

**Implications of the Public Food Distribution System
on Poverty and Inequality in Andhra Pradesh and
Karnataka States of India**

Report Submitted to

International Crops Research Institute for the Semi-Arid Tropics

By

Lara Faye G. Mula



International Crops Research Institute for the Semi-Arid Tropics

Patancheru, 502 324

Telangana, India

icrisat@cgiar.org

August 2014

DECLARATION

I do hereby declare that the dissertation entitled **“Implications of the Public Food Distribution System on Poverty and Inequality in Andhra Pradesh and Karnataka States of India”** is an original and independent record of project work undertaken by the undersigned under the supervision of Dr. Madhusudan Bhattarai (Principal Scientist), Markets, Institutions and Policies at the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) during the period of my study as part of the curriculum of Master of Arts in Development Studies.

Patancheru, Hyderabad

By:

DATE: 22nd August 2014

Lara Faye G. Mula

Table of Contents

Acknowledgments	4
Abstract.....	5
1. Introduction.....	6
1.1. Background to the Study.....	6
1.2. Aims of the Study.....	7
1.3. Limitations of the Study.....	8
2. Engagement with the Literature.....	10
1.1. Right to Food.....	9
1.2. India’s Public Distribution System.....	9
1.3. Social Protection Construct.....	12
3. Methodological Approach	15
3.1. Study Design and Overall Methodology.....	15
3.2. Analytical Tools and Techniques.....	16
4. Results and Discussion.....	17
4.1. Poverty Analysis.....	18
4.2. Poverty Estimates based on VLS Data.....	19
4.3. Inequality Estimates based on VLS Data.....	23
4.4. Insights from Village Visits.....	24
5. Conclusion and Implications.....	28
References	29
Annexes	31
Annex 1. A Glimpse at India’s Public Distribution System.....	31
Annex 2. Interview Guide	33
Annex 3. Photo Documentation	36

ACKNOWLEDGMENTS

I am deeply grateful to **Dr. MCS Bantilan** (Research Programme Director, Markets, Institutions and Policies) for giving me the opportunity to conduct this Project as part of my academic curriculum. I wish to express my gratitude to **Dr. Madhusudan Bhattarai** (Principal Scientist, Markets, Institutions and Policies) for his constant supervision and valuable guidance all throughout the course of undertaking this study.

I am grateful to the **Learning Systems Unit (LSU)** at ICRISAT for providing me with the opportunity to join an institute of international repute and excellence in research.

I wish to express my thankfulness to the capable staff under Dr. Bhattarai – **Padmaja Cheeti** (Scientific Officer), **A. Sidhu** (Scientific Officer), **Monica Gopey** (Data Associate), and **A. Sudha Rami** (Data Associate), for their assistance in helping me understand the intricacies of the data relevant to my study. They have made me feel welcome and have been wonderful company from the beginning of my ten-week stay with the Department.

A special thanks to **Dr. R. Padmaja** (Scientist, Markets, Institutions and Policies) for extending her suggestions to further improve my study design, to **Mr. Mohandra** for sharing his invaluable knowledge during the visits in Aurepalle and Dokur, and to **Ms. Pamela Samuel** (Associate Documentation) for always ensuring that I am taken care of.

From the depths of my heart, I would like to extend my sincerest gratitude towards my family. To **Dr. Rosana Mula** and **Dr. Myer Mula**, for their unwavering support and guidance in enriching my life. To **Ruth Marl Boyton** and **Lou Franz Mula** for being my personal cheerleaders and prayer warriors.

Thank you to all my fellow Filipino scholars in New Zealand – **Kris Ablan**, **Annie Donato**, and **Grace Molina** – for their constant encouragement.

Lastly, I would like to thank my most gracious **Heavenly Father** for granting me this wonderful opportunity to conduct my research in India and for sustaining me all throughout my entire stay.

Title : **Implications of the Public Food Distribution System on Poverty and Inequality in Andhra Pradesh and Karnataka States of India**

Name : **Lara Faye G. Mula**

Institute : **The University of Auckland
Faculty of Arts
Auckland 1142, New Zealand**

Supervisor : **Dr. Madhusudan Bhattarai
Principal Scientist
Markets, Institutions and Policies
International Crops Research Institute for the Semi-Arid Tropics**

Submitted : **22nd August 2014**

Abstract

With an annual expenditure of about USD 13 billion, the Public Distribution System (PDS) in India is one of the major welfare schemes not only in India but also globally. It provides social safety nets and food security to over 65 million households by entitling eligible households to selected commodities at subsidized prices.

Although the PDS is functioning for over 50 years, India has still the highest prevalence of malnutrition in the world, with 214 million undernourished people. Recently, the effectiveness of the PDS has also been questioned. Hence, this study analyses the effectiveness of the PDS as a social safety net measure in addressing food insecurity.

Using household level panel data compiled by ICRISAT on eight villages in the states of Andhra Pradesh and Karnataka, this paper assesses the incidence and depth of poverty and how PDS has contributed in narrowing the income inequality gap. The preliminary results suggest that the PDS has a significant impact on the reduction of poverty and inequality. The impacts of the PDS transfer to households are more pronounced on percentage changes in poverty gap indices than head count poverty, which implies that the lower stratum of rural poor are more critically dependent on PDS support than others.

1. INTRODUCTION

1.1. Background to the Study

The Food and Agriculture Organisation of the United Nations (FAO) defines food security as existing “when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (as cited in FAO, 2003, p. 28). Chronic food insecurity is closely associated with poverty (Gibson, 2012, p. 21), as people living on less than \$1.25 a day face enormous difficulties in keeping themselves or their families adequately fed. Alleviating poverty and improving food security are key components of the first Millennium Development Goal (MDG) – halving by 2014 the proportion of those suffering from extreme poverty and hunger. With the deadline of the MDGs on the horizon, there have been a number of recent dialogues about the creation of a global development framework beyond 2015. Ending poverty and ensuring food security and good nutrition form twelve of the universal goals identified by the United Nations (UN) High Level Panel in its proposed post-2015 global development agenda (UN, 2013, p. 30). The universal goals and their corresponding national targets will drive five transformative shifts, with the first transformation tackling with the causes of poverty, exclusion and inequality to ensure that no person is denied universal human rights and basic economic opportunities (UN, 2013, p.7).

India is one of the fastest growing economies in the world and its rapid economic growth over the last two decades has led to steady progress in reducing absolute poverty (OECD, 2012). However, growth and poverty reduction have been accompanied not only by rising inequality but persisting malnutrition as well. Ensuring food security remains a huge challenge as the country has the highest prevalence of malnutrition in the world, with 214 million undernourished people

accounting for roughly 17.5% of its population (FAO, 2013). The International Food Policy Research Institute (IFPRI) ranks India 63rd out of 78 countries with a Global Hunger Index¹ (GHI) of 21.3, higher than many countries in Sub-Saharan Africa (IFPRI, 2013).

The Government of India (GOI) has acted to put in place several safety nets to improve incomes and provide protection from shocks for the poor and vulnerable, one of which is the public food distribution system (commonly referred to as PDS). The PDS is a massive food-based intervention, which supplies ration cards to eligible households that entitle these beneficiaries to purchase their quota of selected commodities at subsidised rates from a network of ‘fair price shops’² (FPS). Based on recent estimates of the Department of Food and Public Distribution (2014), food grains are distributed to a network of 515,233 FPS that cater to about 65.2 million families Below Poverty Line (BPL); with around 24.3 million ration cards issued to *Antyodaya Anna Yojana*³ (AAY) families.

1.2. Aims of the Study

Although the PDS has been established as early as the Second World War, its efforts to provide access to food and reduce hunger have remained inadequate. The effectiveness of the PDS in improving food security of poor and vulnerable households has received considerable critical attention. Studies have examined a vast number of issues related to the program on a national scale and at state levels – including its impacts, targeting design, cost-effectiveness, program management, efficiency of operations, resource appropriation, and others.

¹ Comprehensively measures and tracks hunger by combining three equally weighted indicators (undernourishment, child underweight, and child mortality) into one index with a 100-point scale, on which zero is the best score (no hunger) and 100 the worst.

² Shops licensed to distribute essential commodities to ration cardholders under the PDS.

³ Launched in December 2000, the AAY scheme targets the poorest among the BPL families.

The primary objective of this study is to assess whether the PDS is effectively serving as a social safety measure in the semi-arid tropics (SAT) of India. Further to this objective, the study aims:

- (1) To evaluate and quantify the benefits received by households and its distributional implications; and
- (2) To estimate the impact of the PDS on poverty and inequality in selected villages in SAT India.

1.3. Limitations of the Study

This study had several limitations. First, the breadth of analyses was limited by the brief period I have spent in the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). My ten-week immersion in the institute only allowed for the empirical analyses of two out of the five states in SAT India covered by the Village-Level Studies (VLS). Also, a greater depth of information may have been obtained by conducting village focus groups comprised of participants representative of each landholding class and caste, not only in Andhra Pradesh but in the other four states as well. Second, I have encountered limitations with the data, particularly for PDS consumption. The VLS surveys have only captured consumption for certain PDS commodities, hence this study only looks into the impact of PDS transfers for rice, wheat (flour), sugar, palm oil, and dal since these are clearly coded in the database. Kerosene, one of the items regularly purchased by household beneficiaries, was not included in the analyses since it was lumped together with other fuel sources, making it difficult to determine its exact consumption. Third, this study primarily looks into the economic impacts of the PDS and does not further explore its social consequences, such as its impacts on gender dynamics or nutrition.

These could be further explored in future research. Lastly, in spite of utilising the social protection framework for food security, this study does not fully examine the PDS as a food-based intervention through the four-pillar model of food security developed by the FAO that has come to be accepted across institutional divides – availability, access, utilization, and vulnerability. This study touches upon each dimension to some extent – more so on access, availability and utility, but not fully on vulnerability.

2. ENGAGEMENT WITH THE LITERATURE

2.1. *Right to Food*

The right to adequate food is a fundamental human right recognised in a few international instruments, particularly in Article 25 of the UN Declaration of Human Rights adopted in 1948 (UN General Assembly, 1948) and in Article 11 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) adopted in 1966 and entered into force in 1976 (UN General Assembly, 1966). Despite such early-articulated provisions, the development of a food security construct only got underway during the global food crisis of the mid-1970s when food supply problems became of utmost concern. Since then, the concept of food security has evolved and its definition broadened to reflect the changing global food concerns over the years (FAO, 2003, pp. 26-27).

India is a signatory to the aforementioned instruments involving right to food. While the Constitution does not explicitly mention the right to food, it is implicitly expressed in Articles 21 and 47. The National Food Security Act (NFSA), approved only in 2013, establishes the right to food as a legal right. It thereby obligates the principal duty bearer, the GOI, to respect, protect and fulfil this right for every citizen of India, hence lending statutory backing to the PDS – the nation's largest food-based safety net.

2.2. *India's Public Distribution System*

The concept of public distribution in India can be traced back to a half a century ago when the British Government established a war-rationing measure in what was then Bombay to ensure fair distribution of food grains amid rising costs. The GOI reintroduced rationing in selected cities shortly after the country gained independence and the public distribution of food

grains has since then been retained as a significant component of Government's social policy (Pal, 2011). The PDS evolved into a universal scheme in the 1970s and was revamped in the 1990s to target the poor households. For an overview on the working of the PDS, refer to Annex 2.

There is a growing body of literature on the utilisation, impact, and effectiveness of the PDS. Table 1 presents a summary of the various issues in the functioning and implementation of this food-based scheme.

2.3. Social Protection Construct

The PDS is one of several programs that form part of a network of social protection mechanisms established by the GOI for the poor and vulnerable in India. While unpacking the concept of social protection, Gentilini and Omamo (2011) found that social protection is approached from a vast array of disciplinary perspectives thereby making it difficult to create a definitive practical definition. And yet there are attempts to find common ground or at least some degree of convergence regarding the social protection construct, one of which is that safety nets are a subset of the overarching social protection framework (Gentilini and Omamo, 2011, p. 330).

Safety net measures are a key component of a country's poverty reduction strategy (Barrientos, 2011), as safety nets are found to not only directly alleviate poverty through transfers but also stimulate higher economic growth for the poor (Alderman & Yemtsov, 2013). As illustrated in Figure 1 below, safety nets as a form of non-contributory social assistance gives a boost to those below the poverty line to enable them to meet the minimum standard of living and prevents the poor from slipping further away from the poverty line.

Table 1. Implementation Gaps in the Public Food Distribution System

Issues	Author(s)	Geographic Coverage	Key Findings
1. Exclusion and targeting errors	Jha, Gaiha, Pandey, and Kaicker (2013)	Andhra Pradesh, Maharashtra and Rajasthan	<ul style="list-style-type: none"> Program is not well targeted in some instances as both the poor and non-poor get subsidised by the PDS.
	Khera (2011)	Rajasthan (388 households in 8 villages, 2002-2003)	<ul style="list-style-type: none"> Limited access to the PDS with only about 1/3 of the households in the sample with BPL cards.
	Kattumuri (2011)	All-India Level	<ul style="list-style-type: none"> Exclusion of a large number of genuinely needy households due to problems associated with identification and exclusion errors.
	Ray and Ray (2011)	All-India Level	<ul style="list-style-type: none"> More than 60% of the population was effectively excluded from the PDS, including BIMARU and relatively backward states.
2. Utilisation of entitlements	Svedberg (2012)	All-India Level (2004-2005)	<ul style="list-style-type: none"> Actual purchase of BPL and AAY cardholders is only 14.7 kg in rural areas and 17.4 kg in urban areas, when both groups are allowed to buy 35 kg of subsidized grains per month.
	Khera (2011)	Rajasthan (388 households in 8 villages, 2002-2003)	<ul style="list-style-type: none"> Utilisation levels, in terms of proportion of households actually buying some grain from the PDS and also in terms of quantities purchased, are low among those with access to the PDS, with only 13% of BPL households in the sample purchasing their full quota of grain. On average, BPL households bought 12.6 kg of wheat per month as opposed to their full monthly entitlements of 35 kg.
3. Procurement, storage and distribution of food grains	Jha, Gaiha, Pandey, and Kaicker (2013)	Andhra Pradesh, Maharashtra and Rajasthan	<ul style="list-style-type: none"> FCI is very inefficient in procuring, storing and distributing food. About 10% of all grains are spoilt during storage and transportation.
4. Resource misappropriation	Khera (2011)	Rajasthan (388 households in 8 villages, 2002-2003)	<ul style="list-style-type: none"> 67% of wheat is siphoned off to the open market. Levels of diversion of PDS grain are generally much lower in south India than in north India.
	Kattumuri (2011)	All-India Level	<ul style="list-style-type: none"> Only 16% of the resources allocated towards the PDS reach the poor.
	Khera (2011)	All-India Level	<ul style="list-style-type: none"> Huge variation in leakage rates nationwide, where Tamil Nadu and Himachal Pradesh (both implementing a universal PDS) with the lowest diversion rates and Chhattisgarh (which transitioned from targeted to near universal) with a reduction in its leakage rate to about zero. There is a correlation between universal coverage and leakage rates, wherein poor households in a state with a universal PDS have a greater probability of getting their full entitlements relative to poor households in a state with targeted PDS.
	Planning Commission (2005)	All-India Level	<ul style="list-style-type: none"> Abnormally high share of leakages in off-take from central pool with the exception of West Bengal and Tamil Nadu states.
	Jha, Gaiha, Pandey, and Kaicker (2013)	Andhra Pradesh, Maharashtra and Rajasthan	<ul style="list-style-type: none"> More than 36.7% of subsidized grain intended for BPL families ends up as sales to APL families.

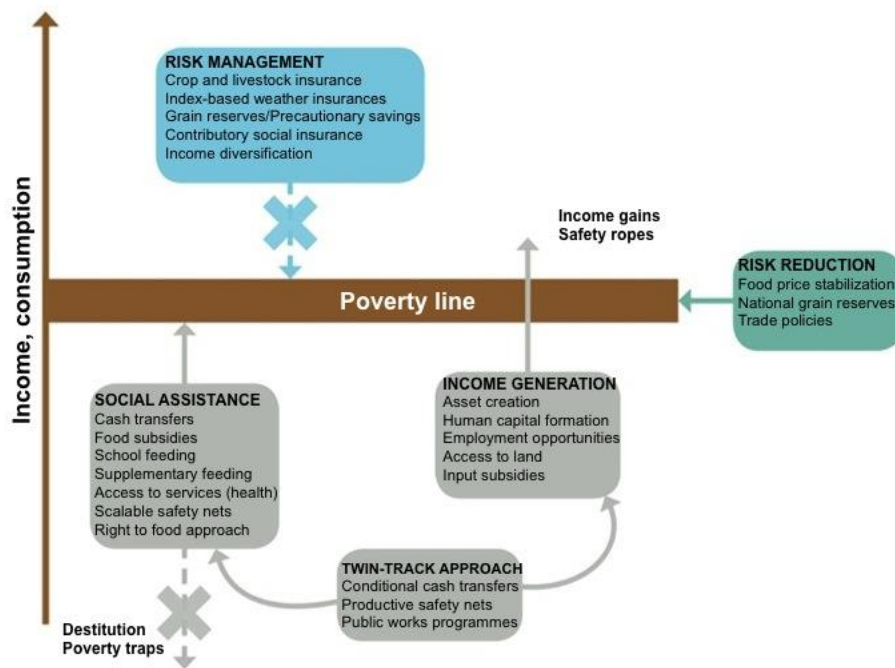


Figure 1. Social Protection Conceptual Framework

Source: adapted from de Janvry, as cited in the High Level Panel of Experts on Food Security and Nutrition report (2012)

Poor people are more likely vulnerable to hunger than the rest of the population as they lack the resources to secure access to sufficient amount of safe and nutritious food. A regular and reliable transfer of cash (conditional or unconditional) or of food directly addresses inadequate access to food by increasing the purchasing power of beneficiaries.

Safety nets primarily function as a form of non-contributory social assistance, with or without conditions, designed to raise the poor or vulnerable to a minimum standard of living (Cook & Pincus, 2014; Fiszbein, Kanbur & Yemtsov, 2014). Brown and Gentilini (2007) further attribute a social insurance function to safety nets, in that it provides protection against various short- and long-term life contingencies. Safety nets include transfers in cash or in-kind (mostly food-based such as the PDS), subsidies, school feeding, labour-intensive public works, and targeted food assistance, among others (Fiszbein, Kanbur & Yemtsov, 2014). Aside from the dual

functions of safety nets, this type of social protection mechanism has two objectives – the protection of incomes and food security along with protection against irreversible losses of physical assets and human capital; and the maintenance of political consensus around the necessary policies required for crisis resolution (Alwang & Norton, 2011, p. 144).

3. METHODOLOGICAL APPROACH

3.1. Study Design and Overall Methodology

This study will utilise the aforementioned social protection framework to assess the effectiveness of the PDS as a social safety net measure in rural India. A quantitative approach will be primarily used in this investigation. Analysis will be based on household data collected using personal interviews and survey instruments in eight selected villages in Andhra Pradesh⁴ and Karnataka.

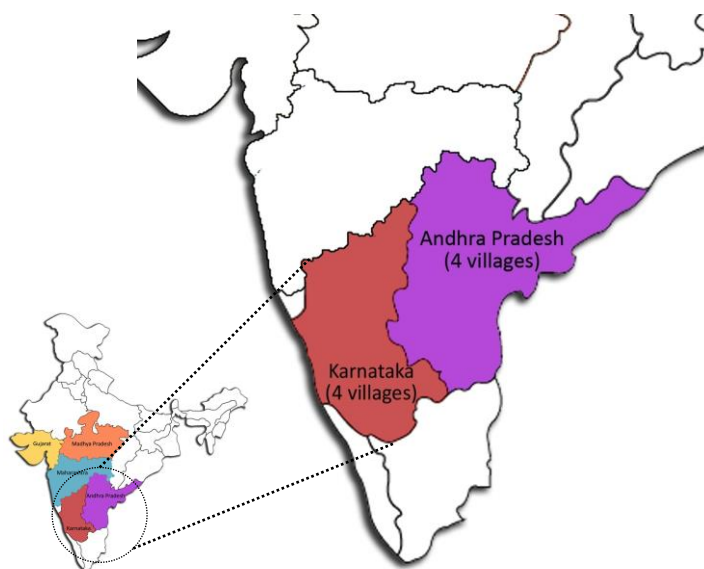


Figure 2. Map of SAT India – Andhra Pradesh and Karnataka

The data collected from selected households in the study villages, which includes relevant information related to the PDS, is compiled by ICRISAT through its VLS longitudinal household panel surveys initiated in 1975. The household data will be supplemented by information gathered from key informants and other stakeholders, particularly PDS beneficiaries and dealers.

⁴ Since the study covers the period 2009–2011, the two villages under the newly formed Telangana state are still classified under the state of Andhra Pradesh since the bifurcation of the former was only enacted in June 2, 2014.

3.2. Analytical Tools and Techniques

To evaluate and quantify the benefits received by households and its distributional implications, the implicit income transfer is computed for each household based on the reported PDS consumption in the VLS database. This will be validated in semi-structured interviews conducted in selected villages where the PDS is functioning.

To estimate the impact of the PDS on poverty in selected villages in SAT India, the well-known Foster-Greer-Thorbecke (FGT) class of decomposable poverty measures will be employed. Introduced by Foster, Greer, and Thorbecke in 1984 (Foster, Seth, Lokshin & Sajaia, 2013, p. 123), this family of indices calculates a number of summary statistics describing the incidence, depth and severity of poverty in the following formula:

$$P_{(\alpha)} = \frac{1}{N} \sum_i \max \left(\frac{z - y_i}{z} \right)^\alpha, \text{ where } \alpha \geq 0$$

where z is the State-specific poverty line estimated by the Planning Commission; y_i represents the reported income or consumption of a household; and α accounts for the sensitivity of the index to inequality among the poor. When $\alpha=0$, the above equation generates the head count index (HCI) which captures the proportion of the population whose expenditure level is below the poverty line. When $\alpha=1$, the above equation generates the poverty gap index (PGI) which illustrates the shortfall in living standards of those below the poverty line. Alternatively, the PGI is simply the minimum cost for eliminating poverty through a perfectly targeted transfer. When $\alpha=2$, the above equation generates the squared poverty gap index (SPGI). Also known as the poverty severity index, the SPGI measures the severity of poverty and gives more weight to the poorest of the poor (Fiszbein, Kanbur & Yemtsov, 2013). However, the SPGI has no intuitive interpretation and is quite difficult to interpret.

The Kuznets ratio will be utilised *to estimate the impact of the PDS on inequality in selected villages in SAT India*. One of the commonly used measures of inequality, it compares how the richest are faring relative to the poorest when real income changes due to the reduction in food prices brought about by the PDS. The Kuznets ratio is calculated as the share of the income to the top quintile (i.e., the richest 20%) divided by the income share of the bottom quintile (i.e., the poorest 20%).

4. RESULTS AND DISCUSSION

4.1. Poverty Analysis

4.1.1. Indicator of Living Standards

Poverty is commonly measured with reference to either household consumption expenditure or income. One can make a case for or against the use of each. The usual argument for using consumption as a better indicator of living standards over income is that the latter fluctuates significantly, within a given year and across the life cycle (Foster et al., 2013, p. 46). Moreover, in developing countries, income is greatly affected by seasonal fluctuations whereas consumption tends to be less variable (Duclos and Araar, 2007, p. 21). Hence, this study uses consumption expenditure as the welfare indicator.

4.1.2. Poverty Threshold

To identify the poor from the rest of the population, a poverty threshold needs to be selected. The two common approaches to poverty analysis include (1) an absolute approach where the poverty threshold is constant and (2) a relative approach where the poverty threshold is a constant fraction of an income standard (Foster et al., 2013, p. 27). The World Bank uses the first approach in its reference lines set at \$1.25 per day measured at 2005 international price and adjusted to local currency using Purchasing Power Parity (PPP). On the other hand, the Planning Commission of India uses the second approach in its state-specific and region-specific (rural and urban) poverty lines that capture demographic pattern, consumer behaviour as well as state-wise and regional variation in the prices of goods and services. However, the poverty estimates suggested by the Tendulkar Committee have come under severe criticism over its low poverty lines. Recently, an Expert Group under the chairmanship of Dr. C. Rangarajan suggested new consumption poverty lines using the newer price indices, which this study will utilise in its

evaluation of poverty. The 2011-12 national poverty line in India generated by the Expert Group (Rangarajan) is \$1.94 a day, after adjusting the international poverty line to Indian currency using the latest set of PPP values (Planning Commission, 2014, p. 49). The rural poverty estimates for 2009 to 2010 are given in Table 2.

Table 2. Rural Poverty Lines, 2009–2011

State	2009	2010	2011
Andhra Pradesh	832.27	932.01	1,031.74
Karnataka	680.81	828.12	975.43

Source: Planning Commission (2014)

4.2. Poverty Estimates based on VLS Data

4.2.1. PDS Transfer

To estimate the impact of the PDS on poverty, this study uses the VLS data to compute what the household's consumption expenditure would be without the transfers it receives from the aforementioned social safety net programme. According to Drèze and Khera (2013), a straightforward manner of assessing the impact of the PDS on poverty is to regard it as an implicit income transfer (hereafter referred to as PDS transfer⁵), which can be written as:

$$T = Q \times (P_M - P_I)$$

where Q is the quantity of the subsidised commodity being provided⁶, P_M is its market price, and P_I is the PDS issue price. The total transfer for several commodities supplied through the PDS can be calculated by aggregating all transfers.

Data collected on expenditure through the VLS survey is already inclusive of household consumption of PDS commodities. However, the reported PDS consumption is only half of the implicit income transfer. Thus, the total expenditure needs to be adjusted to include the amount

⁵ Accounts for implicit income transfer from the consumption of five PDS commodities – rice, wheat (flour), sugar, palm oil, and dal.

of PDS commodities consumed in market value. This adjusted consumption expenditure forms the base for the analysis of Scenario 1, i.e., household consumption expenditure *with* PDS. On the other hand, to derive the poverty estimates for Scenario 2, i.e., household consumption expenditure *without* PDS, total PDS transfer is simply deducted from the adjusted consumption expenditure.

Table 3. Total PDS Transfer in Rs (in '000), VLS Sample

	AP		KN		Both States	
2009	1,321.75	<i>0.02%</i>	1,329.48	<i>0.03%</i>	2,651.23	<i>0.02%</i>
2010	1,766.66	<i>0.03%</i>	1,906.11	<i>0.04%</i>	3,672.78	<i>0.03%</i>
2011	1,104.61	<i>0.02%</i>	1,910.73	<i>0.03%</i>	3,015.34	<i>0.02%</i>

** Figures in italics represent transfers as share of food expenditure.*

Source: VLS Data

The total PDS transfer as presented in Table 3 above is rather a small share of food expenditure, ranging from 0.02% to 0.04%. If the poverty indices show great reduction in poverty, it means that it significantly impacts consumption expenditure despite its minute portion of the consumption expenditure.

4.2.2. Incidence of Poverty

The poverty headcount index (HCI) is an appropriate measure to determine the scale of poverty in a given population. This index indicates the percentage of the population whose living standards, herein measured by consumption expenditure, falls below the poverty threshold.

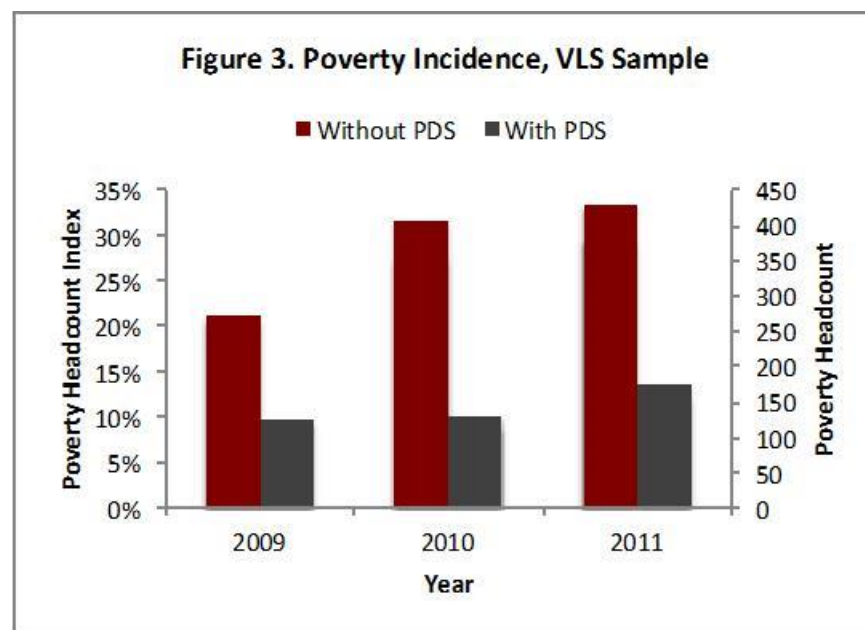
Table 4. Poverty Incidence, VLS Sample

	Andhra Pradesh				Karnataka				TOTAL			
	Without PDS		With PDS		Without PDS		With PDS		Without PDS		With PDS	
2009	192	<i>27%</i>	89	<i>12%</i>	82	<i>14%</i>	36	<i>6%</i>	274	<i>21%</i>	125	<i>9%</i>
2010	148	<i>21%</i>	43	<i>6%</i>	257	<i>34%</i>	88	<i>12%</i>	405	<i>28%</i>	131	<i>9%</i>
2011	169	<i>25%</i>	78	<i>11%</i>	259	<i>34%</i>	97	<i>13%</i>	428	<i>30%</i>	175	<i>12%</i>

** Figures in italics represent Poverty Headcount Index*

Source: VLS Data

Table 4 reports the poverty incidence in the sample for both states. These estimates suggest that the number of poor people decreased due to the PDS transfers in both states across the three-year study period, with the largest drop in poverty headcount recorded in 2010. Figure 3 below shows an increase in the number of poor people over the years for both states. However, the increase in poverty headcount is considerably higher without the PDS transfers. The HCI will not change irrespective of whether the people below the poverty line become poorer or inch their way closer to the poverty threshold.



Source: VLS Data

4.2.3. Depth of Poverty

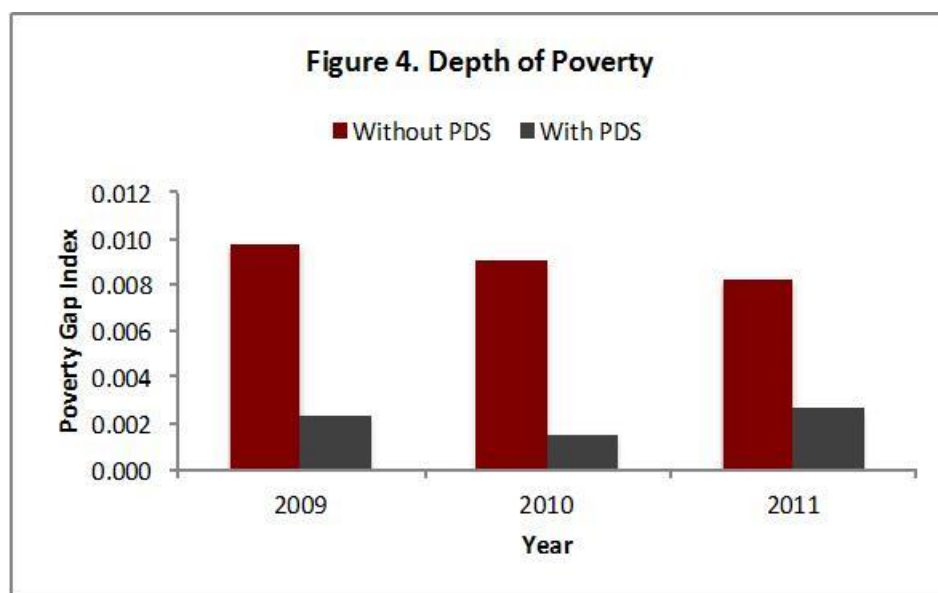
The poverty gap index (PGI) captures the depth of poverty. It reflects the average shortfall of the poor from the poverty threshold.

Table 5. Poverty Gap Index, VLS Sample

	Andhra Pradesh		Karnataka		TOTAL	
	Without PDS	With PDS	Without PDS	With PDS	Without PDS	With PDS
2009	0.012	0.003	0.007	0.002	0.010	0.002
2010	0.007	0.001	0.011	0.002	0.009	0.002
2011	0.009	0.003	0.008	0.002	0.008	0.003

Source: VLS Data

Although the calculations using the VLS sample yield very low indices, poverty is more severe without the PDS as seen in its higher PGI over the three years for both states. The declining PGI means that not only is the number of poor people falling but also, on average, the distances from the poverty line has diminished.



Source: VLS Data

The poverty gap is also thought of as a means of measuring the cost of eliminating poverty in the absence of transaction costs. The aggregate poverty gap, as shown in Table 5, shows the cost of eliminating poverty through perfectly targeted transfers to the identified poor in the VLS sample. With the PDS, the perfectly targeted government transfer needed to eliminate poverty is considerably lesser than without the PDS, with the ratio ranging from 1:3 to 1:4. Although unrealistic, this has a huge policy implication, as it is informative of the minimum scale of financial resources required to address the problem of poverty.

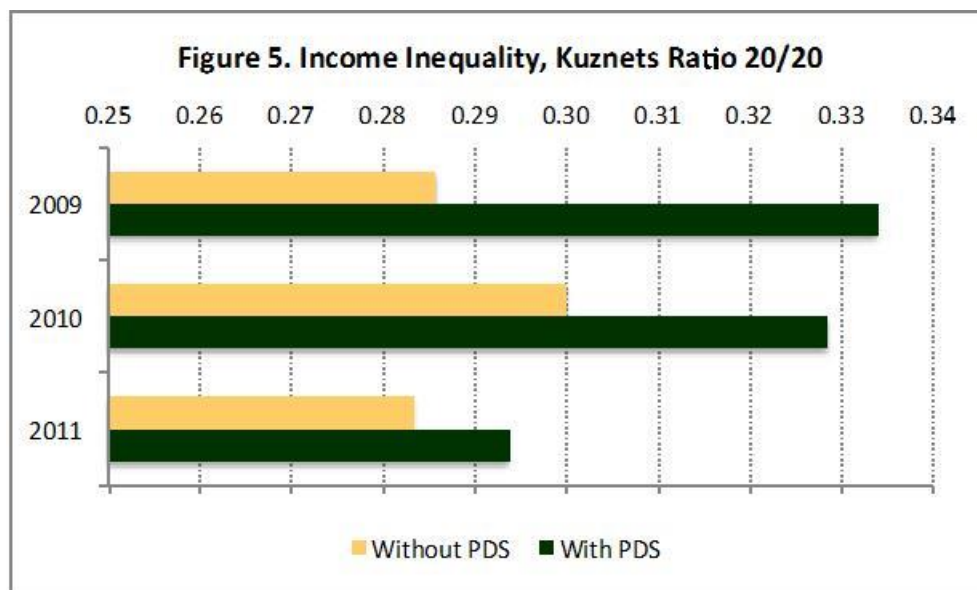
Table 6. Aggregate Per Capita Poverty Gap (in Rs), VLS Sample

	AP		KN		TOTAL	
	With PDS	Without PDS	With PDS	Without PDS	With PDS	Without PDS
2009	1,688	7,209	703	2,872	2,391	10,081
2010	708	4,627	1,245	6,917	1,953	11,545
2011	2,362	6,145	1,453	5,808	3,815	11,953

Source: VLS Data

4.3. Inequality Estimates Based on the VLS Data

The Kuznets ratio was calculated to determine whether the PDS reduces income inequality or exacerbates it. This measure simply gives the ratio of the total income held by the richest 20% to that of the income held by the poorest 20% of the sample population. A ratio of 1 represents perfect equality. Hence, a lower ratio indicates higher income inequality.



Source: VLS Data

Figure 5 presents a graphic representation of the Kuznets ratio for both Andhra Pradesh and Karnataka. Although income inequality has worsened from 2009 to 2011, as captured by the decreasing ratios, the graph above shows that the PDS transfers contribute to the decline in income inequality for each year.

Table 7. Kuznets Ratio 20/20, VLS Sample by State

	Andhra Pradesh		Karnataka	
	Without PDS	With PDS	Without PDS	With PDS
2009	0.30	0.34	0.42	0.50
2010	0.27	0.31	0.38	0.48
2011	0.26	0.29	0.41	0.51

Source: VLS Data

Table 6 reports the Kuznets ratios for each state. It is seen that the PDS transfers reduce income inequality for each year at the state level, albeit income inequality increased from 2009 to 2011 in Andhra Pradesh and its levels fluctuated in Karnataka for the same three-year period.

4.4. Insights from Village Visits

The purpose of the village visit is to gain an understanding of the functioning of the program from the perceptions and experiences of the stakeholders, specifically FPS dealers and PDS beneficiaries. These consultations add another dimension to the empirical analyses. The following tables present a summary of the points raised while conducting interviews in the two nearby villages of Aurepalle and Dokur.

Table 8. Summary of Interview with FPS Dealers

	Aurepalle	Dokur
Number of Respondents	1 (Shop No. 14)	2 (Shop No. 11 & Shop No. 33)
Participation in the PDS	11 years	2 years
Operating Hours	5 th to 16 th of the month (7:30AM to 11:30AM)	1 st to 15 th of the month (8:00AM to 12:00NN)
Accreditation Requirements	<ul style="list-style-type: none"> - 10th class minimum qualification - Resident of the village 	
Total Cards	960	759
Commodities Sold	<ul style="list-style-type: none"> - Rice, wheat (flour), sugar, oil, dal, kerosene - Salt, tamarind, wheat 	
Issues Encountered	<ul style="list-style-type: none"> - Low profit margins - Loss of stocks during transport 	

On the supply side, FPS dealers open shop at a specific period of the month, usually during the first fifteen days, with operating hours ranging from 3 to 5 hours. FPS dealers carry rice, wheat (flour), sugar, oil, dal, and kerosene on a monthly basis and sell salt, wheat, and tamarind irregularly due to the low demand for these items.

To be accredited as an FPS dealer, the State requires minimum educational attainment of 10th class and applicants must be residents of the village. It is interesting to note that the Regional Division Office accredited two ration shops for Aurepalle but the dealer in Nallavaripalle was divested off his shop due to his reported mismanagement. Shop No. 14 then caters to 960 cardholders, including those who were initially covered by the FPS in Nallavaripalle.

Dealer respondents generate low profit margins when monthly entitlements are not taken out by the beneficiaries when they have already incurred considerable cost and time in making payments for obtaining the monthly stocks the month prior (i.e., August stocks are paid for back in July). They are therefore prompted to engage in other wage-earning activities to compensate for the low commission received. Moreover, they reported that stocks transported to their shops are less than what they actually expect (e.g., receiving a 48kg-49kg of a 50kg bag of rice).

Table 9. Summary of Interview with PDS Beneficiaries

	Aurepalle	Dokur																																	
Number of Respondents	5	4																																	
Participation in the PDS	- More than 20 years																																		
	<table border="1"> <thead> <tr> <th>Item</th> <th>Quantity</th> <th>PDS Price</th> <th>Market Price</th> </tr> </thead> <tbody> <tr> <td>Rice</td> <td>4 kg</td> <td>1.00</td> <td>35.00 - 40.00</td> </tr> <tr> <td>Sugar</td> <td>0.5 kg</td> <td>13.50 - 14.00</td> <td>35.00 - 40.00</td> </tr> <tr> <td>Wheat (flour)</td> <td>1 kg</td> <td>15.50</td> <td>23.00 - 28.00</td> </tr> <tr> <td>Kerosene</td> <td>1-2 li</td> <td>14.75 - 15.00</td> <td>30.00</td> </tr> <tr> <td>Salt</td> <td>1 kg</td> <td>4.50 - 5.00</td> <td>10.00</td> </tr> <tr> <td>Dal</td> <td>1 kg</td> <td>49.50 - 50.00</td> <td>75.00 - 80.00</td> </tr> <tr> <td>Palm Oil</td> <td>1 li</td> <td>39.00 - 40.00</td> <td>75.00 - 80.00</td> </tr> </tbody> </table>			Item	Quantity	PDS Price	Market Price	Rice	4 kg	1.00	35.00 - 40.00	Sugar	0.5 kg	13.50 - 14.00	35.00 - 40.00	Wheat (flour)	1 kg	15.50	23.00 - 28.00	Kerosene	1-2 li	14.75 - 15.00	30.00	Salt	1 kg	4.50 - 5.00	10.00	Dal	1 kg	49.50 - 50.00	75.00 - 80.00	Palm Oil	1 li	39.00 - 40.00	75.00 - 80.00
Item	Quantity	PDS Price	Market Price																																
Rice	4 kg	1.00	35.00 - 40.00																																
Sugar	0.5 kg	13.50 - 14.00	35.00 - 40.00																																
Wheat (flour)	1 kg	15.50	23.00 - 28.00																																
Kerosene	1-2 li	14.75 - 15.00	30.00																																
Salt	1 kg	4.50 - 5.00	10.00																																
Dal	1 kg	49.50 - 50.00	75.00 - 80.00																																
Palm Oil	1 li	39.00 - 40.00	75.00 - 80.00																																
Issues Encountered	<ul style="list-style-type: none"> - Insufficient quantity - Poor quality of commodities - Irregular hours of fair price shops 																																		
Cash or In-Kind	- Preference for current set-up due to possible misuse of funds intended for food security																																		

The household beneficiaries interviewed come from different landholding classes. Seven of these households are white cardholders while the remaining are in possession of AAY cards. They have been participating in the program for more than 20 years. Aurepalle somehow implements a universal scheme, as it was reported that in 2006, households (except for AAY) were given white cards irrespective of their previous card types. The same quantity and prices apply unlike prior 2006 when different quantities and prices were in effect for the different card types.

Household beneficiaries receive the same monthly entitlements bought from the village FPS, with slightly higher prices in Dokur (usually Rs 0.50 paise). AAY cardholders receive 35kgs of rice per month while white cardholders get 4kgs of rice per person, with a maximum of 20kgs per household (or 5 members).

All respondents affirmed that they personally consume the PDS commodities, and do not re-sell their benefits. Even large holder farming households utilise their benefits despite the low quality of goods. They use these items for other purposes, such as creating snacks out of the PDS rice or using PDS sugar for tea when entertaining guests.

One of the common issues encountered by beneficiaries relate to the FPS. Beneficiaries are not able to obtain their monthly entitlements since FPS dealers do not keep regular hours. The quality of commodities is not consistent throughout the year, with the PDS providing low quality in some months. The monthly entitlements are said to be insufficient. For instance, 4kgs of rice can be consumed in 10-15 days. Thus, households still have to purchase additional quantities from the market to augment the benefits they receive from the PDS.

There has been an on-going debate on allowing cash transfers as a means of food security. When posed with the question of choosing between cash transfer and the current PDS set-up, all

respondents preferred the latter. There appears to be a sense of lack of trust among the poor, as they have voiced out the cash will most probably be misused on other things instead of what it was intended for. Moreover, the purchasing power of the beneficiaries will not be constant in a cash transfer set-up since it will be dependent on the fluctuating market prices.

5. CONCLUSION AND IMPLICATIONS

This study assesses the effectiveness of the PDS as a social safety net measure in eight selected villages in rural Andhra Pradesh and Karnataka using the VLS household panel surveys from 2009 to 2011. It evaluated and quantified the benefits received by households through the generation of the implicit income transfer from the PDS. The impact of the calculated PDS transfer on poverty and inequality was then estimated using the poverty indices and the Kuznets ratio, respectively.

The preliminary results suggest that the PDS has a significant impact on the reduction of poverty – both on poverty incidence and depth. The PDS transfers also contribute to the decline in income inequality. The impacts of the PDS transfer to households are more pronounced on percentage changes in the poverty gap index than the headcount ratio. This implies that the lower stratum of the poor is more critically dependent on PDS support than others. As I intend to conduct the same empirical analyses on the remaining 3 states in SAT India (i.e., Gujarat, Madhya Pradesh, and Maharashtra), it has yet to be seen whether the PDS-induced poverty and inequality reduction trends seen in the initial results will hold true for the other states and at an all-SAT India level.

This study can contribute to the on-going policy dialogue on cash versus in-kind transfers. Implementing the PDS lowers the poverty gap index, which means that perfectly targeted government transfers to the poor will be lesser than the scale of financial resources required to eliminate poverty in the absence of the PDS. Based on the poverty depth analysis, the ratio of the aggregate per capita poverty gap between implementing the PDS and the absence of it is significant. Hence, even if administrative and transaction costs are double the amount of PDS transfers, government expenditure would still be considerably lesser than directly transferring cash without administrative and transaction costs.

References

- Acharya, S. S., Guha-Khasnobis, B., & Davis, B. (2007). National food policies impacting on food security: The experience of a large populated country – India. *Food Insecurity, Vulnerability and Human Rights Failure*, 3-34.
- Alderman, H., & Yemtsov, R. (2013). How can safety nets contribute to economic growth?. *The World Bank Economic Review*.
- Alwang, J., & Norton, G. W. (2011). What types of safety nets would be most efficient and effective for protecting small farmers and the poor against volatile food prices?. *Food Security*, 3(1), 139-148.
- Barrientos, A. (2011). Social protection and poverty. *International Journal of Social Welfare*, 20(3), 240-249.
- Brown, L., & Gentilini. (2007). On the edge: The role of food-based safety nets in helping vulnerable households manage food insecurity. *Food Insecurity, Vulnerability and Human Rights Failure*, 82-105.
- Cook, S., & Pincus, J. (2014). Poverty, Inequality and Social Protection in Southeast Asia: An Introduction. *Journal of Southeast Asian Economies*, 31(1), 1-17.
- DFPD (2014). Department for Food and Public Distribution, Government of India. Retrieved April 23, 2014, from <http://dfpd.nic.in/?q=node/101>
- Duclos, J. Y., & Araar, A. (2007). *Poverty and equity: measurement, policy and estimation with DAD (Vol. 2)*. Springer.
- FAO (1996). *Rome Declaration on World Food Security and World Food Summit Plan of Action*. Rome: Food and Agriculture Organization of the United Nations. Retrieved January 17, 2014, from <http://www.fao.org/docrep/003/w3613e/w3613e00.htm>
- FAO. (2003). *Trade reforms and food security: Conceptualizing the linkages*. Rome: Food and Agriculture Organization of the United Nations.
- FAO (2013). *The State of Food Insecurity in the World*. Rome: Food and Agriculture Organization of the United Nations.
- Fiszbein, A., Kanbur, R., & Yemtsov, R. (2014). Social Protection and Poverty Reduction: Global Patterns and Some Targets. *World Development*, 61, 167-177.
- Foster, J., Seth, S., Lokshin, M., & Sajaia, Z. (2013). *A Unified Approach to Measuring Poverty and Inequality: Theory and Practice*. Washington, DC: World Bank.
- Gentilini, U., & Omamo, S. W. (2011). Social protection 2.0: Exploring issues, evidence and debates in a globalizing world. *Food Policy*, 36(3), 329-340.
- Gibson, M. (2012). *The feeding of nations: Re-defining food security for the 21st century*. Boca Raton, Florida: CRC Press.
- HLPE. (2012). *Social protection for food security: A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. Rome: High Level Panel of Experts.

- IFPRI (2013). *The Challenge of Hunger: Building Resilience to Achieve Food and Nutrition Security*. Washington: International Food Policy Research Institute.
- Jha, R., Gaiha, R., Pandey, M. K., & Kaicker, N. (2013). Food subsidy, income transfer and the poor: A comparative analysis of the public distribution system in India's states. *Journal of Policy Modeling*, 35(6), 887-908.
- Kattumuri, R. (2011). *Food security and the targeted public distribution system in India*. London: Asia Research Centre.
- Khera, R. (2011). India's public distribution system: Utilisation and impact. *Journal of Development Studies*, 47(7), 1038-1060.
- Khera, R. (2011). Trends in diversion of PDS grain. *Economic and Political Weekly*, 46(21), 106-114.
- OECD (2012). *India: Sustaining High and Inclusive Growth*. Paris: Organisation for Economic Cooperation and Development.
- Pal, B. (2011). Organization and Working of Public Distribution System in India: A Critical Analysis. *Research on Humanities and Social Sciences*, 1(1), 4-9.
- Purushothaman, U. (2011). Indian and American Perspectives on Food Security. *International Studies*, 48(3&4), 281-303.
- Ray, S., & Ray, I. A. (2011). Role and effectiveness of public distribution system in assuring food security in india: An appraisal. *Journal of Economics and Sustainable Development*, 2(4), 238-251.
- Stevens, C., Greenhill, R., Kennan, J., & Devereux, S. (2000). *The WTO agreement on agriculture and food security*. London: Commonwealth Secretariat.
- Svedberg, P. (2012). Reforming or Replacing the Public Distribution System with Cash Transfers?. *Economic & Political Weekly*, 47(7), 53-62.
- UN. (2013). *A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development – The Report of the High Level Panel on Eminent Persons on the Post-2015 Development Agenda*. New York, NY: United Nations.
- UN General Assembly. (1948). The Universal Declaration of Human Rights. Retrieved March 9, 2013, from <http://www.refworld.org/docid/3ae6b3712c.html>
- UN General Assembly. (1966). International Covenant on Economic, Social and Cultural Rights. Retrieved March 9, 2013, from <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>

ANNEXES

Annex 1. A Glimpse at India's Public Distribution System

Swaminathan (as cited in Ray & Ray, 2011) identifies four phases in the history of the PDS in India, as seen in Table 1.

Table 1. Public Food Distribution System Timeline: 1930s to present

Phase	Period	Particulars
1	1939 – 1960	<ul style="list-style-type: none"> ▪ Largely dependent on imported food grains. ▪ Expansion of coverage to include rural areas facing food shortages.
2	1960 – 1978	<ul style="list-style-type: none"> ▪ GOI adopted a holistic approach to food insecurity. ▪ Strengthened domestic procurement and storage of food grains.
3	1978 – 1991	<ul style="list-style-type: none"> ▪ Underwent a large-scale expansion in the aftermath of the Green Revolution. ▪ Evolved into a universal scheme by the 1970s. ▪ Revamped in the 1990s to target the poor and improve access for people in inaccessible areas.
4	1991 – Present	<ul style="list-style-type: none"> ▪ Launched the TPDS in 1997 with a focus on poor households. ▪ Launched the Annapurna scheme in 1999 to provide food to people aged 65 and above ▪ Launched the AAY scheme in 2000 to target the 'poorest of the poor'. ▪ National Food Security Act (NFSA), 2013 passed by Parliament establishing the right to food as a legal right

Source: adopted from Balani (2013) and Purushothaman (2011).

The Central Government (hereinafter referred to as Centre) determines the percentage coverage⁷ under the PDS for each state and calculates the total number of households below the poverty line (BPL) to be covered based on population projections. From this number, the State Government (hereinafter referred to as State) then identifies eligible households to be covered under the *Antyodaya Anna Yojana* (AAY) scheme while the remaining households become categorised as priority households.

The Centre is responsible for the procurement of food grains⁸ from farmers at the minimum support price⁹ and the allocation of food grains to each State at the central issue price.

⁷ As set out in the NFSA, the entitlements of persons belonging to eligible households extend up to 75% of the rural population and up to 50% of the urban population.

⁸ Rice, wheat, or coarse grains, or any combination thereof.

⁹ Typically higher than the market price to incentivise production.

It also provides for the transport of food grains to designated FCI depots. On the other hand, the State is charged with the task of allocating and distributing good grains from the designated depots to FPS from which beneficiaries purchase their monthly food grains entitlements at subsidised prices.

The Centre and States are jointly responsible for the functioning of the PDS. Figure 1 provides an overview of the scheme's multi-level process.

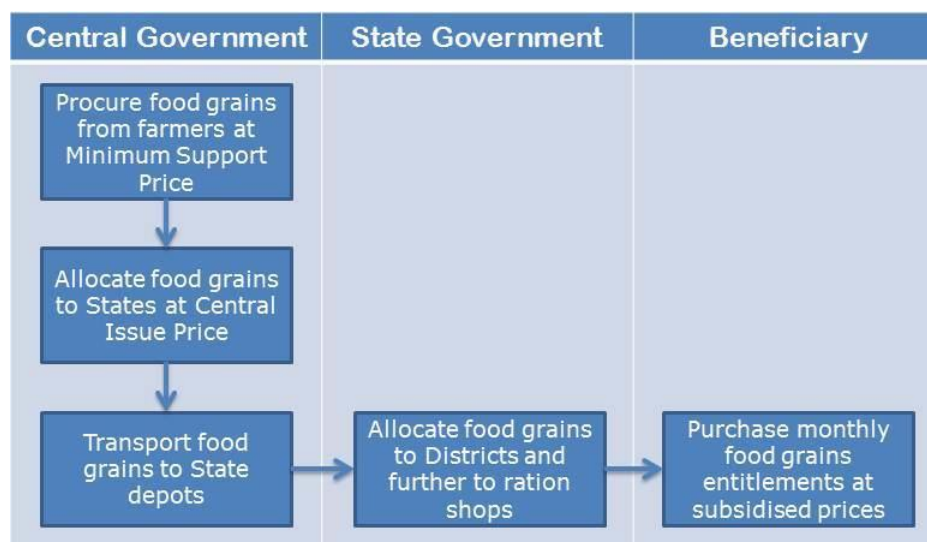


Figure 1. Simplified depiction of the Public Food Distribution System Back-End Process.
Source: adapted from Balani (2013).

Costs incurred by the Centre due to the difference between procurement and distribution expenses and the costs of issuing food grains under different programmes are covered by the food subsidy in the union budget (Acharya, Guha-Khasnobis, & Davis, 2007). The food subsidy in India, which was 0.43% of GDP in 1990-91, increased to 0.57% in 2000-01 and further grew to 0.82% in 2010-11. The total allocation for food subsidies in the 2013-14 budget is projected at Rs. 850 billion, which is 6% of the total budget (Ministry of Finance, 2013).

Annex 2. Interview Guide

Fair Price Shop Dealers

Date of Interview: _____	Location: <input type="checkbox"/> AUR <input type="checkbox"/> DOK
Respondent: _____	<input type="checkbox"/> PDS Beneficiary <input checked="" type="checkbox"/> PDS Dealer

Question 1. Please tell us your name and how long you have been a dealer of the PDS.

Less than 5 years
 5 to 10 years
 10 to 15 years
 15 to 20 years
 More than 20 years

Question 2. What are your operating hours?

Days: _____ Time: _____

Question 3. How did you become an accredited fair price shop? What process did you go through? Did you encounter any difficulties?

Question 2. How are commodities transported to your shop?

Question 3. What PDS commodities do you carry in your shop?

Rice Wheat Sugar Oil Dal Kerosene
 Others _____

Question 3. What are some issues you have encountered as a dealer of the PDS?

Low margin / profit Loss of stocks during transport
 Low quality of stocks Not enough stocks to meet demand
 Others _____

Question 5. What needs improvement in the PDS?

Beneficiary Households (1 of 2)

Date of Interview: _____	Location: <input type="checkbox"/> AUR <input type="checkbox"/> DOK
Respondent: _____	<input checked="" type="checkbox"/> PDS Beneficiary <input type="checkbox"/> PDS Dealer
Card Type: <input type="checkbox"/> AAY <input type="checkbox"/> BPL <input type="checkbox"/> APL	

Question 1. Please tell us your name and how long you have been participating in the programme.
 < 5 years 5 to 10 years 10 to 15 years 15 to 20 years > 20 years

Question 2. How did you obtain your PDS card?

Question 3. What are the major benefits you get from the PDS?

Question 4. In what way is your life different because of your inclusion in the PDS?
 Much Worse Worse Same Better Much Better
 Why do you say so?
 Increased/decreased incomes More/less purchasing power
 Eat more/less; regularly/irregularly Increased/decreased labour efficiency
 Others _____

Question 5. How much are you purchasing and at what price?

Question 6. Where do you purchase your PDS benefits?

Question 7. Do you re-sell your PDS benefits? To whom? At what price?

Question 8. If there is no PDS, what commodity do you buy and at what price?

Question 9. If there is no PDS, how many families do you think will be poor (lack enough money to survive)?

Beneficiary Households (2 of 2)

Question 10. For smallholder farmers, if there is no PDS, do you grow more rice?

Question 11. What are the problems / issues you encountered in the PDS?

- High rates Low quantity Low quality (sufficient) Limited commodities
 Others _____

Question 12. Do you think PDS should only benefit targeted families or should everybody benefit from the PDS? Why?

Question 13. Does the PDS affect your agricultural activities (i.e., cropping pattern changes, lesser hours devoted to farmers, relocation of household members)?

Question 14. Would you prefer cash transfers instead of the PDS? Yes No
Why?

Question 15. What needs improvement in the PDS?

- Targeting Quantities of commodities distributed
 Fair Price Shops / PDS Shops Rates of commodities distributed
 Others _____

Annex 3. Photo Documentation



Bags of rice in a fair price shop



Packets of pigeon pea dal and salt



Weights used in a fair price shop



A fair price shop dealer



AAY Cardholder



Large holder farmer (White Cardholder)



Small holder farmer (White Cardholder)



With the ICRISAT field investigators