

Shweta Saini and Ashok Gulati

Abbreviations

APMC	Agricultural Produce Market Committee
BE	Budget estimates
C&F	Cost and freight
CACP	Commission for Agricultural Costs and Prices
CAGR/CARG	Compound annual growth rate/compound annual rate of growth
CAP	Cover and plinth
CCI	Cotton Corporation of India
CIF	Cost insurance and freight
CoP	Cost of production
CSO	Central Statistics Office
CV	Coefficient of variation
DAC	Department of Agriculture and Cooperation
DARE	Department of Agricultural Research and Education
DES	Directorate of Economics and Statistics
DFPD	Department of Food and Public Distribution
DGCIS	Directorate General of Commercial Intelligence and Statistics
DGFT	Directorate General of Foreign Trade
ECA	Essential Commodities Act, 1955

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F&V	Fruits and vegetables
FAO	Food and Agriculture Organization
FAQ	Fair average quality
FCI	Food Corporation of India
FFPI	FAO Food Price Index
FOB	Free on board
FY	Financial year
GCF	Gross capital formation
GDP	Gross domestic product
KMS	Kharif marketing season
MEP	Minimum export price
MSP	Minimum support price
MSR	Marketed surplus ratio
MMT	Million metric tonnes
NFSM	National food security mission
NWRs	Negotiable warehouse receipts
OGL	Open general license
OMSS	Open market sale scheme
OWSs	Other welfare schemes
PDS	Public distribution system
PMEAC	Prime Minister's Economic Advisory Council
PSS	Price support scheme
Qtl	Quintal
SEZs	Special Economic Zones
STC	State Trading Corporation
TE	Triennium ending
TFP	Total factor productivity
TRQ	Tariff rate quota
USDA	United States Department of Agriculture
WDRA	Warehousing Development and Regulatory Authority
WTO	World Trade Organization

14.1 Backdrop

In a country which has a population of 1.25 billion and which still has the largest number of poor and malnourished people in the world, ensuring food security for the masses is one of the prime concerns of the government policy.

It may be worth noting that an average Indian household still spends about 45 % of its total expenditure on food (NSSO 2013). The decade of the 2000s saw the overall GDP grow by an average annual growth rate of more than 7 %. With population growing by less than 1.5 % per annum, per capita incomes consequently rose by more than 5.5 % per annum, thus exerting pressure on food demand, and the pressure is only going to amplify in the foreseeable times. If India can raise its domestic food production at a pace faster than its domestic demand, it can at least

have food available to feed its population from domestic sources. Otherwise, India would have to increasingly rely on food imports.

India is already importing more than half of its edible oil consumption and about 15–20 % of pulse consumption from global markets. Any abrupt increase in the global prices of these commodities will therefore directly affect their domestic prices and consumption and thereby elements of food security. Domestic prices of important food commodities are also affected when the commodities are exported. India, for example, has been the largest exporter of rice from financial year (FY) 2011–2012 to 2014–2015, and its domestic prices are affected by what is happening in the global rice market.

Against this backdrop, this paper looks at the issue of food security in India in the wake of recent global food price volatility, especially the price spikes of 2007–2008 and the price surge in early 2011, when global food price index exceeded the previous peak from 2008. How did India react to global food price spikes of 2007–2008? Could it protect its poor? What were the likely implications of India's policy choices on global prices? What lessons can we learn from that experience in terms of providing reasonable stability in food prices, locally and globally, so that food security can be ensured for the masses? These are some of the questions that will be addressed in this paper.

The paper is organized as follows: In Sect. 14.2, we study the global rice and wheat markets and how India is placed in it. Section 14.3 elaborates on the policy landscape of rice and wheat, the two primary staples in India. The section is subdivided into two parts where both the trade and the domestic policies are given. After elaborating on India's policy response to the global food crisis of 2007–2008, we use the interconnectedness of the global and the domestic food prices to illustrate India's competitiveness in the global markets. The subsection about domestic grain policies highlights the domestic grain dynamics and the major policy changes in the domain. The last section encapsulates the things that could be learned from the analysis in this paper and gives suggestions for the future with regard to the Indian grain trade market.

14.2 Global Rice and Wheat Markets and India

Only 9 % of the total rice production was globally traded between 2013 and 2014 (see Figs. 14.1 and 14.2). This indicates a rather thin global rice market compared to wheat and corn, where 23 % and 13 % of the production was traded respectively. The rice supply in global markets is also highly concentrated: in 2013–2014, 80.4 % of the global rice supply came from five countries, namely, Thailand, Vietnam, the United States, Pakistan, and India.

Globally, the production of all three staples is going up. The markets are expanding and so are the demands. Between 2011–2012 and 2013–2014, global exports of rice, wheat, and corn increased by 9 %, 5.4 %, and 24.9 %, respectively. This increase may also be due to the markets liberalizing after the 2007–2008 global food crisis, in which the major food exporters like India and Thailand restricted

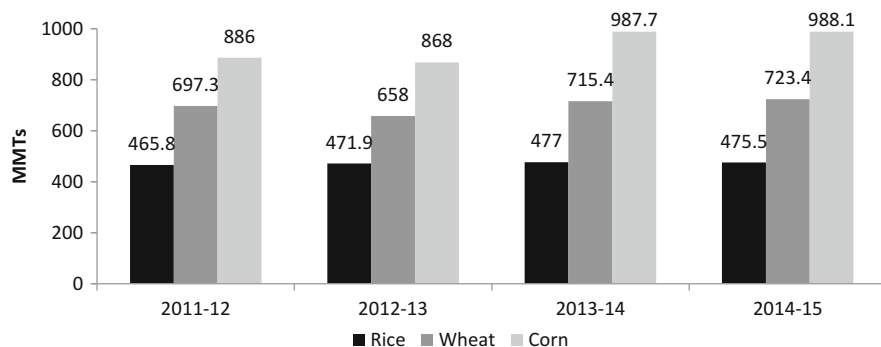


Fig. 14.1 Global production trend of the three staples—rice, wheat, and corn since FY 2011–2012. *Source:* USDA



Fig. 14.2 Trends in world exports (MMT). *Source:* USDA

their food supplies and thus triggering an unprecedented global food price spike in history.

As a net food exporter, India was bound to benefit from such global trend. We next examine the performance of the Indian agriculture exports.

India exported more than US \$42.6 billion worth of agricultural exports in 2013–2014, while it imported agricultural commodities worth US \$15.9 billion; India's agriculture trade account had therefore a net surplus (Fig. 14.3). According to the WTO, India's share in the total global export of agricultural products increased from 0.8 % in 1990 to 2.6 % in 2012. India emerged as the world's largest exporter of rice.

India has a gross cropped area between 190 and 200 million ha, depending upon the amount of rainfall during the monsoons. In 2013–2014, India produced about 106 million metric tonnes (MMTs) of rice from roughly 43 million ha (m ha) of rice planting area and 96 MMT of wheat from 29 m ha of wheat planting area. India's share of rice and wheat production globally is roughly 22 % and 13 %, respectively (FAO, stat).

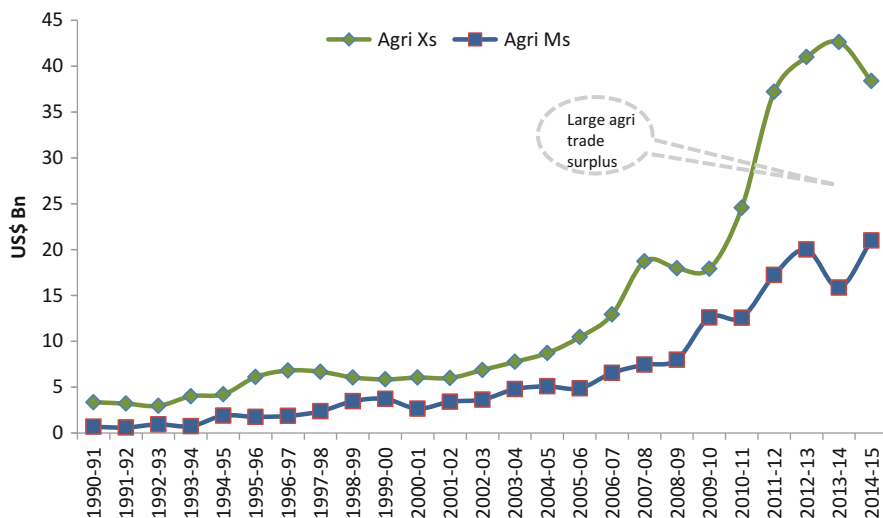


Fig. 14.3 India's exports and imports of agricultural commodities. *Source:* Agricultural Statistics at a glance (various issues) and the Department of Commerce. *Note:* Figures for 2014–2015 are estimates

Rice and wheat are staple crops of the country and help in meeting a significant proportion of the daily caloric needs of the people. Close to 22 % of the population still live below the poverty line, as estimated by the Planning Commission based on Tendulkar poverty line (Planning Commission 2014). By international definition of US \$1.9/day/capita, almost 21.3 % of the people in India lived below poverty line in 2011 (World Bank 2014). The largest mass of poor and malnourished people in the world live here (World Bank 2013). Roughly about one-sixth of the world's people and one-third of the world's poor are Indians. One in every three malnourished children in the world is from India (HUNGaMA 2011). Thus, anything affecting food prices, and rice and wheat in particular, is important for Indians, especially for those hovering around the poverty line. It is no wonder that the government monitors food prices very closely.

The Indian government supports both the cereal producers as well as its consumers. By providing price support mechanisms for paddy and wheat using minimum support price (MSP) and by reducing their effective costs of production (input subsidies mainly for fertilizers, electricity, and irrigation), the government supports and incentivizes cereal (rice and wheat) production. The government also supports the consumers by ensuring that prices of wheat and rice remain low and stable through its public distribution system (PDS). It provides identified beneficiaries with subsidized (and sometimes free) food under its various food-based welfare schemes. The government also utilizes the Open Market Sale Scheme Domestic (OMSS-D) to smoothen any inter-/intra-year fluctuations by actively regulating the market grain supply and thereby ensuring price stability.

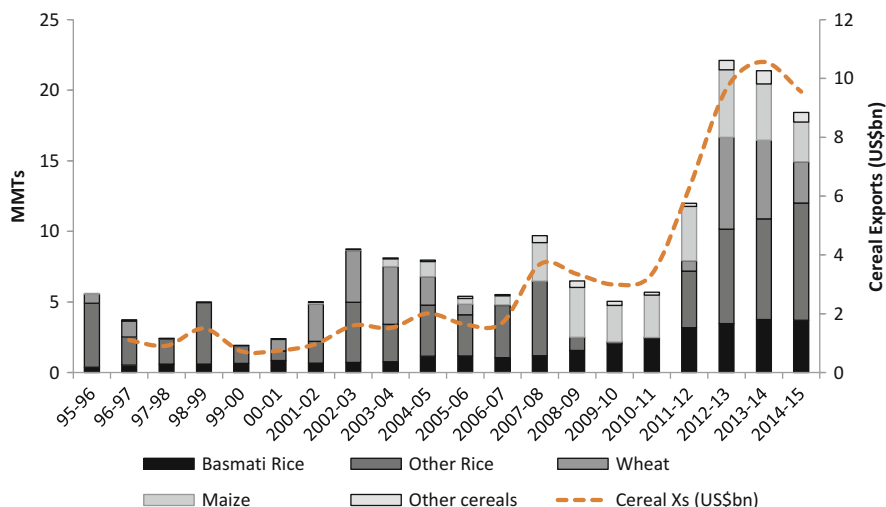


Fig. 14.4 Trends in cereal exports quantity and values. *Source:* DGCI&S

India is a net exporter of agricultural commodities, whereas it is a net importer in the overall trade (CACF, Kharif Report 2013–2014). Both in terms of quality and cost, Indian rice has a comparative advantage in the global market. Nevertheless, India’s agricultural trade policies are somewhat conservative and subject to frequent bans/restrictions. Nevertheless, in the last 3 years since FY 2012–2013, India exported a total of approximately 62 MMTs of cereals, and around 53 % (i.e., 33 MMTs) of this consisted of rice exports. The country earned close to US \$30 billion from these cereal exports (Fig. 14.4).

What could explain such a massive increase in cereal exports? Open trade policy regime (more recently for common rice), overflowing government granaries owing to production gains, and global price (cost) competitiveness could explain the phenomenon. We will look at the factors individually.

14.3 Rice and Wheat Policy: Trade and Domestic

Historically, India has been a country of droughts and famines. It is an agrarian economy with large dependence on rains for irrigating its crops. 54 % of its gross cropped area and 40 % of the rice planting area are still rainfed. With close to 1.25 billion people to feed, including the highest number of the global poor, opening the trade of its staple crops, like rice, is still a decision to be made with extreme caution. A significant proportion of the Indian population is still rice eating. Because of growing concerns regarding the high level of malnutrition and food security issues in the country, the government has always been cautious in liberalizing the rice and wheat trade. Therefore, the government has always first met the consumption needs and maintained *enough* buffer stocking before letting the “residual” determine the nature of trade policy.

India has come a long way since the mid-1960s, when it was living from “ship to mouth” through PL 480 imports from the USA to today when it has become the largest rice exporter globally and a net agricultural exporter. Still India's rice and wheat trade policy is highly cautious and sometimes even unpredictable as we will see in the section below.

14.3.1 Grain Policy: Trade

India exports mainly two types of rice: basmati and common rice (raw or par boiled). While the former is a finer quality rice meant for niche markets in the Gulf, Europe, and the USA, the latter is comparable to the type of rice supplied by Thailand, Vietnam, and others. India's trade policies for both types of rice are different from each other. While there has been no restriction on the export of basmati rice, trade restrictions, such as minimum export price (MEP), export quotas, and even complete bans, have been imposed on the common rice export. Until 1991, the common rice export was completely restricted; with quotas and MEP in place. Overvalued exchange rate and export restrictions taxed the Indian farm sector before 1991. The devaluation of the Indian rupee in 1991 contributed immensely to making the expensive basmati rice more price competitive in the global market, and thus its export surged.

Common rice exports were banned until October 1994 despite being highly price competitive globally. The government finally decided to open common rice exports in FY 1995–1996. As a result, the net exports of the common rice surged from 0.9 MMTs in 1994–1995 to 4.9 MMTs in 1995–1996 (Fig. 14.5), making India the second largest exporter of rice in the world. Encouraged by the phenomenal growth in rice exports, India opened its wheat exports in May 1995. However, increasing exports squeezed domestic market supplies thus building pressures on the domestic prices. Within a year, the rising prices of staple crops like rice and wheat drove the policymakers to reverse the trade decision and completely ban the rice and wheat exports in 1996–1997 (Hoda and Gulati 2008).

Increased production incentivized by rising minimum support prices (MSPs), falling global grain prices owing to many factors like the 1997 East Asian crisis, falling PDS grain offtakes due to the “targeted” focus of the system in 1997, and export bans were among the many factors that resulted in the overaccumulation of grain stocks in the coming years in the country. This forced the government to remove the bans on rice and wheat exports in 2000.

But it was not before 2005–2006 when Indian wheat regained its competitiveness because global prices had improved from their trough in around 2001–2002 (Hoda and Gulati 2008). Wheat exports were expected to rise; however, contrary to expectations, the government had to import wheat in 2006 to refill its plummeting wheat stocks in the Food Corporation of India (FCI) granaries. The FY 2006–2007 was an interesting year for the food sector of the country. Owing to farmers (mainly wheat) getting a better price for their produce from the private market, the FCI was unable to meet its annual procurement targets, and thus its granaries fell below the

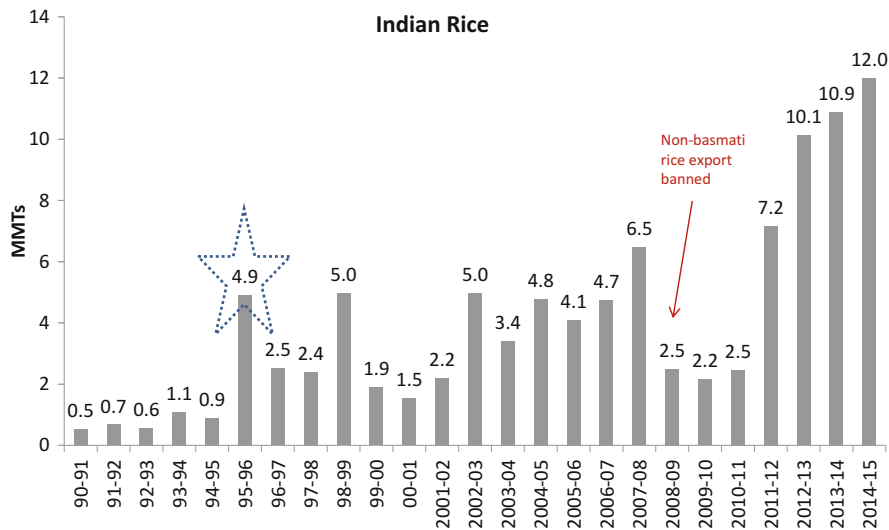


Fig. 14.5 India's exports of rice from 1990–1991 to 2014–2015. *Source:* Ministry of Commerce, GoI

desired stock norm level. Consequently, the government imported wheat amounting to 5.6 MMTs in that year. This is when India decided first to ban wheat exports in February 2007 (Sharma 2011).

14.3.2 The 2007–2008 Global Price Hikes and India's Response

From the point of view of Indian policymakers, India's withdrawal from the international rice and wheat markets in 2007 was a well-calibrated response. However, it appeared like a knee-jerk reaction to outsiders. Some of the alarming concerns driving the Indian policymakers' response to the global food crisis included food insecurity at the household level, impacting millions of vulnerable people, continued volatility in agricultural production caused by weather changes, fear of political unrest in times of high and sticky food inflation, and the need to feed a large PDS. In this section, we discuss India's policy response to the crisis, mainly for the rice and wheat markets.

Export Restrictions on Rice To stop the global price hikes from being transmitted to the domestic market and to strengthen the government's grain stocks, the country started imposing export restrictions on common rice. In October 2007, they imposed an MEP on common rice of US \$425/ton; but by December 2007, this MEP was increased to \$500/ton. Nevertheless, the exports of rice continued unabated. In March 2008, the government finally imposed a complete ban on common rice exports. The exports of rice dropped from 6.5 MMT in 2007–2008 to only 2.5

MMT in 2008–2009 (and these were mainly basmati rice exports). This decision to ban exports of common rice in the wake of surging global prices came under severe criticism from several rice-importing countries. In response, India opened a window to export common rice at “concessional” prices compared to prevailing global prices of rice to some neighboring countries, like Bangladesh and Bhutan, and also to some low-income African countries. However, not much rice was actually exported. The government eventually lifted the export ban on common rice in September 2011. Since then, India has exported record quantities of rice, especially in 2014–2015, when 12 MMT of rice was exported (Fig. 14.5).

The share of common rice in the total rice export earnings increased from 4 % in 2010–2011 to 42.6 % in 2 years. During the period in which the export ban on common rice was in place, India's basmati rice exports constituted 2.5 % (2008–2009) and 2.4 % (2009–2010) of the total rice production in India. Today, after the ban has been removed, the country is exporting close to 10 % of its annual production (Fig. 14.6).

The 1990–1991 Indian rice export basket comprised mainly basmati rice. With the opening of the common rice trade, the share of basmati rice exports in the total rice export decreased over time to less than 35 % in 2012–2013.

India has emerged as the world's largest rice exporter since 2011, closely competing with Thailand. Despite the export competitiveness, the country imposes, contrary to expectations, high import duty on rice: –70 % on semi-milled or wholly milled rice and 80 % on paddy, brown rice, and broken rice. Such a high import duty is ineffective when the country is quite export competitive in rice and has been exporting more than 10 MMT of rice annually since 2012–2013.

Export Restrictions on Wheat India is the world's second largest wheat producer after China, producing about 12 % of the global wheat. It has, however, not been

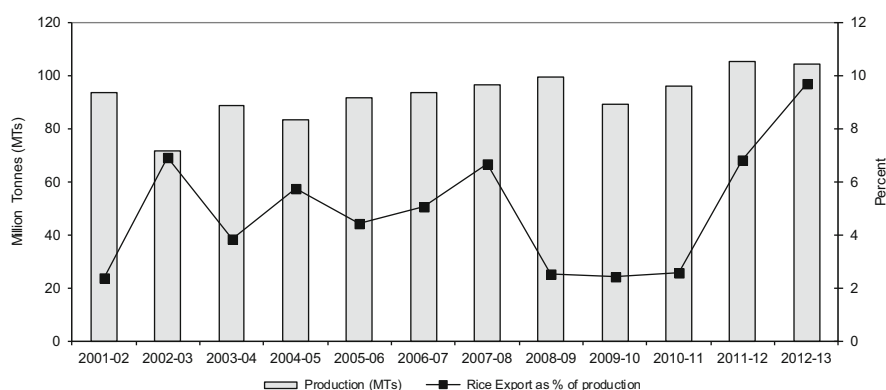


Fig. 14.6 India's exports as a percentage of rice production. *Source:* Agricultural Statistics at a Glance, Various Issues

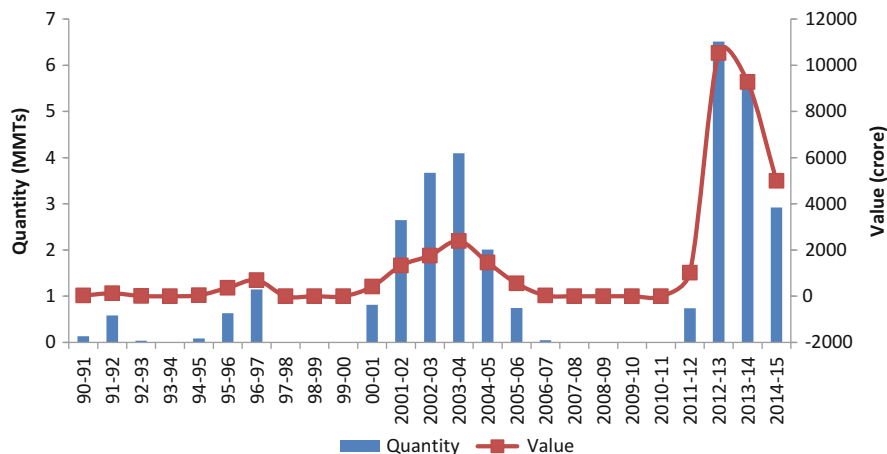


Fig. 14.7 India's exports of wheat from 1990–1991 to 2013–2014. *Source:* Ministry of Commerce, GoI

among the largest wheat exporters (accounting for about 3 % of total world exports) because the country consumes more than 90 % of its production, and it even had to import wheat in some of years (India was the fourth largest importer of wheat in 2006–2007). India imposed a complete ban on wheat exports in February 2007 (Fig. 14.7) in reaction to rising prices and supply fears, both domestically and globally.

Since India has a very small share in the global wheat market, its restrictions on wheat exports did not have any significant effect on international prices. But the imposition of the ban pulled domestic prices of wheat down from US \$283/ton in February to US \$225/ton by April (Fig. 14.8).

The export ban also helped the domestic market to remain stable and insulated from the steep hike in international prices in the first half of 2008; in April 2008, when the wheat price in the global market touched US \$380/MT, the domestic wheat price in India was less than US \$280/MT (Fig. 14.8).

14.3.3 Impact of Global Prices on Domestic Prices

In 2006–2007, as mentioned before, India imported about 6 MMTs of wheat after a long time. When the global prices of rice and wheat increased drastically in 2007–2008, banning the rice and wheat exports seemed to be a logical response in the country's efforts to insulate its poor from global prices spikes getting transmitted to the domestic markets. As a result, India was actually able to contain its domestic cereal inflation to about 6 % in 2007–2008, which helped restrict the overall food inflation at the time and thus *protect* India's poor from the price volatility. Similarly, India managed to avoid the more severe price spikes of 2010–2011, when

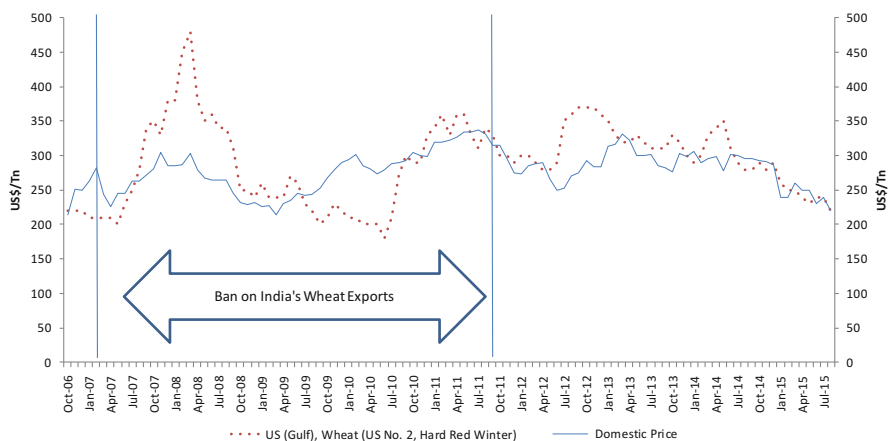


Fig. 14.8 Trend in India's domestic and international wheat prices. *Source:* International price (USA, Gulf, No. 2 Hard Red Winter): GIEWS Food price data and analysis tool. Domestic price (avg monthly data of HYV wheat—wholesale prices in Lucknow, UP and Amritsar, Punjab): DoE

in February 2011 the global food price index even exceeded the peak reached in 2008. However, what happened in the long run is an interesting departure from expectations.

A closer examination of the food price indices of the country and of the world (Wholesale Price Index (WPI) food and FAO food, respectively) reveals that the *protection* was only effective in the short run as the two price indices appear to have converged over the longer run, thus rejecting the *transmission insulation* theory.

Since the period between 2004 and 2013, the correlation between FAO food and Indian WPI food has been 0.78, indicating strong comovement between the indices. Figure 14.9 shows that India's restrictive stance on trade policy has in fact helped the country to escape the food price spikes of the food crisis of 2007–2008 and 2010–2011. However, in the longer run, the domestic price line appears to be converging with its global counterpart.

Clearly, India managed to avoid price spikes in its domestic market. Interestingly, the country also managed to avoid the troughs in global markets. In other words, it did not allow falling global prices to immediately get transmitted to its domestic prices. For the years 2000–2005 and more recently since 2013, when the global food prices fell, Indian food prices remained somewhat higher. It is possible that the domestic prices will converge over a longer period. The upshot is that Indian trade policy has tried to smoothen out the effects of global price spikes and troughs to prevent volatility transmission to the domestic prices, but in the medium to long term, Indian food prices have broadly followed the global food prices.

The FAO Food Price Index is a measure of the monthly change in international prices of a basket of food commodities. It consists of the average of five commodity group price indices, weighted with the average export shares of each of the groups for 2002–2004. The commodity groups are sugar, dairy, meat, edible oils, and

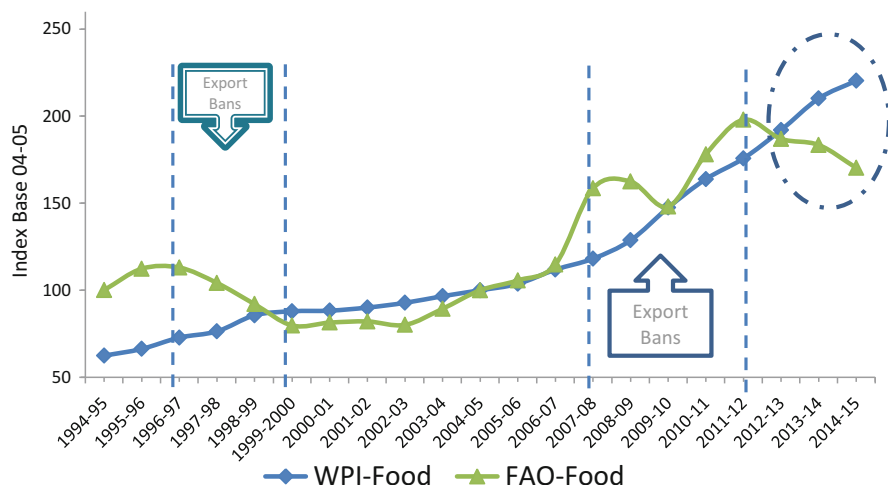


Fig. 14.9 Global price transmission to Indian prices. *Source:* FAO and CSO

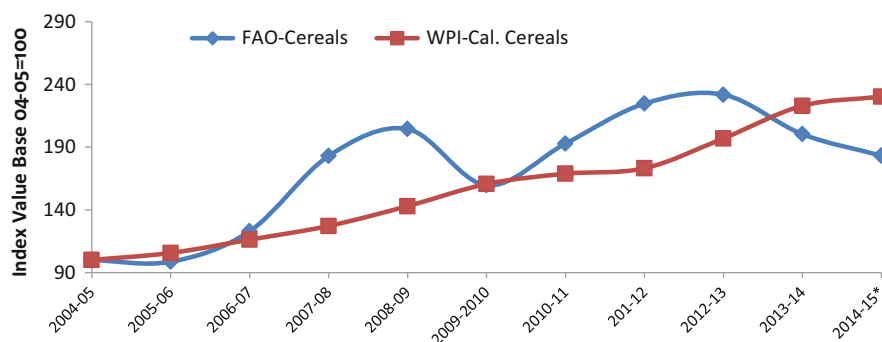


Fig. 14.10 Cereal price comovements. *Source:* FAO and CSO

cereals. Upon bringing the base of all these groups from 2002–2004 to 2004–2005, we analyzed the numbers together with subindices of India’s WPI (Figs. 14.10 and 14.11).

Similarly, the domestic prices appear to be catching up with the international long-run trends. The role of restrictive trade policy is evident here.

Several researchers have proven the non-transmission or limited transmission of global volatility to domestic prices (see, e.g., Pinstrup-Andersen 2015; Kalkuhl 2014). Baltzer (2015) wrote:

Non-fiscal interventions, such as non-tariff trade barriers, parastatal grain traders (China, India, Vietnam, Ethiopia, Malawi, Zambia and Egypt) and price controls (notably Senegal), disrupt the price transmission mechanisms in ways harder to generalize.

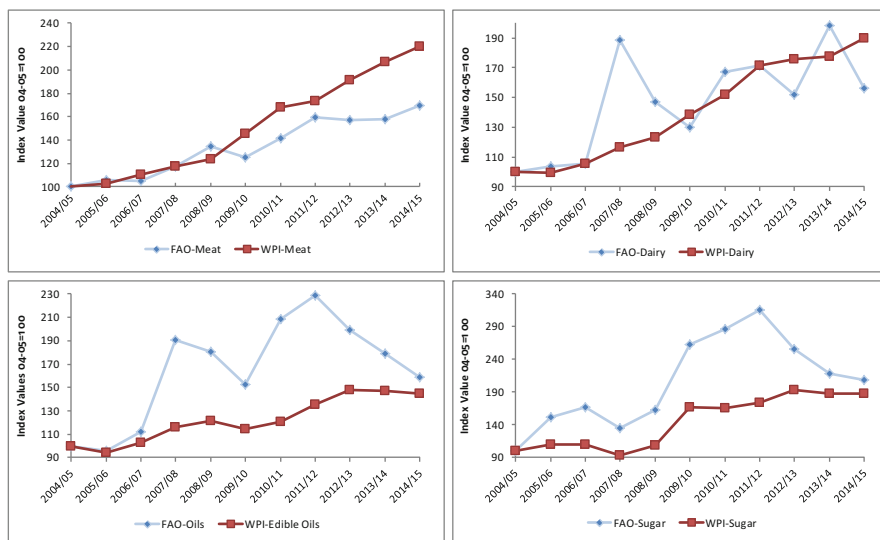


Fig. 14.11 Trends in WPI and FAO price subindices. *Source:* FAO and CSO

India's Economic Survey 2014–2015 attributed the divergence between the global and domestic prices to restrictive domestic food and trade policy. However, the curves shown above highlight the limitations of these opinions—even though these opinions may be true in the short run, but over a longer run, the opinions appear to fall flat with the commoving global and domestic food prices, as evidenced by the converging global and domestic food price curves. More sophisticated, statistical, and econometric tools are needed for a more robust analysis of the phenomenon.

14.3.4 Indian Rice and Wheat Competitiveness

From 2001–2002 to 2007–2008 (Q1), India's domestic wholesale rice prices were generally higher than international prices, but from 2007–2008 (Q2) to 2012–2013 (Q3), they have been continuously lower than the international prices (Fig. 14.12). It may be observed that MSP of paddy converted to rice has been continuously lower than domestic wholesale prices of rice during the same period.

Indian wheat prices, on the other hand, have closely followed the international wheat prices of the US hard red winter (HRW) and the soft red winter (SRW) (*FOB*). The 2007 export ban on wheat protected India's domestic wheat prices from the enormous international food price volatility (Fig. 14.13). While the export ban protected consumers from these fluctuations, it also harmed farmer's interests by limiting their exposure to lower domestic prices. Indian wheat prices generally hovered between the *FOB* and *CIF* wheat prices. With global wheat prices rising in 2007–2009, Indian wheat became highly price competitive. It has regained its price

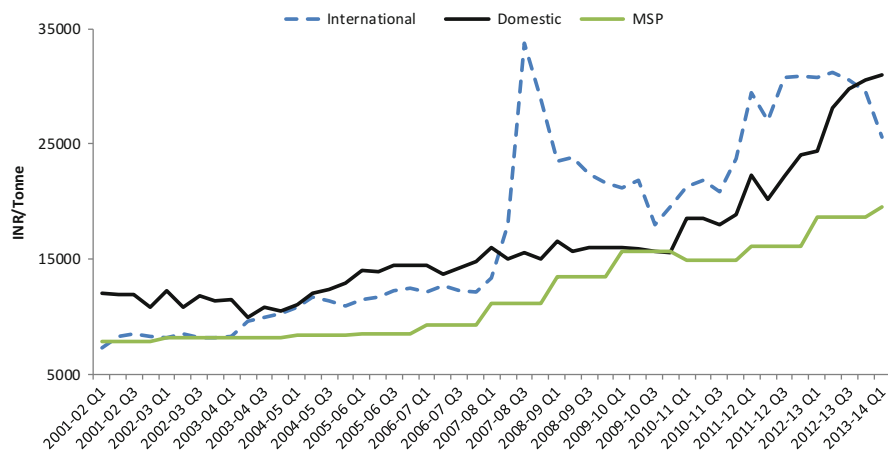


Fig. 14.12 Domestic wholesale prices versus international rice prices. *Source:* World Bank for International prices and DES for Domestic wholesale prices. *Note:* Rice (Thailand), 25 % broken, WR, milled indicative survey price, Government standard, f.o.b. Bangkok. Quarters refer to marketing year (October–September)

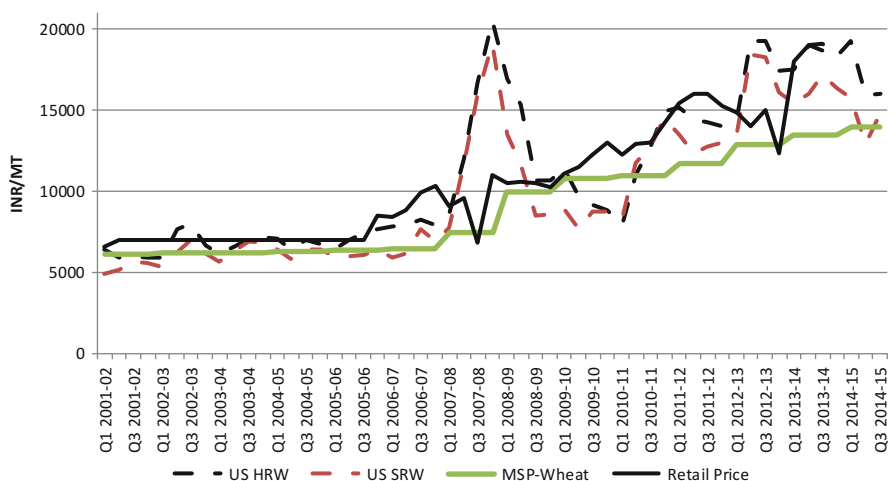


Fig. 14.13 Domestic wholesale prices versus international wheat prices. *Source:* World Bank for International Price and DES for domestic Prices & MSP from CACP Report. *Note:* (1) Wheat (US) No. 1 HRW, export price delivered at US Gulf port for prompt or 30 days Shipment. (2) Wheat (US) No. 2, SRW, export price delivered at US Gulf port for prompt or 30 days Shipment. (3) Domestic prices of wheat are the farm harvest prices in Punjab

competitiveness in 2011, when it opened its wheat exports in September. More than 12 MMTs of wheat were exported in 2012–2013 and 2013–2014.

India's MSP has been fairly lower than most of the other rice and wheat-producing economies (Fig. 14.14). Studies (Gulati et al. 2010) using the nominal

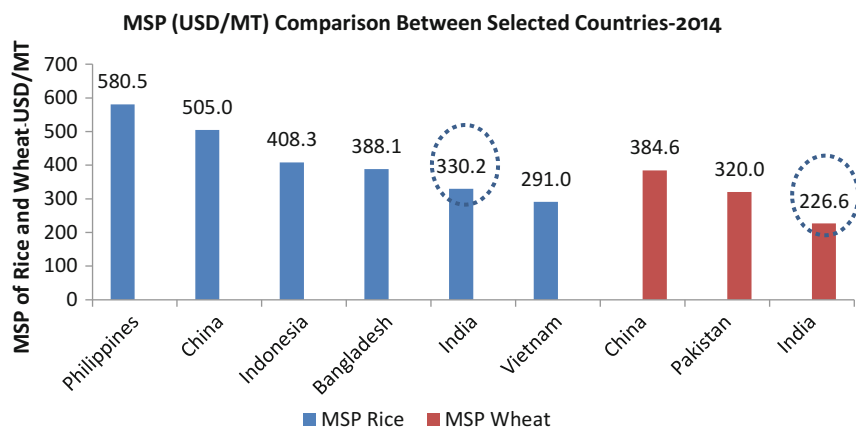


Fig. 14.14 MSP of selected rice- and wheat-exporting countries. *Source:* Links from the respective countries

protection coefficient (NPC) have shown that Indian rice is export competitive, with its domestic prices lower than the global rice prices in most years.

In the next section, we unearth the trends in the domestic production and understand the policy environment governing the rice and wheat farmers and the consumer.

14.3.5 Grain Policy: Domestic

The government intervention in domestic markets of wheat and rice, ranges from providing farmers with price support under MSP, procuring grains from *mandis* (grain wholesale markets) or through millers under compulsory levies on rice, to stocking and distributing the procured grains through the PDS. The reason that government intervention has been heavy in wheat and rice markets is rooted in the country's history of famine and shortage of basic staples. Despite the costs of market intervention, the government is unwilling to withdraw the intervention for fear of risking potential high price volatility, which affects the food security of the vulnerable sections of society. Lately, the new government set up a high-powered committee to look into the functioning of the FCI in this context. The committee made some wide-ranging recommendations, which included abolishing levy on rice, outsourcing grain-stocking operations to private sector, introducing cash transfers in the PDS, and reducing the buffer stocks held by the government. The government has introduced pilot schemes for cash transfers, but many other recommendations are still under consideration.

During the 2007–2008 global price crisis, the Government of India took two major steps: (1) it raised the MSP substantially and (2) it started the NFSM in 2007 to produce additional 20 MMT of grains in the subsequent 5 years.

The MSPs were raised aggressively in the years 2007–2008 and 2008–2009. MSP increases were also necessitated by the country's need to become self-sufficient in cereals' production, which suffered a setback in 2006–2007, when it had to import wheat because FCI grain stocks fell below the norm. The MSP increases formed a pivotal step in the direction of attaining maximum self-sufficiency domestically.

14.3.6 National Food Security Mission 2007–2008

As a response to this forced wheat import in 2006–2007, India launched the NFSM in 2007–2008. The objective of this mission was to increase the country's food grain production by at least 20 MMT in the 5 years after that—rice production by 10 MMT, wheat by 8 MMT, and pulses by 2 MMT. A two-pronged strategy was adopted to boost grain production: (1) introducing better technology (seeds) to the districts/states which were identified as priority, and (2) MSP for wheat and rice were raised by almost 40 % over the next 2 years, thereby encouraging farmers to grow more of food grains. Farmers responded positively to the combination of technology and incentives, and grain production increased by 42 MMT between 2006–2007 and 2011–2012, even though the target was just 20 MMT. This increase in production coincided with a period of export bans on rice and wheat. The unexpected production boom resulted in massive accumulation of grain stocks. The stocks with FCI, for example, reached unprecedented levels of 80.5 MMT on 1 July 2012 (Fig. 14.15).

Increasing MSPs guaranteed the further strengthening of the grain production. Eventually the policymakers opened the exports of wheat and common rice in 2011. Since then India has become the largest rice exporter in the world, regularly

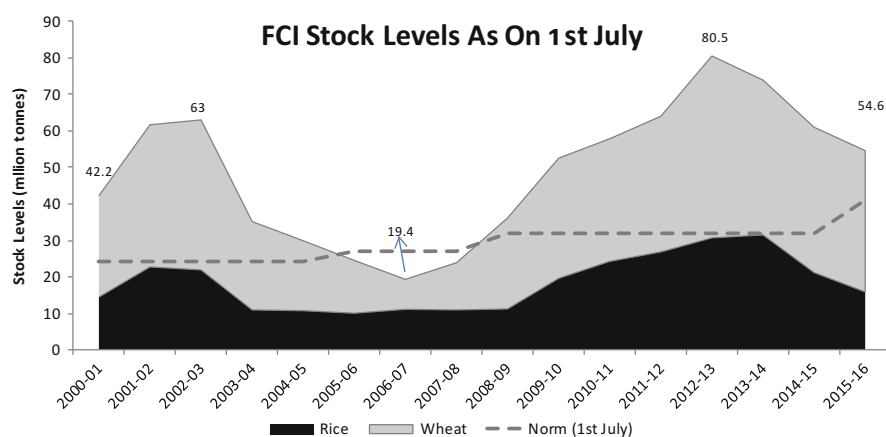


Fig. 14.15 FCI grain (rice and wheat mainly) as of 1st July every FY. *Source:* FCI

exporting more than 10 MMT of rice each year until 2014–2015, when rice exports reached 12 MMT.

Rising grain stocks also encouraged the government to introduce a bill in the parliament in 2011 and then enact the National Food Security Act (NFSA) in 2013.

14.3.7 National Food Security Act, 2013

By ensuring ample food stocks with a robust and expanding production base, the country appeared to have attained food security at the national level. However, as highlighted before, the situation at the microlevel was bleak, with widespread malnutrition and stunting among the population. Backed by the growing food grains stocks, the government enacted the NFSA in 2013.

The PDS is the tool through which the government of India improves food security at the microlevel. The FCI is the nodal agency which procures, stores, and distributes grains (mainly rice and wheat) to states, which in turn distribute it to the identified beneficiaries under the various food-based welfare schemes run by the central government of the country. Appendix (Fig. 14.16) summarizes the evolution of the PDS. The depth, scope, and coverage of the PDS expanded under the NFSA 2013. The Act aims to solve the problem of food and nutritional security of the Indian population. It combines and expands some existing *food-based* welfare schemes and a *conditional cash transfer* scheme. The Act is likely to be the biggest program of its kind so far and aims at reaching more than 800 million people (67 % of India's population), with an annual, legally enforceable distribution commitment of 61.4 MMT of grains sold at highly subsidized prices (with almost 90 % subsidy).

A legal commitment of such quantum of grains is likely to put greater pressure on the government's procurement machinery which would need the farmer to continue (and possibly increase) his production of the two crops. Price incentives are important drivers of farmer behavior (Gulati et al. 2013), and future MSP increases thus form an inevitable tool under NFSA. If the Act, in its present form, is to deliver on its set objective of alleviating poverty and malnutrition, commensurate price incentives have to be put in place. Supplying the committed 61.4 MMTs of grains necessitated the government to revisit its quarterly buffer-stocking norms. The government has already approved a newly revised, quarterly buffer stock norm (with higher norms for three quarters).

The Act is currently unfolding in the country and faces several challenges ranging from large leakages in the PDS and distortions in production basket to ballooning food subsidy bill (Saini and Gulati 2015). There are apprehensions about the capacity and the ability of the act to deliver on its set objectives. The problem is caused by the inefficiency of the existing PDS machinery, which forms the base of implementing the Act. The machinery is marred with inefficiencies and redundancies. (Saini and Kozicka 2014) There are talks of substituting the systems with a dynamic platform of direct cash/benefit transfer (DBT), whereby instead of physical grains an equivalent amount of cash will be transferred into the account of the beneficiary. Four Indian union territories (UTs)—Chandigarh, Puducherry,

Daman and Diu, and Dadra and Nagar Haveli—have agreed to introduce the DBT scheme in September 2015. Out of 36 Indian states/UTs, 13 have started implementing the provisions under the Act.

Falling yields in the traditional rice-growing states and the lowering water tables is one of the big challenges faced by the country today. Feeding the growing grain needs of the country necessitates the urgency to create alternative supply stations in the country. Therefore, the resource-rich Eastern states of Bihar, UP, Jharkhand, and Assam need to evolve into becoming the future supplier of rice in particular. The Second Green Revolution is likely to begin in Eastern India this time.

14.3.8 Second Green Revolution

Eastern India, with 2–3 times more rainfall compared to the Northwest states, has underused its high-quality groundwater aquifers. Vast social capital resource gives Eastern India a relative advantage in terms of sustainable rice production. The Eastern states account for 56 % of the total rice planting area in India but produce only 48 % of the total rice production. The productivity levels in the Eastern states, except Uttar Pradesh and West Bengal, are among the lowest in India. Out of the 26.6 million ha rice planting area in Eastern India (UP, Bihar, Jharkhand, West Bengal, Assam, Orissa, and Chhattisgarh), approximately 14.3 million ha is rainfed and thus prone to different abiotic stresses like flooding, drought, and soil salinity/sodicity. These abiotic stresses are the single most important yield-limiting factor for rice production in Eastern India. The rice productivity of Eastern India, except UP and West Bengal, is not only low (1.7–2.5 tns/ha) but also fragile.

The central government has been allocating money under *Rashtriya Krishi Vikas Yojana* from 2010 to 2011 for extending the Green Revolution to the eastern regions of the country comprising of Bihar, Jharkhand, Eastern UP, Chhattisgarh, Orissa, and West Bengal. The objective is to increase the productivity of crops, mainly rice, wheat, maize, pulses, by intensive cultivation through the promotion of recommended agriculture technologies, package of practices and high-yielding stress-tolerant hybrid rice varieties.

14.4 Lessons Learned and the Way Forward

Overall, the experience of 2007–2008 did play a significant role in India's agriculture sector. Country's intrinsic aversion to volatile food prices coupled with a disinclination to importing food to feed its population led the policymakers to act the way they did during the food crisis of 2007–2008.

However, the country learned three key lessons from the food crisis. First, price incentives are important for Indian farmers, whose encouraging response to raising the MSP under the NFSM brought the country to new heights in the global trade. Second, India is not insulated from global events, and putting export bans offers only a temporary respite to the domestic food prices, which in the longer run

converged with their global counterpart. Third, agriculture could be a large source of foreign exchange (net exports) for the country. As evident in the trade flows and demonstrated using a Balassa Index,¹ India has a higher relative trade advantage in agriculture than manufacturing. Yet the country has not been able to tap the full potential of the sector because of its restrictive agricultural trade policies.

Therefore, to harness the full potential of the agricultural sector, there is a need to ensure that agricultural trade policies are consistent, stable, predictable, and conceived for the long term. Concerted efforts, however, should be made for aligning domestic and international prices while guarding against sharp price spikes and troughs through constant monitoring and applying calibrated tariffs rather than outright bans.

Food security has been and will continue to be one of the primary concerns of the country's agriculture and food sector. The NFSA 2013 is seen as a vital step in alleviating the issue of widespread poverty and malnutrition. Apprehensions about the inability of the Act to deliver on the set objectives are widespread. There are even talks about substituting the entire system of subsidized physical grain distribution (price policy) with direct cash transfers (income policy), but a complete substitution is still unlikely in the short run. Given the slow pace of policy changes, it may take 3–5 years to transition from physical transfers to cash transfers once the government decides to implement the changes. Therefore, the country would remain dependent on and sensitive to any factors affecting food crops like rice and wheat, particularly with regard to their production and price levels.

However, the country's policymakers should dilute the intrinsic bias of the policy and the policy incentives toward food grains (mainly rice and wheat), which have resulted in inefficient resource allocation and usage. The country needs to reorient its agriculture sector and policies by calibrating them with two things: the changing consumption patterns of the Indian population and the relative comparative advantage that the country's agricultural sector has globally. While the former would bridge the increasing gap between the "plough" and the "plate," the latter would help the country reap benefits from trade in terms of efficiency.

Apart from crops, the country's policymakers have an inherent bias toward certain regions. The Second Green Revolution, which is envisaged to be a game changer for the Eastern states, is a step in the right direction, with the focus shifting away from the traditional northern and southern agricultural states. This evolution should be accompanied by a reorientation of the roles of the many stakeholders, with the public sector playing a much smaller role in the food market in the future.

¹Balassa Index for revealed comparative advantage: It is an index used in international economics for calculating the relative advantage or disadvantage of a certain country in a certain class of goods or services as evidenced by trade flows. It is based on the Ricardian comparative advantage concept. For year 2013–2014, value of the index for agriculture is 1.37 and that of manufacturing is 0.8, thus indicating India's relative advantage in agri trade than manufacturing.

India is an important economy in the global food space and is naturally interdependent with the world. By having a stable long-run trade policy, creating institutions and infrastructures to facilitate trade, and focusing on promoting resource allocation in line with its inherent competitive advantage, the country will not only tap the full potential of its agricultural sector but will also benefit the world immensely.

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Appendix

Appendix

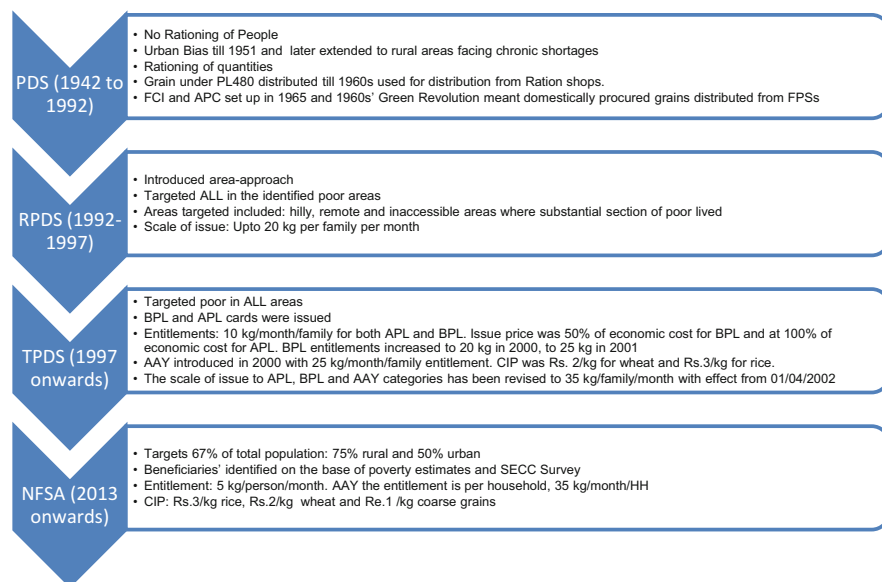


Fig. 14.16 Brief about the evolving system of PDS in India. *Source:* Saini and Kozicka (2014)

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