

Saini, Shweta; Kozicka, Marta

**Working Paper**

## Evolution and critique of buffer stocking policy of India

Working Paper, No. 283

**Provided in Cooperation with:**

Indian Council for Research on International Economic Relations (ICRIER)

*Suggested Citation:* Saini, Shweta; Kozicka, Marta (2014) : Evolution and critique of buffer stocking policy of India, Working Paper, No. 283, Indian Council for Research on International Economic Relations (ICRIER), New Delhi

This Version is available at:

<https://hdl.handle.net/10419/176301>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# **Working Paper 283**

## **Evolution and Critique of Buffer Stocking Policy of India**

**Shweta Saini  
Marta Kozicka**

**September 2014**



## Table of Contents

<b>Abbreviations .....</b>	<b>iii</b>
<b>Acknowledgments .....</b>	<b>iv</b>
<b>Abstract.....</b>	<b>v</b>
<b>1. Introduction .....</b>	<b>1</b>
<b>Section I: Review of Indian Food Management Policies .....</b>	<b>3</b>
1. History .....	3
1.1 Stocks .....	3
1.2 Distribution .....	6
1.3 Procurement .....	8
2. Current system outline.....	9
<b>Section II: Evaluation of the performance of the current system .....</b>	<b>14</b>
1. Open-ended procurement .....	18
2. Procurement Prices have become Support Prices .....	19
3. One tool serving many objectives .....	20
4. Inefficient Inventory Management.....	20
5. Rising Costs of Operation .....	25
6. De-facto Nationalisation of the Grain Market.....	30
7. Increasing gap between per capita production and per capita availability .....	31
8. Inefficiencies in the Targeted Public Distribution System (TPDS) .....	32
<b>Section III: Way Forward.....</b>	<b>36</b>
<b>Appendix 1: Changing food consumption patterns of India.....</b>	<b>39</b>
<b>Appendix 2: Quarter-wise buffer stocks- actual vs. norms.....</b>	<b>40</b>
<b>Appendix 3: State-wise grain storage capacity .....</b>	<b>41</b>
<b>Appendix 4: Central issue prices (CIPs) of rice, wheat and coarse grains.....</b>	<b>42</b>
<b>References.....</b>	<b>43</b>

## List of Figures and Tables

<b>Figure 1:</b> Stocks of food grains: 1951 to 1974.....	6
<b>Figure 2:</b> Levels of buffer stocks vs. norms for rice and wheat (million tonnes).....	10
<b>Figure 3:</b> Trend of Indian population and production indices 1980-81=100 .....	10
<b>Figure 4:</b> Current Indian food-administration diagram.....	11
<b>Figure 5:</b> Details of grain buffer stocking norms.....	13
<b>Figure 6:</b> Procurement trend of rice and wheat since 1991-92 .....	19
<b>Figure 7:</b> Cyclicity of procurement in wheat market .....	20
<b>Figure 8:</b> Converging WPI- calculated cereals and FAO-cereals price indices (calendar year) ..	22
<b>Figure 9:</b> Trends for MSP and production for rice and wheat since 2001/02 .....	23
<b>Figure 10:</b> India's cereal exports- quantity and value since 2000 .....	23
<b>Figure 11:</b> OMSS-D - allocation (A) and off-take (O) of rice and wheat .....	24
<b>Figure 12:</b> MSP and state bonuses over MSP in the last four years (INR/qtl) .....	28
<b>Figure 13:</b> Increasing gap in FCI storage capacity and annual buffer stocking costs .....	29
<b>Figure 14:</b> FCI losses- transit and storage (Quantity in Lakh MT and value in INR crore) .....	30
<b>Figure 15:</b> Levy rates for rice for KMS 2012-13 .....	31
<b>Figure 16:</b> Per capita availability and production trends (grams/day) .....	32
<b>Figure 17:</b> State-wise PDS and open-market consumption of rice and wheat vs. poverty ratios.....	33
<b>Figure 18:</b> Trends in economic cost (EC) and central issue prices (CIP) of wheat: 1991-92 to 2012-12 .....	35
<b>Figure 19:</b> Growth of food subsidies in India.....	35
<b>Figure 20:</b> Expenditure on various categories of food (as per cent of total food expenditure) and non-food items (as per cent total consumer expenditure), all- India.....	39
<b>Table 1:</b> Indian food grain market policy environment.....	15
<b>Table 2:</b> Break-up of cost of 1 quintal of Custom Milled Rice (CMR) when procured from select Decentralized Procurement (DCP)/Non-DCP States in KMS 2013-14.....	26

## Abbreviations

AAY	Antyodaya Anna Yojana Programme (Poorest of the Poor)
APL	Above Poverty Line
BPL	Below Poverty Line
CACP	Commission for Agricultural Costs and Prices
CCTs	Conditional Cash Transfers
CIP	Central Issue Price
CPIAL	Consumer Price Index for Agricultural Labourers
CPI-IW	Consumer Price Index-Industrial Workers
CSO	Central Statistical Office
CWC	Central Warehousing Corporation
CY	Crop Year
FAPI	Food Articles' Price Index
FCI	Food Corporation of India
FPI	Food Price Index
FPS	Fair Price Shops
FY	Financial Year
GDP	Gross Domestic Product
IMF-FAO	International Monetary Fund – Food and Agriculture Organization
m-o-m	Month over Month Indicator (gives the current month's value relative to the previous month's value)
MOSPI	Ministry of Statistics and Policy Implementation
MSP	Minimum Support Price
MY	Marketing Year
NAFED	National Agricultural Co-operative Marketing Federation of India Limited
NCCF	National Co-operative Consumers' Federation of India Limited
NFSB	National Food Security Bill
NFSA	National Food Security Act
OMSS-D	Open Market Sale Scheme – Domestic
OWS	Other Welfare Schemes
PDS	Public Distribution System
TPDS	Targeted Public Distribution System
UT	Union Territory
WPI	Wholesale Price Index
y-o-y	Year on Year Indicators (gives the value of the current period (e.g. month) relative to the value in respective period the previous year )

## **Acknowledgments**

The research leading to this publication has been funded by the German Federal Ministry for Economic Co-operation and Development (BMZ) within the research project “Commodity Price Volatility, Trade Policy and the Poor” and by the European Commission within the “Food Secure” research project.

We would like to thank Dr. Ashok Gulati, Prof. Anwarul Hoda and Prof. Joachim von Braun, for their guidance and important suggestions. We would also like to thank Ms. Tara Nair and Dr. Matthias Kalkuhl for their highly insightful and valuable comments.

## Abstract

India's economic standing and its policy landscape have come a long way since the 1943 Bengal famine. History saw buffer stocking of food grains as a famine-combating tool. Today, apart from serving as an effective hedge in times of famines, such grain stocks are a conduit deployed by the government to foster the country's agriculture development and food security. The buffer stocking policy of food grains has become the one tool with the government used to fulfil the interlinked objectives of supporting food-producers and food-consumers, and of ensuring food availability at the national level.

The policy of widespread government intervention in the food management of the country has been successful in many ways. From a food-scarce, food-importing country, India has emerged as a grain-surplus and a net grain-exporting country. The production base is strong and growing. Food security, in terms of ample grain supplies, has been attained at the national level.

However, an evaluation of the country's buffer stock policy reveals gaps and inefficiencies. Large quantities of food grains have accumulated in the godowns of the Food Corporation of India (FCI) and its nominated state agencies, raising questions about the economic efficiency of the entire operation. At the same time, there is high incidence of malnutrition and rising food grain prices across the country. The level of government intervention in grain markets is straining government finances because of the increasing burden of food subsidy. There are increasing concerns regarding the imbalances being created in the national production basket, of alienation of market forces and its players, of quality of grain, and the sustainability and relevance of such operations.

---

**JEL Classification:** *Q18, N50, H44, E61, H57, I38, O13, Q13.*

**Keywords:** *Buffer Stocks, Indian Agriculture, Price Stabilisation, Food Security, Food Policies*

**Authors Email:** *shwetasaini22@gmail.com; marta.kozicka@uni-bonn.de*

---

**Disclaimer:** This discussion paper series by ICRIER-ZEF is an attempt to encourage unbiased discussion on critical issues affecting agricultural sector and food security.

Opinions and recommendations in the paper are exclusively of the author(s) and not of any other individual or institution including ICRIER.

# Evolution and Critique of Buffer Stocking Policy of India

Shweta Saini and Marta Kozicka\*

## 1. Introduction

Uncertainty is an integral part of agricultural production, given its vulnerability to variations in climate and weather. Increased agricultural investment and technology up-gradation do help make production systems more adaptive to the vagaries of nature but to say that one can completely hedge a year's production against any production shocks would be naïve. And these production shocks, together with other factors, are the drivers of food availability and price volatility. The harmful impact of the two on nutrition, and macroeconomic distortions and misallocations pose a serious threat to long-term development and economic growth (von Braun & Tadesse, 2012).

Every country faces this risk, although the degree of exposure may vary. Over time, based on past experience and/or political and economic considerations, each country has devised its own strategy to combat volatility in food availability and prices. While some have undertaken buffer stocking, i.e., physical stocking of grains between seasons, there are others who have built up monetary reserves to fund a grain emergency. Some countries rely on the international food market to bridge the gap between demand and availability arising from production fluctuations. The guiding motivation for all has been to find an effective, reliable, and cost efficient tool to smoothen inter-year and intra-year/inter-seasonal fluctuations of farm grain supplies, their farm-gate and retail prices and hence, consumption levels.

Rising food prices during the 2007-08 food crisis and the increased price variability in subsequent years made many countries, especially food importing countries, wary of over-reliance on the international grain markets, particularly in times of a food emergency. Consequently, they started hoarding increasing quantities of grains. AMIS data<sup>1</sup> indicates a steeper growth in world cereals' stocks after the 2007-08 food crisis. They grew at an average yearly growth rate of 5.9 per cent between 2008-09 and 2013-14. The massive grain procurement and hoarding driven by the largest food-exporting countries of the world, namely India and China, has contributed greatly to the rapid increase in world stock levels. In 2012-13, India and China together had 67.8 per cent and 34 per cent of world rice and wheat stocks respectively in their granaries. (AMIS)

In India, the food production and management system is characterised by a high degree of government involvement. The government's role in India's food management system has increased because of its focus on multiple objectives such as providing famine relief,

---

\* Shweta Saini is Indian Council for Research on International Economic Relations (ICRIER), India, E-mail: shwetasaiani22@gmail.com and Marta Kozicka, Centre for Development Research (ZEF), University of Bonn, Germany, Email: marta.kozicka@uni-bonn.de

Authors are members of the joint ICRIER and ZEF research project titled Stabilising Food Prices through Buffer Stocking and Trade policies.

<sup>1</sup> Agricultural Management Information System (AMIS) Statistics, accessed on 6 May, 2014



ensuring food security and providing production incentives. As India is one of the major players in the world grain market today (it is the largest exporter of rice and controls the second largest stock of grains in the world, after China), studying India's buffer stocking policies is crucial not only from the perspective of food security and fiscal costs in India but also for the likely implications it has for world food price stability.<sup>2</sup>

In India today, both grain prices and the cost of intervening in the grain markets are rising. The wholesale price index (*WPI*) based inflation rate of food articles, averaged 12.2 per cent for the last five financial years since 2009-10. The food grain buffer carrying costs for the Food Corporation of India (FCI) increased by close to 200 per cent in nominal terms in the period between 2005 and 2013.<sup>3</sup> The system of delivering subsidised grain to identified vulnerable sections of society through fair price shops, under the targeted public distribution system (TPDS), is plagued by inefficiencies. Both, the players and the market orientation of the grain market are fast disappearing.

Under the TPDS, subsidised (and sometimes free) food grains (rice, wheat and coarse cereals) are distributed to more than 883.96 million beneficiaries (73 per cent of the total Indian population of 1.21 billion). To deliver 3 kg of grain to these identified poor beneficiaries, the government has to release 5 kg!<sup>4</sup> The government procures grain every year from the market to meet the needs of the public distribution system, run by the central and the state governments, and to hold strategic stocks (to meet grain exigencies). The government procured, on an average, 33 per cent of the rice and 30.4 per cent of the wheat produced in the country between 2008-09 and 2013-14. In July 2012, rice and wheat stocks in the country's central pool (FCI) were more than 6 per cent and 7 per cent of the world's total rice and wheat utilisation.<sup>5</sup> The sheer scale of the grain management system, with monopoly control by the government, edges out private players and isolates the system from market forces.

Despite such large production and hoarding of grain by a country that spends almost 1 per cent of its GDP on an extensive food management system,<sup>6</sup> there is widespread malnutrition and poverty among its citizens. The situation is lamentable particularly for children under the age of five years in India; while almost half of them are chronically malnourished, close to 43 per cent are underweight for their age.<sup>7</sup>

The country's existing system of food management has been severely criticised in many quarters yet no major changes have been effected so far. The current study presents a review

---

<sup>2</sup> The rice price spikes in the first 5 months of 2008, which resulted in panic and food riots in poor food importing countries, were triggered by export bans imposed in two major rice-exporting countries, i.e., India and Vietnam (Poapongsakorn (2010)). Such actions are touted as one of the reasons for international food price spikes during the 2007-2008 world food crisis (Headey, 2011).

<sup>3</sup> Source: FCI Annual Reports

<sup>4</sup> According to the CACP (2013), there is a 40.4 per cent grain leakage in the PDS.

<sup>5</sup> Based on data from FCI, India and AIMS

<sup>6</sup> Gulati, Gujral and Nanda Kumar (2012). National Food Security Bill: Challenges and Options

<sup>7</sup> National Family Health Survey(2009), The 2005-06 National Family Health Survey (NFHS-3), released in August 2009

of various aspects of food management in India, with particular emphasis on food grain buffer stocking policies.

In India, buffer stocking of food grains is conceptually seen as a vehicle to deliver strategic food and agricultural domestic support policies, but in terms of its effectiveness in delivering its objective, there is a growing consensus, both domestically and internationally, that the food stocking programme has been not just costly but also imprudently wasteful. The purpose of the study is to examine the relevance and effectiveness of such operations in the present policy environment and to advocate ways to reduce the levels of grain stocks, without making any compromises on the domestic food security front.

The paper is organised as follows. Section I provides a history of the food policy in general and the Indian buffer stocking policy in particular. We briefly trace the evolution of three specific aspects of grain management in the country, namely, the building of buffer stocks, distribution and procurement of grains. The section ends by outlining the current policy environment in this regard. In Section II, we evaluate the recent performance of buffer stocking operations of the government. Based on the evaluation, we conclude in Section III with suggestions and policy recommendations to make the food grain management system more market friendly and efficient.

## **Section I: Review of Indian Food Management Policies**

### **1. History**

#### *1.1 Stocks*

From a conceptual and a historical stand point, India's buffer stocking policy worked on an insurance approach; the buffer stock is kept as an insurance against a reduction in supplies in times of falling production. The evolution of food policy and thus, of buffer stocking in free India, is the story of a calamity-oriented policy being transformed into an instrument of delivering equitable development.

In India, food management policy and application assumed much importance after the great Bengal Famine of 1943, and took shape during the post-war years, even though traces of government intervention in providing relief to the needy in times of distress (famines, scarcities and crop failures) can be found as early as in the 15th century. It was in 1486, under the rule of Sher Shah Suri that the first famine relief store was created. The British created the first granaries (*golas* in local terminology) in 1783-84, in response to a prolonged drought in north-India during that time.

The roots of the food grain policy with food grain reserve as its essential part dates back to the great Orissa famine of 1865-67. In 1878, under Lord Lytton, the Government of India, for the first time, formulated and codified its policy on famine relief. During the same period, India got its first Famine Insurance Fund, maintained with the Governor-General of India. This fund recommended setting aside of money instead of grain to meet famine relief measures. On account of the escalating economic costs of procuring, storing and distributing

food grains, the Famine Commission of 1880 termed hoarding grain as unadvisable (Acharya, 1983).<sup>8</sup> Until about the first half of the 20<sup>th</sup> century, there were limited or no physical stocks of food grains maintained by the government. As a tool to ensure equitable distribution of food grains to urban consumers facing rising prices, the British Government introduced “rationing” in 1939. For this, the government needed grain and so the 1943 Food grains’ Policy Committee, appointed by the central government, formalised the first scheme of centralised grain purchase.

On the food grain market front, until 1943, free market forces were allowed to determine the prices of food grains. However, due to both internal and external forces, the economy often faced food crises. The consequences were severe since nutrition intake levels were low even in normal times. According to a World Bank report on India’s food grain marketing policies,<sup>9</sup> during this period, “weak integration of sub-markets stifled market adjustments causing local food grain shortages even though there was no shortage at the global level”. World War II affected food imports and the transportation system in the country, leading to the collapse of the free market system and a food crisis. The situation was aggravated by the inter-province food grain movement restrictions imposed by surplus provincial governments. Then, the dreadful Bengal Famine of 1942-43<sup>10</sup> happened. Due to a drastic fall in production and a crippled grain market with restrictions on grain movements, more than a million people died of starvation. These events led to the creation of the Food Department (December 1942)<sup>11</sup> at the central level. The period marked the beginning of the shift away from reliance on the private sector/traders to one establishing complete government monopoly in the procurement, storage and distribution of food grains.

The government introduced administrative controls, monopoly procurement and public distribution during 1943-47. The subsequent two decades saw varying policies vis-à-vis the domestic grain market, when it fluctuated between tight controls and the market autonomy. The only unchanged policy during the time was the control on grain imports on private account (World Bank, 1999).

Overall, the scale, coverage, and administrative structure of public intervention grew rapidly during the remainder of the colonial era.<sup>12</sup> With the partition of the country in 1947, not just the political situation but food administration also suffered a huge setback. After 1947, India inherited 82 per cent of the population but only 75 per cent of the area under cereals, and only 69 per cent of the total pre-partition irrigated area. Compared to 24 per cent of cropped area that was irrigated in the pre-partition era, only 19 per cent was irrigated in the post-partition days (Chopra, 1981).

---

<sup>8</sup> Acharya, KCS (1983), Food Security System of India, Chapter 4, P42

<sup>9</sup> World Bank (1999), India Food Grain Marketing Policies: Reforming to Meet Food Security Needs, Report No. 18329-IN, August 17, 1999

<sup>10</sup> The Bengal Famine of 1943 wiped out about 1.5 million people; it began with the failure of the Aman crop in 1942 and ended with the bumper harvest of the Aman crop in December 1943

<sup>11</sup> KCS Acharya (1983) “Food Security System in India” and R.N. Chopra’s “Evolution of Food policy in India” (1981)

<sup>12</sup> Rashid, Shahidur, Ashok Gulati and Ralph Cummings Jr. (2008): From Parastatals to Private Trade, Lessons from Asian Agriculture

While in the 1940s, the focus of buffer stocking operations was on the urban and food-deficit areas, in the 1950s, the focus on welfare led to the extension of these operations to even rural areas. The framing of the Constitution of India (1950) provided for the creation of a welfare state; Article 47, included in the Directive Principles of State Policy, provided that the “State shall regard the raising of the level of nutrition and the standard of living of its people, and the improvement of public health as among its primary duties”. Likewise, after the adoption of planned development in 1950s, the idea of “economic growth with social justice” became the guiding principle for India’s economic policy formulation and the country adopted the so-called “socialist pattern of society” in 1955.

The 1950s saw the government assume monopoly control over inter-state grain movements. State-zones were created and licensing was widespread to curb private trade. However, later, in view of increased production and a fall in cereal prices, the government intervened by scrapping state zones. Rafi Ahmed Kidwai, who became the Food Minister of India in 1952, introduced decontrol for both rice and wheat in December 1953. Food grain trade in India was free again. But this situation was very short-lived. Buffer stocks got reduced to 0.92 million tonnes (including wheat) by 1955 and rising grain prices necessitated the return of zoning and licensing. The Essential Commodities Act, 1955, was enacted during the period, marking the increased “centralisation” of the production, supply, distribution and trade of “essential commodities”<sup>13</sup>; licences and permits were used for this purpose.

The 1960s saw the onset of a revolution in wheat production in the country. Contrary to the general expectation that government intervention would be reduced in the wake of increased production, the intervention intensified and expanded in scope after the Green Revolution. In order to create a stable environment for farmers to adopt new production techniques and inputs, government had to get involved in the food grain marketing of the country. The country was successful in bringing about a revolution. Since the 1970s, India has never been a big importer of wheat. As a departure from history, this period marked the country’s ability to link buffer stocks with local surplus production of food grains, unlike earlier when a buffer stock was created from imported grain only.

It was during the Fourth Five-Year Plan that the creation of a food-grain buffer stock of adequate size<sup>14</sup> as a central feature of food policy (Figure 1) was introduced. Till about 1965, the food policy mainly comprised short-term measures recommended by ad-hoc committees. Because of this policy arbitrariness, it was felt that no permanent administrative structures could be built for implementing the policies with regard to food management in the country.

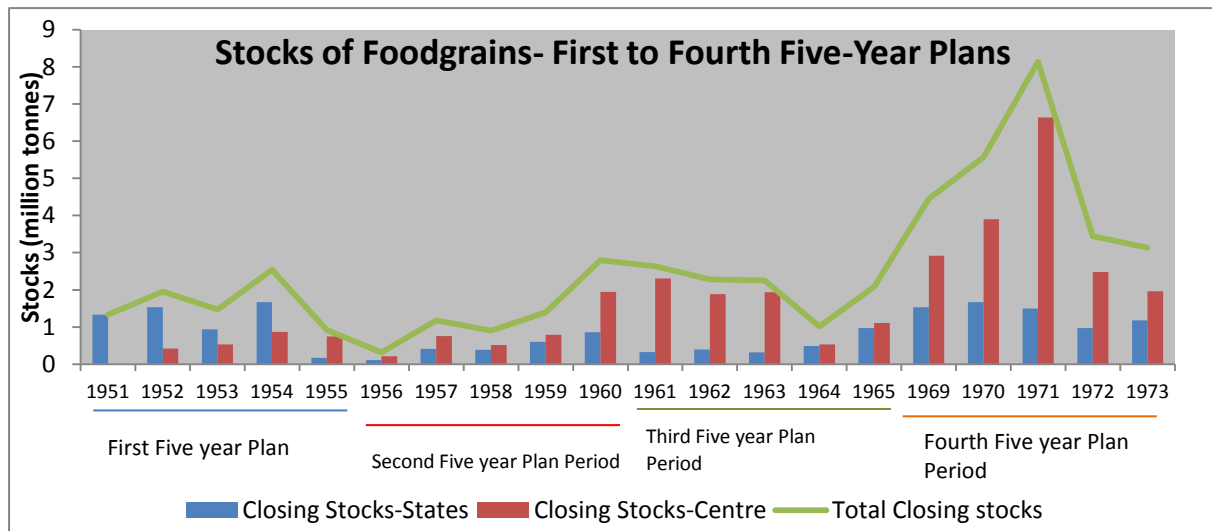
---

<sup>13</sup> The ECA includes orders for essential commodities like wheat, pulses, edible oils, edible oilseeds, rice, paddy and sugar. While some states/UTs impose stocking limits, some impose licensing/stock declaration requirements on one or all of these commodities under the Act.

<sup>14</sup> The Plan created a scientific method of calculating FCI stock levels at a point in time. Operational stocks levels were calculated based on actual food grain off-take levels – two months’ off-take in the case of wheat, six months’ off-take in the case of rice, and seven months’ off-take in the case of coarse grains. This formula was based on proximity to the harvest season and was to be reckoned as on April 1 and stock levels worked out accordingly. (Acharya, 1983)

The economic and political evolution of the country, in mid-60s, steered policy makers towards a preference for price stabilisation, elimination of hunger, and government involvement in grain markets to curb speculative trade. Both the Food Corporation of India (FCI) and Agriculture Prices Commission (APC) were set up in 1965 to secure a strategic and commanding position for the public sector in food grain trade.

**Figure 1: Stocks of food grains: 1951 to 1974**



Source: (Chopra, 1981) Based on Bulletin on Food Statistics 1977; ESA, Ministry of Food and Agriculture, New Delhi, p.33. Reprinted in Chopra (1981 p.289)

### 1.2 Distribution

The public distribution system (PDS), whose basic principles were laid in the 6<sup>th</sup> Price Control Conference held in September 1942, is regarded as one of the most stable elements of India’s food policy. The central objective of the system in the beginning was “stabilisation of prices” and the focus of food distribution was the urban and food deficit areas. The welfare focus of this programme assumed importance only during the 1980s and the coverage extended to rural areas. The PDS has substantially helped contain a rapid rise in food grain prices and ensured access to food for urban consumers. As agricultural production had grown in the aftermath of the Green Revolution, the outreach of the PDS was extended to tribal blocks and areas with a high incidence of poverty in the 1970s and 1980s.

Until 1992, the PDS was a general entitlement scheme for all consumers without any specific target. The 1991 hunger deaths in mostly the tribal areas in the country led to the formation of a revamped PDS (RPDS), which propagated the adoption of an area approach, i.e., people living in the disadvantaged areas, mainly hilly, tribal, drought prone and “desertified” areas, were identified and were designated to benefit from the RPDS. But on account of their failure to serve all the country’s poor, particularly because of their area bias and limited coverage and for lack of transparency and accountability, both the PDS and RPDS were criticised. The Targeted Public Distribution system (TPDS) was introduced in June, 1997. Unlike the RPDS, which targeted “all in the poor areas”, the TPDS would target the “poor in all areas”. The

new system identified poor people across the country and provided them rationed quantities of essential commodities (mainly grain, sugar, kerosene etc.) at subsidised prices.

The “Antyodaya Anna Yojana” (AAY) was later launched in December, 2000, which was an extension of the TPDS and aimed to reduce hunger among the poorest segments<sup>15</sup> of the below poverty line (BPL) population. As on December 31, 2013, 24.3 million families had been issued AAY cards by states/union territories (UTs).

Government of India makes allocations of food grains to three categories of beneficiaries under TPDS,<sup>16</sup> namely AAY, BPL (Below Poverty-Line) and APL (Above Poverty Line). Thirty-six per cent of the Indian population is identified as BPL.<sup>17</sup> The entitlements differed between these three categories of beneficiaries. But since 2002, the scale of issue to APL, BPL and AAY categories has been revised and made uniform at 35 kg/family/month for all. In September 2013, the National Food Security Act (NFSA), 2013 was passed, which brought under its ambit many of the existing food-distributing welfare schemes run by the central government of the country, including TPDS. Under this, the three categories of beneficiaries are replaced by only two categories, namely AAY and priority. The latter is supposed to include the existing TPDS- BPL beneficiaries, unless they are found to have crossed the poverty threshold. The Act aims to provide food security to 67 per cent of the country’s population by distributing a fixed quantity of subsidised grain to them every month.

Grains under such schemes are released to beneficiaries at highly discounted/subsidised rates called the central issue price (CIP). Allocations are made to BPL families at the subsidised rates of Rs.4.15/kg for wheat and Rs.5.65/kg for rice since July 25, 2000. Ever since the inception of the AAY scheme in 2000, allocations to these families are made at the even more highly subsidised rates of Rs.2/kg for wheat and Rs.3/kg for rice. At the time the TPDS was introduced, the allocations to the APL families were made at the CIP, which was equal to the economic cost (EC)<sup>18</sup> of the grains. However, the CIPs for APL have been Rs. 6.10/kg for wheat and Rs.7.95/kg for rice since July 7, 2002, which have been consistently lower than the

---

<sup>15</sup> These include landless agricultural labourers, marginal farmers, rural artisans/craftsmen earning their livelihood on a daily basis in the informal sector; households headed by widows or terminally ill persons/disabled persons/persons aged 60 years or more with no assured means of subsistence or societal support; widows or terminally-ill persons or disabled persons or persons aged 60 years or more or single women or single men with no family or societal support or assured means of subsistence and all primitive tribal households.

<sup>16</sup> Apart from TPDS, the central government has been releasing grain to different vulnerable categories of beneficiaries, under various other welfare schemes like the mid-day meal scheme, under which cooked meals are provided to school going children between the ages of 6 and 14 years, wheat-based nutrition programme under the ICDS, in which nutritious food is provided to children below 6 years of age and to lactating/expecting mothers etc.

<sup>17</sup> Allocations are made to (BPL) families under targeted public distribution system (TPDS) on the basis of the 1993-94 poverty estimates of the Planning Commission and March 2000 population estimates of the Registrar General of India or the number of such families actually identified and ration cards issued to them by the state/UT governments, whichever is less. The all-India poverty line per capita per month (associated with a calorie intake of 2400/2100 per capita per day respectively) at 1973-74 prices is INR 49.09 for rural and INR 56.64 for urban areas.

<sup>18</sup> Economic costs refer to the sum of the acquisition and distribution costs of grains incurred by FCI and the food subsidy is calculated as the difference between the total cost and receipts from sale of grains at CIP.

associated economic costs. The CIPs have not been revised for the BPL and AAY families since July 25, 2000, and for APL since July 1, 2002. The National Food Security Act, 2013, (NFSA) freezes the issue prices at Rs.2/kg for wheat and Rs.3/kg for rice for all identified beneficiaries for three years. (Appendix 4 presents summary of changing CIPs)

Interestingly, the TPDS is one amongst the many other food-related schemes run by the central government (centre) and different states/UTs. The TPDS has the highest number of beneficiaries (covering more than 90% of the country's population), with a very high level of grain distribution commitment (in 2012-13, close to 52 million tonnes of grains was allocated for distribution under TPDS). There are several other welfare schemes<sup>19</sup> run by both the centre and the states, which differentiate and target beneficiaries based on their age, levels of nutrition deprivation, etc., and the entitlements include cash, raw food grains, pre-cooked/hot-cooked meals, other essential commodities like pulses, etc.

### ***1.3 Procurement***

To provide grain for all these schemes, the government procures grain directly from the farmers or from the open market at a minimum support price (MSP),<sup>20</sup> which is decided by the central government on the recommendations of the Commission for Agricultural Costs and Prices (CACP), Government of India. The government purchase/procure a part of the domestic marketed surplus of grain, monopolises imports, and supplies the grain to low-income, ration-card-carrying population at a subsidised price and hold some as buffer stock.

Just as the farmer has two markets for selling his produce, i.e., the open market at the open market prices and government procurement agencies at the MSP, consumers identified as beneficiaries under various schemes too source their requirement from two sources, namely, the PDS and the open market. Both – the unmet residual demand of ration cardholders and the total demand of non-ration cardholders – are met from the open market. The government's procurement drive and the minimum support-price (MSP) operations influence the open-market operations.

Historically, the government purchased food grains from the markets at two prices. These were support prices and procurement prices. Support prices,<sup>21</sup> declared in advance of the sowing season, were to provide strategic production incentives to producers and ensure stability in price and farm income around certain minimum levels. Procurement prices were declared for crops, mainly rice and wheat, for which the government had to undertake procurement to meet increasing demand. These prices were announced at the beginning of

---

<sup>19</sup> Apart from meeting the grain needs under TPDS, the Central government also procures and distributes grains under other welfare schemes, like Mid-day meal scheme, Wheat-based Nutrition Scheme among others. There are in total 7 such schemes together addressed as Other Welfare Schemes (OWSs).

<sup>20</sup> MSP is calculated on the basis of demand and supply forces for the crop, its costs of production, and crop price trends in both the domestic and international markets. Other inputs used in the determination of MSP are inter-crop price parity, terms of trade between agriculture and non-agriculture and the likely implications of MSP on the consumer of the product.

<sup>21</sup> Support prices remained practically inoperative in India due to the policy of fixing these at very low levels compared to the market prices; due to which the government later abandoned the practice of announcing support prices.

each marketing season and maintained for the entire year. Such procurement was done from producers, traders and millers, more often on a voluntary basis but sometimes, with an element of compulsion.

Upon realising that declaring procurement prices after sowing did not influence production decisions, the policy was revised and for the first time in 1978-79, procurement prices for the rabi season<sup>22</sup> cereal crop were announced before the sowing period and the practice continues till date. Even though the practice of setting procurement targets continues even today, it does not have much meaning as the government follows practically an open-ended procurement policy owing to which it ends up procuring all the grain offered to it.

Since these support prices also acted as procurement prices in the wake of an open-ended procurement drive, the distinction between support and procurement prices disappeared eventually. The government eventually abandoned the practice of announcing support prices. Today, the Commission for Agricultural Costs and Prices (CACPC) is entrusted with the task of recommending the minimum support prices (MSP), for 23 crops. In the case of sugarcane, it is the fair and remunerative price (FRP). The Food Corporation of India (FCI) and its nominated state agencies undertake procurement operations in the case of major cereals, The National Agricultural Co-operative Marketing Federation of India Limited (NAFED) provides price support for oilseeds and pulses, the Cotton Corporation of India (CCI) for cotton and the Jute Corporation of India (JCI) for jute, whenever the need arises, at least in theory. In reality, even for paddy and wheat, market prices often go below MSPs in several markets in the absence of any effective procurement machinery to provide price support. Other crops too suffer from this from time to time, as the procurement machinery remains weak.

In the next section, we present the current policy stance of the government with respect to buffer stocking operations of the country.

## **2. Current system outline**

The current level of public stock of food grains,<sup>23</sup> maintained and operated by the FCI, was close to 65.3 million tonnes at the beginning of July 2014, which is more than double the existing buffer stocking norm of 31.9 million tonnes for the quarter. The stocks of grains in the central pool are at their highest level at the beginning of the July-September quarter<sup>24</sup> due to the high procurement of rabi wheat (99.6 per cent of annual wheat is procured in the months of April to June). The FCI has been criticised for procuring and holding actual stocks that are higher than the norms laid down by the government. (Figure 2)

---

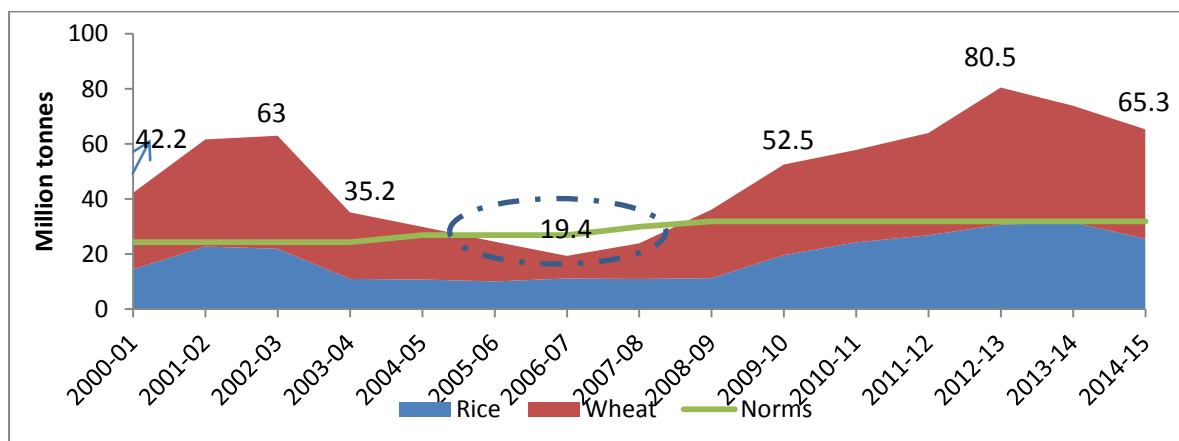
<sup>22</sup> The two crop seasons in India are Kharif (mainly paddy) and Rabi (mainly wheat). Rabi crops are sown in winter and harvested in spring. The marketing season for wheat is April-March and for rice it is October-September.

<sup>23</sup> Includes rice, wheat and un-milled paddy

<sup>24</sup> On a quarterly basis, the FCI stocks are observed to be the highest at the beginning of the July-September quarter. However on a monthly basis, it is observed that ordinarily, the FCI stocks reach their peak on the 1st June of any year.



**Figure 2: Levels of buffer stocks vs. norms for rice and wheat (million tonnes)**

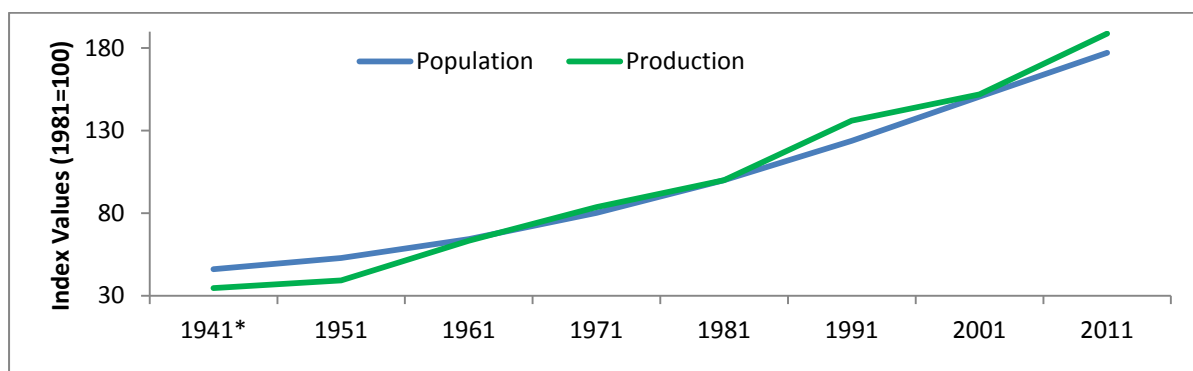


Sources: FCI

For a period, between 1998 and 2013, except for the three years 2005, 2006 and 2007 when stock levels in July fell below the norm, stocks have been much higher than mandated levels. Since 2008, the average stocks have been 190 per cent of the mandated norm.

According to the Reserve Bank of India (RBI) (2013)<sup>25</sup>, the annual rate of increase in food stocks over the past five years is close to 27 per cent. The recent Economic Survey<sup>26</sup> states that food production in India has increased more steadily than its population<sup>27</sup>. (Figure 3)

**Figure 3: Trend of Indian population and production indices 1980-81=100**



Population (millions) and food grain production (million tonnes) has been converted into an index with 1981 values for both=100

Source: \* Joseph, S.C. (1961), Food Policy and Economic Development in India, 1961, Page 16

Sources: Agricultural Statistics at a Glance, 2012 and Census of India

The existing system of food grain management in India is characterised by the dominance of the government in production, marketing and stocking (Figure 4). From input pricing to post-

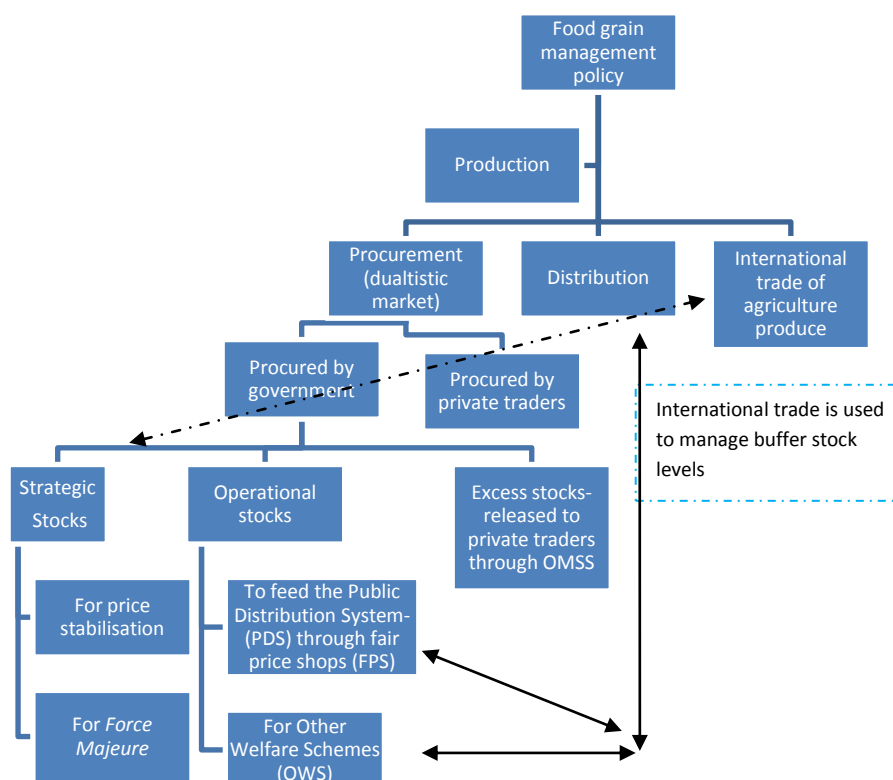
<sup>25</sup> RBI (2013). Macroeconomic and monetary developments in 2012-13. May 2. 2013

<sup>26</sup> Economic Survey (2012-13). Agriculture and food management.

<sup>27</sup> However, as we will see in later sections, per capita per day availability of food grains is still below the per capita per day production in the country, indicating gaps between the transmissions of increased production into increased food availability.

harvest handling to cross-border trading, all decisions are in the hands of the government today. Buffer stocking is one component of the overall food grain policy of the country.

**Figure 4: Current Indian food-administration diagram**



Source: Authors' representation

The central government extends price support to paddy, wheat and coarse cereals through the Food Corporation of India (FCI), state governments participating in the decentralised procurement programme (DCP)<sup>28</sup> and state agencies who buy all the offered-for-sale food grains, provided the grain conforms to prescribed specifications. As a policy, the procurement operations of FCI are largely limited to rice and wheat. Procurement operations related to oilseeds and pulses are taken care of by other agencies<sup>29</sup> under the price support scheme (PSS) when the market price of a particular commodity falls below the MSP. In the year 2010-11, government procured more than 49 per cent of the marketable surplus of rice, which was nearly 34 per cent of the total production that year. Apart from the cost implications of

<sup>28</sup> The DCP was introduced by the Government of India in 1997-98 where states, which voluntarily become part of this programme, procure, store and distribute food grains under the targeted public distribution system (TPDS) and other welfare schemes (OWSs), on behalf of the central government. The idea was to enhance the efficiency of the process by encouraging local participation. All expenses are centrally met.

<sup>29</sup> The National Agricultural Co-operative Marketing Federation of India Limited (NAFED), National Co-operative Consumers' Federation of India Limited (NCCF) and Central Warehousing Corporation (CWC) are the central nodal agencies for oilseeds and pulses procurement operations.

procuring and storing such large quantities of stocks, private trade is crowded out of the market, with a consequent impact on prices in the open market.

The procurement for both rice and wheat is open-ended, although there are indicative targets set before each season. The producers of the grains have the option to sell their produce to FCI/state agencies at support prices or in the open market as is advantageous to them. Rice/paddy, in particular, is collected by way of statutory levies on rice millers and rice dealers. The levy percentage varies between states.

The norms and composition of FCI stocks are evaluated under two heads: operational and strategic. The government fixes the buffer stock norms (Figure 5), prescribing the minimum quantities of food grains (wheat and rice) to be maintained in the central pool at the beginning of each quarter, namely for January, April, July and October. A Technical Group, chaired by the Secretary of the Ministry of Food, with representations from the Ministry of Agriculture, FCI, Planning Commission and Ministry of Consumer Affairs, periodically evaluates both the levels and composition of buffer stocks of food grains (rice, wheat and coarse cereals) to be maintained through the year with both the central pool (with FCI) and with the states. The process of evaluating the norms is scientific and involves synchronisation of the seasonal and stochastic character of production (and thus supply) with the reasonably predictable nature of food grain consumption. The general stocking norm in the case of seasonal crops is that 17-20 per cent of production should be in the form of year-end-stocks to take care of demand till the next crop hits the market.

Of the total buffer stocks, quarterly norms for operational stocks<sup>30</sup> are based on mapping food grain distribution requirements with the food procurement patterns. Given that food distribution needs are uniformly spread through the year but procurement of grains is highly concentrated (99.6 per cent wheat is procured in the quarter beginning 1<sup>st</sup> April and close to 80 per cent of rice is procured in the two quarters beginning October and January), there is need to synchronise grain stocks to ensure the efficiency and efficacy of food grain distribution. As an operational rule, the granaries are said to have the lowest stock levels in the quarters beginning April (for incoming wheat harvest) and October (for the incoming kharif harvest).

FCI maintains stocks of grains in excess of what is needed for meeting operational needs, and these stocks are called strategic stocks.<sup>31</sup> These are maintained for ensuring price stability in the country and for meeting any exigent grain requirements.

---

<sup>30</sup> Operational Stocks are defined as the minimum quantities required for running the TPDS/NFSA and OWSs until quantities procured from the new crop become available for distribution.

<sup>31</sup> There is confusion in the literature over the use of various heads under buffer stocks. After the deliberations of the 1968 Seminar on Food grains Buffer Stock in India, a distinction has been drawn between the buffer and operational components of food grain stocks, the former being meant for inter-seasonal (counter-speculative) purposes and the latter for intra-seasonal (pipeline) purposes. Khusro (1973) viewed buffer stocks as stocks in addition to the pipeline or operational stocks. Government norms call the cumulative stock of food grains as the buffer stock and, since 2008, have added “strategic” reserves. Following the present terminology, grain stocks procured for distribution purposes under various welfare schemes are called operational stocks and the portion kept for counter-cyclical purposes is called strategic reserves.

In times when grain prices in the open market are soaring, the government releases these grains (the policy is functional mainly for wheat) from its stores to the open market through co-operative societies/super bazars/roller flour mills and state nominated agencies to moderate prices. This scheme of market intervention is called the open market sale scheme – domestic (OMSS-D). Apart from using the stored grain to stabilise prices, the government has also been releasing grain for export (close to 3 million tonnes of rice and wheat were exported from the central pool in 2012-13), or as food aid. There has been no import of food grains for the central pool since 2009-10.

**Figure 5: Details of grain buffer stocking norms**

(Fig. in Million Tonnes)

Year	Rice				Wheat				Total (Rice + Wheat)			
	Jan	April	July	Oct	Jan	April	July	Oct	Jan	April	July	Oct
<b>1991-1998</b>	7.7	10.8	9.2	6	7.7	3.7	13.1	10.6	15.4	14.5	22.3	16.6
<b>1999-2004</b>	8.4	11.8	10	6.5	8.4	4	14.3	11.6	16.8	15.8	24.3	18.1
<b>Up to April 2005</b>	8.4	11.8	--	--	8.4	4	--	--	16.8	15.8	--	--
<b>With Effect From (w.e.f.) 20.04.2005</b>	11.8	12.2	9.8	5.2	8.2	4	17.1	11	20	16.2	26.9	16.2

*In addition to buffer norms, government has prescribed a strategic reserve of 3 million tonnes of wheat w.e.f. 1.7.2008 and 2 million tonnes of rice w.e.f. 1.1.2009.*

Source: FCI

Historically, there has not been much rationalisation in terms of setting the levels of strategic stocks. According to existing norms (Figure 5), five million tonnes (3 MT of wheat and 2 MT of rice) are to be kept aside as strategic stock. For operational stocks, FCI would generally hold in its granaries at least two months' TPDS requirement at all times, and treats grain in excess of that amount as the strategic stock. States are given standing instructions periodically about the levels of stocks to be maintained by them at all times. The present norms are that states have to maintain stocks equivalent to twice the average off-take of food grains during the last three months.

The National Food Security Act, 2013 (NFSA), was notified on September 10, 2013, and by March 2014, 11 states<sup>32</sup> had implemented the act. The act marks a fundamental change in the country's food policy in that it makes people's right to a basic amount of food a legal entitlement. Interestingly, the entitlement has been delinked from poverty levels. The act aims to provide a legal entitlement to subsidised food grains to at least 75 per cent people in rural areas and 50 per cent in urban areas. There were debates on and apprehensions about the scope and coverage of such an entitlement, both domestically and internationally.

<sup>32</sup> Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, Rajasthan, Bihar, Madhya Pradesh and Chandigarh

Questions have been raised on whether the massive scale of food procurement and subsidised distribution, envisaged in the NFSA 2013 creates a conflict with India's commitments under the WTO Agreement on Agriculture (AoA). Although the AoA does not bar either public stockholding programmes for food security or the subsidised distribution of food grains, it considers food procured at administered prices as part of a farmers' support programme and hence, subject to AOA disciplines on such support. The WTO rules provide, *inter alia* that a country like India, where the subsidy level on a particular product during the agreed base year of 1986-88, was less than the *de minimis* limit of 10 per cent of the annual value of production, has to ensure that the subsidy level does not go beyond that limit in future years. The problem arises because the rules fix the benchmark price of 1986-88 in *nominal* terms. Although the rules allow "due consideration" to be given to the "influence of excessive rates of inflation" during the review process in the relevant WTO committee, there is some uncertainty on the situation in which a member like India can be deemed to be in breach of the obligations. For this reason, at the Bali Ministerial meet, India and some other developing countries sought and obtained a four-year peace clause, under which no disputes would be raised against them relating to this issue for four years so that they could work out a permanent solution during the period.

Food grains required under the Act has been estimated at about 61.2 million tonnes of cereals, primarily rice and wheat, which will be distributed through the existing public distribution system (PDS) and other welfare schemes (OWS)<sup>33</sup>. The current direct cost estimate for a full-year roll-out is Rs.125,000 crore; there are other costs associated with the roll out that include meeting under-recovery of costs by FCI, etc., estimated at between Rs.47,000-50,000 crore. According to a Ministry of Finance report, the food subsidy with NFSA implementation is estimated to increase to Rs. 140,192 crore and Rs. 157,701 crore in 2014-15 and 2015-16 respectively.

After understanding the current food grain management systems of the country in this section, we next move to evaluating the performance of buffer stocking operations of the country.

## **Section II: Evaluation of the performance of the current system**

Buffer stocks of food grains, at any point in time, is determined by four interlinked factors: the level of procurement by the central and by the state governments, the level of distribution commitment, the export and import policy, and limits on private sector stocking levels. The level of procurement of food grains itself is a function of the level of grain production, the ratio of procurement price to market price, policy towards grain export and import, and limits on private sector stock holdings. Distortions in the market, namely level of state levies, which

---

<sup>33</sup> Apart from meeting the grain needs under TPDS, the central government also procures and distributes grains under other welfare schemes, like mid-day meal scheme, wheat-based nutrition scheme, etc. There are in total 7 such schemes together addressed as *other welfare schemes* (OWSs). The quantum of grain needs and commitments under the TPDS (actual off-take of grains under TPDS in 2012-13 was 51.5 million tonnes) is the highest compared to all other schemes (actual off-take of grain under OWSs in 2012-13 was 4.2 million tonnes).Source: DFPD

govern the viability of private participation and state bonuses announced over and above the centrally declared MSPs, also influence the stock level with the government.

There are several problems in operating and designing a sustainable food intervention system. From procurement of grains, to storing the grains to releasing them, the system is handled mainly by the government (although more recently some part of the logistics have been handed over to private contractors, based on tender-auctions) and is plagued by inefficiencies. Table 1 gives a snapshot of the present policy environment governing and regulating the Indian agricultural wholesale and retail grain markets.

**Table 1: Indian food grain market policy environment**

<b>Regulation</b>	<b>State</b>	<b>Food grain System Implication</b>	<b>Territorial Coverage</b>
<b>GOI</b>			
<b>Rural Wholesale Markets</b>			
Essential Commodities' Act, 1955		FCI procurement and price support operations	All India; adjusted yearly
	Agriculture Produce and Market Acts	Restricts farmer sales to mandis, multi-point market fees	Some States
	Decentralised Procurement Scheme (DCP) 1997-98	State Government procures paddy/rice and wheat on behalf of GOI; stores and distributes these food grains under PDS and OWS. Central government reimburses the expenditure	
	FCI Act, 1964	The Central government extends price support to paddy, coarse grains and wheat through the FCI and state agencies. Rice is also procured through statutory levy (fixed by State governments in consultation with Centre) on rice millers and rice dealers.	Some States
<b>Transport</b>			
Essential Commodities' Act, 1955		Restricts inter-state movement, sporadically enforced in recent years	All India; lifted/sporadic
Jute Packaging Materials (Compulsory use in packing commodities) Act		Restricts transport of rice and wheat intended for retail sales in gunny bags	All India
	State Paddy/Rice (restrictions and	Restricts intra- and/or inter- state movement	Orissa, Tamil Nadu, Andhra

<b>Regulation</b>		<b>Food grain System Implication</b>	<b>Territorial Coverage</b>
<b>GOI</b>	<b>State</b> movement) Order		Pradesh, west Bengal, J&K
<b>Storage</b>			
Essential Commodities' Act, 1955	State Storage Control Orders	Imposes stock quantity limits Creation of integrated bulk handling and transportation facilities at identified locations in procuring and consuming areas through private sector participation	All India; lifted/sporadic
National Policy On Bulk Handling Storage & Transportation Of Food grains		Development and regulation of warehouses, and registration and accreditation of warehouses intending to issue negotiable warehouse receipts.	
Warehousing (Development and Regulation) Act, 2007		Builds, runs, facilitates and regulates warehousing of agriculture produce	
CWC (General) Regulations, 1965	State Warehousing Corporations	Limits amounts and interest rates for working capital loans	All India; lifted/sporadic
RBI Selective Credit Controls			
<b>Grading</b>			
Agriculture Produce (grading and marking) Act, 1937		Grading standards are revised annually, may differ between states	All India
<b>Processing</b>			
Rice Milling Industry (Regulation and Licensing) Act, 1958		Restricts rice-milling to small-scale firms Forced rice mill output delivery to FCI, limits open market sales until levy commitments fulfilled, fixes processing margins of levy rice	All India; abolished in 1997
	State Levy Control Orders		Most states
	New Rice Mill Incentives	Levy and sales tax exemptions to new mills	
<b>Marketing</b>			

<b>Regulation</b>		<b>Food grain System Implication</b>	<b>Territorial Coverage</b>
<b>GOI</b>	<b>State</b>		
Agricultural Produce Marketing Committee (APMC) 2003	State Agricultural Produce Marketing (Development and Regulation) Act, 2003	Establishment of private markets/ yards, direct purchase centres, consumer/farmers' markets for direct sale and promotion of public private partnership in the management and development of agricultural markets in the country. Provides for separate constitution of special markets for commodities like onions, fruits, vegetables, flowers etc. In a declared market area, no person or agency is allowed freely to carry on wholesale marketing activities	Some states
<b>Distribution</b>			
Essential Commodities' Act, 1955		Buffer stock operations; FCI open market sales at below market prices; subsidised sale of grains; export and import controls	All India
Forward Contracts (regulation) Act, 1952		Bans on futures' trading of common rice and wheat	All India
	State Licensing Acts	Requires licences for traders, prescribes storage limits	Most States
	FCI Act, 1964	Undertake the purchase, storage, movement, transport, distribution and sale of food grains and other foodstuffs	State Food Corporation

Source: World Bank (1999) and Ministry of Agriculture

Such a high degree of regulation of grain markets by the government has not only implied its *de facto* nationalisation by strangling private trade but has also implied huge wastage at very high costs, leading to fiscal distress in the country.

India was forced to import 6 million tonnes of food grains in 2006-07, after which the government launched the National Food Security Mission (NFSM) in 2007 to raise food production by 20 million tonnes over the next five years. In a bid to incentivise higher



production of rice and wheat, the minimum support price (MSP) in the year was raised by 20.2 per cent in nominal terms in the case of paddy and by 21.4 per cent in the case of wheat. A part of this sharp rise in MSP can be attributed to the sharp rise in global prices the previous year. Over the five years from FY08, the nominal minimum support prices rose by an annual average of 12 per cent and 11.1 per cent for paddy and wheat respectively. The production did increase substantially by 40 million tonnes or twice the targeted amount. In fact, in 2011-12, more than 200 million tonnes of rice and wheat were produced in the country and the government's total procurement was 63.4 million tonnes; FCI's storage capacity (owned and hired) was only 33.6 million tonnes. The year inevitably saw huge losses owing to the lack of storage.

Combining data on food grain production and availability from the Directorate of Economics and Statistics (DES) with the population data from the Registrar General of India, per capita production and availability figures were estimated. Net production on a per capita daily basis, increased from 458 gms to 488 gms, in the period between FY 2007 and 2011. In the same period, net availability increased from 443 gms to 463 gms, indicating an increasing gap between production and availability, due to possible leakages, wastage, etc., from the system. These massive increases in production did not result either in a more equitable distribution of food nor did it lead to a moderation in food inflation. Some of these and more systemic and operational inefficiencies in the grain management system in the country are discussed in the following sections.

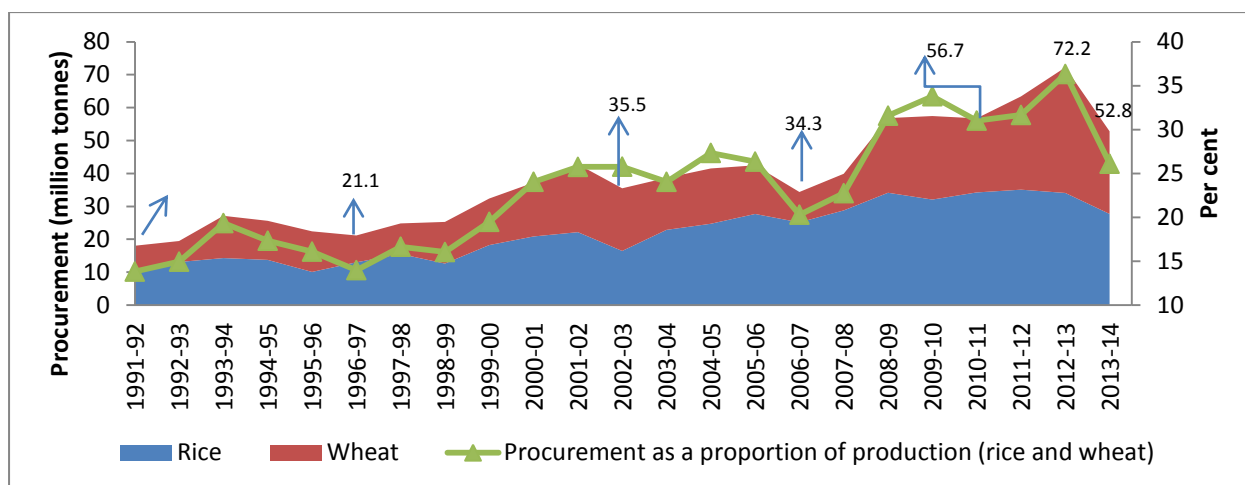
## **1. Open-ended procurement**

As seen in Figure 2 above, the actual stock levels of the FCI are phenomenally above official norms (Appendix 2 gives the quarterly comparison of actual stock levels with norms). The phenomenon has persisted since the start of the century, except for a few years in between.

The government procures to meet the needs under TPDS, other welfare schemes (OWS), ad-hoc/additional needs in times of exigencies, and to maintain buffer/strategic stocks. The scale of procurement of food grains by the government in recent years has increased manifold (Figure 6), whereas norms have not undergone any revision since 2005. The reason for this increase in procurement, more so in recent years, is two-fold. On the supply side, owing to rising MSPs and policies restricting private participation, the government has become the residual buyer of all grain produced. With rising production, the government's role as a buyer of last resort has resulted in rising stocks. On the demand side, the expanding grain commitments by the centre and states, under various food-based welfare schemes, put pressure on the FCI to intensify its procurement drive. Consequently, the government ends up procuring a major share of the produce offered in the market. Today, the government is the single largest procurer and hoarder of grain. The government procured 36 per cent of the total

rice and wheat produced in 2012 (see Figure 6). In FY 12, the government alone procured more than 40 per cent of the marketable surplus<sup>34</sup> of rice and wheat.

**Figure 6: Procurement trend of rice and wheat since 1991-92**



Source: Agricultural Statistics at a Glance and DFPD

According to the Kharif report of CACP for 2013-14, due to increasing public procurement, “the private sector has been largely marginalised in traditional high contributing states like Andhra Pradesh, Punjab and Haryana”. This indicates de-facto nationalisation of the food grain market in some states.

## 2. Procurement Prices have become Support Prices

In theory, procurement prices are not the minimum government guaranteed purchase prices. These are prices at which the government is supposed to procure the quantities needed for buffer stock and to meet the grain needs of various intra-year distribution programmes, at its discretion and without any compulsion. In reality, however, these prices are used to purchase virtually whatever quantities the farmers offer for sale. More often than not, the actual stocks exceed the country’s storing capacity and thus results in massive damage to procured grains.

Since procurement prices are fixed and announced before the sowing period and are maintained at those levels for the entire marketing year, any change in the supply-demand situation in the market between the sowing and the harvesting periods causes stresses and strains on the government’s procurement operations. Thus, when a bumper crop is harvested due to favourable weather and market prices threaten to fall, pressure builds up on the government to purchase, irrespective of its requirement, whatever quantities are offered for sale at the procurement price. Similarly, in a year of poor harvest due to a drought, when market prices rule higher than procurement prices, government finds it difficult to procure required quantities.

<sup>34</sup> From the total produce, a farmer makes adjustments for wastage, and his own food and cattle-feed needs. The residual produce, also called marketable surplus, is supplied to a market.

### 3. One tool serving many objectives

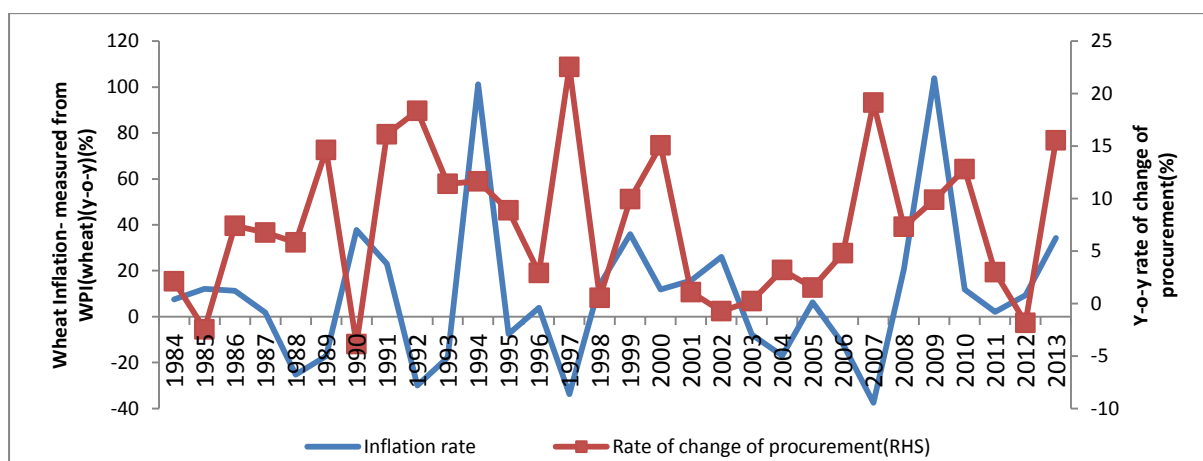
The buffer stocking policy of food grains has become the one tool with the government to fulfil the interlinked objectives of supporting food producers and food consumers, and of ensuring food availability at the national level. Buffer stocking is used to simultaneously tackle the problem of volatility in the price of food grains, provide food security and incentivise high production. Using the same instrument to achieve the objectives of ensuring remunerative price to farmers and providing the food grains so procured to the poor at highly subsidised prices creates conflicts. By implication, this entails a huge gap between the purchase price and issue price, and consequently a larger subsidy bill.

### 4. Inefficient Inventory Management

As an FCI accounting policy, stocks in the central pool at any point in time are segregated as operational and strategic. At any point in time, the amount of grain needed to feed the four-month distribution needs under TPDS and other food-based welfare schemes is treated as operational stock. The residual becomes the strategic stock. In the absence of clear targets for the stock level, the whole inventory management system of the FCI becomes inefficient and thus costly.

First, the FCI's inventory management policy has a counter-cyclical character. Ordinarily, market supplies of grains govern the direction of grain from the FCI granaries; that is to say, the government should procure grain in times of abundant supplies in the market, and release it in times of scarcity. However, the need to meet the needs of the TPDS and the other food-based welfare schemes, the government not only withholds stocks during a bad crop year, because it expects off-take to be higher than normal, it also steps up its procurement, pushing up prices in an already supply-constrained market (see Figure 7).

**Figure 7: Cyclicity of procurement in wheat market**



Source: RBI and CSO

In the diagram, we present the movement of wheat procurement changes together with wheat-WPI inflation rates. One would normally expect negative year-to-year changes in

procurement levels in years of rising prices and positive and increasing procurement in years of falling prices. Except for 1985, 1990 and 2012, when procurement showed a negative relation to the inflation rate, for all other years, the procurement of wheat has gone up irrespective of the inflation level.

Interestingly, while falling prices were accompanied by increasing wheat procurement (1997, 2007 among others), times of increasing prices (1994, 2009 among others) were also associated with increasing levels of procurement. Such counter-cyclical operations tend to exacerbate existing price trends. Some empirical studies have actually proved that, historically, government intervention tended to increase intra-year price variability in the food grain market. (Ray, 1973)

Next is the inefficiency in the treatment of the strategic stocks. After meeting the grain needs of states/UTs for distribution under various food-based welfare schemes, the FCI maintains strategic stocks. As mentioned before, after deducting the four-month TPDS grain requirement by states/UTs, the remaining becomes the strategic stocks. FCI meets ad-hoc or additional needs of grain by states/UTs, in the wake of any exigency, a festival or any special need from this reserve of stock. According to standing instructions to state/UTs by the centre, a stock equivalent to twice the average off-take during the previous three months has to be maintained by each state at all times. This entails additional grain needs at a given time. Even after the FCI meets all these needs, there is still a large quantity of grain left in the granaries. There is no active mechanism to manage this residual grain in the system. In 2012-13, the government had more than 82 million tonnes of grains in its godowns. Close to 51 million tonnes was allocated for TPDS distribution. Even after making an allocation of 5-7 million tonnes to meet the cumulative grain need under other welfare schemes (OWS) and to meet ad-hoc needs of states/UTs, there is an excess of more than 20 million tonnes of grain in FCI godowns. There is no pro-active, pre-defined, sustainable policy practiced in this regard.

As a policy, such residual grain, which is of good quality, can be released through two channels. It could be released in the domestic market under the open market sale scheme (OMSS), where tenders are floated for bulk orders and/or an over-the-counter sale is executed for smaller quantities for retail traders<sup>35</sup>. The grain can also be released in the global markets through exports (depending on the prevailing export policy). Grain of inferior quality or destroyed grain is disposed of as feed, generally at a pre-determined reserve price. Owing to the random and unpredictable use of the two channels, OMSS (D) and exports, to release good quality grain, there has been widespread, intentional and unintentional, wastage of good quality grain in FCI granaries.

The policy towards international grain trade has been of an ad-hoc nature, with the domestic grain supply and price situation determining the export/import policy every year.

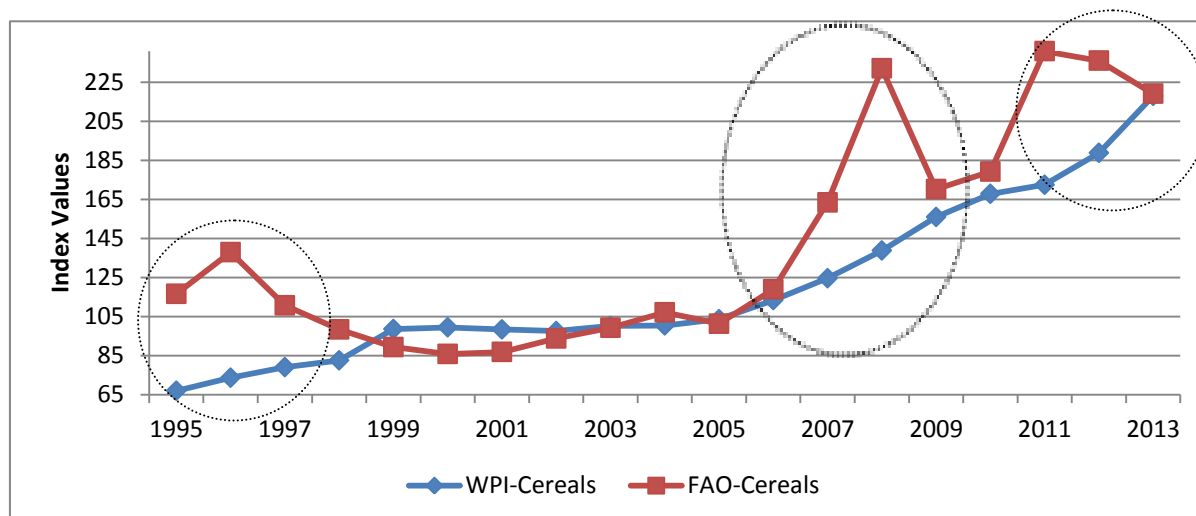
---

<sup>35</sup> As per the 2012-13 OMSS(D) policy, the minimum quantity of wheat for which a bid can be submitted is 100 tonnes. The maximum quantity which a tenderer can bid for in a single tender is 3000 tonnes. Scheme for small private traders will also continue where small private traders are allowed to lift 3 to 9 tonnes wheat per day from FCI godowns at reserve price.

In the year 2006, India had to import more than 6 million tonnes of wheat; inflation in cereals (as measured by WPI for rice, wheat and maize) jumped from close to 3 per cent in 2005 to roughly 10 per cent in 2006. Globally, the food crisis<sup>36</sup> was driving the food prices up. The FAO-cereals' index jumped from a state of falling cereal prices in 2005 to one with more than 17 per cent inflation rate in 2006 (Figure 8). The index showed exceptional spikes in years of 2007, 2008 and 2011.

Domestic cereal prices reflected the rising trend of international prices. Gulati and Saini (2013)<sup>37</sup> showed econometrically that a one per cent rise in global food prices implied a 0.3 per cent increase in domestic food prices.

**Figure 8: Converging WPI- calculated cereals and FAO-cereals price indices (calendar year)**



Source: FCI and FAO

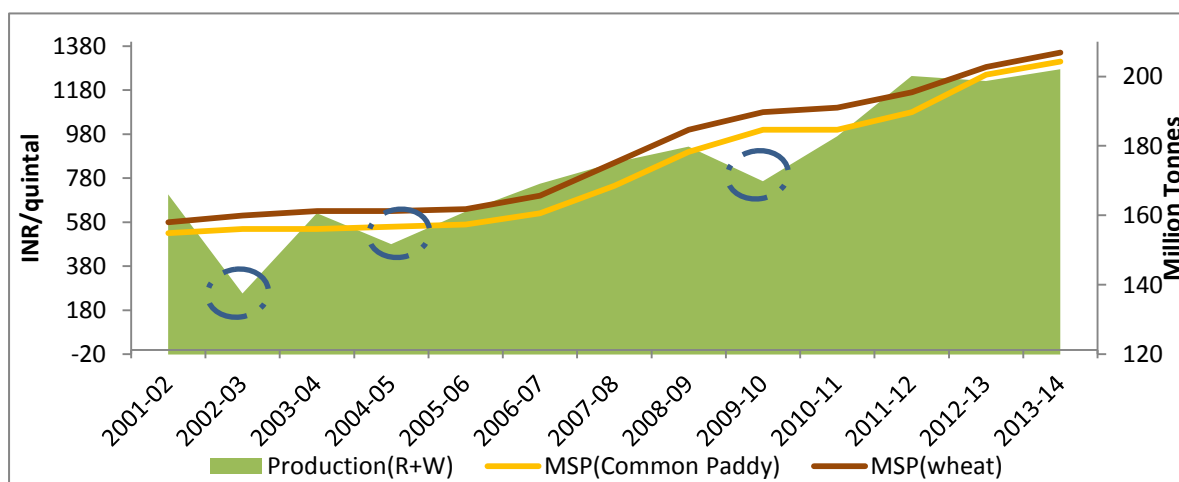
Although domestic cereal prices appear to be less volatile than global prices (circled areas), there has been convergence between the two indices over the long-run. This indicates that the Indian export bans may have helped India avoid the spikes in prices, but over the long run, the rising trend in prices has been transmitted to India too, through various channels.

To incentivize production, under NFSM, and to bring parity between MSPs and global prices, the MSPs of rice and wheat were consequently increased by 20 per cent in the two marketing years of 2007-08 and 2008-09. (see Figure 9).

<sup>36</sup> 2007-08 was the year when the global economy underwent a crisis in the food, fuel and financial markets. The food crisis was triggered by food prices rising globally and food exporting countries like India, China and Thailand imposing a ban on food exports.

<sup>37</sup> Gulati, Ashok and Shweta Saini (2013), Taming Food Inflation in India, Discussion Paper No. 4, CACP, Ministry of Agriculture, Government of India, April 2013

**Figure 9: Trends for MSP and production for rice and wheat since 2001/02**

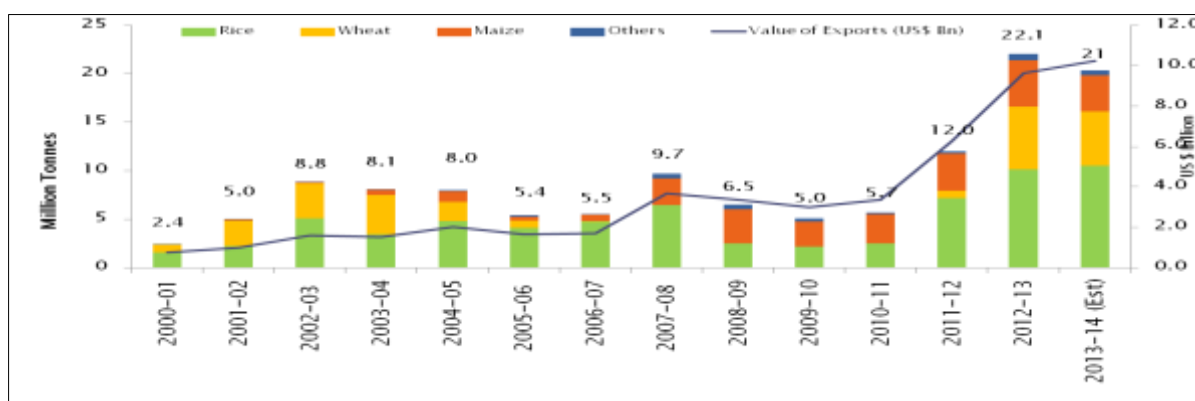


Source: CACP and DES

Wheat MSP is adjusted for the marketing year. So, an MSP for 2005/06 is relevant for 2006-07 crop year production. The circled years represent the drought years.

Farmers are known to respond to relative price incentives for farm products. A study (Gulati and Saini, 2013) shows that a 1 per cent increase in the relative price ratio of agricultural product to non-agricultural product prices increases the agricultural GDP by 0.25 per cent. Not surprisingly, farmers responded to price incentives and higher investments by increasing their production by close to 40 million tonnes in 2011-12 over the 2006-07 level. This led to historically high levels of grain in FCI godowns (80.5 million tonnes of rice and wheat in the central pool as on July 1, 2012). Given the falling growth rate in domestic cereal consumption, exports offered a lucrative vent for the government to offload bulging grain stocks and they exported more than 21.5 million tonnes of grains.

**Figure 10: India's cereal exports- quantity and value since 2000**



Source: DGCIS

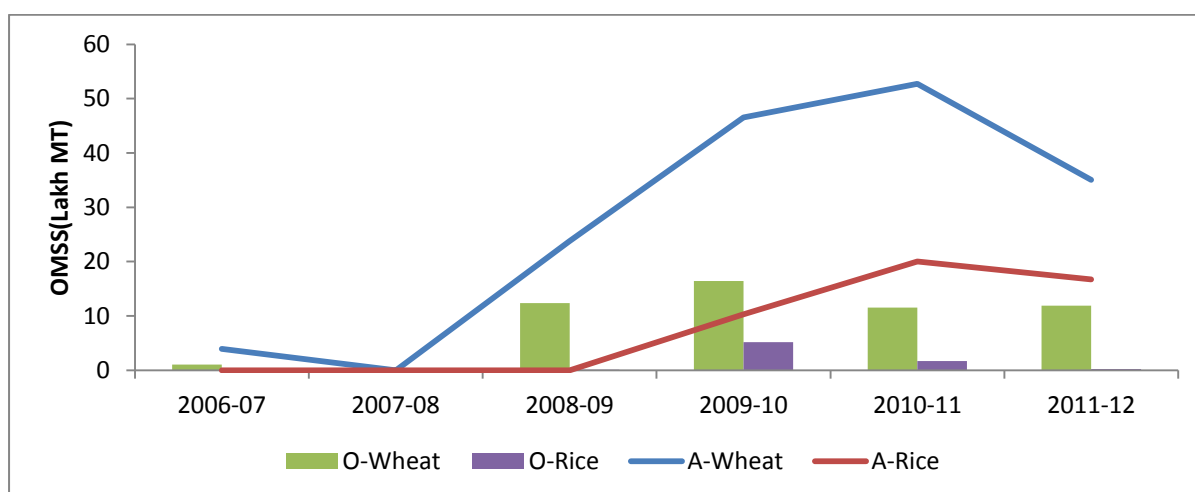
Figure 10 shows the step increase in both the quantity and the value of grain exports since 2012-13. In the last two years, the country has cumulatively exported more than 43 million

tonnes of cereals. Had the grain not been exported, the cost of rotting grain and the loss of potential export revenue would have implied mammoth financial losses.

However, there have been frequent bans on grain export. The ban on rice export was removed in 1994 only to be re-imposed between 1996 and 2000, after which the ban was briefly lifted and re-imposed between 2007 and 2011. Since September 2011, the situation with rice exports has been more liberal. Exports offer domestic farmers the opportunity to sell their produce at global prices. However, the export policy is still ad-hoc in nature; the potential benefits of grain export have not been realised.

Similarly, the open-market sale scheme (domestic) or OMSS- D is another tool with the government to release grain in the domestic market when prices increase. Since 2008-09, when the government started allocating substantial grain under the scheme, the actual off-take has been marginal (Figure 11). The OMSS channel has come under severe criticism for various reasons.

**Figure 11: OMSS-D - allocation (A) and off-take (O) of rice and wheat**



A-wheat and A-Rice is the allocation and O- wheat and O-rice is the off-take of the respective crop under the scheme.

Source: FCI

High issue prices (set at about 45 per cent above the previous year's MSP, which in turn has been above the market price in recent years) and the poor quality of released grains, attributable primarily to poor storage practices, are the major reasons for low OMSS-D off-take (FCI OMSS-D data for the period between 2008 and 2011).

Because the policies on OMSS- D and exports have been ad hoc and inconsistent, these policy instruments have not contributed much to efficient food management in the country. The absence of a consistent policy has also implied huge costs and losses to FCI's grain management operations.

## 5. Rising Costs of Operation

Under grain management, FCI's main heads of costs are acquisition costs, which include the pooled cost of grain and procurement incidentals, and distribution costs (these are costs involved in the allocation and distribution of grains to various states/UTs under various food-based welfare schemes). For 2014-15, pooled cost was 1935.15 and 1353.25 for rice and wheat respectively. After adjusting for procurement incidentals, the total acquisition cost to FCI to acquire a quintal of rice and wheat is Rs. 2410 and Rs. 1701.7 respectively. The per quintal distribution cost of grains to FCI is Rs.346 and Rs. 292 respectively. Upon adding the acquisition cost with the distribution cost, FCI estimates the economic costs for the two grains. Between 2001-02 and 2014-15, the economic cost for rice and wheat has gone up by 151 per cent and 134 per cent respectively.

To maintain strategic stocks, FCI incurs buffer-carrying costs, which include the cost of warehousing, stock maintenance etc and this cost of FCI is called "annual rate of buffer carrying cost". This cost has more than doubled since 2001-02, rising from Rs.2 per kg that year to Rs.5 per kg in 2014-15.

The main reasons for the sharp rise in costs are discussed below.

### *Higher Acquisition Costs*

Both the pooled costs of grain and the incidental cost components of FCI operations have been rising. Rising MSPs, higher bonuses given by some states over and above the MSPs, taxes/levies charged additionally by some states and FCI's greater reliance for procurement on relatively high-cost states/UTs have resulted in rising acquisition costs.

Open market prices, including prices in the international market, are an important component used while estimating MSPs. As mentioned before, because of rising international prices and evolving policy direction (mainly due to NFSM, 2007), MSPs were increased to incentivise farmers to produce more. However, this also led to an increase in the cost of procurement. .

### Higher Procurement Incidentals

Procurement incidentals comprise the various costs involved in the procurement process from different states/UTs – for example, administrative charges, mandi charges, milling charges, etc. Apart from the MSP, these charges contribute to FCI's grain acquisition cost. These charges vary among states/UTs from a low of 0-1 per cent in states like Gujarat to 14.5 per cent in Punjab. Haryana (11.5 per cent), Andhra Pradesh (13.5 per cent) and Orissa (12 per cent) also have high levels of statutory charges.



**Table 2: Break-up of cost of 1 quintal of Custom Milled Rice (CMR) when procured from select Decentralized Procurement (DCP)/Non-DCP States in KMS 2013-14.**

State/UT	Statutory Charges (apart from VAT)	Dami/ Arhatia Charges	Mandi Labour Charges	Driage	Custody and Maintenance Charges	Interest Charges	Milling Charges	Administrative Charges	Provisional Proc. Cost of 1 quintal of Common Raw Rice from the State	Per cent of total Procurement from the State
Andhra	1% MSP (market fee)		Rs. 10.62	1% MSP	Rs.2.4/quintal/month	@11.75% pa on MSP	Rs. 15	2.5% of MSP	Rs. 2389.47	24.4
	5% MSP (RD Cess)									
Bihar	-		Rs. 7.85	1% MSP	Rs.2.4/quintal/month	@11.75% pa on MSP	Rs. 15	2.5% of MSP	Rs. 2255.9	2.7
Chhattisgarh	2% MSP (market fee)		Rs. 5.18	1% MSP	Rs.1.84/quintal/month	@11.79% pa on MSP	Rs. 15	2.5% of MSP	Rs. 2394.34	13.9
	5% MSP (commercial tax)									
	0.2% MSP (special)									
Haryana	1% MSP (market fee)	2.5% MSP	Rs. 15.39	1% MSP	Rs.2.4/quintal/month	@11.79% pa on MSP	Rs. 15	-	Rs. 2310.41	7.8
	5% MSP (RD Cess)									
Karnataka	1.5 % MSP (market fee)		Rs. 9.83	1% MSP	Rs.2.4/quintal/month	@11.79% pa on MSP	Rs. 15	1% of MSP	Rs. 2210.47	Neg.
Punjab	2% MSP (market fee)	2.5% MSP	Rs.13.64	1% MSP	Rs.2.08/quintal/month	@11.79% pa on MSP	Rs. 15	2.5% of MSP	Rs. 2395.81	26.4
	2% MSP (RD Cess)									
	2% MSP (Infra. Dev. Cess)									
West Bengal	0.5% MSP (market fee)		Rs. 8.56	1% MSP	Rs.2.08/quintal/month	@11.79% pa on MSP	Rs. 15	2.5% of MSP	Rs. 2265.14	3.4

Source: DFPD

The table above shows the break-up of procurement incidentals for paddy, charged by select states. Of the total paddy procured in 2013-14, close to 80 per cent was from these states (last column in the Table 1). The MSP declared for the season is Rs.1310/quintal for procurement of common rice. However, as the table above indicates, after adding other associated costs, the total cost of procurement from a state ranges between Rs. 2210 and 2396 per quintal. Ironically, the government meets more than 70 per cent of its procurement needs from Andhra Pradesh, Chhattisgarh, Punjab and Haryana, which, as indicated above, are the most expensive states for procurement with cost per quintal ranging between Rs. 2310 (Haryana) and Rs 2396 (Punjab). States like Bihar, West Bengal and Karnataka offer lower procurement costs, but government procures relatively marginal quantities from them.

The story is similar for wheat, where the procurement is concentrated from expensive states like Madhya Pradesh, Punjab and Haryana.

Such high incidentals not only increase FCI's costs of operation but also make private participation in the market economically unviable. The other section that is hard hit by high state bonuses and statutory charges is the milling sector. For example, flour mills in Punjab find it economically viable to procure grain for running their mills from states like UP, where wheat is available at prices much lower than in Punjab.

#### Higher MSPs and Bonuses on Top

Apart from these issues, the arbitrary policy stances adopted by various state/UTs have compounded the problem. Governed by the need to incentivise the farmers to produce more grain, various states (Figure 12) have been announcing generous bonuses over and above the declared MSPs. This results in crowding out private traders in the state, who find such prices excessive and non-competitive. Private traders in the neighbouring states are also affected as it is inevitable that the food grains would move across state borders to take advantage of the higher procurement prices. There is additional financial and logistics burden as well, as some part of the food grain procured in the state with higher procurement price is likely to go back to the state with lower procurement price eventually through central allocations under PDS.

Interestingly, the States like Chhattisgarh, Madhya Pradesh who offer large bonuses over and above MSPs are also the ones with high procurement incidentals (as seen in the previous section). This implies additional drain on the already financially strained procurement machinery of the country.

According to the CACP, these bonuses have the effect of distorting the production basket by influencing the "inter-crop" parity.<sup>38</sup> Paddy bonuses may warrant an alarm in the long run, more so because unlike other major crops, the crop's water needs may cause a significant depletion of the ground water reserves of a state. Beyond myopic benefits, such distortions in the product mix are more likely than not to attract diseconomies of scale, raising production and procurement costs.

---

<sup>38</sup> Price Policy for Rabi Crops, 2014-15, CACP, Ministry of Agriculture, GOI

**Figure 12: MSP and state bonuses over MSP in the last four years (INR/qtt)**

States	Marketing Year							
	2010-11		2011-12		2012-13		2013-14	
	Paddy	Wheat	Paddy	Wheat	Paddy	Wheat	Paddy	Wheat
<b>MSP</b>	<b>1000</b>	<b>1100</b>	<b>1080</b>	<b>1170</b>	<b>1250</b>	<b>1285</b>	<b>1310</b>	<b>1350</b>
Chhattisgarh	50	-	50	-	270	-	50	-
Karnataka	100	-	250	-	250	-	-	-
Kerala	400	-	420	-	450	-	-	-
M.P.	Comm-50 Gr.A-50	100	Comm-50 Gr.A-50	100	Comm-100 Gr.A-100	100	50	150
Rajasthan	-	-	-	-	-	100	-	150
Tamil Nadu	Comm-50 Gr.A-70	-	Comm-50 Gr.A-70	-	Comm-50 Gr.A-70	-	Comm-50 Gr.A-70	-
U.P.	-	-	-	50	-	-	-	-

Source: CACP and Authors' Research

Note: Paddy prices are for common- rice, unless otherwise indicated

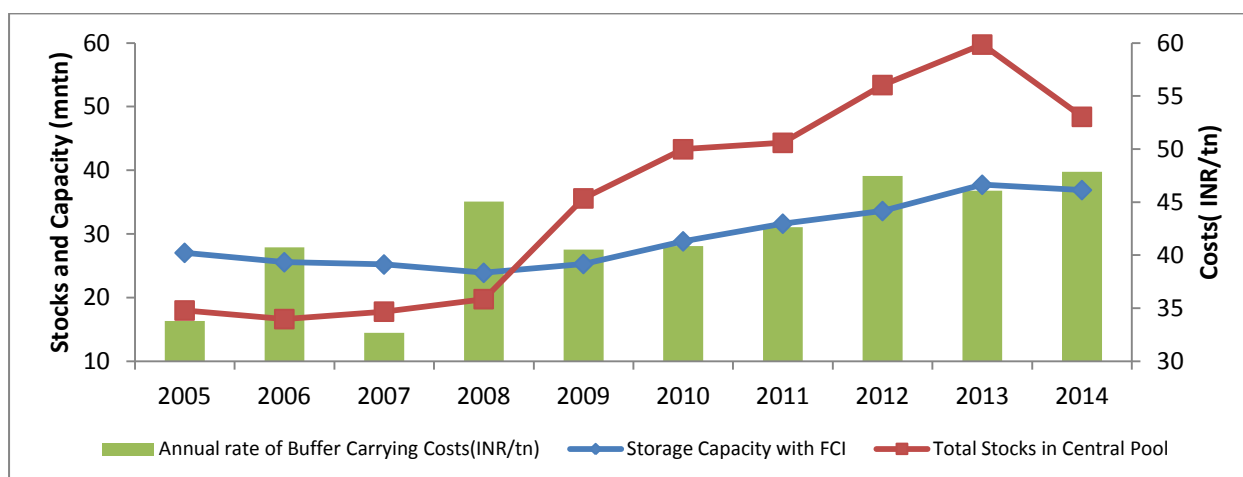
High bonuses and high statutory charges paid to state agencies to procure grain implies that the centre and consuming states have to bear a higher financial burden to run various food welfare programmes.

Owing to the skewed production pattern, where a large part of production and thus, procurement is concentrated in a few states, these enjoy monopoly power to manipulate the system. With growing TPDS grain distribution commitments, procurement targets rise commensurately. Greater reliance on these high cost states to meet procurement needs results in multiplying costs. With a constant revenue per kilogram of grain, cost increases strain the already stretched treasury of the country, making the whole operation immensely costly.

#### ***Higher storage costs and losses due to inadequate capacity***

FCI's average annual rate of increase in storage capacity has been a meagre 4.5 per cent while the growth rate of rice and wheat stocks in the central pool has been more than 18 per cent during the same period. (Figure 13)

**Figure 13: Increasing gap in FCI storage capacity and annual buffer stocking costs**



Stock and storage capacity figures are as on April 1 of the year

Total stocks include stocks of rice, wheat and coarse cereals in the central pool.

Total storage capacity represents the total storage capacity of FCI – Covered and covered and plinth (CAP)

Annual rate of buffer carrying costs are for the accounting year for rice and wheat.

Source: Own design FCI Annual Reports

This has led to acute storage problems. An inordinately large quantity is thus stored in the open under covered and plinth (CAP) storage that implies a deterioration in grain quality.

A look at the state-wise storage capacity<sup>39</sup> (Appendix 3) indicates that more than 64 per cent of the country's storage capacity is concentrated in the states of Punjab, Haryana, Andhra Pradesh, Madhya Pradesh and UP. Fourteen states/UTs boast of more than 95 per cent of the country's storage capacity, which implies that the remaining 21 states survive and manage on 5 per cent of the country's storage capacity. Barring a few states, most states in the latter category are grain consuming. The dearth of storage capacity in these states implies a huge strain on the transport and distribution machinery of states. Data for the year 2011-12 show that FCI's storage and transit losses<sup>40</sup> have increased by close to 147 per cent in nominal terms between 2006-2007 and 2011-2012, much of which is accounted for by a 164% increase in storage costs in the period. (Figure 14)

<sup>39</sup> There are three storage agencies- Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and State Warehousing Corporation (SWC). The storage capacity could be either owned by these agencies or be hired from private owners. The grain is stored either in covered godowns, or silos or in uncovered godowns called covered and plinth (CAP). The storage capacity here is the grand total storage capacity of all the three agencies- hired/owned and covered/CAP.

<sup>40</sup> Transit losses for FCI occur at various stages – within mandis, between mandis and the FCI godowns, in transit by rail and road, between zones and within zones and at the time of issue to the PDS.

**Figure 14: FCI losses- transit and storage (Quantity in Lakh MT and value in INR crore)**

	Transit losses		Storage Losses	
	Quantity Lost	Value of Loss	Quantity Lost	Value of Loss
2006-07	1.39	145.38	1.34	153.76
2007-08	1.21	123.95	1.39	182.43
2008-09	1.06	117.42	0.58	101.31
2009-10	1.55	233.32	1.31	228.36
2010-11	1.77	281.94	1.74	323.78
2011-12	1.96	333.01	2.05	405.36
<b>Total</b>	<b>8.94</b>	<b>1235.02</b>	<b>8.41</b>	<b>1395</b>
Percent of Loss	0.43		0.19	

Source: CAG (2013)

In the last six years since 2006-07, off the total grain issued, 0.43 per cent of the grain was lost in transit and close to 0.2 per cent was lost owing to storage incapacities, implying a total loss of close to 1.7 million tonnes.

Economic cost implications: As mentioned before, acquisition and distribution costs add to the economic cost of grain operations for the FCI. The economic cost of wheat is estimated at INR 20,100 per tonnes and of rice around INR 26,430 per tonnes for the financial year (FY) 2013-14. According to the recent Kharif Report of CACP, the economic costs of FCI for acquiring, storing and distributing food grains is about 40 per cent more than the procurement price. Clearly, increases in these differences and/or in the total quantity of food grains distributed through fair price shops cause increases in the government's total food subsidy bill.

The cost of maintaining strategic stocks is FCI's annual rate of buffer carrying costs. Between 2005-06 and 2013-14, this cost has increased by close to 37 per cent. The rise in carrying cost can be attributed to increasing procurement incidentals, acquisition and distribution costs.

## **6. De-facto Nationalisation of the Grain Market**

Higher MSPs, higher state bonuses, excessive state taxes/levies have all strangled private sector participation in the Indian grain market. Apart from this, the rice market is subject to excessive state levies (Figure 15) under which a major portion of the total paddy/rice production is acquired by the government machinery.

With more than 75 per cent of the marketable surplus procured by the government, very little grain is available for the open market. This lower market supply exerts an upward pressure on prices in the open market, neutralising much of the consumer benefits that the subsidy provides. Such levies also adversely affect the price competitiveness of Indian grain in the international market.

**Figure 15: Levy rates for rice for KMS 2012-13**

State(s)	Levy Rate
A.P., Haryana, Odisha, Punjab, Uttarakhand	75%
U.P.	60%
Assam, Bihar, Chattisgarh, Gujarat, H.P., J&K, Jharkhand, West Bengal	50%
Karnataka	33%
M.P., Maharashtra, Tamil Nadu	30%

*Source:* FCI and Kharif Report, CACP, 2013/14

Apart from this, private participation and the open market dynamics have also been adversely affected by legislations like the Essential Commodities' Act, 1955 (ECA), and the Agriculture Produce Market Committees (APMC) Act. The ECA, enacted as a safeguard to protect consumers by restricting the activities of unscrupulous traders, puts restrictions on the production, distribution, storage, trade and thus pricing of some "essential commodities".

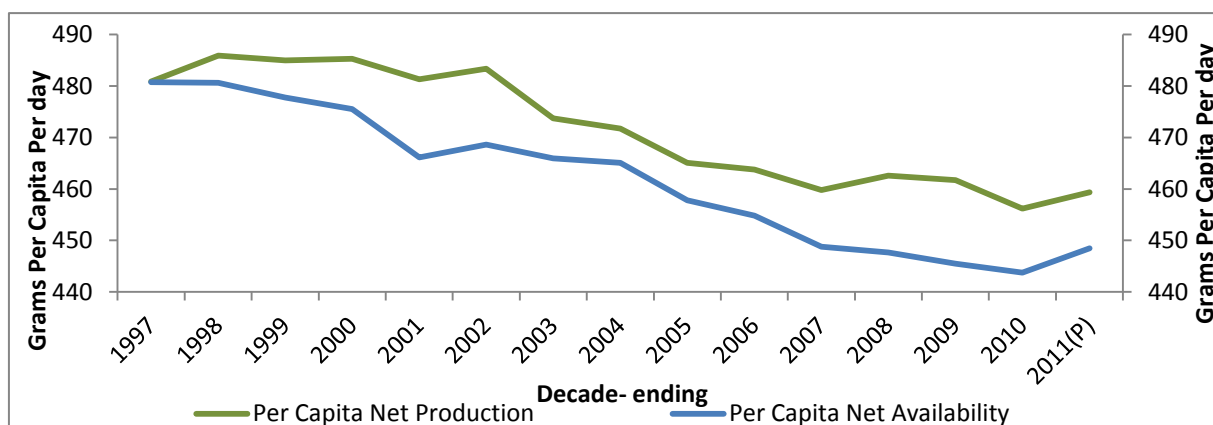
Control orders relating to levy rice, licensing of dealers, regulation of stock limits, restrictions on the movement of goods and compulsory purchase under the system of levy all emanate from the ECA; the resultant market distortions stifle private trade. The ECA includes orders for essential commodities like wheat, pulses, edible oils, edible oilseeds, rice, paddy and sugar. While some states/UTs impose stocking limits, some impose licensing/stock declaration requirements on one or all of these commodities. Although there are no restrictions on inter-state movement, some state governments have at different times imposed restrictions on inter-state movement of food grain. The effect of these measures has been to virtually eliminate the role of private trade, stripping the food grain market of even a vestige of market orientation.

## **7. Increasing gap between per capita production and per capita availability**

In the last 15 years, while the net production of food grains in the country has gone up by close to 23 per cent, the net available food grains has gone up by little more than 15 per cent. In 2012-13, close to 260 million tonnes were produced in the country and of this, 199 million tonnes was rice and wheat. With a population of 1.2 billion, this level of food grain production implies an availability of 583 grams per capita per day. According to the 2012 provisional estimates from the Directorate of Economics and Statistics (DES), less than 500 gms of food grains was available per person per day in the country. Although rice and wheat production rose by 29 per cent between 2000 and 2012, per capita net availability of grains went down by close to 1 per cent.

As can be seen from Figure 16 below, the gap between the net availability and net production, on a per capita per day basis, has been increasing. In the five years between 2007 and 2011, the excess of production over availability has increased by 64 per cent. This increasing gap can be attributed to increasing government stocks, since export of grain was marginal in the period.

**Figure 16: Per capita availability and production trends (grams/day)**



*Source:* Department of Food and Public Distribution (DFPD) and Directorate of Economics & Statistics (DES)

**Note:** Net availability = Net production + Net imports - changes in government stocks. The production figures relate to an agricultural year: 1997 figures correspond to 1996-97 and so on.

When rising stock levels with the government reduces grain availability for consumption, it counters the whole objective of buffer stocking. The idea was to procure grain and distribute it to the needy to improve the access to and availability of grain. However, if the grain is procured, stored, and not distributed/released when needed, then it could, contrary to the objectives of the system, increase food insecurity.

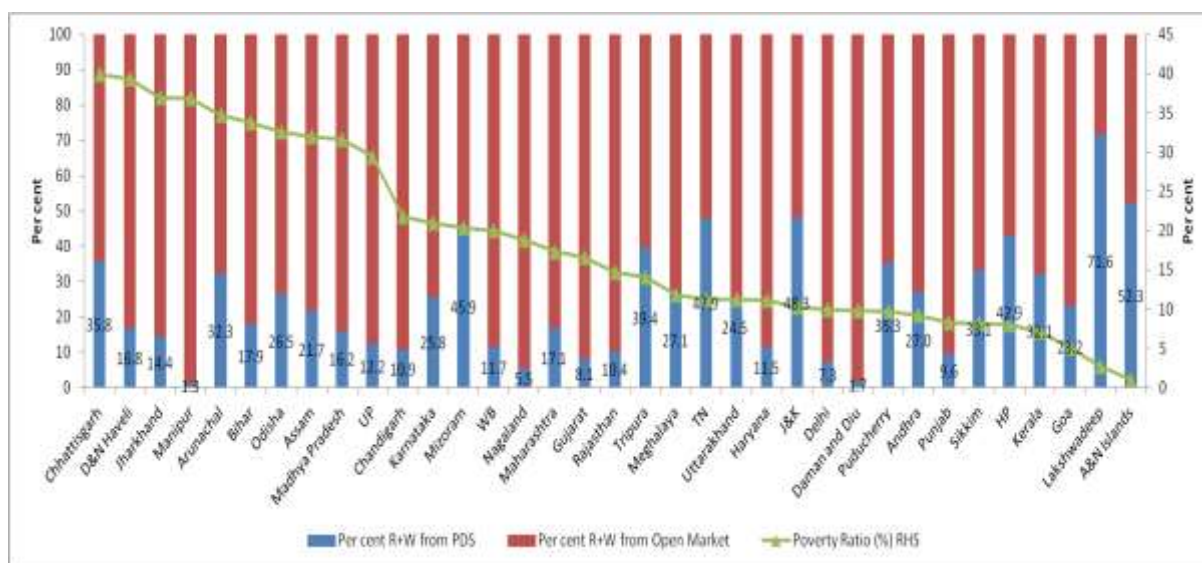
## 8. Inefficiencies in the Targeted Public Distribution System (TPDS)

The disconnect between PDS consumption and poverty: Comparing the consumption data for 2011/12 released by National Sample Survey Office (NSSO)<sup>41</sup> with poverty numbers from Planning Commission, one finds that states with a higher ratio of the poor appear to have a higher rate of leakage as a greater part of their total consumption was met from the open market (Figure 17). Of the states with more than 30 per cent of the population below the poverty line, less than 20 per cent of total consumption was met through PDS.

Leakages and pilferage: In 2004-05, close to 54 per cent of the total rice and wheat released under PDS in the country leaked or was subject to pilferage. The PDS grain is perceived as inferior compared to open market grain, thus the off-take from the FPSs was generally lower, and thus, there was greater motivation to divert/steal the surplus grain from the system. However, with the gap between the central issue prices (CIP) and the market price of grains increasing, the grain demand under TDPS has increased due to which grain pilferage has declined. In 2011-12, close to 30 per cent of the grain issued by the government were diverted from the system.

<sup>41</sup> NSSO(2014). Household consumption of various goods and services in India 2011-12. NSS 68<sup>th</sup> round. July 2011-June 2012. NSSO. MOSPI. GOI

**Figure 17: State-wise PDS and open-market consumption of rice and wheat vs. poverty ratios**



Source: CSO and Planning Commission

Inadequacy of the entitlement – quantity and nutrition: The National Sample Survey Organisation’s (NSSO) (2009-10) data show that in rural India, only 23.5 per cent of rice consumption and 14.6 per cent of wheat consumption were met through PDS. Under the recently introduced NFSA, 2013, the government has agreed to grant a maximum of 5 kg of cereals (rice, wheat and coarse cereals) – except for those covered under the AAY, who have a family entitlement of 35 kgs/month – to the targeted beneficiary. Now the total per capita demand per month for cereals is 10.7 kgs/person/month (NSSO, 2009-10). This implies that people will have to buy at least half their cereal requirements from the open market. The de facto nationalisation of the grain market has increasingly led to lower quantities being available for the open market, exerting an upward pressure on open market prices. What remains a mystery is that even in the wake of such high cereal inflation in recent times, the government has still not off-loaded grain from its granaries, where due to storage capacity constraints, the grain is rotting. High grain prices in the open market also mean that the food subsidy received by beneficiaries through the NFSA will be negated by high cereal inflation in the open market.

Consumption of micro-nutrients: These are important for health and the physical and cognitive development of children. These micro-nutrients are part of a diversified diet, which includes proteins, fruits and vegetables. The PDS in its current form focuses on providing the ‘calorie’ support, completely neglecting ‘nutrient’ support. The demand for richer diets is reflected in consumption expenditure data. Cereals have registered the largest decline in share among all items of consumption expenditure – from 26.3 per cent to 15.6 per cent in rural India and from 15 per cent to 9 per cent in urban India according to the 2013 NSSO report<sup>42</sup>

<sup>42</sup> Key Indicators of Household Consumption Expenditure in India (2013). NSS 68th Round. July 2011- June 2012.NSSO



on household consumption (Appendix 1). While the proportion of food expenditure on cereals is falling drastically, that on proteins and relatively higher valued products is increasing.

**Inclusion and exclusion error:** The targeting of beneficiaries is flawed under the present TDPS system. There are excessive exclusion errors, where many families, based on consumer expenditure levels, should be categorised as BPL but are actually issued APL cards, thus cheating them of their due entitlements/benefits under the system. There are also inclusion errors in the system, where based on expenditure levels, certain people who should have been categorised as APL (and thus be getting lower benefits under the TPDS) are issued BPL cards and enjoy undue benefits.

As on March 31, 2014, there were close to 23 crore ration cards issued by states/UTs; concerted efforts to reduce the inclusion error mentioned above helped identify close to 4 crore cards that were bogus or issued to ineligible persons and hence, invalidated.

The Indian government passed the National Food Security Act (NFSA) in September 2013. Among the objectives of the act, a major one was to ensure that all needy persons got access to subsidised grains and that the exclusion error in the system was eliminated. The act identified close to 67 per cent of the total Indian population as beneficiaries under the TPDS. In an economy with close to 22 per cent population below poverty line, covering 67 per cent of the population can surely rid the system of the exclusion errors but simultaneously imply massive inclusion errors.

#### ***a. Increasing Gap between CIP and economic cost***

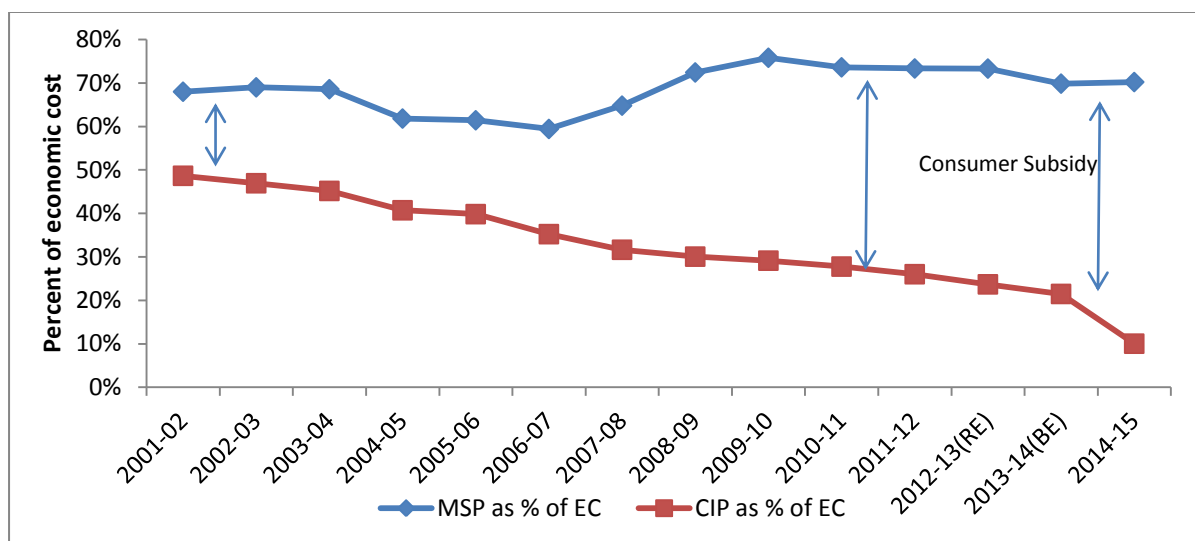
Almost the entire quantity of food grains required for intra-year distribution is used for maintaining and supporting the PDS. The distribution is done through fair-price shops, where consumers get fixed quantities of food grains at central issue prices or the CIP (Figure 18). The government fixes these prices at levels lower than the market price and the procurement price, and the gap has been widening.

While the economic cost of operation of wheat has gone up by more than 100 per cent from Rs. 853 in 2001-02 to Rs.1994 in 2014-15, central issue prices have been constant since July 1, 2002. This increases the effective rate of consumer subsidisation in the system. The NFSA, 2013, has reduced issue prices across the board for the two types of beneficiaries<sup>43</sup> under the Act. The increasing gap between costs and revenues has strained the finances of the FCI.

---

<sup>43</sup> The two types of beneficiaries under the TPDS under NFSA, 2013, are: priority and AAY. While the AAY beneficiaries and the scheme are retained as before under the TPDS, the priority beneficiaries are supposed to cover all BPL families, unless they have crossed the BPL threshold. The issue of the subsidised grains to both is at a uniform price of Rs.3/Rs.2/Rs.1 for rice/wheat/coarse cereals.

**Figure 18: Trends in economic cost (EC) and central issue prices (CIP) of wheat: 1991-92 to 2012-12**



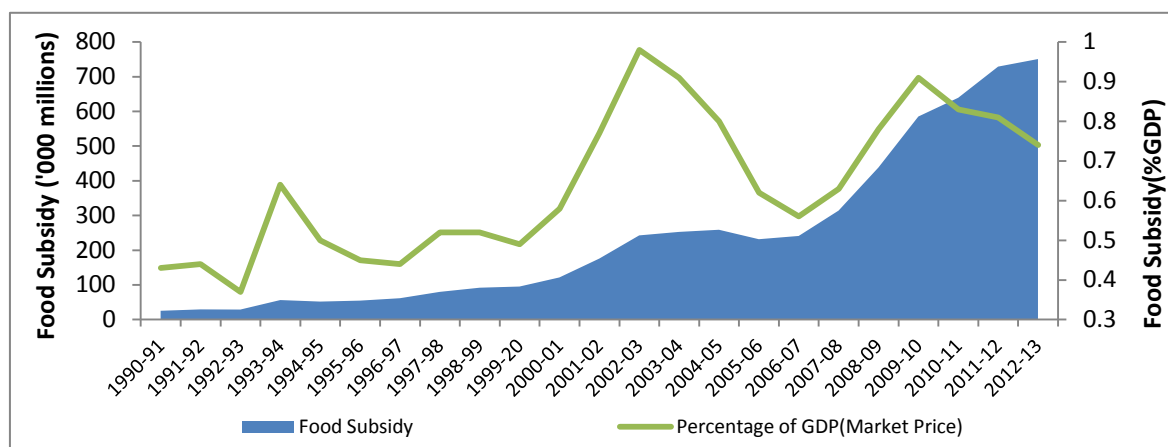
Source: FCI Annual Reports, Several Years

Due to price differences and the added cost arising from storage, handling, transportation and other charges, the economic cost per unit of food grains purchased by the government at procurement prices and distributed through fair price shops has tended to rise. This difference between the economic cost and issue price is borne by the government as consumer subsidy for food (discussed in the next section)

**b. Financial Implications**

India’s food subsidy bill (Figure 19) has grown more than 25 times (in nominal terms) during the last two decades; it is more than one per cent of annual gross domestic product (GDP) and five per cent of the agricultural GDP, and is nearly one-third of all subsidies given by the central government.

**Figure 19: Growth of food subsidies in India**



Source: Own design based on Planning Commission and RBI

According to a Ministry of Finance report, the food subsidy is expected to increase to Rs. 1401.92 billion and Rs. 1577.01 billion in 2014-15 and 2015-16 respectively with the implementation of the NFSA. These estimates, however, do not include additional investment expenditures, identified in the NFSA document but not quantified.

### **Section III: Way Forward**

“One clear lesson of history is: grain should be considered a matter of commerce and not a matter of administration” (Boyle, 1937).<sup>44</sup> One of the major problems of buffer stocking operations in India arises from the attempt to use a single tool to serve multiple objectives. Buffer stocking is used to simultaneously tackle the problem of volatility in the price of food grains, provide food security and incentivise high production. These objectives often conflict with each other, leading to inefficiencies in buffer-stocking operations and falling short in terms of intended deliverables.

The evaluation of the performance of the buffer stocking policy highlights gaps and inefficiencies at most levels. The subsidised food has an opportunity cost associated with it and an artificial reduction in the prices of such commodities, increases demand for the product beyond their market clearing levels, thus creating inefficiencies. There is a greater systemic realisation today of the need to substitute traditional methods of operation under the policy with more scientific and economically efficient methods. So the first need is to unbundle competing objectives served by the buffer stocking policy.

The efficiency and the efficacy of MSP operations in acting as production incentives may not be questionable, but the need to provide double support to the farmers in terms of exorbitant input subsidies and cost-indexed MSPs – each to incentivise production behaviour – is questionable. It needs to be considered whether it would be sufficient to use one of the two tools – providing price support for output or subsidising inputs – to incentivise production. For instance, the government could consider procuring food grains for the TDPS by procuring the required grain at market prices while offering deficiency payments (making up the difference if the market price falls below the minimum to farmers) without physical procurement of grains to provide income support to farmers. The existing system of negotiable warehouse receipts (NWRs)<sup>45</sup> offers a unique, effective tool of insurance and credit to farmers, but a lot still remains to be done to improve stakeholder awareness regarding NRWs, improve the integration and acceptability of these receipts by banks, and its coverage.

As highlighted in the paper, the government procurement operations are influenced by five inter-related factors, namely production levels, price incentives (MSPs relative to the market prices), public distribution commitments, state statutory and rice levies, restrictions on private

---

<sup>44</sup> Boyle, J.E. (1937), That Ever-normal Granary, Saturday Evening Post, May 8, 1937

<sup>45</sup> The NWR system was launched in April 2011 by the Ministry of Consumer Affairs, GOI. Under this, farmers can seek loan from banks against warehouse receipts issued to them against storage of goods in the warehouse. These receipts are issued by warehouses registered with the Warehousing Development and Regulatory Authority (WDRA). These form a fully negotiable instrument backed by central legislation.

stock holdings of grains, and the import-export policy. Higher production in a year, MSPs (plus bonuses in some states) higher than prevailing market prices, higher TPDS/NFSA distribution commitments, higher statutory levies and a higher levy on rice millers, and a ban on exports all imply a greater burden on the government to become a residual purchaser and thus, a hoarder of grain. It implies a huge drain on scarce financial resources. While the MSP plus bonuses in some states have led to the production basket being skewed in favour of certain crops, the bonuses plus statutory levies have cumulatively stifled the private sector and driven it out of the market. The concentration of procurement in a few states with the highest statutory taxes not only implies higher financial outflows from the centre but adversely affects the country's competitiveness in the international market.

There is need to phase out levies on rice procurement and stock limits on private trade, and rationalise state-level statutory taxes. It is also necessary that seamless movement of agricultural commodities all over the country is ensured. Besides, there needs to be greater effort towards integration across the food processing supply chains – direct buying by processors and retailers from farmers.

Rationalisation of pricing and taxation policies will not only reduce the burden on the central and state exchequers but also correct the distortion in the product mix resulting from the procurement operations. Instead of an open procurement policy, with ineffective procurement targets, the central government should rationalise these targets/norms. With the advent of econometric sophistication and the existence of good time-series data, it may not be difficult for policy makers to logically evaluate the norms for buffer grain stocks, both operational and strategic, to be held by central and state agencies at any point in time. The former can be computed based on the decennial census, and the food grain distribution commitment to them. The strategic reserve, to be procured and maintained to meet any climatic exigencies and for market intervention activities, can be evaluated by analysing the requirement trend from existing time-series data.

The essential role of any market is price discovery, which can act as a signal for efficient allocation of productive resources. The Indian agricultural market is stifled by controls on each possible front – from production, to trade to domestic marketing and stocking. Reforming such distortions will create greater competition, promote efficiency and growth, and thus should be accorded high priority.

A mechanism with triggers to set off automatic purchase and release, depending on demand and supply conditions, should be put in place. It should also incorporate best practices in inventory management.

The ad hocism that characterises the OMSS and export policies should be replaced with more stable policies to achieve more effective resource allocation and sustained agricultural growth, a recommendation that has also been made by leading Indian academicians and policy-makers (e.g. Gulati, Jain, and Hoda, 2013). The effects on domestic prices as well as the fiscal costs of more flexible trade and more flexible use of the OMSS need to be carefully evaluated and taken into consideration for policy design. Another factor that needs to be taken

into consideration is the impact of the limitations of India's export policy on world food prices.

The favourable outcome of the Bali round provides a temporary respite to policy makers, but the government will have to come up with a permanent, acceptable solution to the issue of agricultural subsidies, which will always remain a contentious issue.

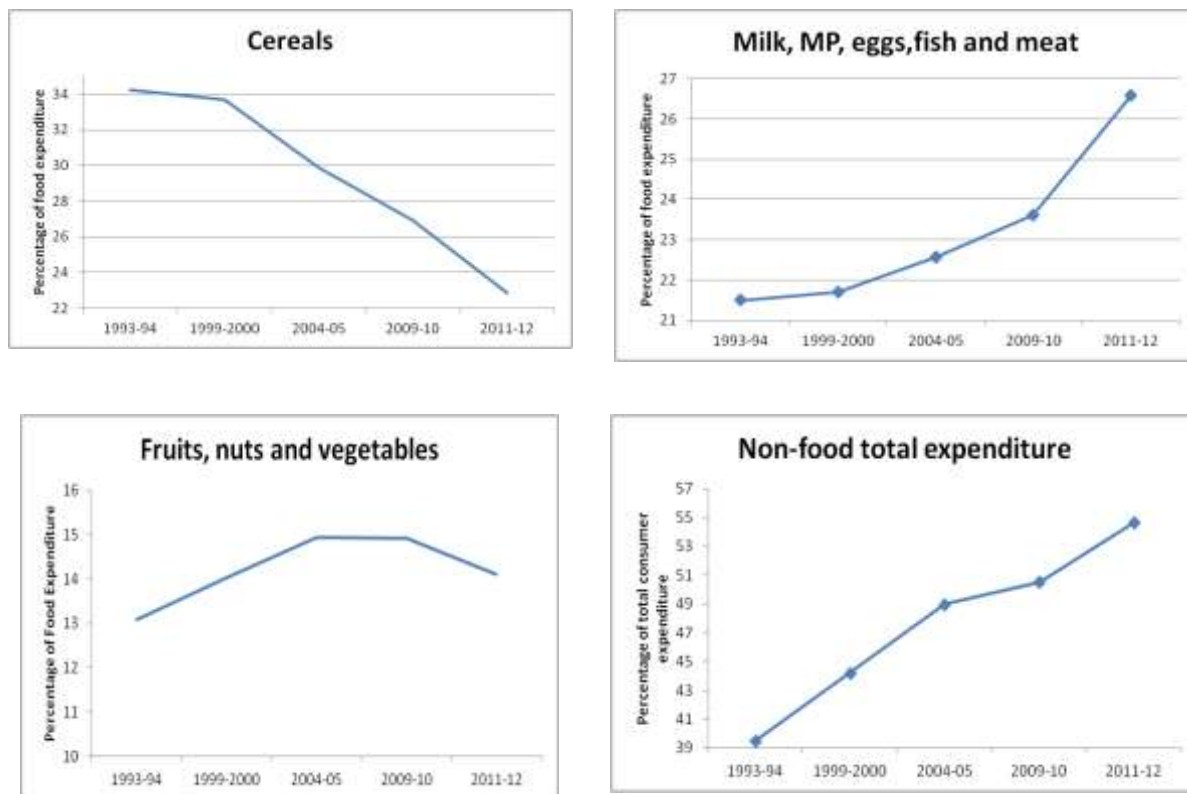
The other issue that needs to be looked at is the feasibility of replacing the physical distribution of food with direct cash transfers to vulnerable sections. It has been argued that direct cash transfers would help in better targeting and reduce the huge costs associated with government intervention in the grain market. India today has issued hundreds of millions of smart cards that make it much easier to identify and target vulnerable sections of the population. The use of smart cards can provide a more sustainable and economical solution to the issues of food and nutritional security for the country's poor.

There are no two opinions about the fact that growth will not have much meaning if India is unable to drastically reduce hunger and malnutrition. The issue is how best this can be done with available resources and with greater efficiency. The shift to direct cash transfer will help reduce the level of buffer stocks needed for both strategic and operational purposes to about one-third the present norm. This can save and release large amounts of government expenditure, which in turn can be used to support various targeted welfare schemes.

While the government's role was pivotal during historical periods of scarcity, its continuance and extension today in times of plenty is inefficient, counter-productive and undesirable. Instead, there should be an increased emphasis on a greater role for the private sector. Cohesive policy and infrastructure ecosystems should be created to facilitate "directed" operations by the private sector.

## Appendix 1: Changing food consumption patterns of India

**Figure 20: Expenditure on various categories of food (as per cent of total food expenditure) and non-food items (as per cent total consumer expenditure), all- India**



Source: *Key Indicators of Household Consumption Expenditure in India (2013)*. NSS 68<sup>th</sup> Round. July 2011- June 2012. NSSO

## Appendix 2: Quarter-wise buffer stocks- actual vs. norms

Buffer Norms				Stocks in Central Pool			
	Rice	Wheat	Total	Year	Rice	Wheat	Total
As on	1st January						
Normal	11.8	8.2	20	2006	12.6	6.2	18.8
Strategic	2	3	5	2007	12	5.7	17.7
Total	13.8	11.2	25	2008	11.5	7.7	19.2
				2009	17.6	18.2	35.8
				2010	24.3	23.1	47.4
				2011	25.6	21.5	47.1
				2012	29.7	25.7	55.4
				2013	32.2	34.4	66.6
				2014	14.7	28	42.7
As on	1st April						
Normal	12.2	4	16.2	2006	13.7	2	15.7
Strategic	2	3	5	2007	13.2	4.7	17.9
Total	14.2	7	21.2	2008	13.8	5.8	19.6
				2009	21.6	13.4	35
				2010	26.7	16.1	42.8
				2011	28.8	15.4	44.2
				2012	33.4	19.9	53.3
				2013	35.5	24.2	59.7
				2014	30.6	17.8	48.4
As on	1st July						
Normal	9.8	17.1	26.9	2006	11.1	8.2	19.3
Strategic	2	3	5	2007	11	12.9	23.9
Total	11.8	20.1	31.9	2008	11.2	24.9	36.1
				2009	19.6	32.9	52.5
				2010	24.3	33.6	57.9
				2011	26.9	37.1	64
				2012	30.7	49.8	80.5
				2013	31.5	42.4	73.9
As on	1st October						
Normal	5.2	11	16.2	2006	6	6.4	12.4
Strategic	2	3	5	2007	5.5	10.1	15.6
Total	7.2	14	21.2	2008	7.9	22	29.9
				2009	15.3	28.5	43.8
				2010	18.4	27.8	46.2
				2011	20.4	31.4	51.8
				2012	23.4	43.1	66.5
				2013	19	36.1	55.1

### Appendix 3: State-wise grain storage capacity

State/UT	Per cent of total storage capacity	Per cent of total CWC warehouses	Per cent of total SWC warehouses
<b>Punjab</b>	25.1%	5%	7%
<b>Uttar Pradesh</b>	12.2%	10%	9%
<b>Haryana</b>	9.8%	6%	6%
<b>Madhya Pradesh</b>	8.9%	6%	16%
<b>Andhra Pradesh</b>	8.4%	10%	8%
<b>Maharashtra</b>	6.6%	9%	11%
<b>Rajasthan</b>	5.6%	7%	5%
<b>Karnataka</b>	3.9%	7%	8%
<b>Chhattisgarh</b>	3.4%	3%	7%
<b>Tamil Nadu</b>	3.2%	6%	3%
<b>West Bengal</b>	2.4%	7%	2%
<b>Gujarat</b>	2.2%	6%	4%
<b>Odisha</b>	1.9%	5%	4%
<b>Bihar</b>	1.5%	4%	2%
<b>Kerala</b>	1%	3%	3%
<b>Assam</b>	1%	1%	3%
<b>Delhi</b>	1%	2%	0%
<b>Chandigarh</b>	1%	0%	0%
<b>Uttarakhand</b>	0%	1%	0%
<b>Jharkhand</b>	0%	1%	0%
<b>J&amp;K</b>	0%	0%	0%
<b>Puducherry</b>	0%	0%	0%
<b>Tripura</b>	0%	1%	0%
<b>Nagaland</b>	0%	0%	0%
<b>Himachal Pradesh</b>	0%	1%	0%
<b>Goa</b>	0%	0%	0%
<b>Meghalaya</b>	0%	0%	0%
<b>Manipur</b>	0%	0%	0%
<b>Mizoram</b>	0%	0%	0%
<b>Arunachal Pradesh</b>	0%	0%	0%
<b>Sikkim</b>	0%	0%	0%
<b>A&amp;N Islands</b>	0%	0%	0%
<b>D&amp;N Haveli</b>	0%	0%	0%
<b>Daman &amp;Diu</b>	0%	0%	0%
<b>Lakshadweep</b>	0%	0%	0%

Source: DFPD



## Appendix 4: Central issue prices (CIPs) of rice, wheat and coarse grains

### Commodity: Rice

Period	APL		BPL	AAY	NFSA	Tide-Over Allocation
	Common*	Grade A	Common/Grade A	Common/Grade A	Common/Grade A	Common/Grade A
01.12.1997 TO 28.01.1999	550	700	350	-	THE NFSA rates are applicable from the date of Implementation of NFSA in the respective state/UT	
29.01.1999 TO 24.07.2000	1135	1180	590	-		
25.07.2000 TO 11.07.2001	1087	1130	565	300		
12.07.2001 TO 31.03.2002	795	830	565	300		
01.04.2002 TO 30.06.2002	695	730	565	300		
01.07.2002 TO TILL DATE	795	830	565	300		
					300	830

### Commodity: Wheat

Period	A.P.L	B.P.L	A.A.Y	NFSA	Tide-Over Allocation
01.06.1997 TO 28.01.1999	450	250	-	THE NFSA rates are applicable from the date of Implementation of NFSA in the respective state/UT	
29.01.1999 TO 31.03.1999	650	250	-		
01.04.1999 TO 31.03.2000	682	250	-		
01.04.2000 TO 24.07.2000	900	450	-		
25.07.2000 TO 11.07.2001	830	415	200		
12.07.2001 TO 31.03.2002	610	415	200		
01.04.2002 TO 30.06.2002	510	415	200		
01.07.2002 TO TILL DATE	610	415	200		
				200	610

### Commodity: Coarse grains

Period	A.P.L	B.P.L	A.A.Y	NFSA
From KMS 2008-09 till date	450	300	150	100

Source: FCI

\* APPLICABLE ONLY TO J&K, HP, NE STATES, SIKKIM & UTTARAKHAND

## References

- Acharya, K.C.S. (1983).** Food security system of India- evolution of the buffer stocking policy and its evaluation. Concept Publishing Company. New Delhi
- Agricultural Statistics at a Glance 2012 and 2013.** Controller of publications, Government of India. Delhi
- Agriculture Market Information Statistics (AMIS).** Link: <http://statistics.amis-outlook.org/data/index.html> . Assessed on 6 May, 2014
- Basu, D. and Basole A. (2013).** An empirical investigation of the calorie consumption puzzle in India. No. 16. , Department of Economics, University of Massachusetts, USA
- Basu, K. (2010).** The economics of food grain management in India. 2/2010-DEA. Department of Economic Affairs. Ministry of Finance. Government of India
- Basu, K. (2011).** India's food grain policy: an economic theory perspective. Economic & Political Weekly, Vol. 46(5), 37-46
- Bhardwaj, M. (2012).** As crops rot, millions go hungry in India. Reuters. Link: <http://in.reuters.com/article/2012/07/02/india-wheat-food-malnutrition-crops-idINDEE86101620120702> . Retrieved October , 2013
- Boyle, J. E. (1937).** That ever normal granary. Saturday Evening Post, Vol. 14(15), 67-69
- Comptroller Auditor General of India (CAG) (2013).** Performance audit report on storage management and movement of food grains in FCI. Chapter IV. Report No.7. 74-75
- Chand, R., and Birthal P. (2011).** Food grain stock requirement during twelfth five-year plan. Working Paper 9. National Centre for Agricultural Economics and Policy Research
- Economic Survey (2012-13).** Agriculture and food management. Chapter 8. Controller of Publications, Government of India. Delhi
- Chopra, R.N. (1981).** Evolution of food policy of India. Macmillan, 1981. New Delhi
- Cummings Jr., R. W. (1969).** Buffer stocks in seminar on food grains buffer stocks in India. Seminar Series- VIII, Indian Society of Agriculture Economics
- Davis, J S. (1938).** The economics of the ever-normal granary. Journal of Farm Economics, Vol. 20 (1), 8-21
- Desai, A V. (1999).** Price of onions. Penguin USA
- Dimand, R and Dimand M. A. (1990).** J.M. Keynes on buffer stocks and commodity price stabilization. History of Political Economy. 22.113-21

- Economists (2013).** Towards the end of poverty, not always with us. June 1-7, 2013, 23
- Edwards. R and Hallwood C.P. (1980).** Determination of optimum buffer stock intervention rules. The Quarterly Journal of Economics, Vol. 94(1). 151-166
- FAO (2006).** Food security. Policy Brief- Issue 2
- Gangopadhyay, S., Lensink, R.,and Yadav, B. (2013).** Cash or food security through the Public Distribution System? Evidence from a randomized controlled trial in Delhi, India. Link: [http://www.econ.kuleuven.be/eng/ew/seminars/papers2013/Paper\\_Lensink.pdf](http://www.econ.kuleuven.be/eng/ew/seminars/papers2013/Paper_Lensink.pdf)
- Gilbert, C. L. (2011).** Food reserves in developing countries: trade policy options for improved food security. University of Trento, Italy. Issue Paper No. 37, ICTSD Programme on Agriculture Trade and Sustainable Development
- Gouel, C. (2013).** Food price volatility and domestic stabilization policies in developing countries. (No. w18934). National Bureau of Economic Research.
- Graham, B. (1937).** Storage and stability- a modern ever-normal granary. Benjamin Graham Classics. McGraw-Hill Publishing, New York
- Gulati, A. (2014).** Food and nutritional security, A symposium on the year that was. 653, India Seminar
- Gulati, A., Gujral, J., and Nandakumar, T. (2012).** National Food Security Bill challenges and options. Discussion Paper No. 2, CACP, Ministry of Agriculture, Government of India. New Delhi
- Gulati, A., Jain, S., and Hoda, A. (2013).** Farm trade: tapping the hidden potential. Discussion Paper No. 3, CACP, Ministry of Agriculture, Government of India. New Delhi
- Gulati, A. and Saini S. (2013).** Taming food inflation in India. Discussion Paper No. 4, CACP, Ministry of Agriculture, Government of India. New Delhi
- Gulati, A. and Jain S. (2013).** Buffer stocking policy in the wake of NFSB: concepts, empirics and policy implications. Discussion Paper 6, CACP, Ministry of Agriculture, Government of India. New Delhi
- Gulati, A., Jain S. and Satija S. (2013).** Rising farm wages in India: the pull and the push factors. Discussion Paper No. 5, CACP, Ministry of Agriculture, Government of India. New Delhi
- Gustafson, R. L. (1958).** Carryover levels for grains. Technical Bulletin No. 1178, United States Department of Agriculture

- Hueth, D., and Schmitz, A. (1972).** International trade in intermediate and final goods: some welfare implications of destabilized prices. *The Quarterly Journal of Economics*, 352-365.
- Human Development Report (2013).** The rise of the south: human progress in a diverse world. UNDP, New York
- Joshi, P. K. (2013).** National Food Security Bill and need for a stronger implementation strategy. Governance Knowledge Centre, Department of Administrative Reforms and Public Grievances, Government of India. <http://indiagovernance.gov.in/thinkpiece/?thinkpiece=5>. Assessed on January 2014
- Kharif Report 2013-14 and 2012-13.** Commission for Agricultural Costs and Prices, Department of Agriculture Cooperation, Ministry of Agriculture. Government of India. New Delhi
- Khusro, A.M. (1973).** Buffer stocks and storage of major food grains in India. Tata McGraw-Hill Publishing. New Delhi
- Krishna, R. Haykin S. and Chhibber A. (1983).** Policy modelling of a dual grain market: the case of wheat in India. International Food Policy Research Institute
- NSSO (2013).** Key indicators of household consumer expenditure in India, 2011-12 (July 2011-June 2012). Vol. KI of 68th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India
- NSSO (2012).** Nutritional intake in India, 2011-12 (July 2009-June 2010). Vol. 540 of 66th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India
- NSSO (2013).** Perceived adequacy of food consumption in Indian households. (July 2009-June 2010). Vol. 547 of 66th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India
- Planning Commission (2005).** Performance evaluation of the Targeted Public Distribution System (TPDS). Programme Evaluation Organization (PEO), Planning Commission, Government of India. New Delhi
- Porter, R. S. (1950).** Buffer stocks and economic stability. *Oxford Economic Papers*, New Series, Vol. 2 (1)
- Prakash, A. (2011).** Safeguarding food security in volatile global markets. Food and Agriculture Organisation. Ed. Rome
- NSSO (2013).** Public Distribution System and other sources of household consumption. (July 2009-June 2010), Vol. 545 of 66th round. National Sample Survey Office, Ministry of Statistics & Programme Implementation, Government of India

- Rabi Report 2013-14.** Commission for Agricultural Costs and Prices, Department of Agriculture Cooperation, Ministry of Agriculture. Government of India. New Delhi
- Ray, S. K. (1973).** Stabilizing food grains availability and prices through buffer stocks operation: an econometric approach. Department of Economics, University of Delhi. Delhi
- Reserve Bank of India (2013).** Macroeconomic and Monetary Developments in 2012-13. Issued with the Monetary Policy Statement 2013-14. Reserve Bank of India, Mumbai
- Robertson, D.H. (1926).** Banking policy and the price level. London: P.S. King, reprinted with a new preface in 1949, New York
- Srinivasan, P.V. and Jha S. (1999).** Food security through price stabilization: Buffer stocks v/s variable levies. Economic and Political Weekly, Vol. 34(46-47)
- The Economic Times (2013).** 'Food security' jacks up food prices. 13 June, 2013. 12
- Braun, J. V., and Tadesse, G. (2012).** Global food price volatility and spikes: an overview of costs, causes, and solutions. ZEF-Discussion Papers on Development Policy. 161
- Wilson, E.J. (2005).** Foodgrain price policies in India: The effects on foodgrain production and rural poverty, 1951-2001. Applied Econometrics and International Development (AEID), Vol. 5-3
- World Bank (1999).** India food grain marketing policies: reforming to meet food security needs. Report No. 18329-IN

**LATEST ICRIER'S WORKING PAPERS**

<b>NO.</b>	<b>TITLE</b>	<b>Author</b>	<b>YEAR</b>
282	FACILITATING BILATERAL INVESTMENTS BETWEEN INDIA AND GERMANY: THE ROLE OF NEGOTIATIONS AND REFORMS	TANU M. GOYAL RAMNEET GOSWAMI TINCY SARA SOLOMON	JULY 2014
281	TRADE AND INVESTMENT BARRIERS AFFECTING INTERNATIONAL PRODUCTION NETWORKS IN INDIA	ANWARUL HODA DURGESH KUMAR RAI	JULY 2014
280	INDIA-KOREA CEPA: HARNESSING THE POTENTIAL IN SERVICES	NISHA TANEJA NEETIKA KAUSHAL NAGPAL SAON RAY	JULY 2014
279	SALIENT FEATURES OF MEASURING, INTERPRETING AND ADDRESSING INDIAN INFLATION	KIRTI GUPTA FAHAD SIDDIQUI	JULY 2014
278	THE ECONOMIC IMPACTS OF TEMPERATURE ON INDUSTRIAL PRODUCTIVITY: EVIDENCE FROM INDIAN MANUFACTURING	ANANT SUDARSHAN MEENU TEWARI	JULY 2014
277	JOINING THE SUPPLY CHAIN: A FIRM-LEVEL PERSPECTIVE FROM SOUTHEAST ASIA	GANESHAN WIGNARAJA	JUNE 2014
276	EL NIÑO AND INDIAN DROUGHTS- A SCOPING EXERCISE	SHWETA SAINI ASHOK GULATI	JUNE 2014
275	INDIA-PAKISTAN TRADE: AN ANALYSIS OF THE PHARMACEUTICAL SECTOR	MANOJ PANT DEVYANI PANDE	JUNE 2014
274	ENHANCING INDIA-PAKISTAN ECONOMIC COOPERATION: PROSPECTS FOR INDIAN INVESTMENT IN PAKISTAN	PALAKH JAIN AND SAMRIDHI BIMAL	MAY 2014
273	SECURITIES TRANSACTION TAX- CASE STUDY OF INDIA	NEHA MALIK	APRIL 2014
272	IMPACT OF TRANSACTION TAXES ON COMMODITY DERIVATIVES TRADING IN INDIA	SAON RAY NEHA MALIK	MARCH 2014
271	FEEDSTOCK FOR THE PETROCHEMICAL INDUSTRY	SAON RAY AMRITA GOLDAR SWATI SALUJA	FEBRUARY 2014

## **About ICRIER**

Established in August 1981, ICRIER is an autonomous, policy-oriented, not-for-profit, economic policy think tank. ICRIER's main focus is to enhance the knowledge content of policy making by undertaking analytical research that is targeted at informing India's policy makers and also at improving the interface with the global economy. ICRIER's office is located in the institutional complex of India Habitat Centre, New Delhi.

ICRIER's Board of Governors includes leading academicians, policymakers, and representatives from the private sector. Dr. Isher Ahluwalia is ICRIER's chairperson. Dr. Rajat Kathuria is Director and Chief Executive.

ICRIER conducts thematic research in the following seven thrust areas:

- Macro-economic Management in an Open Economy
- Trade, Openness, Restructuring and Competitiveness
- Financial Sector Liberalisation and Regulation
- WTO-related Issues
- Regional Economic Co-operation with Focus on South Asia
- Strategic Aspects of India's International Economic Relations
- Environment and Climate Change

To effectively disseminate research findings, ICRIER organises workshops, seminars and conferences to bring together academicians, policymakers, representatives from industry and media to create a more informed understanding on issues of major policy interest. ICRIER routinely invites distinguished scholars and policymakers from around the world to deliver public lectures and give seminars on economic themes of interest to contemporary India.

