk mil
11	Forestry	Forestry	frs
12	Fishery	Fishing sector	fsh
13	FoodPrd	Food Products	ofd
14	BeverTobac	Beverages & Tobacco	b_t
15	OthFoodPdts	Other food products	vol pcr sgr
16	ProcRum	Processed Ruminants	cmt
17	ProcNRum	Processed Non Ruminants	omt
18	Coal	Coal	coa
19	CrudeOil	Crude Oil	oil
20	Electricity	Electricity	ely
21	NGas	Natural Gas	gas gdt
22	Oil_pcts	Petroleum & coal products	p_c
23	Water	Water sector	wtr
24	En_Int_Ind	Energy intensive Industries	crp i_s nfm
25	Oth_Ind_Se	Other industry and services	omn tex wap lea lum ppp nmm fmp mvh otn ele ome omf cns trd otp wtp atp cmn ofi isr obs ros osg dwe