

India's Agricultural Trade Policy and Sustainable Development

By Anwarul Hoda and Ashok Gulati

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LIST OF ABBREVIATIONS AND ACRONYMS

A2+FL	Actual Paid Cost Plus Imputed Value of Family Labour
AAY	Antyodaya Anna Yojana
AICL	Agriculture Insurance Corporation Limited
AMS	Aggregate Measurement of Support
APL	Above Poverty Line
APMC	Agricultural Produce Marketing Committee
BCD	Basic Customs Duty
BGREI	Bringing Green Revolution to the Eastern India
BPL	Below Poverty Line
C2	Comprehensive Cost including the Imputed Rent on Owned Land, Interest on Capital and Transportation, Marketing and Insurance Costs
CACP	Commission for Agricultural Costs and Prices
CCI	Cotton Corporation of India
CGWB	Central Ground Water Board
DAP	Di-Ammonium Phosphate
FCI	Food Corporation of India
GATT	General Agreements on Tariff and Trade
GDP	Gross Domestic Product
GHG	Green House Gas
ICAR	Indian Council for Agricultural Research
ISF	Irrigation Service Fee
ISOPOM	Integrated Oilseeds, Oil palm, Pulses and Maize Development
ITC	International Trade Centre
LSHS	Low Sulphur Heavy Stock
MOP	Muriate of Potash
MRP	Maximum Retail Price
MSP	Minimum Support Price
MMT	Million Metric Tonne
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation
NAIS	National Agriculture Insurance Scheme
NAPCC	National Action Plan on Climate Change
NFSB	National Food Security Bill
NFSM	National Food Security Mission
NHM	National Horticulture Mission

NMMI	National Mission on Micro- Irrigation
NSC	National Seeds Corporation
NSSO	National Sample Survey Organisation
OBC	Other Backward Castes
O&M	Operation and Management
OTS	One Time Settlement
PDS	Public Distribution System
PDSN	Public Distribution System Network
PL480	Public Law 480 (also known as Agricultural Trade and Assistance Act Estimates)
PLF	Plant Load Factor
PPP	Public-Private- Partnership
RBI	Reserve Bank of India
RPS	Retention Price Scheme
RRB	Regional Rural Bank
SC	Scheduled Castes
SEB	State Electricity Board
SFCI	State Farms Corporation of India
SPUs	State Power Utilities
ST	Scheduled Tribes
STE	State Trading Enterprises
T&D	Transmission and Distribution
TPDS	Targeted Public Distribution System
TRQ	Tariff Rate Quota
UNCTAD	United Nations Conference on Trade and Development
USA /US	United States of America
USD	US Dollar
WBCIS	Weather based Crop Insurance Scheme
WTO	World Trade Organisation
WUA	Water Users Associations

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FOREWORD

In a nation of 1.2 billion people, in which its Prime Minister claims 50 percent of children are underweight and malnourished, food policy is a vital matter, to say the least. As I write this foreword and we go to press with this groundbreaking piece, the Upper House of the Indian Parliament passed an unprecedented law, expanding food subsidies to the poor to an annual total of US$ 20 billion. The law is likely to be controversial, even if the amounts are modest compared to food subsidies in some wealthier economies (e.g.: in the US about a third of the population benefits from food programmes, and for its largest, the food stamp scheme, subsidies account to over US$ 90 billion). As the initiative guarantees grain farmers minimum purchase prices by the state, it naturally raises controversy about the optimal use of resources in India, as well as concerns all over the world, given the current and potential scale of India's food economy.

Policy-makers and analysts have devoted particular attention to India's policies on agricultural trade, for a number of reasons. These include the country's remarkable growth in the past few years, its structural significance in the global economy, its initiatives to tackle rural poverty and food insecurity, its role in contributing towards efforts to address climate change, and its significant share of world population. Furthermore, the country's farm policy objectives, pursued through instruments such as its rapidly-growing domestic support programmes and accompanied by new proposals for addressing food insecurity such as those set out in the Food Security Bill, have also helped to propel the country's chosen approach into the limelight – especially as others, such as China, have opted for quite different policy instruments to achieve similar overall goals.

As India proceeds with implementation of the 2012 Five Year Plan, and the now approved programmes under its Food Security Bill, and with India continuing its pursuit of integration into the global economy through bilateral and regional trade agreeements, we hope that this study will provide a useful and timely contribution to domestic and international discussions in these areas. At the same time, with emerging interest in the extent to which the country's farm subsidies cause no – or at most minimal – trade distortion, other WTO members remain keenly interested in the trade dimension of India's domestic farm policies. The complex ways in which agricultural domestic support and market access policies affect different national constituencies – including producers and consumers, rural and urban, subsistence farmers and those producing for markets – mean that the nature of the relationships in these areas is likely to require careful study and analysis. However, as governments around the world search for viable policy tools that could allow them to address global challenges related to climate change, water, energy, biodiversity and food security, India's experience in pursuing its objectives in these areas could represent a valuable contribution to the wider debate in this area.

At ICTSD we are aware that agricultural policy, and in particular, carefully designed agricultural trade policies can contribute towards ensuring economic growth in a sustainable and equitable manner. Also that such policies can help overcome food insecurity and poverty in both domestic and global populations. While reforms of relevant international regulatory frameworks under the WTO's ongoing Doha Round have widely been seen as a significant step towards harnessing agricultural trade policy to these objectives, governments and other stakeholders increasingly recognise the imperative actively to seek compatibility between domestic agricultural trade policies and broader public policy goals.

For these reasons, ICTSD is currently conducting a series of studies and policy dialogues aimed at exploring some of these relationships in major economies, looking not just at agricultural trade policies in more advanced economies such as the US and EU, but also in some of the larger emerging economies of China, India and Brazil. To date, discussions of farm policy directions in the EU,

under the bloc's post-2013 Common Agricultural Policy, have represented a valuable opportunity for domestic policy-makers as well as their trading partners to review the implications of agricultural trade policy for sustainable development objectives, as has discussion over the future of farm policy in the United States under Farm Bill legislation now expected in 2013. In addition to reviewing how current policies may affect internationally agreed goals in areas such as food security, these discussions have provided an opportunity for policy-makers and experts to share analysis of the implications of new aspects of the policy environment – such as the challenges posed by high and volatile food prices.

This study therefore seeks to deepen domestic and international policy-makers' understanding of the relationship between India's agricultural domestic support policies and broader public policy goals, by providing an evidence-based assessment of the extent to which India's current farm trade policies are successful in achieving economic, social and environmental objectives. We're proud of having brought together two foremost thinkers and policy experts on these matters, Prof Anwarul Hoda and Dr. Ashok Gulati, as authors, and of doing so at this very moment; that in itself boosts our trust that this paper represents a significant addition to the evolving discussion in this area.

Following ICTSD practice and approach, a policy dialogue on a preliminary draft of the paper, involving experts and stakeholders was held in New Delhi in April 2013, co-convened by ICRIER under the guidance of Dr. Rajat Khaturia, for which we're most grateful.

Ricardo Meléndez-Ortiz
Chief Executive, ICTSD

EXECUTIVE SUMMARY

Scope of the paper

During the last six decades or so Indian agriculture has made remarkable progress with food grain production growing five fold from about 50 MMT in 1950 to more than 250 MMT in 2012. Despite the increase in population from 361 million to 1.2 billion during this period, India has turned from a food deficit to a food surplus country. From the angle of achieving growth in production, clearly India's agricultural trade policy has been highly successful.

This paper examines India's agricultural trade policy mainly from the perspectives of public policy objectives, especially providing food security to the poor within the overall goal of inclusive and sustainable development, but also against the benchmark of the WTO rules and India's commitments therein. The analysis covers in detail domestic support measures and market access issues in agriculture, and the way forward in terms of policies that can promote efficiency (least trade and production distorting) while simultaneously ensuring food security and the sustainability of agricultural production.

Underpinnings of India's agricultural trade policies

Ensuring food security for a rapidly increasing population has been the principal goal of India's food and agricultural policies, and all agri-trade policies have been subservient to this goal. In the quest for self-reliance in basic food (especially key staples like rice and wheat) trade policy has oscillated between export controls and high import duties. Nevertheless, over the years, India has been gradually integrating its agriculture with global markets, and its agri-trade (imports plus exports) as a percentage of agri-GDP has risen from about 5 percent in 1990-91 to about 18 percent in 2011-12.

Given that India still has the largest number of poor and malnourished people in the world, one of the major concerns has been to keep food prices under control. It is this over-riding concern that has often led to export controls, high stock holdings to feed the public distribution system, and large food subsidies for the poor. To incentivise production, cultivators have been provided with subsidies on inputs and minimum support prices for some of their products. This twin-track approach of keeping food prices low for the consumer and incentivising production through domestic support has been the hall mark of India's agricultural policies.

Due to the rising population the per capita availability of cultivated land and water has declined and raising food production in a sustainable manner has become a bigger challenge. With falling water tables in much of India, and forecasts that the frequency and intensity of droughts and floods will increase with climate change, there is increasing concern about the sustainability of agriculture.

Policies and programmes to support farm operations

Input subsidies and market price support are the two pillars of India's domestic support programmes.

In 2010-11, input subsidies generally available to cultivators (non-product-specific subsidies) totalled USD 27.6 billion, comprising of subsidies for irrigation (USD 4.7 billion), power (USD 6.5 billion), fertilisers (USD 13.7 billion), credit (USD 2.47 billion), and some small amount coming from subsidies for seeds, insurance etc. In that year, these subsidies were 8.88 per cent of the total value of agricultural output but earlier in 2008-09 the level had topped 15 per cent. However, how these percentages measure up against the de *minimis* level of 10 per cent fixed in

the WTO Agreement on Agriculture for developing countries, would depend on the interpretation of 'low-income' or 'resource-poor' farmers in respect of whom Article 6.2 of the WTO Agreement exempts them from reduction commitments. Without doubt, the area of agricultural holding cannot be the sole measure of the income status of farmers as farm income depends critically on the availability of assured irrigation. However, because of the lack of availability of detailed holding wise data on water, there is little option but to undertake analysis on the imperfect basis of the area of the holding alone. Analysis by the authors shows that whether we take the defining level to determine the low-income or resource-poor status as 10, 4 or 2 ha, in 2010-11, the total non-product-specific subsidy as a percentage of the total value of agricultural output was well below the benchmark of 10 per cent. Even in 2008-09, when there was an unprecedented spike in government support for agriculture, this percentage remained below the benchmark and was 7.75 percent, for the most rigorous interpretation of 'low-income' or 'resource-poor'. The benefit to the farmer of input subsidies is substantially neutralised by inefficiencies in the delivery of the service by the government or government agencies. In surface irrigation, due to the lack of maintenance and disrepair of existing canal systems the farmer does not get the water for the crops in a timely fashion. Deficiencies in the functioning of State Electricity Boards result in interruptions in power supply and voltage fluctuations, which damage the pumps used by the farmer. Low irrigation service fees and free or very nominal rates for power are contributory factors leading to these inefficiencies.

Sustainable Development

There has been a tendency on the part of the state governments to spread thin the available financial resources by taking too many irrigation projects in hand. As a result, there are time and cost overruns in the completion of projects and delays in benefits flowing to the farmers. Lack of command area development, after the head works and main canal systems have been completed, leads to the same situation.

Over the years, ground water has gained in importance and now accounts for about 62 per cent of the net area under irrigation. However, in many parts of the country power subsidies have resulted in the farmers drawing out ground water in excess of the utilisable recharge, with the result that the water table has fallen, causing environmental degradation.

Fertiliser subsidies have resulted in the overuse and skewed use of chemical fertilisers and led to the neglect of organic matter and depletion of micro-nutrients with adverse consequences for soil fertility.

Minimum price support

Rice and wheat are the main crops in which the declared MSP is backed by extensive and regular purchase operations by a government agency. Calculations by the authors show that after making full adjustment for the excessive levels of inflation as envisaged in Article 18.4, the MSPs are well below the fixed external reference prices. The negative gaps between the fixed external reference prices and the MSPs are large enough to allow full adjustment of product-specific investment and input subsidies.

National Food Security Ordinance (NFSO)

Given that providing economic access to food for the poor is a major concern, the central government has promulgated the National Food Security Ordinance (NFSO) on July 5, 2013. The Ordinance grants the 'Right to Food' to the population and is the biggest ever experiment in the world for physically distributing highly subsidised food grains (61.2 million tonnes) to 67 percent of population. It would

raise the direct food subsidy bill from the current level of about Rs 900 billion (USD 15 Billion) to Rs1,250 Billion (USD 20.8 billion) annually. The main weakness of the NFSB is that it relies on the existing Public Distribution System (PDS) machinery, which is known to be highly inefficient (almost 40 percent of food leaks away) and expensive, given the high costs of operations of public agencies like FCI.

Market access and export controls

India's average tariff binding on agri-commodities is 113.1 percent while its applied rates of tariffs were at 31.8 per cent in 2009. The wide gap between bound and applied levels of tariffs is principally the result of the unilateral and autonomous liberalisation undertaken by India since the Uruguay Round, which deserves appreciation rather than criticism. However, the applied tariffs on India's biggest agri-import items have been brought down to the low level of 2.5 per cent on crude edible oils and 7.5 percent on refined edible oils in June 2013. India imported edible oils worth more than USD 11 billion in FY 2012-13. The applied tariff on pulses, the next biggest agri-import of around USD 2.3 billion, is zero.

In the past, particularly during 2007-11, the use of quantitative restrictions on exports of some agricultural products (like common rice and wheat), by the government benefited consumers but hurt the interests of farmers. Moreover, the restrictions led to large accumulation of grain stocks at home, touching 80 MMTs on July 1, 2012. There are indications that this may be changing and exports have been opened since October 2011, and India has emerged as a significant exporter of both rice and wheat (16.6 MMT in FY 2012-13).

The way forward

In general, domestic support of agriculture needs to move from measures that cause more than minimal trade and production distortions to those that do not have such effects, from input to investment subsidies and from consumption subsidies in kind to direct or conditional cash transfers. The funds so saved can be used for greater public investment in physical infrastructure and in research, extension and measures to safeguard animal health. The following are the specific suggestions:

Further investment in major and medium irrigation projects should aim mainly at completing the projects in hand. Command area development should be intensified to bridge the gap between the potential created and utilised. The ISF should be progressively raised to meet the O&M cost, and management of irrigation projects should be handed over to WUAs.

Drip irrigation with fertigation (the application of fertilisers through micro-irrigation) in crops like sugarcane and banana can go a long way in promoting sustainability as it can save 40 to 50 per cent of water, and almost 30 to 40 per cent of fertilisers and energy consumption, compared to the traditional method of flood irrigation. There is a need to scale up investment subsidies for micro-irrigation already being granted by the central and state governments, with the added element of fertigation, as it could save up to 30 per cent in fertiliser consumption while ensuring better yields.

- The starting point in power has to be assuring the farmer of good quality supply of power even if this can be done only for a limited period of time. This could be accomplished as Gujarat has done by separating the feeders for supply of power for farm operations. Improvement in supplies is a pre-requisite for the next step of raising power rates progressively to the level of the average cost of supplies. Further, solar panelled motor pumps need to be incentivised to promote environment friendly and sustainable irrigation.

- The first task in fertilisers must be to extend Nutrient Based Subsidy (NBS) scheme to urea. The NBS should be fixed in nominal terms, allowing inflation to erode it in real terms over time. An alternative could be to shift to the system of conditional cash transfers, whereby direct payments are made on the condition that farmers get soil analysis done and know the proportions of nutrients suitable for their holdings.

- Given that almost 40 percent of agri-credit is still from informal sources at much higher rates of interest, the highest priority needs to be given to improving the reach of agri-credit through institutional sources. Interest subsidy can be contained and phased out gradually. Repeating loan waivers is not advisable as it damages the credit culture.

- The TPDS needs to be reformed for obtaining better delivery of benefits and reduction of the cost by adopting the system of conditional cash transfers. Ideally, this should have been done before implementation of the new legislation on food security. Since the National Food Security Ordinance, 2013 has already come into force, the reform agenda would need to be addressed on priority.

- The Government should keep only strategic reserves of food grain stocks, which should be acquired from the private sector by inviting open tenders. The open ended physical procurement of grains needs to be reviewed, and farmers need to be incentivised by 'getting the markets right', i.e., by removing the myriad controls on markets including exports and rationalising taxes and other levies.

- To impart a modicum of stability in the applied tariff levels on agricultural products the statutory rates should be reduced to the exempted levels, where exempted levels have remained unchanged over a long period

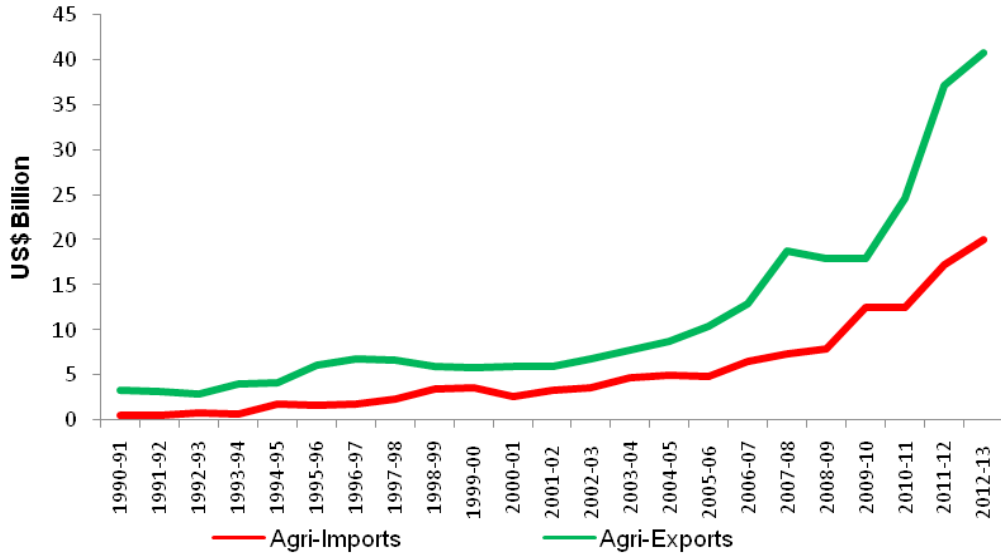
- Whenever it becomes imperative to limit exports, the objective should be accomplished by levying an export duty rather than imposing quantitative restriction.

- For sustainable agriculture it is necessary to take steps to bridge the gap between creation and utilisation of irrigation potential, regenerating groundwater through check dams and water harvesting, encouraging drip irrigation with fertigation and motor pumps with solar panels, stimulating agricultural activities in Eastern India, which has plentiful groundwater resources and promoting the conjunctive use of biological nutrients together with chemical fertilisers.

INTRODUCTION

Since economic reforms began in 1991, India has remained consistently a net exporter of agri-products, with agri-exports touching USD 40.7 billion and imports at USD 20 billion in FY 2012-13 (Figure-1). India's share in global agri-exports has also increased from 0.8 per cent in 1990 to 2.1 per cent in 2011, indicating its growing international competitiveness in agriculture. Overall, agri-trade (exports plus imports) as a percentage of agri-GDP has also improved from about 5 per cent in 1990-91 to more than 18 per cent by 2011-12, suggesting India's gradual integration with the global economy. During FY 2012-13, India exported 22 MMTs of cereals and emerged as the biggest exporter of rice and buffalo meat. Yet, Indian agri-trade policies have remained somewhat overly cautious, with export controls on wheat and common rice during 2007-11 and earlier during 1996-2000, and restrictive export policies on oilseeds/edible oils and pulses. The primary objective of food policy in the country is to ensure food security (adequate supplies at affordable prices) to the poorest, and it is inevitable for trade policy to be guided and influenced by the overall food policy. It is against this backdrop that one must understand the dynamics of India's agri-trade policy.

Figure 1: India's Exports and Imports of Agri-commodities, 1990-91 to 2012-13



Source: based on DGCIS data

In order to ensure food security to the rapidly increasing population, the foremost policy effort in India has been to increase domestic production in an efficient and sustainable manner. Viewed from this perspective, India's agriculture has made impressive strides in the six decades since becoming an independent republic. In 1951, it had a population of 361 million and food grain production of 50.82 MMTs. It was a food deficit country with abject dependence on food aid from the USA. In 2012, its population is estimated to have grown to 1.2 billion but the food grain production has grown more, to 256 million MT. Its granaries are full and India is exporting large quantities of cereals (22 MMTs in FY 2012-13). India has been for some time the world's second largest producer of both wheat and rice and, in 2012, it emerged as the largest exporter of rice. It is also the world's largest producer of milk and the largest exporter of beef (buffalo meat). It has been truly a remarkable transition.

Under the Indian Constitution, agriculture is a state subject, but states generate very little revenue surplus to undertake new schemes for development. As a result, they are dependent on the centre for taking new initiatives. The programmes of support and protection in agriculture are initiated and funded principally by the centre, and states play a role mainly in

implementation. The policies that have made the growth story possible have basically four elements: technology (R&D, seeds, extension), incentives (prices, procurement, input subsidies), infrastructure (roads and power) and institutions (markets, land laws, credit, insurance, etc.). This paper critically examines India's agricultural trade policy mainly from the perspective of public policy objectives, including food security, poverty alleviation and sustainable development. It also assesses it against the benchmark of WTO rules and India's commitments therein.

Section I describes briefly the public policy objectives that have shaped the policies of agricultural support and protection. Section II takes the reader through the multifarious schemes and policies introduced to achieve the objectives described in the previous Section, while dwelling on both successes and failures in implementation. Section II also undertakes an analysis of the policies and practices in the light of the rules and obligations of the WTO. Section III offers suggestions and recommendations for change.

1. FOUNDATION OF INDIA'S AGRICULTURAL TRADE POLICY: THE OVER-ARCHING OBJECTIVE OF FOOD SECURITY

This section dwells on the main factors that have shaped India's agricultural trade policy.

1.1 Guaranteeing Food Security[1] by Augmenting Domestic Production

The need to produce food grains sufficient to meet the needs of a burgeoning population has been at the centre of India's policies of support for agriculture. In 1951, when India embarked on a programme of planned economic development the Planning Commission assessed the food grain 'deficit' of the country to be 6-7 per cent of production and policy makers put the greatest emphasis on the need to end dependency on imported food grains (First Five-Year Plan). Since the foreign exchange earnings from the narrow range of products exported by India at that time were needed for the import of raw materials, intermediate and capital goods, very little could be spared for imports of food grains. Consequently, striving for maximum self-sufficiency in food grains was seen as a *sine qua non* for food security. Nevertheless, for many years, India continued to depend on imported food grains, financed partly by the US aid under P.L.480. International political developments brought about a change in food aid flows from the USA to India. At the time of the Indo-Pakistan war in 1965, the USA suspended food aid to both countries, but more significantly, in 1966, the US administration refused to renew the PL 480 agreement on a long-term basis, declaring its intention to keep India 'on a short leash'. The overt attempt to use food aid as a political weapon strengthened India's resolve to increase food production and agricultural strategy was geared even more towards self-sufficiency in food grains. A series of new initiatives were taken to stimulate agricultural production. The Agricultural Prices Commission and the Food Corporation of India were established in January 1965 with the objective of providing remunerative and effective Minimum Support Price (MSP) for key staples. It was during this time that the initial steps to usher in the Green Revolution in India were taken, inter alia, by importing HYV seeds for wheat.

In order to allow domestic agricultural production to grow, no scope was left for import competition and trade policy swung to the extreme of autarky. A highly restrictive policy on imports was facilitated by the fact that India could impose quantitative restrictions on imports for balance-of-payments reasons under the GATT rules. High import tariffs could also be maintained except on a few products in which India had made a commitment to reduce or eliminate duties in past negotiations. During the next twenty years or so, agricultural trade policy remained highly restrictive and even the import of edible oils, in which domestic production was well short of the demand was progressively closed.

Things changed with the introduction of economic reforms in 1991and there was greater willingness to allow imports. There was a slow transition in trade policy away from quantitative controls towards tariffs and imports of items such as edible oils increased sizably. The next big step came in 2000, when on account of the improvement of its balance-of-payments position, India had to phase out quantitative restrictions altogether. While this reinforced the trend towards liberalisation of imports, India raised import tariffs to ward off the perceived danger of a possible flood of imports after the elimination of quantitative controls in some key products such as rice, maize and skimmed milk powder. To do this, India had to undertake renegotiations in the WTO as it had undertaken a binding commitment to maintain the tariff at zero for these products during the original negotiations in GATT 1947.

Despite import liberalisation following economic reforms, policy makers have retained the basic orientation towards self-

sufficiency in food grains production. Imports of 6 MMTs of wheat in 2006-07, and the steep rise in the international price of food grains in 2007 prompted export controls on wheat and rice on the one hand, and renewed steps to raise production on the other. The National Food Security Mission was launched in May 2007 to raise food grain production by 20 MMTs by 2011-12 (rice by 10 MMTs, wheat 8 MMTs, and pulses 2 MMTs). The achievement of the target for wheat and rice led to a massive accumulation of food grain stocks, which touched 80 MMTs on July 1, 2012.

1.2 Guaranteeing Food Security by Enabling "Economic Access" to Food

While farmers received substantial incentives to increase food production, an equal or even more heightened concern for the government was to protect consumers. It is this concern that led to the expansion of the public distribution system under which poorer consumers received basic staples (primarily rice and wheat) at subsidised rates.

Although the government tried to maintain parity between the interests of producers and consumers, in fact the there was a pro-consumer bias and domestic prices were held down below international prices in most years despite purchase operations to defend minimum support prices. Exports of food grains were prohibited to keep domestic prices down, leading to an implicit taxation on domestic production of food grains. Input subsidies were given to farmers to partially compensate them for the implicit taxation and to ensure that they did not lose the incentive to produce.

The Food Security Ordinance, 2013, which proposes the distribution of 61.2 MMTs of food grains to 67 per cent of the population through the existing public distribution system (PDS) at highly concessional prices (almost at one-tenth of the economic cost) is the latest policy effort to provide "economic access" to food.

1.3 Challenges of Small Holders and Sustainable Development

According to the Agriculture Census of 2010-11, there were 137.76 million operational holdings, covering 159.18 million hectares of land, giving an average holding size of only 1.16 ha. The average holding size has been steadily falling over time: from 2.28 ha in 1970-71 to 1.84 ha in 1980-81 and further to 1.55 ha in 1990-91, 1.33 ha in 2000-01 and 1.16 ha in 2010-11, indicating increasing pressure on limited land.

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Small and marginal farmers with less than 2 ha, as defined in the Agricultural Census, account for 85 per cent of holdings and 44 per cent of operational area. Those with less than 4 ha (semi-medium and below) account for 95 per cent of holdings and 68 per cent of operated area. Indian agriculture is thus dominated by tiny plots, and an overwhelming majority of farmers are resource- poor. The NSSO results for 2011 also show that almost 49 per cent of the work force is still working in agriculture. Government policy, therefore, is aimed at providing livelihood support to large numbers of resource-poor farmers. This support is all the more critical because the pressure on natural resources, especially water, is already intense at several places, and the IPCC report on climate change points towards greater severity and frequency of droughts and floods in future, magnifying the overall risk in farming. Government has formulated a National Action Plan on Climate Change (NAPCC) with eight different missions encompassing both adaptation and mitigation strategies. In brief, sustainable development of agriculture would require government support to millions of farmers with a focus on better utilisation of water and the means to cope with the risks of climate change.

2. POLICIES AND PROGRAMMES TO SUPPORT FARM OPERATION

This section explains the main types of farm subsidy programmes and market access measures currently in position in India. It looks at the whole gamut of domestic support measures, including input subsidies and market price support as well as buffer stocking operations, public distribution system and domestic food aid, and evaluates the extent to which these programmes and measures have been effective in addressing the public policy goals described in Section 1. It also examines the policies and practices in the light of the rules and obligations of the WTO.

2.1 Domestic Support

2.1.1 Non-Product Specific Subsidies

Input subsidy for agricultural operations has been an important component of domestic support programmes in India for the last four decades. The six main types of subsidies are (a) irrigation subsidy given by charging user charges that are much below what might be warranted by the expenditure on the operation and maintenance of surface irrigation; (b) power subsidy through user charges that are lower than the cost of supplying power; (c) fertiliser subsidy that involves sales below the market prices of fertilisers; (d) credit subsidy through an interest subsidy on credit obtained from commercial banks or other financial institutions for investment or production purposes and through outright waiver of loans; (e) subsidy on crop insurance and (f) subsidised sales of seeds. There may be other subsidy programmes introduced by state governments from time to time, which are not covered in our analysis. But we believe that we have included all the major ones and any other programmes would be very small in comparison to the ones included here. We describe the main features of the input subsidy programmes and their likely effects, and attempt to quantify them. We examine these subsidies in the light of WTO rules and, in this context, we consider input subsidies in the aggregate and calculate the non-product-specific AMS as a proportion of the value of agricultural production (crop agriculture plus animal husbandry, excluding fishery and forestry). Wherever applicable, we also look at the programmes from the angle of environmental sustainability.

2.1.1.1 Irrigation subsidies

Since assured irrigation is a key input for increasing agricultural production, expansion of irrigation through public investment in major and medium irrigation projects has been at the centre of the government's strategy for expanding agricultural production in the country. Building on the canal system inherited from the time of British colonial rule, the central and state governments have collaborated in making large public investments in river-valley and other major and medium projects during the period 1951- 2012. For a number of reasons, which we shall examine in the next section, the relative importance of surface irrigation vis-à-vis lift irrigation has been on a decline in the country. But in the past this development did not affect the allocation of resources to surface irrigation projects and it is only in the Twelfth Five Year Plan that a decision has been taken to limit investment in new projects. The cumulative nominal investment during this period was about Rs 3500 billion, and it raised the irrigation potential from 9.72 million hectares (MHA) to an estimated 46 MHA up to 2012.

Major problems have been encountered in the implementation of major and medium irrigation projects. First, since available financial resources have been spread thin by taking up a large number of projects, their completion has inevitably taken a long time. In 2012, at the end of the Eleventh Five-Year Plan, there were as many as 337 projects that had spilled over from previous Plan periods, including 36 from 1980 or earlier. Mainly because of the time overruns the incremental additions to the total irrigation potential created have been disproportionately small compared to the large sums invested every year. Second, the gap between the creation

and utilisation of irrigation potential has been growing. Utilisation had reached only 35 MHA by the year 2011-12 against the irrigation potential of 46 MHA created. The main factors responsible for the gap are inadequate command area development resulting in missing water outlets and field channels. Difficulty in acquiring land is one of the reasons impeding the construction of field channels. Third, the collection of irrigation service fee (ISF) or water rates has been falling. The Committee on Pricing of Irrigation Water appointed by the Planning Commission, in its Report of September 1992, had recommended that the rates of ISF should be so fixed as to allow for full cost recovery, covering operation and maintenance, depreciation as well as interest on capital employed (GOI 1992). The Committee had acknowledged the need for increasing the ISF gradually along with parallel action for improving the quality of service. In the first phase, it recommended full recovery of the Operation and Management (O&M) cost plus one per cent of the cumulative capital cost.

As against this recommendation, the ground reality is that for a number of decades only a small fraction of the O&M expenses are being covered by the collection of ISF and the proportion has been falling. Water rate collections have been falling also as a percentage of the cumulative investment and as a proportion of the value of crops as can be seen in Table 1

Table 1: Irrigation Service Fee in India

Year	1902-03	1977-78	1986-87	2001
Irrigation Service Fee as a % of investment	10%	1.43%	0.3%	0.2%
Irrigation Service Fee as % of Value of Crops	11%	NA	2%	1.2%
Irrigation Service Fee as a % of O&M costs	280%	45%	20%	7.9%

Source: Adapted from India Infrastructure Report 2011, Water: Policy and Performance for Sustainable Development, Infrastructure Development Finance Corporation (IDFC), New Delhi, November, 2011.

The water rates fixed in the past were not periodically revised to take inflation into account, and there are substantial shortfalls in the collection even of the low rates fixed. As a result, they cover a diminishing proportion of O&M expenses and depreciation. The National Accounts Statistics contain an estimate of imputed subsidies in the working of departmental enterprises of the central and state governments. Imputed irrigation subsidies, calculated on the basis of O&M expenses and depreciation but excluding gross receipts constitute the bulk of the subsidies in the working of departmental enterprises. Table 2 shows the level of imputed subsidies in irrigation during the years 2007-08 to 2010-11, covering major, medium and minor irrigation projects with public investment.

Table 2: Irrigation Subsidies: Estimates Based on National Accounts Statistics on Major, Medium and Minor Irrigation *(Billion US Dollar)*

Years	Imputed Subsidy	Irrigation Subsidy as a percentage of Imputed Subsidy	Imputed Irrigation Subsidy
1	2	3	4
2007-08	8.06	59.85	4.82
2008-09	7.66	61.8	4.73
2009-10	8.53	62.3	5.31
2010-11	10.15	65.31	6.63

Source: Statement 39, National Accounts Statistics, 2012.

Note 1: Statement 39 gives the imputed subsidy in the working of all departmental enterprises other than Railways and Communication, such as operation of government irrigation system, ordnance factories, printing presses etc. It has been ascertained from the Ministry of Statistics and Programme Implementation that out of the total the percentages mentioned in col. 3 represent the share of irrigation subsidies.

Note 2: The USD- INR exchange rates used here and all subsequent Tables are based on the annual averages given in the Economic Survey (2011-12), which are reproduced in Annex Table A 10.

Use of water resources for agriculture and sustainable development

There is little doubt that irrigation from public irrigation projects has contributed significantly to the increase in agricultural production in the last six decades. But long delays in the construction of irrigation projects, cost overruns, the substantial gap between the creation and utilization of irrigation potential, low irrigation service fees (despite the willingness of the farmers to pay for improved services), absence of volumetric measures to distribute water, the inability of the state governments to maintain the canal systems in a state of repair and the waste of water by farmers in the head reaches, all raise questions of efficiency and sustainability (financial and environmental) in the use of water resources from the public irrigation system.

One of the institutional initiatives undertaken in India is that of participatory irrigation management, made effective by setting up water users' associations to take over the functions of collection of ISF, and operation and maintenance. So far, 15 states have enacted Participatory Irrigation Management (PIM) Acts, but the scheme has not been uniformly successful even in the states that have put the legal framework in place.

Quantification of irrigation subsidies under WTO rules

Annex 2 of the Agreement on Agriculture exempts certain domestic support programmes that are considered to have no, or at most minimal, trade distorting effects or effects on production. Infrastructural services are specifically mentioned and item 2(g) of the Annex defines the scope of exemption as follows:

'infrastructural services, including: electricity reticulation, roads and other means of transport, market and port facilities, water supply facilities, dams and drainage schemes, and infrastructural works associated with environment programmes. In all cases the expenditure shall be directed to the provision or construction of capital works only, and shall exclude the subsidised provision of on-farm facilities other than for the reticulation of generally available public utilities. It shall not include subsidies to inputs or operating costs, or preferential user charges.'

It follows from the above provision that all capital related charges, be it interest on capital or the opportunity cost of the capital, would need to be excluded from the calculation of subsidies in irrigation facilities provided by government, for the purposes of estimating the Aggregate Measurement of Support (AMS). Similarly, depreciation would also be excluded. There is a subsidy only to the extent the irrigation service fees does not cover O&M expenses. Table 3 gives the calculations of irrigation subsidies for the latest four years for which data is available. This is estimated by deducting depreciation based on National Accounts Statistics from the figures of imputed irrigation subsidy calculated in Table 2.

Table 3: Irrigation Subsidies: Estimates Based on National Accounts Statistics on Major, Medium and Minor Irrigation *(Billion US Dollar)*

Years	Imputed Subsidy	Irrigation Subsidy as a percentage of Imputed Subsidy	Imputed Irrigation Subsidy	GDP From Departmental Enterprises (Agriculture)	NDP From Departmental Enterprises (Agriculture)	Depreciation (Col. 5 - Col. 6)	Irrigation Subsidy (Col.4-Col. 7)
1	2	3	4	5	6	7	8
2007-08	8.06	59.85	4.82	4.49	3.01	1.48	3.34
2008-09	7.66	61.8	4.73	4.43	2.98	1.46	3.28
2009-10	8.53	62.3	5.31	5.22	3.58	1.64	3.67
2010-11	10.15	65.31	6.63	6.73	4.79	1.93	4.70

Source: Statements: 27, 28 and 39, National Accounts Statistics, 2012.

2.1.1.2 Power subsidies

Rural electrification has been a big factor in the growth of agricultural production in the country over the past 50 years as it has greatly expanded lift irrigation for the exploitation of groundwater resources. In most parts of the country, lift irrigation has surpassed surface irrigation in importance. Even in the command areas of surface irrigation projects lift irrigation is used to supplement surface irrigation. The Twelfth Five-Year Plan mentions that over the last four years, groundwater has accounted for about 84 per cent of additions to the net irrigated area in the country. Tube wells and other wells have become the main source of irrigation in the country as shown in Table 4.

Table 4: Net Area under Irrigation by Source ('000 hectares)

Year/State/ Union Territory	Canals			Tanks	Tube Wells and other Wells	Other Sources	Total
	Govern-ment	Private	Total				
1	2	3	4	5	6	7	8
2000-01	15809	203	16012	2466	33818	2909	55205
2001-02	14992	209	15200	2186	35183	4350	56920
2002-03	13865	206	14071	1803	34348	3662	53884
2003-04	14248	206	14455	1916	36383	4292	57046
2004-05	14550	214	14763	1734	35189	7531	59218
2005-06	16489	227	16716	2083	36070	5962	60831
2006-07	16802	224	17026	2078	37641	5998	62744
2007-08	16595	217	16812	1978	38400	6103	63291
2008-09	16750	195	16945	1985	38795	6015	63740
2009-10	16508	188	16697	1638	39042	5880	63256
2009-10	16508	188	16697	1638	39042	5880	63256

Source: Statistical Year Book, India, 2013.

Tube wells are powered not only by electricity but by diesel as well, and in fact according to NSSO data (Ackermann 2012), 66 percent of the tube wells in the country use diesel pumps. The use of electric pumps is particularly poor in the eastern states, being as low as two per cent in Bihar and Jharkhand, because of the poor progress in rural electrification in these states. While diesel pumps are in greater use in the country as a whole, major agricultural states are reliant on electric pumps, and there is little doubt that rural electrification has been an important contributory factor in raising agricultural production in these states.

The inexorable rise of groundwater irrigation is due to the fact that, in using this source of irrigation, farmers are in full control, unlike in the case of surface irrigation. Groundwater irrigation enables farmers to draw water at the times and in quantities that they need. As the country progresses towards high value agriculture and precision farming, and there is need for using micro-irrigation (sprinkler and drip-irrigation) for greater efficiency in water use, lift irrigation will grow further in importance. The possibility of application of fertilisers through micro-irrigation (fertigation) will further enhance the value of this mode of irrigation.

While the private sector is allowed entry, the generation, transmission and distribution of power is done largely in the public sector, primarily by the State Electricity Boards. The past two decades have seen extensive reforms in the power sector, which have resulted in the unbundling of generation, transmission and distribution and in the establishment of regulatory bodies both in the states and at the centre. The regulatory bodies at the state level have been empowered to fix the power rates to be charged from various categories of consumers, but in effect, these are still being substantially influenced by state governments, based on electoral considerations. There is wide variation in the rates for agricultural consumers across states and in some states power is supplied free. The charges for farmers have been raised in recent years but the average rates charged by State Electricity Boards are still much below either the cost of supply or the rates charged from other categories of consumers.

Table 5 shows the full picture.

Table 5: Average rates of power supply for various consumer categories *(USD/Kwh)*

	2007-08	2008-09	2009-10	2010-11	2011-12
Unit cost of power supply	404.42 (0.101)	459.58 (0.100)	476.04 (0.101)	483.87 (0.106)	487.15 (0.102)
Average rate of sale	306.46 (0.076)	325.76 (0.071)	333.44 (0.070)	357.33 (0.079)	379.56 (0.079)
Average rate for agriculture	77.57 (0.019)	94.73 (0.021)	100.97 (0.021)	123.49 (0.027)	153.13 (0.032)
Average rate for industry	416.41 (0.103)	432.74 (0.094)	449.99 (0.095)	477.88 (0.105)	497.11 (0.104)
Average rate for domestic	242.23 (0.060)	252.96 (0.055)	275.82 (0.058)	300.49 (0.066)	320.03 (0.067)
Average rate for commercial	494.34 (0.123)	509.88 (0.111)	525.76 (0.111)	560.23 (0.123)	581.04 (0.122)

Source: Annual Report (2011-2012) on 'The Working of State Power Utilities &Electricity Departments, Planning Commission, Government of India, October 2011, New Delhi

In assessing the benefit flowing to the farmer from the subsidised sale of power, we must take into account a number of aspects. First, many factors result in sharply raising the cost of supply of power from the SEBs. These include the poor plant load factor in generation (PLF), theft of electricity wrongly ascribed to transmission and distribution losses (T&D) and overstaffing. The PLF for State Electricity Boards was only about 66 percent in 2009-10. T&D losses were high on the average at about 22 per cent in 2011-12, much beyond the level that may be technically justified. The latest Annual Report on 'The Working of State Power Utilities' points out that the staffing levels are well above the norm. Second, the compulsion to charge highly subsidised rates from agricultural and domestic consumers cripples the SEBs financially and hampers operation and maintenance functions, resulting in deficiencies in both the quality and quantity of supply to all categories of consumers, perhaps agricultural consumers more than others. The irony is that it is the subsidised rates for supply of power to agriculture that constitutes one of the principal factors affecting the financial viability of the SEBs and impairing the efficiency of their operations. Over the past five years, the share of agriculture in the total sale of power has hovered around 22-23 per cent, while the share of agriculture in revenue has been in the range of 6-9 per cent. The commercial losses of SEBs are closely correlated to the subsidy for agricultural consumers as shown in Table 6.

Table 6: Commercial profit/loss of SPUs *(Billion US Dollar)*

	2007-08	2008-09	2009-10	2010-11	2011-12
Subsidy to agriculture	8.32	8.61	9.49	9.83	9.54
Subsidy to domestic users	4.05	4.94	5.16	5.20	5.13
Gross subsidy including others	12.10	13.24	14.92	15.10	14.71
Subvention from State Government	4.22	5.00	5.14	3.99	3.69
Surplus from other users	1.12	-0.78	-0.57	0.03	0.10
Uncovered subsidy	6.73	9.02	10.33	11.06	10.04
Commercial Profit/Loss	-8.37	-11.41	-12.63	-13.08	-11.58

Source: Annual Report (2011-2012) on 'The Working of State Power Utilities &Electricity Departments, Planning Commission, Government of India, October 2011, New Delhi

Note: Here, as in Column (2) of Table 8 below, the calculation of subsidy for each category of consumer is based on the difference between the unit cost of supply and the tariff for that category in each state.

While the scale of subsidy on supply of power for agriculture might be expected to result in benefits to farmers, it is arguable that the inefficiencies in the operation of the SEBs outweigh these benefits. There are interruptions in power supply to farms, especially when they need it most in times of deficient rainfall. The quality of supply is also poor and burnout of motors in pumping sets is a common occurrence due to voltage fluctuations. Gulati and Narayanan (2003, p 119) quote the National Sample Survey (NSS) of 1997-98 as saying that 'a whopping 48 per cent of the households who possessed electric pumps reported that they remained idle for at least some part of the last 365 days due to lack of electricity'. The same authors also quote another survey held in 1998-99, which reported that 'the cases of motor burn outs were 548 in number, about 61 per cent of the sample'. With the deficiencies in the quantity and quality of power supply, farmers in several agricultural states are known to be using both electric and diesel pumping sets, a practice that results in higher capital and operational cost. There is some evidence to suggest that farmers would be willing to pay much higher rates for good quality and assured supplies. Rajasthan experimented with a scheme in which farmers were provided connections out of turn as long as they paid the actual cost of connection (which is about 10 times higher) and agreed to a tariff of a Rs1.20/unit rather than the 0.50rupee for normal connection. The response was very good and farmers opted for this scheme for about 60 per cent of the new connections (Gulati &Narayanan 2003, p 132).

Use of power for ground water irrigation and sustainable development

The practice of charging very low rates from farmers results in negative externalities on the environment side. To the extent that the farmer is able to draw free or highly subsidised power, there is no limit to the amount of ground water that can be pumped out. Even where the power supply to farmers is not free, the most common practice is to require the farmers to pay fixed charges related to the capacity of the motor in the pumps. Since the farmers do not pay in proportion to the number of units consumed, the consumption is not metered. This has resulted in farmers drawing out ground water in excess, and sometimes far in excess, of the utilisable recharge in several parts of the country. The falling water tables imply that the practices are in conflict with the requirements of sustainable agriculture.

The Central Ground Water Board set up by the Ministry of Water Resources carries out periodic surveys to monitor the status of exploitation of ground water in the country. Following such surveys it identifies the administrative units (blocks) in which the water pumped out exceeds the utilisable recharge (over exploited), those in which the level exceeds 90 per cent (critical) and those in which it is between 70 and 90 per cent (semi-critical). The monitoring results of 2007 show an alarming situation in five states, Punjab, Rajasthan, Haryana, Tamil Nadu and Gujarat.

Table 7: Stage of Groundwater Development in Selected States of India

State	Stage of Groundwater Development (%)	Total number of blocks	Over Exploited	Critical	Semi-critical	Total	%
Punjab	145	138	103	5	4	112	81.16
Rajasthan	125	236	140	50	14	204	86.44
Haryana	109	108	55	11	5	71	65.74
Tamil Nadu	85	384	142	33	57	232	60.42
Gujarat	76	184	31	12	69	112	60.87

Source: http://cgwb.gov.in/ accessed on 02.07.2012.

Quantifying power subsidies under WTO rules

Subsidy for power supply to agriculture is calculated on the basis of the average unit cost of power less the rate charged in each state multiplied by the consumption of electricity in the agricultural sector. We deduct depreciation from the total figure on the basis of the provision in the WTO Agreement quoted earlier. In its original notification to the WTO *(G/AG/AGST/IND/Vol.2)*, the Government of India had submitted that at least 30 percent of the power consumption in the agricultural sector is used for domestic supply of electricity to the farmer. We, therefore, reduce the net subsidy by a factor of 0.7 to get the proportion of subsidy that should be attributed to agricultural operations.

Table 8: Electricity Subsidy in Agricultural Sector as Per WTO Rule *(Billion US Dollar)*

Year	*Subsidy for Agricultural Consumers*	*Depreciation*	*Net Subsidy*	*Adjusted to actual electricity Subsidy on Agricultural Operation* (Coefficient 0.7)*
(1)	*(2)*	*(3)*	*(4)=(2)-(3)*	*(5)=(4)*0.7*
2007-08	*8.30*	*0.40*	*7.90*	*5.54*
2008-09	*8.57*	*0.39*	*8.18*	*5.72*
2009-10	*9.42*	*0.42*	*9.00*	*6.30*
2010-11	*9.79*	*0.48*	*9.31*	*6.52*

Notes

1. Calculated using Annual Report 2011-12 on The Working on State Power Utilities and Electricity Departments, Power and Energy division, Planning Commission, Government of India.

2. Figures in Column (5) are calculated on the same basis as in the table "Calculation of Electricity Subsidy (Cost-Difference)" on page 35 of WTO Notification (G/AG/AGST/IND/Vol.2). The total subsidy to agricultural consumers is reduced by the coefficient of 0.7 to separate agricultural operations from domestic household consumption.

3. There is a small difference in the figures in Column 2 above and those in the top row of Table 6 as the latter reflects the performance only of SPUs while the former captures the performance of Electricity Departments as well for those States in which the activity is undertaken departmentally

2.1.1.3 Fertiliser subsidies

Three features of fertiliser subsidies must be noted at the outset. First, unlike irrigation and power subsidies, in which revenues are foregone without being reflected in the budget, subsidy is provided through budgetary provisions voted by the legislature in the case of fertilisers. Second, it is the central government that bears the entire financial costs of fertiliser subsidies. Third, while the financial burden of all input subsidies has been rising because of the unwillingness of authorities to revise the user charges to keep pace with inflation, that of fertiliser subsidy has risen most steeply because of the rise in fertiliser prices on account of the rise in input prices, consequent upon the increase in petroleum prices, particularly since 2007.

Domestic production of fertilisers

We have seen in Section 1 that a major underlying aim of Indian policy makers in formulating domestic support policies was self-sufficiency in the production of basic foodstuffs, particularly cereals. An extension of this policy was self-sufficiency in fertilisers as well. Of the three main nutrients, namely, nitrogen, phosphate and potash, India aimed at self-sufficiency in nitrogenous fertiliser for which naphtha was available as feedstock initially. Subsequently, urea units based on fuel oil/Low Sulphur Heavy Stock (LSHS) fuel oil and coal were also established. The production cost of urea based on these feed stocks was far higher than that of units based on natural gas and they needed large subsidies from the government. In the mid-1980's, when natural gas became available from offshore Bombay High and South Bassein fields, gas-based ammonia-urea plants were also set up and India attained a high level of self-sufficiency in nitrogenous fertilisers by the year 2000-01.

Due to insufficient availability of rock phosphate and the non-existence of potash deposits India has always been substantially dependent on imports of phosphatic and potassic fertilisers, mainly Di-Ammonium Phosphate (DAP) and Muriate of Potash (MOP).

Modality of fertiliser subsidies

For many years, the government subsidised fertiliser sales to farmers by fixing the maximum retail price (MRP) of various fertilisers and compensating manufacturers and importers for the difference between the MRP and the cost of production or of imports. In order to encourage domestic production of urea, ammonium sulphate and calcium ammonium nitrate, the Government of India introduced the Retention Price Scheme (RPS) in 1977, which guaranteed a reasonable rate of return to investors, after taking into account the fixed and variable costs

of each unit. The variable cost differed widely from unit to unit depending, inter alia, on the feedstock used and was the lowest where natural gas was used. In 1979, the RPS was extended to apply to phosphatic fertilisers as well. Imports of fertilisers were also restricted to encourage domestic production.

The RPS was a typical example of the policies of the pre-reform era in India before 1991, which rewarded import substitution and neglected efficiency. Things have changed somewhat after the 1991 economic reforms. As suggested by the Expenditure Reforms Commission (2000), the RPS was replaced with a concession scheme for six groups of units based on feedstock use and the vintage of plants. The concession rate for each urea unit on the basis of which the subsidy payment is determined is still differentiated but the differences within the group have been narrowed down.

In order to bring about further economies and to usher in fully competitive conditions in the urea industry, units have been incentivised to make investments for changing over to the most economical feedstock of natural gas or liquefied natural gas. When this happens, subsidy payments will be made to domestic urea manufacturing units at a single rate. Progress towards change of feedstock is held up because of shortage in the supply of indigenous natural gas.

Phosphatic and potassic fertilisers were decontrolled in 1992 and imports were freely permitted, but additional subsidy was given to domestic manufacturers. Later, on April 1, 2008, it was decided to equalise subsidies on imports and domestically manufactured DAP. The only protection now afforded to domestic DAP units is the import tariff of 5 per cent.

One big change in the modality of fertiliser subsidy, which has been made operational already for phosphatic and potassic fertilisers has been the introduction in 2010-11 of the nutrient based subsidy scheme (NBS). The main motivation for this change was to correct the emerging NPK imbalance (away from the optimum ratio of 4:2:1) in the use of fertilisers by subsidising fertiliser products uniformly on the basis of nutrient content, instead of setting separate MRP for each product and subsidising them differentially. Another objective of the NBS scheme was to obtain fixity in the per unit subsidy for various fertilisers. However, as Table 9 shows, the subsidy still varies from year to year. After the changeover to NBS, world prices of DAP and inputs that go into its production as well as of MOP rose sharply, and the Central Government tried to moderate the effective price paid by the farmer through year to year changes in the NBS rates. Despite this, the effective price being paid by farmers is much higher than the pre-NBS MRP.

Table 9 NBS: Rupees per kg of nutrient

Nutrient	2010-11	2011-12	2012-13
N	23.227	27.153	24.000
P	26.276	32.338	21.804
K	24.487	26.756	24.000

Source: Indian Fertiliser Scenario, various issues.

What is more significant, three years after its introduction the NBS scheme has still not covered urea and progress on this has got tied up in knots. The main hurdle is the concern that the price of urea after decontrol would rise steeply to international levels, farmers would have to pay double the current MRP (INR 5310 or about USD 98.3) even after the subsidy.

The cumulative result of partial roll-out of the NBS scheme and the steep rise in international prices of all fertilisers is that Indian farmers are now paying much more per unit for phosphatic and potassic fertilisers while they continue to pay the low MRP for urea. As a result, the imbalance has increased and farmers are using more of the cheaper N and less of the costlier P and K.

Scale of fertiliser subsidies

The critical factor that determines the scale of fertiliser subsidies and the resulting budgetary burden is the Government of India's objective to insulate the farmer from increases in market prices and to keep the MRP unchanged for long periods. As the table at Appendix A.1 shows, during the period from 2003-04 to 2010-11, the MRP of the main fertilisers, urea, DAP and MOP remained constant or changed only marginally, while international prices fluctuated widely and rose sharply. The steep increase in international prices and the lack of adjustment in MRP resulted in a manifold increase in the gap between the two.

The scale of subsidies in the case of DAP and MOP for the year 2010-11 after the introduction of nutrient-based subsidy is shown in Table 10. It should be noted that the MRP indicated does not refer to any price fixed statutorily by the government but to the price recommended by the manufacturers/importers as a measure of consumer protection.

Table 10: MRP and Subsidy on DAP and MOP *(USD/MT)*

Sl. No.	Fertilizers	MRP w.e.f 01.04.2010 (as indicated by companies)	Subsidy under NBS	Total Cost under NBS	% of total cost to be paid by the farmer
1	2	3	4	5=3+4	6=(3/5)X100
1	DAP	218.381	357.047	575.428	37.95
2	MOP	110.946	322.457	433.404	25.6

Source: Indian Fertiliser Scenario, 2010. Department of Fertilisers, Ministry of Fertilisers and Chemicals, Government of India.

The farmer paid only about two-fifths of the price of DAP and one-fourth the price of MOP in 2010-11. For urea the farmer paid just over one-third of the import parity price in that year.

As stated earlier, the subsidy on urea is still given on the basis of the difference between the MRP and the concession rates fixed separately for each unit although the policy may change in the future. The company wise concession rates are not in the public domain but it has been learnt that in October 2010, the concession rate ranged from US $ 97 to US $356 for various groups of urea manufacturing units, based on feedstock used and the vintage of the plants. One of the main reasons for the lower cost of production of gas-based units is that they receive assured supplies of indigenous natural gas, which is supplied at a price fixed under the administered price mechanism (APM). The APM price is much lower than that of imported natural gas or liquefied natural gas (LNG), but a change is under the active consideration of the Government of India.

In the 1980s and 1990s, when the import parity price of urea was below the cost of production of domestic units, a large proportion of the fertiliser subsidy outgo benefited the manufacturing industry rather than the farmer. One estimate was that the farmer's share of budgetary subsidy in the late 1990s ranged between 60 and 65 per cent (Gulati and Narayanan, 2003 p. 55). With the unprecedented increase in international fertiliser prices in recent years, the position has changed considerably and now the farmer is the main beneficiary of the subsidy on urea.

Quantification of fertiliser subsidies

It is easy to quantify the fertiliser subsidy in India as the Government of India bears the whole cost through budgetary grants. In 2007-08 and 2008-09, the budgetary burden increased by such a large amount that the Central Government issued bonds to the fertiliser companies as part payment. In Table 11 below we have added the value of the bonds to the budget provision to arrive at the total subsidy during recent years.

Table11: Total Fertilizer Subsidy *(Billion US Dollar)*

Year	Fertilizer Subsidy in Cash	Subsidy Through Bond	Total
1	2	3	4
2007-08	8.07	1.86	9.93
2008-09	16.66	4.35	21.00
2009-10	12.91	-	12.91
2010-11	13.67	-	13.67

Source: For Column 2: Annex – 3, Expenditure Budget Volume 1, 2012-13.

For Column 3: Annexure-XII, Annual Report, 2010-11. Department of Fertilisers, Ministry of Fertilisers and Chemicals, Government of India.

As is well known, the promise that the Indian economy had shown in the period 2004-09 has come under a cloud mainly because of inflation and growing macroeconomic imbalance. The fiscal deficit of the Central Government has moved to very high levels in recent years. As Table 12 shows, a big contribution to the fiscal deficit has come from fertiliser subsidies.

Table 12: Contribution of Fertiliser subsidy to India's Fiscal Deficit *(Billion USD)*

Year	Fiscal Deficit	Fiscal deficit as a % of GDP	Total Fertilizer Subsidy	Fertilizer Subsidy as a % of fiscal deficit
1	2	3	4	5
2007-08	31.52	2.50	9.93	31.51
2008-09	73.27	6.00	21.00	28.67
2009-10	88.21	6.50	12.91	14.64
2010-11	83.71	5.50	13.67	16.33

Source: Table 3.2, Economic Survey 2011-12.

Use of fertilisers and sustainable development

It must be recognised that chemical fertilisers are the most important element in any strategy for intensive agricultural operations. Availability of water from rainfall or irrigation creates the conditions for intensive agriculture but it is chemical fertilisers that help to increase production manifold. Increased agricultural production in India during the last six decades must be attributed largely to the promotion of chemical fertilisers by the Government of India through subsidies.

But subsidies have had adverse consequences as well. First, they have resulted in skewed use of the three main types of fertilisers (N, P, K) which are generally expected to be used in the ratio 4: 2: 1, given the soil conditions in the alluvial plains. The all-India picture seems to have improved over the years as shown in Table 13, but the picture of fertiliser use in the two major agricultural states of Haryana and Punjab is still far removed from the optimum. A disproportionately high use of N is the consequence of relatively high subsidies on urea.

Table 13: Trends in N-P-K Consumption Ratio in India

Year	NPK ratio		
	All-India	Haryana	Punjab
1	2	3	4
1990-91	6:2.4:1	NA	NA
1996-97	10:2.9:1	NA	NA
2000-01	7:2.7:1	73.9:21.3:1	42.5:11.9:1
2007-08	5.5:2.1:1	39.9:10.9:1	34.3:9:1
2008-09	4.6:2.0:1	32.2:10.7:1	23.6:6.7:1
2009-10	4.3:2.0:1	15.9:5.5:1	18.4:5.9:1

Note: Optimum consumption Ratio is 4.0: 2.0: 1.0

Source: For Columns 1 and 2: Table 22, Indian Fertiliser Scenario, 2010. Department of Fertilisers, Ministry of Fertilisers and Chemicals, Government of India.

For Column 3 and 4: Table 14.4(b), Agricultural Statistics at a Glance 2011 and 2003. Directorate of Economics and Statistics, Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India.

The increased use of fertilisers in recent years has not resulted in a commensurate rise in the production of food grains. Table 14 shows total fertiliser consumption in the country increasing more steeply than food grain production.

Table 14: Fertilizer Consumption vis-à-vis Food grain production

Year	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Food grain production in million MT	175	213	198	209	217	231	234	218	241
Fertilizer consumption in 00,000 MT	161	168	184	203	217	226	249	261	265

Source: Table 25, Indian Fertilizer Scenario, 2010. Department of fertilizers, Ministry of Fertilizers and Chemicals, Government of India.

The policy on subsidy has led no doubt to increased use of fertilisers and to the increase in production of crops but it has also led to waste due to overuse and skewed use. High subsidies have led also to the neglect of organic matter and depletion of micro-nutrients with adverse consequences for soil fertility. Micro-nutrient deficiency and soil deficit in organic matter have lowered the efficiency of chemical fertilisers and raised the cost of production of agricultural crops. Further, one of the adverse environmental consequences of overuse has been that fertilisers have leached into aquifers, making ground water unusable for drinking. These effects taken together give rise to serious concerns on the sustainability of high fertiliser subsidies.

High subsidies on fertilisers have also led to leakage of benefits to unscrupulous traders who have been smuggling fertilisers to the neighboring countries.

2.1.1.4 Agricultural credit subsidy

Crop loans are obtained by farmers from Public Sector Commercial Banks, Cooperative Banks and Regional Rural Banks (RRBs). Out of the total loan of Rs 4475 billion (USD 98.22 billion approx) disbursed to farmers in 2010-11, Public Sector Commercial Banks accounted for 74.4 per cent, co-operative banks for 15.7 and RRBs for 9.9.

The main problem faced by farmers in the past was access to timely and adequate credit from institutional sources. A series of steps taken by the Government of India have helped to improve the availability of credit to farms from commercial banks. In the 1970s, the Reserve Bank of India introduced the requirement that

commercial banks should allocate a proportion of aggregate bank advances for priority sector lending (which included agriculture and small-scale industries). The opening of a large number of branches of nationalised commercial banks in rural areas further helped to increase the access of farmers to institutionalised agricultural credit. The Kisan Credit Card (KCC) scheme introduced in 1998 was yet another big step forward, simplifying the procedures and making it hassle free. It was 'a pioneering credit delivery innovation for providing adequate and timely credit to farmers under single window, with flexible and simplified procedure, adopting whole farm approach, including the short-term credit, medium term and long term credit needs of the borrowers for agriculture and allied activities and a reasonable component for consumption needs' (NABARD 2007). The beneficiaries of the KCC scheme are provided with a credit card-cum-pass-book giving the name and address and the particulars of land holding, which helps them secure loans annually without the need for a fresh enquiry on assets and assessment of needs. Since the scheme was launched, there has been an impressive growth in the number of borrowers and the volume of agricultural credit. There are complaints, however, in respect of adequacy of credit due to which the farmers are compelled to use inputs at sub-optimal levels.

Subsidy on short-term credit for agricultural operations (crop loans) has been a traditional tool of the Government of India for domestic support of the agricultural sector. A Government of India notification (GATT Doc G/AG/AGST/IND) of subsidies in the base period 1986-88 of the Uruguay Round mentions credit subsidy to the agricultural sector ranging from 3.00 to 3.5 percentage points during the period. The practice was discontinued for some years following the 1991 economic reforms but was reintroduced during the kharif crop of 2006-07. Government decided that farmers would receive crop loan up to a principal amount of Rs 300,000 (approx USD 6629.83 at 2006-07 average rupee-dollar exchange rate) at a reduced interest rate of seven per cent, and to facilitate this, announced an interest subvention of 2 percent to the lending agencies. The National Bank for Agriculture and Rural Development (NABARD), an agency of the Reserve Bank of India (Central Bank), was also mandated to make available concessional finance to co-operative banks at 2.5 per cent and to RRBs at 4.5 per cent. In 2009-10, government announced an additional subsidy of 1 per cent for farmers who repaid the loans in time and the incentive was raised to 2 per cent in 2010-11 and further to 3 per cent in 2011-12. Thus, the effective subsidy on the rate of interest for farmers for loans up to a ceiling of Rs 300,000 (approx USD 6629.83) is 5 per cent.

Apart from granting subsidies on the rate of interest for credit on a regular basis, the Government of India, in 2008, took the decision to write off outstanding loans partly or fully as detailed below:

1. All agricultural loans disbursed by scheduled commercial banks, regional rural banks and co-operative credit institutions up to March 31, 2007 and overdue as on December 31, 2007 were covered;

2. For marginal and small farmers (those owning up to 2 hectares of land), all loans that were overdue on December 31, 2007 and which remained unpaid until February 29, 2008 were completely waived. In respect of other farmers, there was a one time settlement (OTS) for all loans which were overdue on December 31, 2007 and which remained unpaid until February 29, 2008. Under the OTS, a rebate of 25 per cent was given against payment of balance of 75 per cent by 30 June 2009. The last date of payment was subsequently extended to December 2009 and later to June 30, 2010.

The decision to waive agricultural debt in May 2009 was clearly against sound banking principles as it sought to benefit those who had not repaid loans and those who had paid up went unrewarded.

Effect of credit subsidy

One of the problems of Indian agriculture in the past was the dominance of usurious moneylenders and the absence of credit institutions. In the last five decades of the 20th century, the situation has changed considerably as can be seen from Table 15.

Table15: Trend in the Share of Debt of Cultivator Households (%)

Sources Of Credit	1951	1961	1971	1981	1991	2002
Institutional (commercial banks, cooperative societies, banks etc.)	7.3	18.7	31.7	63.2	66.3	61.1
Non-Institutional (moneylenders)	92.7	81.3	66.3	36.8	30.6	38.9
Unspecified	-	-	2.0	-	3.1	-
Total	100	100	100	100	100	100

Source: Adapted from Table 2.1, Report of the Working Group on Outreach of Institutional Finance, Co-operatives and Risk Management for the 12th Five Year plan (2012-17), Planning Commission.

Between 1991 and 2002, institutional credit lost ground vis-à-vis private moneylenders. Although this was the period during which credit subsidy was withdrawn the two developments may not be linked. Table 16 gives the trends in institutional credit for agricultural loans since 2002-03. Disbursement of production loans since 2006-07 does not show any strengthening of growth already in evidence before that year. In fact, the CAGR of production loan given between 2002-03 and 2005-06 works out to 24.87 percent, which is more than the CAGR of 17.49 percent for the period between 2006-07 and 2009-10 following the introduction of credit subsidy.

Hassle-free and timely access to institutional credit provided to farmers under the KCC scheme has led to expansion of agricultural credit and facilitated the use of optimum inputs in farm operations. There is little empirical evidence that interest subsidies have an overall beneficial effect. In fact, the large difference between the market rate of interest and the rate at which it is available to farmers may have tempted farmers to re-lend the funds for quick profits instead of using them for agricultural operations and some evidence has been found of such diversion (Barik 2011).

able16: All India Trends in Production and Investment Credit in the Tenth and Eleventh Five Year Plan *(Billion US Dollar)*

Year	Production credit	Share of PC to total credit	Investment credit	Share of IC to total credit	Total
2002-03	9.79	0.61	6.21	0.39	16.00
2003-04	12.13	0.63	7.06	0.37	19.19
2004-05	16.93	0.61	10.96	0.39	27.89
2005-06	23.80	0.58	16.97	0.42	40.77
2006-07	30.60	0.60	20.10	0.40	50.70
2007-08	45.05	0.71	18.20	0.29	63.25
2008-09	45.76	0.70	19.88	0.30	65.64
2009-10	58.31	0.72	22.73	0.28	81.05
2010-11	NA	NA	NA	NA	98.22

Source: Table 2.7, Report of the Working Group on Outreach of Institutional Finance, Co-operatives and Risk Management for the 12th Five Year plan (2012-17), Planning Commission

Quantification of credit subsidy under WTO rules

The WTO Agreement on Agriculture provides for the value of input subsidies to be measured using government budgetary outlays or, where the use of budgetary outlays does not reflect the full extent of the subsidy concerned, the gap between the price of the subsidised good or service and a representative market price for a similar good or service multiplied by the quantity of the good or service. The former method represents the cost to government approach and the latter the benefit to recipient approach. It is apparent that the benefit to recipient approach measures is more accurate and the WTO Agreement also indicates a preference for this alternative. The Government of India also relied on this approach while notifying its subsidies during the base period (GATT Doc G/AG/AGST/IND).

If we were to use the benefit to recipient approach, our starting point for quantifying the subsidy would be the prime lending rate, which was 11 to 12 percent in 2009-10 for instance (RBI, Handbook of statistics on the Indian Economy, 2010-11, Table 74). Subtracting the effective lending rate to the farmer of 6 per cent in that year from the average prime lending rate of 11.50 percent, the benefit works out to 5.50 percent. Since production credit is of six months duration, the total subsidy figure would work out to Rs 2767 billion (USD 58.35 billion approx) * 5.50/100 * ½= Rs 76.09 billion (USD 1.60 billion approx in 2009-10 rupee-dollar exchange rate).

However, in calculating this, we have assumed that the benefit is available in respect of the entire turnover of production loans during that year. This was not the case because the reduced rate of credit is available only up to a ceiling of Rs 300,000 (USD 6629.83 approx). Moreover, we do not have the data on how many of the borrowers paid on time and were eligible for the additional incentive. Lack of availability of critical data leaves us with no option but to adopt the cost to government approach and place reliance on the budgetary figures of the Government of India, as in Table 17.

Table 17: Interest Subsidy to Farmers: *(Billion US Dollar)*

Year	Interest Subvention for providing short term credit to farmers
2007-08	0.42*
2008-09	0.57*
2009-10	0.42
2010-11	0.77

** Using Revised estimates*

Source: From Statement 5, Volume 1 of Expenditure Budget, Government of India, Various Years.

The interest subvention on short-term credit to farmers is a non-product-specific input subsidy and is covered by the overall limit of 10 per cent for non-product-specific subsidies that the WTO Agreement imposes on developing countries.

Quantification of deemed input subsidies arising from debt waiver and debt relief announced in 2008 is problematic because the write off included both short-term production loans and longer term investment loans. In his budget speech, the Finance Minister had mentioned that the total value of overdue loans being waived for small and marginal farmers was Rs 500 billion (USD 12.42 billion approx at 2007-08 rupee-dollar exchange rate) and the OTS relief on the overdue loans for other farmers was Rs 100 billion (USD 2.48 billion approx at 2007-08 rupee-dollar exchange rate). Subsequently, the figure was revised upwards to Rs 710 billion (USD15.58 billion in 2010-11 rupee-dollar exchange rate) in the budget speech of 2010-11. But separate figures of the quantum of waiver/relief provided for production and investment loans were not provided in any of the announcements. The Government of India

has been reimbursing the cost of debt waiver and debt relief to lending institutions and Table 18 shows the amounts reflected in the expenditure budgets of subsequent years.

Table 18: Payment to Lending Institutions against Debt Waiver and Debt Relief Scheme for Farmers *(Billion US Dollar)*

Year	Payment to lending institutions against Debt Waiver and Debt Relief Scheme for Farmers
2008-09	5.44
2009-10	3.16
2010-11	2.49

Source: From Statement 4, Volume 1 of Expenditure Budget, Government of India, Various Years.

For making our estimate of the proportion of the above amounts that could reasonably be attributed to production loans, we can make an assumption relying on the proportion reflected in the historical data given in Table 16. It is observed that in recent years about 70 per cent of the total loans advanced have been production loans. We can also use the figures mentioned by the Finance Minister to refine the data further and separate the annual amounts that could be deemed to be subsidies paid to small and marginal farmers from the subsidies paid to other farmers. The proportion accounted for by farmers other than the small and marginal can be put at one-sixth of the total allocation/ expenditure. Such separation is desirable not merely because, under Article 6.2 of the WTO Agreement on Agriculture, generally available input subsidies for low-income or resource-poor farmers are exempted from reduction commitments but more importantly because there is greater social acceptability of targeted subsidies. We attempt these refinements of data in Table 19

Table 19: Deemed input subsidies for farmers other than small and marginal as a result of debt relief *(Billion US Dollar)*

Year	Total payment to lending institutions	Waiver/relief of production loans	Waiver/relief for farmers other than small and marginal
1	2	3	4
2008-09	5.44	3.80	0.63
2009-10	3.16	2.21	0.37
2010-11	2.49	1.74	0.29

Source: Column 2 is the same as in Table 18; Column 3 is 70 per cent of Column 20, on the basis of the proportion of production loans to total loans reflected in Table 16 in recent years; Column 4 is one-sixth of Column 3, on the basis of the figures mentioned in the Budget Speech 2008-09.

Out of the debt relief provided to farmers in 2008-09 and the subsequent two years only the amounts in the last column can be treated as non-product-specific input subsidies, covered by the 10 percent limit in the WTO Agreement.

2.1.1.5 Crop insurance

National Agriculture Insurance Scheme (NAIS)

The National Agriculture Insurance Scheme has been in operation in the country since 1999-2000. It envisages insurance in the event of failure of crops as a result of natural calamities, pests and disease, based on an area approach. Farmers who have taken loans are covered on a compulsory basis; for others, the scheme is voluntary. At present the scheme is being implemented by 25 States and 2 Union Territories. It covers all food crops, oilseeds and annual commercial/horticultural crops. The premium rates range between 1.5 and 3.5 per cent for food and oilseed crops but actuarial rates are charged for commercial and horticultural crops. A 10 per cent subsidy

in premium is granted to small and marginal farmers. The state governments are expected to notify the areas and the crops well in advance of each crop season. The average yields in a previous representative period are used to estimate the threshold level and crop-cutting experiments are used to determine the loss on account of the natural disaster.

ndemnity claims are worked out on the basis of percentage shortfall in the yield as compared to the threshold yield. Although the scheme is implemented by the Agriculture Insurance Corporation Limited (AICL), the expenses on account of claims beyond 100 percent of food crops and oilseeds and beyond 150 per cent of premium in case of horticultural and commercial crops, and the 10 per cent subsidy for small and marginal farmers, bank service charges and 20 per cent of the administrative and other expenses are reimbursed by the central and state governments on a 50:50 basis.

The budget documents of the Ministry of Agriculture show the allocations made by the Government of India for payments to the AICL but the Annual Reports of AICL give details of payments received from the State Governments as well. The total payments made to the AICL by the Central and State Governments in recent years are indicated below.

Table 20: Government payments to Agriculture Insurance Corporation Ltd *(Billion US Dollar)*

Description of payments	2007-08	2008-09	2009-10	2010-11
Reimbursement of claims, premium subsidy etc by Central and State Governments	0.4039	0.2826	0.6397	1.0403

Source: Annual Report, Agriculture Insurance Corporation Ltd, Various Years

The list of measures exempted from reduction commitments in the WTO Agreement on Agriculture includes 'Payments (made either directly or by way of government financial participation in crop insurance schemes) for relief from natural disasters'. There are certain conditions prescribed by the Agreement on Agriculture for eligibility under the exemption, such as that the payment should be pursuant to a declaration by the government about the occurrence of a calamity and that the crop loss should be more than 30 per cent. It is not within the scope of this paper to undertake a legal analysis on whether the NAIS fulfils these conditions. For the purposes of this study the NAIS seems broadly to fulfill the conditions and qualifies for exemption from reduction commitments.

Weather based Crop Insurance Scheme (WBCIS)

In 2007-08, the Government of India introduced a weather based crop insurance scheme (WBCIS) in selected areas on a pilot basis. The scheme is intended to cover farmers from risks arising from adverse weather conditions, such as deficit or excess rainfall or sudden high or low temperature, which lead to production losses. The WBCIS is based on actuarial rates of premium but as a promotional measure the lower premium rates (1.5 to 3.5 per cent) of NAIS are being charged. The central and state governments bear the difference between the actuarial rates and the premium actually paid.

The amounts paid since the inception of the WBCIS by the central and state governments to the AICL on account of the premium differential are given below:

Table 21: Reimbursement of premium differential in WBCIS by State and Central Governmentsd *(Billion US Dollar)*

Description of payments	2007-08	2008-09	2009-10	2010-11
WBCIS	0.0308	0.0257	0.0481	0.1795

Source: Annual Report, Agriculture Insurance Corporation Ltd, Various Years.

The list of exemptions of domestic support programmes does not include subsidies on premium in respect of crop insurance programmes. This scheme, therefore, qualifies as a non-product-specific support and would need to be added to the figures of other non-product-specific subsidies to determine whether the total subsidies are below the de *minimis* limit of 10 per cent of the total value of agricultural production.

2.1.1.6 Seed Subsidies

Seeds are as critical a determinant of productivity in agriculture as any other input and in recent years the Government of India has been paying increasing attention to this input in formulating programmes to raise agricultural production. One of the causes of low productivity is the low seed replacement rate, which according to the Planning Commission's estimate in 2005, was 2-10 per cent in certain states for certain crops, against the desired norm of 25 per cent for self-pollinated crops, 35 per cent for cross-pollinated crops and 100 per cent for hybrids. At the centre of some of the assistance programmes related to seeds, therefore, is the objective of increasing the seed replacement rate in farms and with this end in view, to expand the production of certified seeds.

India has a well-developed seeds industry, with a large public sector but also with a strong private sector. Breeder seeds, which are the first link in the chain, are produced by the Indian Council of Agricultural Research (ICAR) with the help of ICAR research institutions, other research centres, state agricultural universities and sponsored breeders. The progeny of breeder seeds is the foundation seed, the production of which has been entrusted to the National Seeds Corporation (NSC), the State Farms Corporation of India (SFCI), State Seeds Corporations, State Departments of Agriculture and private seed producers.

Certified seeds are produced from foundation seeds and distributed to farmers through various channels if they meet prescribed standards. In the case of self-pollinated crops certified seeds can be produced from certified seeds provided it does not go beyond three generations from foundation stage -1. Certified seed production is organised by state governments through state seeds corporation, departmental farms and co-operatives. The NSC and the SFCI also produce certified seeds through contract growing arrangements with progressive farmers.

The high volume market for seeds of cereals, pulses and oilseeds is dominated by the public sector. The private sector is an important player in the high-value, low- volume seeds of maize, sunflower and cotton, but is the strongest in vegetable seeds and planting material for horticultural crops.

Recently, the Government of India has introduced a number of incentive programmes to increase the production of certified seeds in the country and to increase the seed replacement rate in farms. One of the important programmes is for the development and strengthening of infrastructure facilities for production and distribution of seeds.

The most important components of the programme, which was established in 2005-06, are (i) strengthening of quality control arrangements for seeds, (ii) creation and strengthening of seed infrastructure facilities in the public sector, (iii) and the seed village programme. Under the seed village programme, there are three main interventions. These are financial assistance for distribution of foundation/certified seeds at 50 percent of the cost of the seed for production of certified/ quality seeds, providing training to farmers on seed production and technology and financial assistance of 25-33 percent of the cost for procuring or making seed storage bins. The expenditure under these heads during the years 2007-08 to 2010-11 is given in Table 22.

Table 22: Subsidy in Seed Village Programme *(Billion US Dollar)*

Year	Seed Distribution	Farmer's Training	Seed Bin	Total Released
2007-08	0.0052	0.0045	0.0017	0.0117
2008-09	0.0076	0.0037	0.0011	0.0124
2009-10	0.0308	0.0118	0.0030	0.0457
2010-11	0.0235	0.0077	0.0033	0.0347

Source: Department of Agriculture, Government of India

Only the expenditure on seed distribution would seem to constitute non-product-specific input subsidy under the WTO rules.

2.1.1.7 Other non-product- specific domestic support by the central government

National Mission on Micro- Irrigation (NMMI)

The National Mission on Micro Irrigation (NMMI) is a major recent initiative by the central government, which envisages support for farmers setting up drip irrigation, sprinkler systems and irrigation systems for protected culivation such as greenhouses. The central government meets 40 per cent of the cost, the state government 10 per cent and the beneficiary the remaining 50 per cent. In the case of small and marginal farmers, the ratio is 50:10:40 (GOI 2010a).

The financial allocations made during recent years are as follows:

Table 23: Expenditure in National Mission on Micro Irrigation *(Billion US Dollar)*

Description of project	2007-08	2008-09	2009-10	2010-11
National Mission on Micro Irrigation	0.1118	0.0935	0.1012	0.2188[1]

Source: Expenditure Budget, Volume 2, different years.

Since the NMMI scheme envisages generally available investment subsidy, it is exempted from the domestic support reduction commitments and the expenditure on this account does not need to be added to the non-product-specific AMS.

2.1.1.8 Total non-product-specific subsidies and WTO obligations[2]

In the foregoing analysis, we have considered inter alia a number of non-product-specific subsidy programmes. As Table A3.1 shows, in recent years, the total non-product-specific subsidy has hovered around 10 per cent of the value of agricultural output, against 4.05 per cent notified by India for the years 1986-88. It is notable that there was a sharp spike in 2008-09 due to the increase in fertiliser subsidies and the Government of India decision on loan waiver/relief for farmers. But in assessing how these programmes stack up against the obligation that the non-product-specific subsidies must not go above the de *minimis* limit of 10 per cent, we must take into account the provision in Article 6.2 of the WTO Agreement on Agriculture, which exempts investment subsidies generally available to agriculture as well as input subsidies generally available to low-income or resource poor farmers from domestic support reduction commitments. The critical factor here is a determination of the category of farmers who may be considered to be low-income or resource- poor. For this, the size of the holding cannot be the sole basis because availability of assured irrigation is a key factor influencing farm income. However, lack of availability of holding wise data on irrigation is a handicap and the easiest way out is to take the size of the holding as the guiding factor to determine whether a farmer is resource-poor. The original notification of Supporting Tables Relating to Commitments on Agricultural Products (G/AG/AGST/IND) made by India pertaining to the years 1986-88 contained the following observation:

'In India, operational holdings of 10 hectares or less accounted for 79.5 per cent of agricultural land. If farmers holding less than 10 hectares of land are considered to be resource poor or low income, almost 80 per cent of the input subsidy will qualify for exemption from inclusion in non-product-specific AMS.'

In its last notification of non-product-specific AMS (G/AG/N/IND/7), India has noted that 98.97 per cent of its farm holdings are of low-income or resource-poor farmers, covered by the exemption of Article 6.2. This too hints at the holding size of 10 hectares as the defining level for determining whether a farmer may be regarded as resource-poor. However, even the level of 10 ha cannot be accepted uncritically for this purpose. Can a farmer with 10 ha of arid or semi-arid land be regarded as falling outside the category of low-income or resource –poor? Views may vary on the size of farm holdings deemed to be of low-income or resource-poor farmers and we make no proposals in this regard. In Tables A3.2, A3.3, and A3.4, we present the results of our calculations if farmers with holdings up to 10 ha, 4 ha and 2 ha were to be covered by the exemption. Farmers with holdings less than 10 ha, hold about 89 per cent of the area, those with up to 4 ha hold about 68 per cent and small and marginal farmers with up to 2 ha account for 44 per cent according to the Agricultural Census 2010-11. In our calculations, we have reduced the subsidy apportioned to various categories according to the area of land held by them. For loan waiver/ relief, more sophisticated calculations are involved as a large proportion of the waiver was directed only at farmers with less than 2 ha.

If we treat farmers with holdings of less than 10 ha as falling in the category, the total non-product-specific subsidy works out to 0.91-1.52 per cent of the value of total agricultural output in the four years that we have studied, against the benchmark of 10 per cent. If farmers holding 4 ha or less are treated as exempt, the percentages are still in the range of 2.68-4.47. Even if the most rigorous possible yardstick is selected and only small and marginal farmers with holdings of 2 ha or less are considered to be exempt, the percentages are in the range of 4.65- 5.30, with a spike in 2008-09 reaching 7.75. Thus, in recent years, it is apparent that non-product-specific subsidies as a percentage of the total value of agricultural output does not exceed the cut off level of 10 per cent.

2.1.2 Product Specific Support

2.1.2.1 Minimum Support Price

Minimum support price (MSP) for the principal crops, guaranteed through purchases by state agencies, has been a pillar of the domestic support programme of the Central Government for agriculture for almost five decades. The MSP is announced annually separately for kharif (summer) and rabi (winter) crops on the basis of the recommendations of Commission for Agricultural Costs and Prices (CACP), after making adjustments, usually of a minor nature.

In making its recommendations, the CACP considers a number of factors. First, it takes into account the costs of production at two levels: the actual paid out costs plus the imputed value of family labour (A2+FL), and second, the comprehensive cost including imputed rent on owned land, interest on capital and transportation, marketing and insurance costs (C2). Several other factors come into play, including the trends in domestic and international prices, the size of existing buffer stocks, the terms of trade between agriculture and industry, inter-crop parity, supply demand balance, export opportunity etc. After taking into consideration various factors the CACP makes its price recommendation based on broad judgment and does not rely on indexation or any precise arithmetical calculations. A2 +FL cost is protected in all cases but C2 is not, keeping in mind domestic and international prices. It is for this reason that despite high import tariffs in food grains, the MSP and domestic prices in India have not got divorced from international prices. Table A.4 gives the full picture in respect of three important crops.

The main flaw in the policy is that although MSP is fixed for 24 crops, it is backed by meaningful purchase operations only in three

major crops - wheat, rice and cotton. Even if purchases are made by designated agencies in some other crops, they are ad hoc and not on a scale that makes a difference. Table A.5 gives the data on procurement of selected major crops by the Food Corporation of India, the Cotton Corporation of India and the National Agricultural Cooperative Marketing Federation (NAFED) in relation to the total production in the country.

In fact, even in respect of wheat and rice (for which substantial procurement operations have been carried out for many years), the complaint is that purchases are well organised only in a handful of states and in others, particularly in the eastern region, farmers sell their products in the market at prices that are below the MSP. Table A.6 shows great disparity in the level of procurement activity in the principal states producing rice and Table A.7 shows the same features in respect of wheat. If this disparity is eliminated or even just reduced, it is possible that there would be higher production of food grains in the regions where procurement operations have been weak or absent.

A feature of the procurement operations in the case of wheat and rice in support of the MSP is that they are carried out virtually indistinguishably from the purchases for maintaining buffer stock and the procured stocks are fungible. We analyse this further in Section 2.1.3

2.1.2.2 Other product-specific domestic support by the central government

National Food Security Mission (NFSM)

As a response to a surge in international cereal prices and the need to import large quantities of food grains, the Government of India launched the National Food Security Mission (NFSM) in 2007-08 aimed at increasing the production of rice by 10 MMT, wheat by 8 MMT and pulses by 2 MMT, through area expansion and productivity improvement in identified districts of the country. The main strategy was the promotion and extension of improved technologies, comprising seed, Integrated Nutrient Management including micronutrients, soil improvement, pest management and resource conservation technologies and capacity building measures.

Out of the elements of the NFSM described above demonstrations, plant protection and training fall under the categories exempted from reduction commitments in the WTO Agreement on Agriculture. However, while financial assistance for production or distribution of seeds and for nutrients qualifies as a product-specific input subsidy, financial assistance for mechanisation, and purchase of pumps and sprinkler sets are considered as product-specific investment subsidies. Article 6.2 of the WTO Agreement on Agriculture provides qualified exemptions for generally available input and investment subsidies but there is no exemption for product-specific subsidies. In Table 24, we compile the aggregate product-specific subsidies under the NFSM, using the scales provided in the guidelines issued by the Department of Agriculture and the targets set in the outcome budget of the department for the years under consideration. These would need to be added to the product specific AMS in respect of rice and wheat, which benefit from product-specific support by way of price support as well. Pulses do not benefit from substantive price support and by itself the product-specific support by way of seed subsidy etc. is deemed to be much less than the de *minimis* of 10 per cent of the value of production.

Table 24: Quantification of Support under National Food Security Mission

Crop	Subsidy in Broad Categories	2007-08	2008-09	2009-10	2010-11*
		in US Dollar Billion			
Rice	Seed Subsidy	0.0005	0.0083	0.0143	0.0125
	Other Input Subsidy	0.0017	0.0083	0.0118	0.0079
	Product Specific Investment Subsidy	0.0005	0.0157	0.0360	0.0156
	Sub-Total	0.0025	0.0322	0.0620	0.0358
Wheat	Seed Subsidy	0.0184	0.0213	0.0261	0.0184
	Other Input Subsidy	0.0022	0.0063	0.0143	0.0053
	Product Specific Investment Subsidy	0.0060	0.0135	0.0175	0.0042
	Sub-Total	0.0266	0.0413	0.0580	0.0279
Pulses	Seed Subsidy	0.0050	0.0163	0.0145	0.0134
	Other Input Subsidy	0.0020	0.0100	0.0162	0.0059
	Product Specific Investment Subsidy	0.0007	0.0067	0.0219	0.0070
	Sub-Total	0.0077	0.0333	0.0527	0.0261
Total		0.0370	0.1065	0.1726	0.0898

** Upto 31.12.2010*

Source: Author's estimate based on National Food Security Mission-Operational Guidelines, Department of Agriculture and Co-operation, Ministry of Agriculture, August 2007 and Outcome Budget, Ministry of Agriculture, Government of India, Various Years.

Integrated Oilseeds, Oil palm, Pulses and Maize Development (ISOPOM)

The scheme is an integrated initiative to enhance productivity in crops in which domestic production in the country is well short of the demand by encouraging the use of improved seeds, nutrient management, and irrigation through sprinkler systems. The main interventions adopted are assistance for production and distribution of quality seeds, plant protection, demonstrations, farmer's training, and subsidies for use of nutrients and for setting up sprinkler systems. Product-specific seed and input subsidies as well as product-specific investment subsidy are the main forms of assistance that are not covered by the Green Box. The magnitude of these subsidies are too small to be of any consequence in the context of de *minimis* limit of 10 per cent stipulated in the WTO Agreement on Agriculture.

Rashtriya Krishi Vikas Yojana (National Agricultural Development Plan)

The Rashtriya Krishi Vikas Yojana (RKVY) was launched in 2007-08 with the twin objectives of encouraging the formulation of district and state level plans and inducing states to increase their own spending in agricultural and allied sectors.

A feature of RKVY was that the states were given full flexibility in the utilisation of funds. According to available information state programmes have been highly diversified and have included interventions in crop development, horticulture, animal husbandry, dairy development, fisheries, natural resource management, agricultural mechanisation, micro-irrigation, seeds, fertilisers, research and organic farming. Mention must be made here that an allocation is being made in RKVY (starting with Rs 400 crore or USD 880 million in 2010-11) for the newly initiated programme of Bringing Green Revolution to the Eastern India (BGREI). The programme includes elements on new seed varieties, farm machinery, integrated nutrient and pest management, and knowledge-based intervention developed for different agro-climatic zones.

Some of the components of RKVY could have trade policy implications but the assessment is that the total monetary value of elements that could qualify as product or non-product-

specific subsidies under the WTO rules would not be significant.

National Horticulture Mission (NHM)

In 2005-06, the Government of India launched the National Horticulture Mission to enhance acreage, coverage and productivity through diversification from traditional crops, extension of appropriate technology, improvement of post- harvest management and capacity building. The Mission was reformulated in 2010 (GOI 2010b) and apart from research, extension, pest and disease control, and farmer's training, it involves assistance to farmers inter alia for setting up new gardens, establishing nurseries for the production of seeds and planting material, creating water sources for protected cultivation, undertaking organic cultivation of vegetables and setting up post-harvesting facilities.

The interventions undertaken in the National Horticulture Mission are almost entirely in the nature of investment subsidy but since they are not generally available within the meaning of Article 6.2 of the WTO Agreement on Agriculture, they would need to be taken into account for the calculation of product specific AMS for horticultural products. Having regard to the total value of horticultural production in the country and the relatively small amounts spent on the programme, it is not considered that there would be a problem vis-à-vis the de *minimis* limit stipulated by the WTO Agreement on Agriculture.

2.1.2.3 MSP and the WTO obligation on product-specific support

The MSP guaranteed through purchase operations constitutes a product-specific subsidy and is covered by the WTO obligations. India does not have any commitments in terms of Total Aggregate Measurement of Support and Annual and Final Bound Commitment Levels. In this situation, as a developing country India has to demonstrate, inter alia, that its Current AMS with respect to product-specific domestic support does not exceed 10 per cent of the value of production of the product concerned.

According to paragraph 8 of Annex 3 of the WTO Agreement on Agriculture, market price support is to be calculated using the gap between the fixed external reference price notified by India to the WTO, on the basis of the prices during the period 1986-1988, and the applied administered price (MSP). According to Article 1 of the Agreement on Agriculture, the Current Total AMS during any year in the implementation period has to be calculated 'with the constituent data and methodology used in the tables of supporting material incorporated by reference in Part IV of the Member's Schedule'. In the tables of supporting material (WTO Doc. G/AG/AGST/Vol.2) the currency used by India for calculating the Base Total AMS is the Indian rupee, and the ERP has been shown in terms of Indian rupees per ton. Therefore, to assess India's Current AMS with respect to product-specific domestic support we use this currency. The unit of weight actually used was Metric Tonne (MT), but was erroneously indicated as ton in the aforesaid notification.

Tables A.8 and A.9 give the calculations for wheat and rice, the principal crops in India in which the declared MSP is backed by extensive purchase operations. In both cases, we add the figures calculated as product specific input and investment support (see Table A.8 and A.9), which do not meet the standard of general availability stipulated in Article 6.2. In view of the provision in Article 18.4 for giving due consideration to the influence of excessive rates of inflation, we have made full adjustments in the MSP for the levels of inflation. Although the provision mentions 'due consideration', the authors do not see any reason for making less than full adjustment for the rates of inflation, particularly keeping in view the high rates of inflation in the country. Since the MSP is well below the fixed external reference price after taking inflation into account, the gap between the two is negative and the negative gap is large enough to allow full adjustment of the product-specific investment and input subsidies. As a consequence, the contribution of product-specific support to the Current Total AMS remains zero.

India has made its domestic support notifications to the WTO up to the year 2003-04 (G/AG/N/IND/7 dated 09-06-2011). In this, the ERP and the applied administered price have been notified in terms of the US$ instead of Indian rupees. Calculated on this basis also, the MSP has been below the ERP up to 2003-04, and it is perhaps for this reason that the currency of notification has not received focused attention. However, the calculations made by Gopinath (2011) show that due to successive increases in the MSP India moved out of the comfort zone in 2007-08 and in US $ terms, the MSP exceeded the ERP in that year. We would argue that the calculations on the basis of the US $ are helpful for analytical purposes but they cannot be the basis for determining whether India's level of product-specific domestic support is in compliance with its WTO obligations. As explained above, since India notified its ERP originally (WTO Doc. G/AG/AGST/Vol 2) in Indian rupees we have to see the relationship between the current support price and the ERP in terms of this currency, making due adjustment for excessive inflation, as we have done in Tables A.8 and A.9.

2.1.3 Other domestic support

2.1.3.1 Purchases in support of the MSP

The Government of India has designated a state enterprise, the Food Corporation of India (FCI), to undertake the purchase of paddy and wheat on its behalf to support the MSP. In addition to purchases to support the MSP the government also imposes a levy on rice millers and traders and acquires compulsorily a proportion of their production/turnover (varying from 30 to 75 per cent in various states). The levy programme is also handled by the FCI. In 1997-98, the scheme of decentralized procurement was introduced under which states conduct the procurement operations on behalf of the Government of India. At present, 10 states and union territories undertake direct purchase of paddy and wheat and procurement of levy rice on behalf of the Government of India.

The total purchase of wheat and rice (including paddy in rice equivalent) by the FCI and the state governments under decentralized procurement in the last four years is given in Table 25:

Table 25: Rice and Wheat Procurement (according to marketing year): *(Quantities in Million Tonnes)*

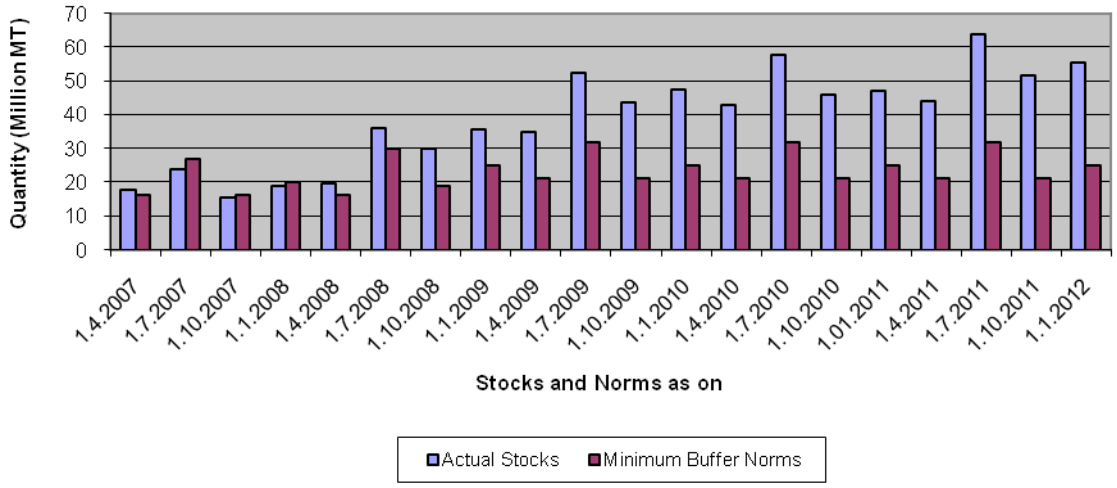
Crop	2007-08	2008-09	2009-10	2010-11
Rice	28.73	33.68	26.82	32.35
Wheat	11.19	26.04	27.94	22.08

Source: Agricultural Statistics at a Glance, 2011.

2.1.3.2 Public stockholding for food security purposes

The Government of India has laid down the buffer stock norms, according to which minimum quantities of stocks of rice and wheat must be maintained at particular times in the year. However, purchases made to support the MSP have resulted in the actual stocks in hand being far in excess of these norms, sometimes even more than double. The FCI carries out purchase operations in support of the MSP and public stockholding operations for food security purposes in a seamless manner and it is difficult to tell where one function ends and the other begins. Figure 2 shows the stock position in relation to norms for the combined buffer stocking of rice and wheat in recent years, with detailed data available in Appendix Table A.2.

Figure 2: Actual Stocks vis-à-vis Minimum Buffer Norms for combined Procurement of Rice and Wheat



2.1.3.3 Public Distribution System

Food grains acquired by the FCI through purchases in support of the MSP or pursuant to the objective of maintaining buffer stocks for food security purposes provide the stocks for central and state governments to run the public distribution system (PDS). The PDS, which is managed jointly by the central and state governments, occupies a crucial position in the food economy in the country although it only supplements the normal channels of trade for the distribution of food grains. The procurement, storage, transportation and bulk allocation to the states is the responsibility of the central government but distribution through fair price shops is handled by the state governments.

In 1997, the Government of India introduced the targeted public distribution system (TPDS) envisaging distribution of food grains and other essential supplies to the poor sections of the population. The original idea was to distribute food grains at concessional prices to 60 million poor families belonging to the poorer sections, with the states being given the full responsibility to identify the population falling below the poverty line (BPL). As a transitional measure, food supplies were continued for the population above the poverty line (APL) but at a higher price. In 2000, a decision was taken that the central issue price of food grains for the BPL sections would be 50 per cent of the economic cost (MSP plus procurement and distribution costs), while for the APL sections, it would be 100 per cent of the economic cost. Since then, a number of new welfare schemes have been introduced with a food component. The first and the most important is the Antyodaya Anna Yojana (AAY), which mandated the identification of the most indigent sections of the population for supplies of food grains at rates that were even more concessional than for general BPL categories. The number of families under the AAY, initially fixed at 10 million, has been expanded gradually to 25 million.

Besides general supplies to the APL, BPL and AAY categories, concessional supplies of food grains (at APL, BPL or AAY prices) are being made in the following schemes:

1. Midday Meal Scheme for schoolchildren in primary and upper primary classes to encourage enrolment, retention and attendance and to improve their nutritional level

2. Wheat-based nutrition programme for children below six years and expectant and lactating mothers

3. Supply of food grains to welfare institutions

4. Supply of food grains for Scheduled Castes (SC)/Scheduled Tribes (ST)/ Other Backward Castes (OBC) hostels

5. Annapurna scheme for supply of food grains to indigent senior citizens

6. Emergency Feeding Programme for the old, sick and infirm people in the depressed districts of Odisha

7. Village Grain Bank Scheme from which BPL/ AAY categories may borrow food grains in times of scarcity

In the context of government-sponsored food programmes it is also relevant to mention the Integrated Child Development Services (ICDS) Scheme, which has been in operation for more than three decades. This scheme, which adopts a multi-pronged approach for child development has a component for providing supplementary nutrition to bridge the calorific gap between the recommended levels and the average intake of children below six years and mothers in low-income and disadvantaged communities at government cost and for pregnant and lactating mothers.

The scale of supplies in the core programmes was first enhanced for each BPL and AAY family from the level of 10 kg per family per month originally fixed in 1997, but since April 1, 2002, it has been uniformly available for all three categories at 35 kg per family per month. Various scales of supplies are fixed in the special schemes described above. More importantly, the subsidy element in the issue price has been increasing every year because the government has not increased the central issue price although the economic cost of food grains has been increasing every year. In fact, for the APL categories the issue prices were brought down somewhat after being initially set at the level of the economic cost. Consequently, the divergence between the two has increased and the subsidy burden on the government has risen.

The central issue price for the three categories of consumers as it has evolved since 2000 when the present system was put in place is given in Table 26. It would be observed that while the economic costs have been on an uptrend the issue prices have remained unchanged for many years.

Table 26: Central Issue Prices for APL, BPL and AAY vis-à-vis Economic Costs for Rice and Wheat

With Effect From/ year*	Central Issue Price (USD /MT)							
	Rice (Common)				Wheat			
	Economic Cost	APL	BPL	AAY	Economic Cost	APL	BPL	AAY
1	2	3	4	5	6	7	8	9
25.07.2000	0.00	237.94	123.68	65.67	0.00	181.68	90.84	43.78
01.07.2001	225.92	163.58	116.26	61.73	175.50	125.52	85.39	41.15
01.04.2002	250.10	149.20	121.29	64.40	189.77	109.48	89.09	42.94
01.07.2002	250.10	170.67	121.29	64.40	189.77	130.95	89.09	42.94
2003-04	272.77	175.43	124.68	66.20	202.73	134.61	91.58	44.13
2004-05	290.13	176.94	125.75	66.77	226.79	135.76	92.36	44.51
2005-06	302.59	179.57	127.62	67.76	235.32	137.78	93.74	45.17
2006-07	307.45	175.69	124.86	66.30	260.29	134.81	91.71	44.20
2007-08	384.96	197.46	140.34	74.51	325.81	151.51	103.08	49.68
2008-09	378.47	172.85	122.84	65.23	300.17	132.63	90.23	43.48
2009-10	383.63	167.57	119.09	63.23	300.28	128.57	87.47	42.16
2010-11	435.25	174.49	124.01	65.84	327.98	133.88	91.08	43.90

**2003-04 onwards*

Source:

Columns 2 and 6 are taken from the table on Accounting Year-Wise opening Stock adjusted weighted Economic Cost and Acquisition Cost from http://fciweb.nic.in/articles/view/326 accessed on 13.08.2012;

Annual Report 2011-12, Department of Food and Public Distribution, Ministry of Consumer Affairs, Government of India.

The operations of the PDS have expanded beyond rice and wheat and they now cover sugar, edible oils and kerosene oil as well. Until recently, sugar in India was under partial control and producers had to deliver 10 per cent of the production to the government and the levy-sugar, as it was called, was acquired and distributed at lower prices through the PDS. Government has also distributed imported edible oil through the PDS with a subsidy of Rs 15-25 per kg. Kerosene oil is sold in India at a much lower price than other fuel oils because of lower levels of excise duty imposed on it and it is made available through the PDS.

Budgetary implications of procurement (MSP), buffer stocks and distribution

The expenditure on all these operations is lumped together and put under the broad heading of food subsidy in the Government of India expenditure budget as shown in Table 27. This includes expenditure on procurement, stocking and distribution as well as the difference between the economic cost (for procurement) and the central issue price (for sale).

Table 27: Food Subsidy (*Billion US Dollar)*

Year	Budgetary allocations released		
	FCI	States	Total
1	2	3	4
2007-08	6.90	0.87	7.76
2008-09	7.99	1.51	9.49
2009-10	9.88	2.40	12.28
2010-11	11.13	2.68	13.81

Source: Columns 2, 3 and 4 are from Annual Report 2011-12, Department of Food and Public Distribution, Ministry of Consumer Affairs, Government of India.

Based on the financial details given in the Annual Reports of the Food Corporation of India, it is possible to obtain a breakup of the total expenditure on food subsidy. A good part of the expenditure is accounted for by procurement incidentals, distribution costs and carrying cost of stocks as shown in Table 28:

Table 28: Costs incurred by FCI in procurement, stocking and distribution of food grains (In USD/MT)

Year	Pooled Cost of Grain		Procure-ment Incidentals		Acquisition Cost		Distribution Cost		Economic Cost		Annual rate of Buffer Carrying Cost
	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat	Rice	Wheat & Rice
1	2	3	4	5	6	7	8	9	10	11	12
2007-08	224.36	257.60	40.74	53.38	265.10	310.98	60.71	73.97	325.81	384.96	81.16
2008-09	207.76	268.10	39.05	49.33	246.81	317.43	53.36	69.74	300.17	384.96	97.94
2009-10	214.44	283.82	43.61	60.83	258.04	344.65	42.23	38.98	300.28	384.96	85.40
2010-11	233.60	317.48	46.61	68.72	280.21	386.20	47.77	49.05	327.98	384.96	89.64

Source: the table on Accounting Year-Wise opening Stock adjusted weighted Economic Cost and Acquisition Cost from http://fciweb.nic.in/articles/view/326 accessed on 13.08.2012.

In 2010-11, procurement incidentals and distribution costs accounted for more than 40 percent of the total cost of acquisition of cereals and the carrying cost of inventories added to the expenses. Table 29 gives the data on the consumer subsidy component of the food subsidy calculated on the basis of the difference between the economic costs and the central issue price to various categories of consumers as shown in the Annual Reports of the FCI. The table also gives the figures of expenditure on carrying cost of inventories.

Table 29:Consumer subsidy and carrying costs incurred by FCI *(Billion USD)*

Year	Subsidy for Wheat	Subsidy for Rice	Carrying Cost of Buffer Stocks	Total costs incurred by FCI
2007-08	2.50	4.78	0.17	7.45
2008-09	2.11	4.67	0.77	7.55
2009-10	2.95	4.84	1.23	9.03
2010-11	4.27	6.72	1.39	12.38

Source: Annual Report, Food Corporation of India, various years.

The biggest concern on food subsidy is the leakage of public funds in the massive procurement and distribution operation. The magnitude of operations of the FCI is so large that it results in inefficiencies, which are manifest in the proportion of expenditure incurred on procurement incidentals, distribution costs and carrying costs. Moreover, given the governance deficit and pervasive corruption in the country, and the large profits to be made from the illicit diversion of subsidised food grains, a substantial proportion of these does not reach the beneficiaries in the BPL and AAY categories. According to a 2005 Report (GOI 2005), the system is full of loopholes. There are inclusion errors where APL households are wrongly given entitlement to subsidised food grains and exclusion errors where BPL households are deprived of their entitlement. Ghost ration cards abound and in several cases, BPL cards are held by persons other than the original owners. The estimate made in the report is that leakages from the TPDS accounted for 36.38 per cent of the subsidised food grain and diversion for 21.45 per cent.

The contribution of food subsidy to the fiscal deficit of the central government is equally a source of major concern.

Table 30:Contribution of Food subsidy to India's Fiscal Deficit *(Billion USD)*

Year	Fiscal Deficit	Fiscal deficit as a % of GDP	Total Food Subsidy	Food Subsidy as a % of fiscal deficit
1	2	3	4	5
2007-08	31.52	2.50	7.76	24.63
2008-09	73.27	6.00	9.49	12.96
2009-10	88.21	6.50	12.28	13.92
2010-11	83.71	5.50	13.81	16.50

Source: Table 3.2, Economic Survey 2011-12.

Buffer stocks, food subsidy and WTO obligations

The WTO Agreement on Agriculture allows expenditure on public stockholding of food, subject to the condition that the stocks correspond to predetermined targets related solely to food security. In India, the buffer stocks are indistinguishable from the open-ended purchase in support of the MSP but this does not seem to be in conflict with the WTO obligations. As for the subsidised distribution of food the main requirement is that eligibility to receive concessional supplies must be subject to clearly defined criteria related to nutritional objectives. In India, the scales of supplies of food grains from the PDS are fixed and the price is also calibrated according to the level of poverty of various sections of the population. The purchase price is the MSP and the difference between the MSP and the fixed external reference price is taken into consideration in the calculations of the AMS as we have seen in Tables A.8 and A.9.

2.1.3.4 National Food Security Bill and Ordinance

A recent initiative of the Government of India is the National Food Security Bill (NFSB) 2011, which has been revised with some important changes in 2013. This is an ambitious document, which seeks to create an entitlement for subsidised food grains for a major segment of the population. Priority households would be entitled to receive 5 kgs of food grains per person per month, and the indigent categories covered by the existing programme of Antyoday Anna Yojana (AAY) would get 35 kgs per household per month. The Bill does not lay down the criteria for the identification of the two eligible categories, but stipulates that the combined coverage would be 'up to 75 % of the rural population and up to 50 % of the urban population'. The central government would determine the percentage coverage under the TPDS in rural and urban areas of each state and the state governments would identify the AAY and other priority households. The NFSB also envisages the subsidised price for eligible households to be fixed in the law (for three years) at Rs 3 (US cents 5.5) per kg for rice, Rs 2 (US cents 3.7) per kg for wheat and 1 rupee (US cents 1.8)) for coarse grains. It further gives a statutory basis for existing programmes for supply of free cooked food or take-home rations for pregnant and lactating mothers, infants and children up to 6 years and for mid-day meal for primary and upper primary school students.

The NFSB has been criticised for a number of reasons. It imposes a highly centralised model, perpetuates existing inefficiencies of the TPDS, is riddled with ambiguities and has a cereal-centric approach. The increased consumption subsidies resulting from the implementation of the Bill would reduce the ability of government to increase public investment in agriculture. It also would result in a virtual state takeover of food grain economy and cripple competition. One specific point of criticism was that the central and state governments were being granted immunity against any claim during natural calamities, including flood and drought, when food supplies are likely to be needed the most. The point was also made that there was no recognition of the need for additional investment in agriculture, storage and transport infrastructure. If these investments were added the total financial implication of the implementation of the Bill would be much higher.

More importantly, the NFSB suffers from two fundamental flaws. First, the Bill proposes to rely on the decrepit machinery of TPDS, which is resulting in a massive leakage of subsidised food grains. The Bill does envisage reforms in the TPDS and Section 18 lists out various elements such as 'application of information and communication technology tools including end to end computerization in order to ensure transparent recording of transactions at all levels, and to prevent diversion' and 'leveraging "aadhar" for unique identification with biometric information of entitled beneficiaries for proper targeting of benefits'. However, there is no time frame for completing the reforms and implementation of the new food subsidy programme will have to depend upon the leaking apparatus currently in position for an indefinite period. Second, it ignores the current fiscal predicament of the country by proposing an increment of Rs 239 billion (Prachi Mishra in Economic Times May 14, 2013) in the annual expenditure on food subsidy. The scheme put forward in the NFSB is designed to lead to ballooning expenditure in future as the issue price for priority households would be fixed in law for three years at the rates mentioned, while the economic cost of food grains will go on rising.

Having regard to the level of incomes in India, giving subsidised food grains to 75 per cent of the population in rural areas and to 50 per cent in urban areas does not appear to be unreasonable. However, the question for the government is whether the time is opportune for this initiative. We have seen above that even at the existing level, food subsidy contributes substantially to the fiscal deficit, which is becoming unsustainable. Any proposal to increase food subsidy massively will constitute a grave threat to macroeconomic stability.

In its report in September, 2012, the Committee on Roadmap for Fiscal Consolidation (GOI 2012c) has underlined that the central government is currently in a state of fiscal stress. It has warned that unless steps are taken to both cut subsidies and increase resources, the fiscal deficit in the current year 2012-13 would be at the unsustainable level of 6.1 per cent of GDP. The consequences of the failure to achieve fiscal consolidation for the Indian economy will be serious, eventually resulting in a slowdown in growth from which the poor and the unemployed would suffer the most. Confronted as we are with a fiscal cliff, it seems difficult to consider an increase in food subsidies as envisaged in National Food Security Bill. Rather, the central government's effort should be directed first towards plugging the loopholes in the TPDS.

Notwithstanding the critique of the NFSB elaborated above, the central government has promulgated the National Food Security Ordinance, 2013, which has entered into effect on July 5, 2013. No doubt the government has taken into account the rising crescendo of public support for the legislation as well as the slight improvement in the fiscal deficit. The flaw regarding immunity for the government from claims in situations of flood and drought has not been eliminated. But Section 12 of the Ordinance envisages reforms in the TPDS to eliminate leakages and diversion of subsidised food grains, as the NFSB had done, not before implementation but progressively in future. Further, Section 31 of the Ordinance read with Schedule III shows the government's readiness to address the need for additional investment in agriculture, transport and storage.

2.2 Market Access

For all of the 1960s, 70s and 80s, India's import regime for merchandise was comprehensively controlled through import licensing and state trading. In addition, high levels of tariffs prevailed on both agricultural and industrial products. The economic reforms of 1991-92 brought about a big change in India's import trade barriers. On industrial products, the peak tariff levels were progressively brought down from 150 per cent or more to 10 per cent by 2007, leaving aside a few exceptions. Quantitative restrictions were eliminated on raw materials, intermediate goods and capital goods to start with. The market access regime for agricultural products, however, did not undergo a parallel process of liberalisation. The rules of the WTO Agreement permitted developing countries to maintain quantitative restrictions on agricultural products under the balance-of-payments exception and during the negotiations India was allowed to offer ceiling bindings on the products on which such restrictions were maintained. Consequently, India bound its agricultural tariffs at 100 per cent for commodities, 150 per cent for processed products and 300 per cent for some edible oils. Only on a few products including cereals and milk products the pre-existing GATT bindings at zero tariffs were carried forward. With such high bound levels, India was under no pressure to bring down its applied levels of tariffs. In any case, as long as quantitative restrictions continued, tariff levels did not determine trade flows. It was not until April 1, 2001 that India decided to lift all quantitative restrictions, following the ruling in a WTO dispute that the balance-of-payments justification for these restrictions had ceased to exist. The elimination of balance-of-payment restrictions in 2001 led India to increase tariffs in a number of agricultural products because of the fear of large-scale imports. In fact in 2000, in view of the impending phase-out of quantitative import restrictions India re-negotiated the bound tariffs and raised them from zero to 60 per cent for skimmed milk powder, from zero to 60 to 80 per cent for maize, rice and certain other cereals, and from 45 to 75 per cent for rape, colza and mustard oils. In these re-negotiations India made compensatory reductions in a number of agricultural products including butter, other cheeses, almonds, fresh citrus and other fruits, malt, olive oil, and processed foods including biscuits, orange juice, shorn wool and wool tops. A feature of these re-negotiations was that India offered tariff-rate-quotas (TRQ) at a lower in-quota tariff in respect of skimmed milk powder, maize and rape, colza and mustard oils.

After the introduction of economic reforms in 1991-92, there was a downward trend in basic customs duty (BCD) on agricultural products, although this was not as striking as that on non-agricultural products. The elimination of quantitative restrictions in 2000 reversed the trend and gave an upward push to India's tariffs on important agricultural products. Despite this, in overall terms, the applied levels of agricultural tariffs have been coming down since the introduction of economic reforms. According to one calculation (Mathur and Sachdeva 2005), the simple average of basic customs duty (BCD) was 108 per cent in 1991-92, and this has come down to 31.8 per cent in 2011 according to the WTO/ITC/UNCTAD World Tariff Profiles.

Due to the ceiling rates of binding allowed in the WTO Agreement on Agriculture, a feature of India's agricultural tariffs is the wide gap between the simple average bound tariffs (113.1 percent) and the average applied rates of BCD (31.8 percent as of 2009) (WTO ITC UNCTAD, World tariff Profiles 2011).

The wide gap between bound and applied levels of tariffs on agricultural products is the result partly of the modalities of liberalisation agreed upon during the Uruguay Round, which allowed ceiling bindings, and partly of the unilateral liberalisation undertaken by India. The opportunity for reducing the gap will come only at the time of conclusion of the Doha Round. The tiered reduction of bound rates proposed for developing countries in the Revised Draft Modalities for Agriculture (TN/AG/W/4/Rev.4) in the negotiations could have been expected to reduce the gap but on account of the flexibilities given to developing countries, the reduction will be modest (See Gopinath and Laborde for a detailed treatment).

Tariffs are applied in India generally on the basis of statutory rates, which are known as the Schedule Rates of Customs Tariff, and are approved by the Parliament while approving the budget from year to year. However, the government also makes lower applied rates effective by executive decisions through exemption notifications issued from time to time. The gap between the bound and applied rates becomes larger when we take into account the exemption notifications. Since changes in the statutory rates need the approval of Parliament (generally once in a year during the budget session), they have greater stability than the rates made effective through exemption notifications, which can be changed any time.

The gap between the bound, Schedule and exempted rates in selected products with substantial actual or potential trade can be seen in the Table below.

Table 31: Basic Customs Duty on Selected Products

Product	Bound Rates % ad valorem	Schedule rates of BCD	Remarks	Rates under exemption
Meat and poultry	35-150	30-100	All tariff lines are at 30 except chicken cut in pieces at 100	
Milk	40-100 TRQ of 10,000 MT bound at 15 for SMP	30-60		TRQ of 50,000 MT at zero for SMP
Peas, beans, lentils	100	30		Zero from 2007-08 onwards
Fresh fruits	30-150	25-50		
Rice	70-80	70-80		The BCD of 70 on milled rice was fully exempted during 2009-10,2010-11 and 2011-12 but raised in 2012-13
Wheat	100	50-100		Zero until 1-4-2013
Tea, Coffee	100-150	100		
Spices	100-150	30-70		
Vegetable Edible oils	45-300 TRQ of 150,000 for rape, colza and mustard oil at 45	0-7.5		2.5 for crude oil and 7.5 for refined
Sugar	100-150	100		60 10 for raw and white sugar (conditional on end use and registration)
Wool	25-100	5-10		
Cotton	100-150	0-30		BCD on cotton, carded not carded and combed is zero

Source: Arun Goyal, BIG'S Easy Reference Customs Tariff 2013-14, 34th Budget edition

The following observations can be made on the evolution of agricultural tariffs in recent years:

- In wheat and rice, the usual practice has been to maintain the statutory (Schedule) rates at the relatively high rates at which they are bound but to exempt the duty whenever imports are considered necessary on account of upward pressure on domestic prices. However, high international food prices in recent years have made the ceiling bound rates increasingly irrelevant and no imports have taken place even when the duty was exempted as happened in the case of wheat in 2012.

- The Schedule rates have been maintained at a relatively high level on tea, coffee and spices (pepper) even though India is a significant exporter of these tropical products

- The tariff on milk has been progressively liberalised by increasing the TRQ and eliminating the in-quota tariff through exemption notifications. Similarly, the BCD on sugar has been effectively lowered to 10 per cent

- On crude vegetable oils the BCD was earlier eliminated through an exemption notification, but in January, 2013 it was raised to 2.5 per cent. Reduction of tariffs by lowering the Schedule rates has greater stability as it cannot be reversed except with the approval of Parliament, usually at the beginning of a financial year

- Imports of industrial raw materials have been liberalised by lowering the Schedule rates of duty progressively.

The wide gap between India's bound and applied tariffs on agricultural products have been a matter of concern for India's trading partners. However, it must be recalled that in the Uruguay Round, high bound levels of tariff were permitted to countries maintaining quantitative restrictions for balance-of-payments reasons. The gap has occurred principally because India has been reducing the applied agricultural tariffs unilaterally and autonomously and surely this needs to be applauded rather than criticised. Why does not India bind its tariffs at a level nearer the applied levels? As we have observed earlier, the opportunity for reducing the gap will come only at the time of conclusion of the Doha Round, and failing that in future negotiations. At that time, India's trading partners would have the opportunity to obtain commitments on a reciprocal basis for closing the gap in selected products of their interest to a greater extent than entailed by the application of formula and the flexibilities for developing countries.

Export controls.

In the past, India's policy on exports of some key agricultural products, including cereals, sugar and cotton has reflected a greater concern for the consumer than for the farmer. Exports are curtailed or prohibited if there is an estimated shortfall in domestic production in order to pre-empt an upward pressure on prices. Recently, the government has tended to show greater sensitivity to the interests of the farmer and there has been a willingness to give them the opportunity to sell the produce in the international market in which they can earn the highest price. The government has been influenced also by criticism coming from outside the borders as export control measures have played a role in exacerbating price spikes in global markets in times of shortages. Since a number of countries have adopted measures for restricting exports of foodstuffs in particular, and effective disciplines on such restrictions are lacking in the WTO Agreement, there has been a growing demand (in the G20) and elsewhere for a worldwide political consensus on prohibiting such restrictions.

3. THE WAY FORWARD: AGRICULTURAL TRADE POLICY AND SUSTAINABLE DEVELOPMENT GOALS

It is difficult for us to question the basic objectives of India's agricultural trade policy, which are to protect the livelihood of farmers while balancing also the interests of consumers, provide support particularly to small and marginal farmers, and to alleviate poverty. However, the instrumentalities must be efficient and effective in achieving these objectives and must fulfill the attainment of sustainable development goals. In general domestic support of agriculture needs to move from measures that cause more than minimal trade and production distortions to those that do not have such effects, from input to investment subsidies and from consumption subsidies in kind to direct or conditional cash transfers. The funds so saved can be used for greater public investment in physical infrastructure and in research, extension and measures to safeguard animal health, and in incentivising private investment in agriculture. In Section 2 we have identified and analysed the shortcomings in government policies in this regard. In this section we formulate suggestions on the agenda for reform.

3.1 Irrigation

With the inexorable rise of groundwater as a source of irrigation, major and medium irrigation can no longer be the anchor of irrigation efforts in the future. However, with the amount of public investment that has already gone into these projects, it is necessary for us to optimize the benefits from them. We need to ensure that we get full benefit from projects that have been completed in the past and fully commissioned. In order to do so we need to reform price, institutions and the financial arrangement. The first imperative is price reform as many of the deficiencies of the system flow from the under-pricing of water. We have seen that (Table 1) the water rates in 2001 were estimated to be about one percent of the value of the main crops grown and eight per cent of the O&M costs. Considering the proportion of the population dependent on agriculture in the country, it would be appropriate to treat water for irrigation as a public good and for society to bear the capital-related charges fully in return for assured availability of locally produced basic foodstuffs. The target for increasing water rates, therefore, must be to cover O&M cost only and capital related charges must be excluded from the equation.

Price reform cannot succeed unless it is accompanied with institutional reform. The second requirement is to set up Water Users Associations (WUAs).for all developed irrigation projects. In fact, a few states such as Andhra Pradesh, Tamil Nadu and Maharashtra have already brought about the change and have been successful in doing so. The experience has not been satisfactory in some other states but there is no alternative to participatory irrigation management and efforts must continue to encourage all states to adopt it without reservation. For the best results, the responsibility of collecting water charges as well of operating and maintaining the canal system should be handed over to WUAs.

An important element of the reform should be to move from the area basis of assessment of water rates to a volumetric basis. For this, it would be necessary to install water measuring devices at the minor level. Shifting to volumetric basis for assessment of water rates will also make it possible to incentivise economy in the use of water.

The third reform needed is in the financing of surface irrigation projects. It is necessary to deal first with the large backlog of projects, some of which have beem under construction for 30-40 years. The ongoing projects should be prioritised according to the stage of completion and annual financial allocations concentrated on projects which are in the last mile stage and which can deliver benefits immediately. For making the maximum funds available for projects in the pipeline, a moratorium should be imposed on new projects.

3.2 Power and Lift Irrigation

Reform in this area is inconceivable without effective action at the outset to address the appalling inefficiencies of the State Electricity Boards (SEBs), which result in problems of interruption and voltage fluctuation in the supply of electricity to farmers. The root cause of the problem is the power shortage in the country, aggravated by inadequacies in transmission and distribution. Despite substantial additions to the installed capacity for generation over the past decade, the energy shortage and the peak demand deficit has persisted in the country mainly because of difficulties in coal supplies. The poor financial health of the SEBs is another cause of their inefficiency. The factors responsible for this include poor governance in states, leading to rampant theft of electricity, and high transmission and distribution losses and the employment of large numbers of unproductive staff.

Addressing the multifarious problems leading to inefficiencies in the SEBs would need a sustained effort by the state governments over a long period. The example of Gujarat has demonstrated that considerable amelioration in electricity supplies to the rural agricultural sector is feasible without fully resolving the wider problems referred to above. Under the Jyotigram programme, Gujarat has separated the feeders for farm and non-farm supply, providing rationed and high quality supplies to the former and 24x7 supplies to the latter. The tube wells receive supplies with full voltage though only for 8 hours a day, according to a pre-arranged schedule and the latter, including domestic consumers, schools, hospitals, receive supplies throughout the day. The programme has not only given satisfaction to several groups of stakeholders, from housewives to students and patients beside farmers, but has also led to a halving of power subsidies. The Jyotigram programme needs to be replicated in other states.

Once the problem of the agricultural sector in getting electricity supplies is resolved in the above manner, the next step can be envisaged for gradually increasing the rate charged for agricultural use so as to narrow the gap with the average cost of supply. Such a step is unavoidable for rescuing SEBs from the dire financial straits into which they have been driven by being compelled to supply electricity either free or at nominal rates to the agricultural sector.

To the extent that irrigation is provided from tube wells owned and operated by the departments of irrigation or agriculture of the state governments, our recommendations are the same as in the case of surface irrigation in the previous section. The objective should be to recover fully the O&M costs by the assessment and collection of water charges. Further, WUAs should be given the responsibility for collection of water charges as well as for the operation and maintenance of the system, and the collected water charges should be ploughed back to them on a guaranteed basis.

3.3 Fertilisers

From the fiscal point of view, an upfront and steep reduction of subsidy on fertilisers is the need of the hour. However, besides being politically unfeasible such a step could have the drastic effect of a reduction in food grain production. Any change in fertliser subsidy can only be brought about gradually to allow farmers to adjust to new conditions. The first task before the Central Government is clearly to extend the NBS scheme to urea to end the skewed use of nitrogenous fertilisers. At the outset, the NBS level should be derived from the current level of subsidy, but once determined, it should remain fixed in nominal terms for an extended period, allowing inflation to erode the NBS in real terms. In phosphatic and potassic fertilisers, in which the changeover to NBS has already taken place, the next step should be to obtain fixity in the NBS level and not to make changes on a year-to-year basis. The reduction in real terms would be imperceptible and could pass the test of political acceptability. In the past, the MRP was fixed in nominal terms and not changed, but in future, the NBS should be fixed in nominal terms and not changed over an extended period.

To check overuse of chemical fertilisers conscious use must be made by the extension machinery of the government to advocate use based on soil analysis, due attention being given also to the existence in the soil of adequate proportions of micro-nutrients and organic matter.

An alternative to the arrangement suggested above would be to shift to the system of conditional cash transfers. Direct payments made to farmers should also be fixed on the basis of the area under cultivation and should be conditional on their having soil analysis results with them, so that there is some assurance that they would be using chemical fertilisers in the right proportions. Shifting to conditional cash transfers for fertilisers would not only correct skewed use and reduce overuse but would also check the smuggling of cheap fertilisers across the borders. Everything taken together, such a systemic change could reduce the fiscal burden on account of fertiliser subsidies significantly.

3.4 Agricultural Credit

Timely and adequate credit has a big role to play in increasing agricultural production, as without it the farmer cannot ensure the use of optimum inputs for farm operations. In the 1970s, the introduction of a requirement by the Reserve Bank of India that commercial banks should allocate a proportion of aggregate bank advances for lending to the priority sector (which included agriculture and small-scale industries) expanded lending by these banks for farm operations. The opening of a large number of branches of nationalised commercial banks in rural areas further helped to increase the access of farmers to institutionalised agricultural credit. The Kisan Credit Card scheme introduced in 1998 was yet another big step forward in expanding agricultural credit by simplifying procedures and making it hassle free. To the extent that subsidised credit reaches the farmer, there can be no doubt that it reduces the credit cost and increases farm incomes. However, one has to take into account the systemic effect of subsidisation. Mandates from government to lending institutions to give farm loans at subsidised interest rates usually act as a disincentive for lenders to advance credit as they are seldom compensated fully for advancing loans at the subsidised rates. On the other hand, a big difference in the subsidised lending rates and the market lending rate creates the temptation for farmers to re-lend the subsidised loans at market rates and make a quick profit by pocketing the difference instead of utilising it in farm operations. This happens more if there are shortfalls in the adequacy of credit on which complaints have continued. The policy initiatives in future must aim at improving the adequacy of credit, and the process would be helped if agricultural credit subsidies are phased out.

3.5 Minimum Support Price

We have noted also that the price support operations in rice and wheat usually result in the central government carrying stocks that are much larger than the optimum buffer stock level. As long as the PDS is continued in its present shape, there may not be any need to reduce the scale of purchases. However, if the PDS is to be reformed as we suggest in the section below and replaced by a system of conditional cash transfers, then the volume of procurement would need to be brought down. If constraints are removed on trade by the private sector, the pressure on the government to purchase large quantities of food grains would ease considerably. For the private sector to be able to enter the food grain market in a big way, the government needs to provide increased opportunities to the farmers to sell their products in the internal and external markets. First, exports should remain open and unrestricted at all times as we suggest in section 3.9 below. Second, excessive purchase tax going up to 14.5 per cent that are levied by some state governments on the sale of food grains should be eliminated and absorbed in the Goods and Services Tax (GST), the introduction of which is on the anvil. Third, the imposition of a levy, whereby rice millers have to surrender to the government a large proportion of their turnover at fixed prices, should be discontinued. Finally, the restrictions on private trade made effective under the Essential Commodities Act, 1955, must be discontinued.

If the measures recommended above are not found to be effective and the government continues to be burdened with large stocks, alternative schemes such as deficiency payments should be introduced, whereby the farmer is compensated for a fall in the market price below the target price, the MSP being treated as the target price.

3.6 Public Distribution System

One way to avoid the pitfalls of leakage and diversion of benefits is to change to a system of direct cash transfer (DCT) or better still conditional cash transfers (CCT). In the latter, the cash transfers are made conditional on the beneficiary families sending children to primary school and meeting basic health care requirements. The scale of subsidy for food grains may remain the same as intended in the TPDS and only the mode of delivery needs to change. The Unique Identity Card (UID) now in the process of distribution will make direct cash transfers to the needy segments of the population feasible to operate. There is a powerful argument in favour of such a scheme: it can transfer purchasing power directly to the target groups without the need for government to handle food grains through the public distribution system. The only administrative burden for the government is to identify populations in the targeted groups and to arrange for a transfer of funds (Josling 2011; page v).

The template for implementing a cash transfer scheme has already been provided in the recent initiative of the Government of India, whereby a pilot project has been adopted for 29 schemes excluding food and fertilisers subsidy in 51 districts in 15 states with effect from January1, 2013. For the cash transfers scheme to go forward, there are two requirements. Individual beneficiaries must have a Unique Identity Card (Aadhar) number and a bank account, to which the funds can be transferred. The Unique Identity Card Authority of India (UIDAI) has already made considerable progress and over time the whole country will be covered. There is a problem in that commercial banks do not have the extensive rural coverage through branches necessary to make the system operational in the whole country. This shortcoming can be overcome by appointing business correspondents as commissioned agents for operating micro-ATMs linked to the banking system.

A big bang approach for introducing the CCT policy in the whole country at the same time is not feasible, and a gradualist approach would be the only way forward. In view of the federal structure of the Indian Constitution, the CCT scheme cannot be imposed on states and they may have to be given flexibility in the application of the scheme. In remote and food deficit areas, states may opt to continue with the earlier system of delivering food grains to the beneficiaries. An eminently sound suggestion is that a start should be made in cities with a population of one million plus and in cereal-surplus states (Gulati et al, 2012).

3.7 National Food Security Ordinance (NFSO)

In order to maximise the benefits and minimise the downside, the central government needs to take a number of steps. First, the reforms envisaged in the NFSO for applying information and communication tools in order to ensure transparent recording of transactions and to prevent diversion must be undertaken as a matter of priority. Second, states should be permitted to use the system of CCT or DCT at least in some areas, so that the benefit of such systems can be assessed before their wider adoption is considered. Third, to meet the likely steep rise in food grains consumption in the country, effort should be redoubled on the irrigation and power front, as we suggest elsewhere in this Section.

3.8 Market Access and Export Controls

A common criticism of India's import tariffs on agricultural products is that there is a large difference between the bound and applied tariffs. India needs to be praised rather than criticised for bringing down applied tariffs on major foodstuffs, even if this has increased the divergence between the bound and applied rates. The opportunity to lower bound duties

comes only during negotiations and the impasse of the Doha Round has deprived India of this opportunity.

Once special agricultural safeguards have been agreed in the WTO, during future multilateral negotiations there should be greater willingness on the part of India to bring down the bound duties on agricultural products across the board. In the meantime, in order to impart greater stability to the applied tariff regime, India could take a step autonomously towards lowering statutory rates to exempted levels, particularly in cases in which the exempted levels have remained low for many years. This would impart a modicum of stability to the tariff regime on agriculture even before India moves during multilateral negotiations to lower the bound tariff levels.

Export controls introduced by India on food and fibre have met with disapproval both inside and outside the country. The criticism from inside is that these measures deprive farmers the opportunity of getting a good price from international markets. The complaint of trading partners is that these measures disrupt trade and exacerbate food and fibre shortages on global markets when prices are already high. The objection against quantitative controls is that they distort more and are cumbersome to administer. A stop-go policy is even worse and has deleterious consequences particularly for the farmer producers. The time, therefore, has come for government to take a policy decision that it would limit exports, when it becomes imperative to do so, only through export duty rather than by prohibition or quantitative restrictions.

3.9 Sustainable Development

Implementation of the suggestions on the way forward in subsections 3.1, 3.2 and 3.3 will help not only in fulfilling the objective of increasing food production consistently with the requirement of efficiency but will also foster sustainable agriculture. Additional effort, however, would need to be made in four key areas for ensuring the sustainable use of land and water resources.

Utilising irrigation potential

Although the Central and State governments have invested large funds in major and medium irrigation projects, there has remained a significant and increasing gap between the irrigation potential created and utilised. From the financial angle, it is important to ensure that benefits start flowing from these projects. As the gap between irrigation potential created and utilised results in wastage of water resources, bridging the gap would be equally important from the perspective of sustainability. The Government of India is seized of the problem and the Twelfth Plan already envisages additional funds for command area development, including the construction of canal systems and field channels. We suggest that the private sector should also be involved through private-public-partnership (PPP) arrangements in command area development activities. In order to get over the problem of land acquisition, pipeline-based field channels should be freely permitted. PPP arrangements could also be permitted within the command areas of irrigation projects for undertaking lift irrigation schemes for micro-irrigation.

Stimulating groundwater regeneration

One of the consequences of free supply of electricity or of unmetered supply (on the basis of the capacity of pumps) in many states is that water pumps can be run at no cost or at a marginal cost, resulting in pumping of water without limit. We have seen in Table 7 the extent to which ground water has been over-exploited in some parts of the country. In order to prevent the unsustainable use of water resources, it is vital to ensure that power is appropriately priced and practices such as levying of fixed charges related to the capacity of the pumps need to be given up. At the same time, efforts should continue to find a consensus among states on appropriate regulatory approaches to address the problem.

As we have seen in section 2.1.1.2, groundwater irrigation has already become the dominant source of irrigation and, given the flexibility that it gives to the farmer, its adaptability

for high value agriculture and its suitability for promoting more economic use of water, its importance is likely to grow further. The challenge of depletion of groundwater resources is here to stay forever. Approaches to increase water rates and introduce regulation will accomplish only half the task. What is needed is to make it possible for the farmer to rely more on this resource rather than less, by the central and state governments undertaking a massive programme of groundwater regeneration. As suggested by experts, "Managing the ground water reservoir ought to be the key aim of India's water policy." (Shah, 2008, p.45, cited by Ackermann, 2012).

The ongoing watershed development programme has to be expanded and revitalised by co-ordinating its implementation with the Mahatma Gandhi National Employment Guarantee programme. Here too, the Gujarat initiative is worthy of emulation by other states. The construction of check dams on a large scale has resulted in the stabilisation of ground water levels even though it is being steadily exploited with the help of rationed but assured supply of power. Even within the command areas of major and medium irrigation projects, canal waters should be used to contribute to the recharge process. Most of the canal systems provide irrigation during the dry season and during the monsoon, water is simply allowed to run off to the seas. The unused canal water can be used in the wet season as well, not only to supplement rain water for water intensive crops, but more importantly to induce seepage through unlined canals into the aquifer, from where it could be pumped by farmers during the dry season. (IWMI, 2002, cited by Ackermann, 2012)

Drip Irrigation and Fertigation

The future course seems to be towards drip and sprinkler irrigation with fertigation facilities. That has the potential to save about 40-50 per cent of water, about 30 per cent of fertilisers, and also about 25-30 per cent of energy. But it would need large initial capital investments, and small and resource poor farmers cannot afford these. The investment incentives under the micro-irrigation initiative of the Government of India need to be scaled up substantially, with the additional element of fertigation included. Such incentives would be superior environmentally and will have lesser production and trade distorting effects. As a beginning, highly drought prone states like Maharashtra, Karnataka, Rajasthan and Gujarat should take a lead in this direction with help from the centre.

Further, solar panelled motor pumps should be incentivised to promote environment friendly and sustainable irrigation, in states with high water tables.

Focusing attention on Eastern States

Policies have to be directed towards enabling the eastern states to use the abundant ground water resources available in the region for achieving higher growth in agriculture. We have seen that farmers in the region rely more on the use of diesel pumps than on electric pumps and in two states (Bihar and Jharkhand) the use of electric pumps is only two per cent. As diesel gets more expensive, the farmers of the region will be under increasing cost pressure. The first step needed is to improve the coverage of rural electrification in the region. If this is done and steps are taken simultaneously to improve the quality and reliability of power supplies as in Gujarat, agricultural development can be achieved in the region in a sustainable manner. Efforts to boost agriculture in this region should be supplemented with better coverage of the region in the procurement activities of the Food Corporation of India to ensure that farmers are not compelled to sell their produce at prices lower than the MSP. We have seen in Section 2.1.2.2 above that under the RKVY, the central Government has initiated a number of interventions for ushering in the green revolution in Eastern India. But rural electrification and assured supply of good quality power together with full coverage of the region in procurement operations needs greater attention.

'In the longer term, the shift in the centre of gravity of agriculture from the western states towards the north-eastern Ganga basin (Eastern Uttar Pradesh, Bihar) may well lead to increased

and more sustainable production'(Ackermann, 2012, p.260).

Checking soil degradation

As envisaged in the Twelfth Five Year Plan (p.45),a programme needs to be initiated to promote along with chemical fertilisers the conjunctive "use of available biological sources of nutrients like bio-fertilisers, organic manure, bio-compost for sustained soil health and fertility". Such a programme is needed to check soil degradation that has been brought about by the overuse of chemical fertilisers.

ENDNOTES

1 The concept of food security has evolved over the past decades. The World Food Summit of 1974 defined food security as 'availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices'. The 1996 Food Summit widened the definition. It stated: 'Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.' While the 1974 definition was concerned with the situation at the global level, the 1996 definition covers all levels. Further, while the earlier definition dwelt only on the physical availability aspect, the 1996 definition added the elements of economic access and nutrition as well. Initially, India's concern was mainly with availability of supplies, but over time it has increasingly covered economic access and nutrition as well. Since this paper is about agricultural trade policy, only the availability and economic access aspects fall within its scope.

2 According to Annex 3 of the WTO Agreement on Agriculture (AoA) the subsidies should include both budgetary outlays and revenue forgone by government or their agents. In the case of input subsidies where the use of budgetary outlays does not reflect the full extent of subsidy concerned, the basis for calculating the subsidy shall be the gap between the price of the subsidised good or service and a representative market price for a similar good or service. In its most recent notification (G/AG/N/IND/7), India has indicated the total monetary equivalent of all input subsidies and not given any calculation of individual elements, noting that 98.97 per cent of the farm holdings (presumably those below 10 hectares) are of low income and resource poor farmers.In its original notification (G/AG/AGST/IND/ Vol.2), India had explained the basis of calculations of each input subsidy. For instance, it had used the budgetary figures for estimating the subsidy on fertilisers, but reduced it on the basis of the import parity price, the remaining portion being treated as subsidy to manufacturing industry rather than to agriculture. In our calculation, we have taken the entire budgetary expenditure as subsidy, because now international prices are far higher than domestic prices and there is no basis for allocating subsidies to manufacturing. For electricity, the subsidy was calculated on the basis of the difference between the average unit cost of power supply and the rate charged from the agricultural consumer. We have also followed the same methodology. In irrigation, Statements 39, 27 and 28 in the National Accounts Statistics were used in the AGST document to calculate the extent to which the irrigation service fee does not cover O&M expenses. We have also made our calculations on the same basis. The calculations of credit subsidy in the earlier notification were made by India on the basis of comparison of the credit rate for agriculture with the general short term credit rate. Since payment of credit subsidy is now conditional on prompt repayment and full details are not available on this, we have used the budget figures for estimating the subsidy. The budgetary outlays have been used also for calculating insurance subsidies and seed subsidies.

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Table A.1: MRP and international prices of main fertilizers

Year	Maximum Retail Price (MRP)						Prices of Imported Fertilizers					
	DAP		MOP		Urea		DAP		MOP		Urea	
							C&F US		FOB		FOB	
	USD/MT	Rs./MT	USD/MT	Rs./MT	USD/MT	Rs./MT	USD/MT	Rs./MT	USD/MT	Rs./MT	USD/MT	Rs./MT
1	3	4	5	6	7	8	9	10	11	12	13	14
2003-04	206.3	9350.0	98.3	4455.0	106.6	4830.0	203.0	9199.2	123.0	5573.9	156.0	7069.4
2004-05	208.1	9350.0	99.2	4455.0	107.5	4830.0	260.0	11682.2	180.0	8087.7	202.0	9076.2
2005-06	211.2	9350.0	100.6	4455.0	109.1	4830.0	290.0	12839.3	243.0	10758.5	243.0	10758.5
2006-07	206.6	9350.0	98.5	4455.0	106.7	4830.0	342.1	15481.7	171.3	7750.8	270.3	12230.5
2007-08	232.2	9350.0	110.7	4455.0	120.0	4830.0	658.0	26491.5	263.0	10588.6	341.0	13728.9
2008-09	203.3	9350.0	96.9	4455.0	105.0	4830.0	911.2	41907.7	824.4	37918.7	495.6	22795.2
2009-10	197.1	9350.0	93.9	4455.0	101.8	4830.0	404.3	19179.4	514.7	24418.6	278.6	13219.6
2010-11	218.4	9950.0	110.9	5055.0	116.5	5310.0	589.0	26836.4	358.0	16311.4	324.0	14762.3

Source:

1. Indian fertilizer Scenario, 2010. Department of fertilizers, Ministry of Fertilizers and Chemicals, Government of India.

2. Report of the Working Group on Fertilizer Industry for the twelfth plan (2012-13 to 2016-17). Department of fertilizers, Ministry of Fertilizers and Chemicals, Government of India.

3. Economic Survey, 2011-12 for the yearly US$/Rupee exchange rates

Table A.2: Year-wise Buffer Stocks vis-à-vis Buffer Norms (Quantities in MMT)

As on	Wheat		Rice		Total	
	Actual Stocks	Minimum Buffer Norms	Actual Stocks	Minimum Buffer Norms	Actual Stocks	Minimum Buffer Norms
1.4.2007	4.703	4.00	13.172	12.2	17.875	16.2
1.7.2007	12.926	17.1	10.977	9.8	23.903	26.9
1.10.2007	10.121	11.0	5.489	5.2	15.610	16.2
1.1.2008	7.712	8.2	11.475	11.8	19.187	20.0
1.4.2008	5.803	4.0	13.835	12.2	19.638	16.2
1.7.2008#	24.912	20.1	11.249	9.8	36.161	29.9
1.10.2008	22.025	140	7.863	5.2	29.888	19.2
1.1.2009#	18.212	11.2	17.576	13.8	35.788	25.0
1.4.2009	13.429	7.0	21.604	14.2	35.033	21.2
1.7.2009	32.922	20.1	19.616	11.8	52.538	31.9
1.10.2009	28.457	14.0	15.349	7.2	43.806	21.2
1.1.2010	23.092	11.2	24.353	13.8	47.445	25.0
1.4.2010	16.125	7.0	26.713	14.2	42.838	21.2
1.7.2010	33.584	20.1	24.266	11.8	57.850	31.9
1.10.2010	27.777	14.0	18.444	7.2	46.221	21.2
1.01.2011	21.540	11.2	25.58	13.8	47.120	25.0
1.4.2011	15.364	7.0	28.82	14.2	44.184	21.2
1.7.2011	37.149	20.1	26.857	11.8	64.006	31.9
1.10.2011	31.426	14.0	20.359	7.2	51.785	21.2
1.1.2012	25.676	11.2	29.718	13.8	55.394	25.0

 # includes Food Security Reserve of 3 million MT of wheat from 1.7.2008 onwards and 2 million MT of rice from 1.1.2009 onwards.

Source: Annual Report 2011-12, Department of Food and Public Distribution, Ministry of Consumer Affairs, Government of India.

Table A3.1: Year-wise Total Non-Product-Specific Subsidy

Year	Total value of Agricultural Output (At Current Prices)	Electricity Subsidy for Agricultural use	Fertilizer subsidy	Irrigation Subsidy	Interest Subvention for providing short term credit to farmers	Subsidy in Other Schemesb	Waiver/relief of production loans (Total)	Total Subsidy	**Subsidy as a % of total Value of output**
	USD Billion								
1	2	3	4	5	6	7	8	9=3+4+5+6+7+8+9	10=(9/2)*100
2007-08	230,69	5,53	9,93	3,34	0.42a	0,04	0	19,26	8,35
2008-09	228,1	5,73	21	3,28	0.57a	0,03	3,8	34,41	15,08
2009-10	252,88	6,3	12,91	3,67	0,42	0,08	2,21	25,6	10,12
2010-11	310,88	6.51a	13,67	4,7	0,77	0,2	1,74	27,6	8,88

a. Using Revised Budget Estimates;

b. Other Schemes here refer to seed distribution subsidy under Seed Village Programme and Weather Based Crop Premium Subsidy;

Sources:

Column 2: Statement 54, National Account Statistics, 2012;

Column 3: See Table 8, Calculated using Annexure 3.27, 3.28, 3.29, 3.30, 4.2, 2.3, 4.4, 4.5, 4.27, and 4.33 of the Annual Report of 2011-12 on the Working of State Power Utilities and Electricity Departments, October 2011, Planning Commission, New Delhi;

Column 4: See Table 11, Calculated using Annexure XII, Annual Report 2010-11, Department of Fertilizers, Ministry of Chemicals and Fertilizers, Government of India, New Delhi;

Column 5: See Table 3, calculated using Statements 27, 28 and 39, National Accounts Statistics, 2011;

Column 6: See Table 17, From Statement 5, Volume 1 of Expenditure Budget, Government of India, Various Years;

Column 7: See Table 20 and 21 From Annual Report, Agriculture Insurance Corporation Ltd, Various Years and Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India;

Column 8: Table19 calculated using 4, Volume 1 of Expenditure Budgets of various years, Government of India.

Table A3.2: Year-wise Total Non-Product Specific Subsidy (Excluding farmers holding less than 10Ha)

Year	Total value of Agricultural Output (At Current Prices)	Electricity Subsidy for Agricultural use	Fertilizer subsidy	Irrigation Subsidy	Interest Subvention for providing short term credit to farmers	Subsidy in Other Schemesb	Sub-Total	Subsidy excluding Farmersc with less than 10 Ha	Waiver/ relief for farmers excluding those with less than 10 Ha	Total Subsidy excluding farmers with less than 10 Ha	Subsidy as a % of total Value of output
	USD Billion										
1	2	3	4	5	6	7	8=3+4+5+6+7	9=8*(10.92/100)	10	11=9+10	12=(11/2)*100
2007-08	230,69	5,53	9,93	3,34	0.42a	0,04	19,26	2,1	0	2,1	0,91
2008-09	228,1	5,73	21	3,28	0.57a	0,03	30,61	3,34	0,13	3,47	1,52
2009-10	252,88	6,3	12,91	3,67	0,42	0,08	23,39	2,55	0,07	2,63	1,04
2010-11	310,88	6.51a	13,67	4,7	0,77	0,2	25,86	2,82	0,06	2,88	0,93

a: Using Revised Budget Estimates

b. Other Schemes here refer to seed distribution subsidy under Seed Village Programme and Weather Based Crop Premium Subsidy

c. As 89.08 percent (approximately) of total area is operated by farmers holding less than 10 Ha (Agricultural Census 2010-11), the subsidy considered is 10.92 percent of total input subsidy calculated;

Sources:

Columns 2-7: Same as for Table A 3.1

Column 10: Calculated from column 4 of Table 19 on the basis of the proportion of total area of agricultural land held by farmers with holdings more than 10 Ha

Table A3.3: Year-wise Total Non-Product Specific Subsidy (Excluding farmers holding less than 4Ha)

Year	Total value of Agricultural Output (At Current Prices)	Electricity Subsidy for Agricultural use	Fertilizer subsidy	Irrigation Subsidy	Interest Subvention for providing short term credit to farmers	Subsidy in Other Schemes[b]	Sub-Total	Subsidy excluding Farmersc with less than 4Ha	Waiver/ relief for farmers excluding those with less than 4 Ha	Total Subsidy excluding farmers with less than 4 Ha	Subsidy as a % of total Value of output
	USD Billion										
1	2	3	4	5	6	7	8=3+4+5+6+7	9=8*(32.10/100)	10	11=9+10	12=(11/2)*100
2007-08	230,69	5,53	9,93	3,34	0.42a	0,04	19,26	6,18	0	6,18	2,68
2008-09	228,1	5,73	21	3,28	0.57a	0,03	30,61	9,82	0,37	10,19	4,47
2009-10	252,88	6,3	12,91	3,67	0,42	0,08	23,39	7,51	0,21	7,72	3,05
2010-11	310,88	6.51a	13,67	4,7	0,77	0,2	25,86	8,3	0,17	8,47	2,72

a: Using Revised Estimates;

b. Other Schemes here refer to seed distribution subsidy under Seed Village Programme and Weather Based Crop Premium Subsidy;

c. As 67.90 percent (approximately) of total area is operated by farmers with holdings less than 4 Ha, (Agricultural Census 2010-11), the subsidy considered is 32.10 percent of total input subsidy calculated.

Sources:

Column 2-7: same as in Tables A 3.1 and A3.2

Column 10: Calculated from column 4 of Table 19 on the basis of the proportion of total area of agricultural land held by farmers with holdings more than 4 Ha

Table A3.4: Year-wise Total Non-Product Specific Subsidy (Excluding farmers holding less than 2Ha)

Year	Total value of Agricultural Output (At Current Prices)	Electricity Subsidy for Agricultural use	Fertilizer subsidy	Irrigation Subsidy	Interest Subvention for providing short term credit to farmers	Subsidy in Other Schemes[b]	Sub-Total	Subsidy excluding farmersc with less than 2Ha	Waiver/ relief for farmers excluding those with less than 2 Ha	Total Subsidy excluding farmers with less than 2 Ha	Subsidy as a % of total Value of output
	USD Billion										
1	2	3	4	5	6	7	8=3+4+5+6+7	9=8*(55.69/100)	10	11=9+10	12=(11/2)*100
2007-08	230,69	5,53	9,93	3,34	0.42a	0,04	19,26	10,73	0	10,73	4,65
2008-09	228,1	5,73	21	3,28	0.57a	0,03	30,61	17,04	0,63	17,68	7,75
2009-10	252,88	6,3	12,91	3,67	0,42	0,08	23,39	13,02	0,37	13,39	5,3
2010-11	225.64	6.52a	13.67	4.70	0.77	0.20	25.86	15.26	0.29	15.55	6.89

a: Using Revised Budget Estimates;

b. Other Schemes here refer to seed distribution subsidy under Seed Village Programme and Weather Based Crop Premium Subsidy;

c. As 44.31 percent (approximately) of total area is operated by farmers holding less than 2 Ha (Agricultural Census 2010-11), the subsidy considered is 55.69 percent of total input subsidy calculated.

Sources:

Column 2-7: same as in Tables A 3.1, A 3.2 and A 3.3 above.

Column 10: Column 4 of Table 19

Table A.4: International, Domestic and Minimum Support Prices of Selected Crops (US$ per MT)

Year	Rice, Thai 25%			Wheat, US HRW			Cotton, A Index*		
	International	Domestic	MSP	International	Domestic	MSP	International	Domestic	MSP
2000-01	162,2	-	167,45	120,06	124,48	133,53	1340,22	-	1111,56
2001-02	157,78	204,21	163,58	125,14	124,18	127,57	964,47	1072,8	1077,03
2002-03	177,49	202,11	170,67	154	132,84	133,1	1108,02	1057,98	1123,69
2003-04	188,06	216,96	182,05	150,46	152,89	139,02	1482,27	1396,68	1189,56
2004-05	241,09	235,89	186,95	153,69	157,77	142,44	1252,21	1250,29	1224,09
2005-06	265,7	244,32	193,12	157,82	172,46	158,11	1245,55	1100,2	1242,28
2006-07	282,31	254,77	205,53	198,19	199,76	187,85	1266	1149,6	1222,38
2007-08	316,47	322,33	277.57/ 316.69**	308,56	238,27	248,38	1492,9	1409,93	1397,16
2008-09	529,61	340,63	293,52	280,98	225,22	234,82	1456,14	1469,85	1698,63
2009-10	459,95	364,43	316,17	215,03	246,47	231,86	1526,88	1458,93	1646,69
2010-11	438,61	401,52	329,22	257,35	254,56	256,79	2978,8	2425,25	1714,69
2011-12	521,04	-	338,04	303,36	234,31	268,14	2739,84	-	1825,84

**MSP for Medium Staple Cotton has been taken into account*

***From 12.06.2008*

Sources:

(1) For International and Domestic Prices of Rice and Cotton: Price Policy for Kharif Crops- the marketing Season 2012-13, Commission for Agricultural Costs and Prices, Ministry of Agriculture, Government of India.

(2) For International Price of Wheat: World Bank Pink Sheet

(3) For Domestic price of wheat: Domestic prices have been calculated by averaging monthly data of Hapur (U.P.) mandi and Khanna (Punjab) mandi available from DES.

(4) For MSPs: Agricultural Statistics at a Glance, various years.

(5) For conversion of Rupees into Dollar: Exchange Rates from RBI

Table A.5: All-India Production vis-à-vis Procurement of Selected Major Crops
(Quantities of crops other than cotton are in Million Tonnes) (Quantity of cotton in Million bales of 170 kgs each)

Crop	2007-08			2008-09			2009-10			2010-11		
	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production
1	2	3	4	5	6	7	8	9	10	11	12	13
Rice	96.7	28.736	29.72	99.18	33.684	33.96	89.09	26.816	30.10	95.33	32.35	33.94
Wheat	78.6	11.19	14.25	80.68	26.04	32.28	80.80	27.94	34.57	85.93	22.08	25.70
Cotton	25.9	1.00	3.86	22.28	12.71	57.05	24.02	0.77	3.19	33.43	1.36*	4.07
Mustard Seed	5.83	0.02	0.38	7.20	NIL	NIL	6.61	NIL	NIL	7.67	NIL	NIL
Groundnut	9.18	NIL	NIL	7.17	0.00	0.00	5.43	NIL	NIL	7.54	NIL	NIL
Sunflower Seed	1.46	NIL	NIL	1.16	0.01	0.89	0.85	0.00	0.40	0.62	0.0009	0.14
Soyabean	11.0	NIL	NIL	9.91	NIL	NIL	9.96	NIL	NIL	12.66	NIL	NIL

**As on 3/5/2011*

#Fourth Advance Estimates as released on 19.07.2011

Source: Agricultural Statistics at a Glance, 2011

Table A.6: Production vis-à-vis Procurement for Rice (State-wise) (Million Tonnes)

State	2007-08			2008-09			2009-10		
	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production
1	2	3	4	5	6	7	8	9	10
Punjab	10.49	7.981	76.08	11	8.553	77.75	11.24	9.273	82.53
Chhattisgarh	5.43	2.743	50.52	4.39	2.848	64.85	4.11	3.069	74.66
Haryana	3.61	1.574	43.6	3.3	1.425	43.21	3.63	1.816	50.1
Andhra Pradesh	13.32	7.597	57.03	14.24	9.061	63.63	10.54	4.471	42.43
Orissa	7.54	2.357	31.26	6.81	2.79	40.95	6.92	1.887	27.28
Uttar Pradesh	11.78	2.891	24.54	13.1	3.687	28.15	10.81	2.623	24.27
Tamil Nadu	5.04	0.969	19.23	5.18	1.199	23.13	5.67	0.981	17.32
Madhya Pradesh	1.46	0.069	4.73	1.56	0.245	15.71	1.26	0.167	13.25
West Bengal	14.72	1.429	9.71	15.04	1.667	11.09	14.34	0.977	6.81
Others	3.5	0.979	27.97	3.56	1.86	52.19	3.35	1.212	36.13
Assam	3.32	-	0	4.01	-	0	4.34	-	0
Karnataka	3.72	-	0	3.8	-	0	3.69	-	0
Bihar	4.42	-	0	5.59	-	0	3.6	-	0
Maharashtra	3	-	0	2.28	-	0	2.18	-	0
Jharkhand	3.34	-	0	3.42	-	0	1.54	-	0
Gujarat	1.47	-	0	1.3	-	0	1.29	-	0
Kerala	0.53	-	0	0.59	-	0	0.6	-	0
All-India	96.69	28.736	29.72	99.18	33.684	33.96	89.09	26.816	30.1

Note: States have been arranged in descending order of procurement as a percentage of production during 2009-10.

Source: Agricultural Statistics at a Glance, various years

Table A.7: Production vis-à-vis Procurement for Wheat (State-wise) (Million Tonnes)

State	2007-08			2008-09			2009-10		
	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production	Production	Procurement	Procurement as a % of Production
1	2	3	4	5	6	7	8	9	10
Punjab	15.72	6.78	43.14	15.73	9.94	63.19	15.17	10.73	70.7
Haryana	10.24	3.35	32.71	10.81	5.24	48.45	10.5	6.92	65.94
Madhya Pradesh	6.03	0.06	0.95	6.52	2.41	36.95	8.41	1.97	23.4
Uttarakhand	0.81	0	0.25	0.8	0.09	10.66	0.85	0.15	17.16
Rajasthan	7.12	0.38	5.38	7.29	0.94	12.83	7.5	1.15	15.36
Uttar Pradesh	25.68	0.55	2.13	28.55	3.14	10.99	27.52	3.88	14.11
Bihar	4.45	0.01	0.18	4.41	0.5	11.34	4.57	0.5	10.87
Gujarat	3.84	0	0	2.59	0.42	16	2.35	0.08	3.19
Jammu & Kashmir	0.5	0	0	0.48	0	0.21	0.29	0	0.34
Himachal Pradesh	0.5	0	0	0.55	0	0	0.33	0	0.31
Maharashtra	2.08	0	0	1.52	0.01	0.66	1.74	0	0
West Bengal	0.92	-	0	0.76	-	0	0.85	-	0
Karnataka	0.26	-	0	0.25	-	0	0.25	-	0
Jharkhand	0.14	0	0	0.15	0	1.3	0.17	0	0
Assam	0.07	-	0	0.05	-	0	0.06	-	0
Others	0.21	0.07	31.43	0.21	3.35	1609.4	0.25	2.55	1036.11
All-India	78.57	11.19	14.25	80.68	26.04	32.28	80.8	1	34.57

Note: States have been arranged in descending order of procurement as a percentage of production during 2009-10.

Source: Agricultural Statistics at a Glance, various years

Table A.8: Product Specific Support for Rice as a Percentage of value of Rice Production

Year	MSP for Paddy	MSP for Rice	WPI (Base= 1986-88)	Fixed External Reference price (ERP)	Inflation Adjusted ERP	Production of Rice	Procurement of Rice	Product Specific Price Support	Product Specific Input and Investment Support #	Total Product Specific Support	Product Specific Support as a % of value
	Rs./ Tonne	Rs./Tonne		Rs./Tonne	Rs./Tonne	Million Tonnes	Million Tonnes	Rs. Billion	Rs. Billion	Rs. Billion	
1	2	3	4	5	6=5*(4/100)	7	8	9=((3-6)*8)/1000	10	11=9+10	12=(11/(7*3))*100000
2007-08	7450	11175	377,21	3520	13277,9	96,69	28,73	-60,42	0,1	-60,31	-5,58
2007-08*	8500	12750	377,21	3520	13277,9	96,69	28,73	-15,17	0,1	-15,06	-1,22
2008-09	9000	13500	407,62	3520	14348,33	99,18	33,68	-28,57	1,48	-27,09	-2,02
2009-10	10000	15000	423,15	3520	14894,93	89,09	26,82	2,82	2,94	5,75	0,43
2010-11**	10000	15000	463,59	3520	16318,38	95,33	32,35	-42,65	1,63	-41,02	-2,87

***Fourth Advance Estimates as released on 19.07.2011(2010-11 production figure) #NFSM only*

Source: Agricultural Statistics at a Glance, various years, for ERP, WTO Doc. G/AG/AGST/Vol.2, for WPI, Economic Survey, various years

Table A.9: Product Specific Support for Wheat as a Percentage of value of Wheat Production

Year	MSP for Wheat	WPI (Base= 1986-88)	Fixed External Reference price (ERP)	Inflation Adjusted ERP	Production of Wheat	Procure-ment of Wheat	Product Spe-cific Price Sup-port	Product Specific Input and Investment Support #	Total Product Specific Support	Product Specific Support as a % of value
	Rs./Tonne		Rs./Tonne	Rs./Tonne	Million Tonnes	Million Tonnes	Rs. Billion	Rs. Billion	Rs. Billion	
1	2	3	4	5=4*(3/100)	6	7	8=((2-5)*7)/1000	9	10=8+9	11=(10/(6*2))*100000
2007-08	10000	377,21	3540	13353,34	78,57	11,19	-37,54	1,07	-36,47	-4,64
2008-09	10800	407,62	3540	14429,85	80,68	26,04	-94,53	1,9	-92,63	-10,63
2009-10	11000	423,15	3540	14979,56	80,8	27,94	-111,17	2,75	-108,42	-12,2
2010-11	11700	463,59	3540	16411,09	85,93	22,08	-104,02	1,27	-102,75	-10,22

#NFSM only

Source: Agricultural Statistics at a Glance, various years, for ERP, WTO Doc. G/AG/AGST/Vol.2, for WPI, Economic Survey, various years

Table A.10: Rupee-Dollar Exchange Rates Used

Year	Rupees/ Dollar
2000-01	45,68
2001-02	47,69
2002-03	48,4
2003-04	45,95
2004-05	44,93
2005-06	44,27
2006-07	42,25
2007-08	40,26
2008-09	45,99
2009-10	47,42
2010-11	45,58
2011-12	47,92

Source: Economic Survey 2011-12, Ministry of Finance. New Delhi. India

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