



India's Agricultural Trade Policy and Sustainable Development Goals



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The opinions expressed in this paper are the personal views of the authors and not those of the organizations they represent.

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List of Abbreviations

A2+FL	Actual Paid Cost Plus Imputed Value of Family Labour
AAJ	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
FO	Fuel Oil
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
MT	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
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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Executive Summary

India's Agricultural Trade Policy and Sustainable Development Goals

Scope of the paper

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, but also against the benchmark of the WTO rules and India's commitments therein. The analysis covers market access and domestic support measures, which could potentially have more than minimal trade-distorting effects or effects on production.

Objectives of India's agricultural trade policies

In India, striving for maximum self-sufficiency in food grains has been seen as a sine qua non for food security since it became an independent republic in 1950.

An equal concern of the government has been the alleviation of poverty especially among the landless class. From the beginning the government has tried to ensure that consumer prices are stabilized in particular to safeguard the interests of the low income consumers. One of the reasons for reliance on input subsidies and for keeping the annual increases in the Minimum Support Price at modest levels was the concern for the poorer sections of the society. Since 1997 the policy has been moved further in favour of outright food subsidies particularly for sections of population Below Poverty Levels.

A central concern of the government has been the interest of small and marginal farmers, with holdings of less than one ha, who constitute 83 per cent of the holdings and account for 41 per cent of the area of agricultural land.

Another major policy goal of government is the sustainable management of land and water resources.

Policies and programmes to support farm operations

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

Irrigation subsidies

Since independence India has made huge investments in major and medium irrigation projects, which have contributed substantially to the increase in India's agricultural production. However, from the beginning the available financial resources have been spread thin over too many schemes and projects have dragged on for decades and the benefits have not started flowing in many of them. Lack of adequate command area development has led to a similar situation in many projects

in which the head works and canal systems have been completed. In completed projects the irrigation service fees (ISF) have not been revised to take inflation into account and there are substantial shortfalls in the collection even of the low fees fixed. The result is that the collection of ISF covers a diminishing proportion of the O&M expenses and results in the inadequate maintenance of these projects. Low ISF also encourages farmers particularly near the head to waste water.

Power subsidies

Rural electrification has been a big factor in the growth of agricultural production in the country as it made lift irrigation possible for the exploitation of groundwater resources. Tube wells and other wells now account for 60 per cent of the net area under irrigation. Ground water irrigation enables the farmers to obtain water just in time and to draw only the volume required for the standing crop. As farmers move towards precision farming the importance of lift irrigation will increase.

The average rates charged from farmers by the State Electricity Boards are much below both the cost of production and the rates charged from other categories of consumers. However, while the scale of subsidy on supply of power to agriculture might be expected to result in benefits to farmers, it is arguable that the inefficiencies in the operation of SEBs outweigh these benefits. There are interruptions in the supply of power and due to voltage fluctuation burnout of motors is a common occurrence.

In many parts of the country power subsidies have resulted in the farmers drawing out ground water in excess of the utilizable recharge, with the further result that water tables have been falling.

Fertiliser subsidies

For many decades the principal modality of granting fertiliser subsidy has been for the Government of India to fix the Maximum Retail Price (MRP) of various types of fertilisers through statutorily controlled prices and then to compensate the manufacturers and importers with the difference between the MRP and the cost of production or of imports. In 2010, the scheme of Nutrient Based Subsidy (NBS) was introduced with the idea to fix the subsidy rates on a per unit basis and pass on further increases in prices to the farmer. The NBS scheme has been extended to phosphatic and potassic fertilisers but not to urea. Because of the rise in international prices of fertilisers and the inputs that go into their production the total subsidy on fertilisers has risen considerably in recent years. In 2010-11, fertiliser subsidy accounted for 16.33 per cent of the Central Government fiscal deficit. What is more, these subsidies have resulted in overuse and skewed use of chemical fertilisers and led to neglect of organic matter and depletion of micro-nutrients with adverse consequences for soil fertility.

Agricultural credit subsidy

Subsidy on short term credit for agricultural operations has been a traditional tool of the Government of India for domestic support of agriculture. In 2009, the Central

Government also announced substantial agricultural debt waiver. Hassle-free access to institutional credit provided to farmers under the Kisan (Farmers) credit cards scheme has led to an expansion of agricultural credit and facilitated the use of optimum inputs in farm operations. However, there is little empirical evidence to show that farmers benefit from subsidized interest. In fact, the large difference between the market rate of interest and the rate at which credit is available to farmers may have created the temptation for farmers to re-lend the funds instead of using them for farm operations.

Total non-product-specific subsidies and WTO obligations

Subsidies in irrigation, power, fertilisers and credit constitute the main input subsidies to agriculture in India. Seed subsidies and subsidies on crop insurance offer smaller benefits.

Calculation made by the author show that in recent years non-product-specific support has remained below the de minimis level of 10 per cent of the total value of agricultural production, except for the year 2008-09, when it rose above that figure mainly on account of the unprecedented rise in fertiliser prices. This calculation has been made on a conservative basis, taking only small and marginal farmers as being covered by the term 'low-income or resource-poor producers', who are covered by the exemption in Article 6.2 of the WTO Agreement on Agriculture..

Minimum price support

A minimum support price (MSP) for the principal crops, guaranteed through purchases through state agencies has been a pillar of the domestic support programme of the Central Government for five decades.

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

Public Distribution System (PDS)

The Government of India has designated the Food Corporation of India (FCI) for carrying out purchase operations in support of the MSP, maintaining buffer stocks and providing the stocks for running the public distribution system (PDS). Open-ended procurement by the FCI has resulted in its being saddled with huge stocks, far in excess of the buffer stocking norms. The total cost of purchasing, stocking and distribution of food grains has been escalating and in 2010-11 it accounted for 16.50 per cent of the fiscal deficit of the Central Government.

Targeted Public Distribution System (TPDS)

In 1997 the Government of India introduced the Targeted Public Distribution System (TPDS) envisaging distribution of food grains and other essential supplies to the sections of the population below the poverty line (BPL). Since then the scope of the TPDS has been expanded and deepened and now concessional supplies are being made to populations above the poverty line (APL) as well as to several other sections of the population. The operation of TPDS is characterized by huge inefficiencies and in all probability rampant corruption. In the list of beneficiaries there are inclusion as well as exclusion errors and Planning Commission estimates suggest that leakages account for 36.38 per cent of the subsidized food grains and diversion for 21.45 per cent.

National Food Security Bill (NFSB)

The main weakness of the National Food Security Bill introduced in the Parliament in December 2011 is that it envisages a steep increase in the food subsidy programme without seeking to remedy the deficiencies in the TPDS that cause substantial leakages and diversion of subsidized food grains. It is also ill timed as it proposes a large increase in expenditure at a time when the Central Government is in a state of fiscal stress.

Market access and export controls

The wide gap between bound and applied levels of tariffs is principally the result of unilateral and autonomous liberalization undertaken by India since the Uruguay Round, which deserves applause rather than criticism. However, a feature of the applied tariff regime is that reduction is done mainly through exemption notifications, which are inherently unstable, and not by changing the statutory rates.

In the past, by using quantitative restrictions on exports of agricultural products the Central Government favoured consumers and neglected farmers. There are indications that this may be changing.

The way forward

In general domestic support of agriculture needs to move from measures that cause more than minimal trade-distortion and effects on production to measures 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 must 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 taken in hand. Command area activities should be intensified to bridge the gap between the potential created and utilized. The ISF should be progressively raised to meet the O&M cost, and the management of irrigation projects should be handed over to WUAs.
- 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.

- 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.
- Agricultural credit subsidy should be phased out and the policy initiatives in future must aim at improving the adequacy of credit.
- To avoid the pitfalls of leakage and diversion of benefits the TPDS must be replaced by a system of conditional cash transfers, in which the transfers are conditional on the beneficiary families sending children to primary schools and meeting basic health care requirements.
- Implementation of the National Food Security Bill should be deferred and full attention be given to obtaining better delivery of benefits and reduction of cost by putting into operation the system of conditional cash transfer.
- In order to reduce the burden of open-ended procurement on the Food Corporation of India greater opportunities should be given to the private sector to engage in trade in food grains by not limiting exports, reducing or eliminating purchase tax, abolishing levies on rice-millers and finally eliminating restrictions on stocks and inter-state movement. If these measures do not result in the reduction of procurement load on government agencies, alternative schemes such as deficiency payments would need to be introduced.
- To impart a modicum of stability in the applied tariff levels on agricultural products the statutory rates should be reduced to the exempted levels.
- When it becomes imperative to limit exports the objective should be accomplished by levying export duty rather than imposing a quantitative restriction.
- For sustainable agriculture it is necessary to take steps for bridging the gap between creation and utilization of irrigation potential, regenerating groundwater, stimulating agricultural activities in Eastern India, which has plentiful groundwater resources and promoting together with chemical fertilisers the conjunctive use of biological nutrients

India's Agricultural Trade Policy and Sustainable Development Goals

Introduction

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 million MT. 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 250 million MT. Its granaries are full and India is exporting large quantities of food grains. 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 an amazing transition.

Under the Indian Constitution, agriculture is a State subject, but the States generate very little revenue surplus to undertake new schemes for development. In the result, they are dependent on the Centre for taking new initiatives, and the programmes of support and protection in agriculture are principally initiated and funded by the Centre, and the States play a role mainly in implementation. The policies that have made the growth story possible have myriad elements including research, extension and diffusion of technology, power, water, and transport infrastructure, market infrastructure and intelligence, wages, tenancy laws and land reforms, agrometeorology, animal health insurance, agricultural credit, and insurance. The domestic support programmes also cover input subsidies and market price support, which together with market access and export controls and the policy for buffer stocks and domestic food distribution could be deemed to be covered by the term 'agricultural trade policy'. This paper critically examines India's agricultural trade policy mainly from the perspectives of public policy objectives, including food security, poverty alleviation and sustainable development but also against the benchmark of the 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 on the need for change.

1. Objectives of India's Agricultural Trade Policy

This section describes the main objectives of India's trade policy as they have unfolded in recent decades.

1.1 *Guaranteeing Food Security*¹

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 country was importing 6-7 per cent of its food requirement and the policy makers put the greatest emphasis on the need to end the dependency on imported food grains. The political leadership at that time reckoned that with the rapid economic development of the country the food requirement would grow. 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 the 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 was established in 1965 with the objective of recommending minimum support prices for important crops and the government undertook the responsibility to make purchases in support of the minimum support prices. An important policy goal of government was to ensure that farmers received stable and reasonable prices for their produce. In addition, it was decided to modernize agriculture through the increased use of inputs such as fertilizers and for this a policy of input subsidies was introduced.

In order to allow domestic agricultural production to grow, no scope was left for import competition and the trade policy swung to the extreme of autarchy. 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 the 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 1991 and there was a greater willingness to allow imports. There was a slow transition in the trade policy

away from quantitative controls towards tariffs and imports of such items 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 liberalization of imports, in some key products such as rice, maize and skimmed milk powder, India raised import tariffs to ward off the perceived danger of a possible flood of imports after the elimination of quantitative controls. To do this India had to undertake renegotiations in the WTO as in these products India had undertaken a binding commitment to maintain the tariff at zero during the original negotiations in GATT 1947.

Despite import liberalization following economic reforms, the policy makers retained the basic orientation towards self-sufficiency in food grains production. In its report in 2002 the High Level Committee on Long Term Grains Policy recommended a policy for self-sufficiency in food grains. The steep rise in the international price of food grains in 2007 prompted another series of initiatives in the Government of India to raise the domestic production of rice and wheat in particular so as to attain levels adequate to meet future increases in demand of a rising population.

1.2 Alleviating poverty

While farmers received all the incentives for increasing food production, an equal concern for the government was the alleviation of poverty especially among the landless class. In the making of the food and agricultural policy the government strove to balance the interests of producers and consumers. The objective on the one hand is to ensure that the producers get reasonable prices so that they have an incentive to increase production. At the same time consumer interests are protected by maintaining prices at a stable level. In particular, importance is accorded to safeguarding the interests of the poorer sections of the population. The Food Grains Policy Committee (GOI 1969; Chapter 10) had recommended a planned management of food supplies in the country with four principal elements, viz., procurement, control of inter-state movement of food grains, a system of public distribution and building up of buffer stocks. In 1969 the Fourth Five Year Plan document (GOI 1969) summarized the main objectives of food policy as follows:

- i. 'to ensure that consumer prices are stabilised and, in particular, that the interests of the low income consumers are safeguarded;
- ii. to ensure that the producers get reasonable prices and continue to have adequate incentives for increasing production; and
- iii. to build up an adequate buffer stock of foodgrains with a view to ensuring both the objectives mentioned above.'

Although the government tried to maintain parity between the interests of producers and consumers, in fact there was a pro-consumer bias and domestic prices were held down below the international price despite the purchase operations to defend the minimum support prices. Exports of food grains were prohibited with the objective of keeping domestic prices down. In the result there was an implicit taxation on domestic production of food grain. 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.

Reduction and eventual elimination of poverty is one of the major challenges facing policy makers in India. There are at present 300 million people below the poverty line in India of whom 220 million live in the villages. Agricultural growth is an imperative for rural poverty alleviation although it has been clear for some time that there are limits on the extent to which agriculture can provide increasing avenues for employment and that jobs for the rural poor have to come eventually from sectors outside agriculture, particularly manufacturing. For this to happen, the economy has to grow at a high rate of 9 per cent plus on a sustained basis over a long period. In the meantime the population below the poverty line needs more investment in health, education, water/sanitation, and child nutrition. They also require directly targeted poverty-reduction programmes. It is in this context that the Rural Employment Guarantee Act has been enacted recently. The idea is to provide unskilled rural workers with short term employment during lean periods when there is absence of opportunities for employment in agriculture.

The Food Corporation of India was established in 1965 for carrying out procurement and distribution functions and for buffer stock operations. To start with, the main objective of food policy was to supply food grains to the consumers at stable prices. From the outset a network of fair price shops licensed by the state governments has been an integral part of the public distribution system. Subsequently, in 1997 the policy went beyond the objective of maintaining stable and fair prices, and the goal became additionally to supply subsidized food grains to the sections of population below the poverty level. Eventually the supply of subsidized food grains was extended to the sections of society above the poverty level as well.

Poverty alleviation is the main aim of the Food Security Bill 2011, which proposes a big increase in supply of subsidized food grains to the populations in both rural and urban areas. Maximum self-sufficiency in the domestic production of the major foodstuffs is no longer the only element of food security. Now, in line with the widely accepted concept of household food security the government has ensured access to adequate supplies of food grains by providing them at affordable prices.

1.3 Dealing with the problems of small and marginal farmers

A feature of Indian agriculture that has determined the policies towards agriculture is the very large numbers of small (those with less than two ha of land) and marginal farmers (those with less than one ha). According to the last agricultural census held in 2005-06, 83 per cent of the holdings were of less than 2 ha, and comprised 41 per cent of the area.

Small and marginal farmers face manifold difficulties and government intervention is needed to promote sustainable livelihood for them. Being resource poor they cannot afford to buy from their own resources inputs for optimum agricultural operations. They have difficulty in obtaining institutional agricultural credit for production as well as investment purposes. They cannot therefore purchase pumping sets for tube wells and are compelled to buy water for irrigation from bigger farmers. Small and marginal farmers face problems on the marketing side too and generally receive

lower prices for their produce than their bigger counterparts.

To get over the inherent difficulties entailed in farming by small and marginal farmers, government has been encouraging group formation and collective effort through self help groups (SHGs). The nationalized banks have taken action to make the flow of agricultural credit easier for small and marginal farmers. Kisan (Farmer) Credit Cards issued to all farmers are particularly of help to small and marginal farmers. As once a card has been issued the farmer can access cash credit facilities from year to year without going through the dilatory screening processes repeatedly. Government subsidies in the agricultural credit subsidy programme and in periodic debt waiver are substantially directed towards small and marginal farmers as is also the premium subsidy in the National Agricultural Insurance Scheme.

1.4 Fostering sustainable development

With population pressure the natural resources in the country have been under great stress and their threatened depletion and degeneration have been a major source of concern. A major public policy goal of the policies that have been adopted is the sustainable management of land and water resources.

With the growth of population the per capita availability of land has been declining. This has made it all the more necessary to harness the full potential of land resources, prevent degradation (particularly of rain fed land) and reclaim degraded land. Out of 328.7 million ha of geographical area of the country, 142 million ha is the net cultivated area. As much as 60 per cent of the cultivated area, or about 85 million ha, is rain fed and it is the rain fed land that is subject to wind and water erosion and liable to degradation. The Central and state governments have been implementing schemes to check degradation and reclaim degraded land.

Watershed development programmes have been adopted as the main instrument to address the problem of degradation in rain fed areas. The approach in these programmes is four pronged: first to treat the land through engineering intervention to minimize runoff of rain water and increase retention of moisture in the soil and at the same time check soil erosion; second to rejuvenate the existing water reservoirs by repairs of rain water channels and drainage systems to maximize the proportion of rainwater flowing into them; third, to encourage farming of appropriate crops suited for dry land agriculture; and last to encourage livestock rearing by pasture development and other measures.

The management of water resources is a challenging task in India, and there is mounting evidence that government intervention has been unable to cope with this challenge. First, as noted above, the age-old rain water channels and drainage systems have been allowed to be in a state of disrepair so that the reservoirs are not getting adequate rain water. Second, although the country has had an ambitious programme of major and minor irrigation projects, utilization has been far behind the creation of irrigation potential. Third, in a number of areas in the country, particularly in Punjab, Haryana and Rajasthan, groundwater is being over exploited and the water table has been falling. The Approach Paper to the Twelfth Five Year Plan (GOI 2011d) mentions that satellite data reveals a decline in the ground water level of 4

centimeters each year between 2002 and 2008 even in the alluvial tracks of North India where the natural rates of recharge are high.

Recognizing climate change as a global challenge India has begun to implement measures for adaptation and mitigation, even as it points out in international negotiations that the principal responsibility for this must fall on the major industrialized countries. The National Action Plan on Climate Change (NAPCC) announced in 2010 not only aims at promoting understanding of climate change but also envisages the implementation of measures for adaptation, mitigation, energy efficiency and natural resource conservation. Eight National Missions form the core of the Action Plan and one of these is on agriculture (Ministry of Environment and Forests 2010).

On the basis of studies made by the Indian Council for Agricultural Research (ICAR) the NAPCC has pointed out that some of the significant effects of global warming would be to reduce wheat production and lower yields from dairy cattle. As a result of climate change the variability in temperatures and rainfall may also increase, with adverse consequences for agricultural operations. The adaptation strategies being considered include the development of new crop varieties that are drought and heat stress tolerant, development of nutritional strategies for managing heat stress in dairy animals, and strengthening of current weather based insurance programmes. Adaptation strategies will have to be devised for dealing with variability in rainfall, which could make droughts and floods more widespread and frequent.

The agriculture sector contributes 28 per cent of the total GHG emissions from India, primarily due to methane emission from rice paddies, enteric fermentation in ruminant animals, and nitrous oxides from use of manures and fertilizers. The options for mitigations that have been identified by a group of experts of the Planning Commission (Planning Commission, 2011c) include evaluation of the mitigation potential of biofuels and their enhancement by their genetic improvement and reduction of methane generation and emission in ruminants by modification of diet, and in rice paddies by water and nutrient management. Overall improving efficiency in the use of inputs in agriculture such as energy intensive inorganic fertilizers and energy itself for lift irrigation can bring about mitigation.

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.

2.1 Domestic Support

2.1.1 Product Non-Specific Subsidies

Input subsidy for agricultural operations has been an important component of domestic support programmes in India for the last four decades. The five main types of such subsidies are charging of user charges much below what might be warranted by the expenditure on operation and maintenance in irrigation, lower user charges than for other categories of customers in power, subsidised sales below the market price in fertilisers, subsidy on interest on credit obtained from commercial banks or other financial institutions for investment or production and subsidised sales of seeds. There may be other subsidy programmes introduced by the state governments from time to time, which are not covered by our analysis, but we believe that we have included all the major ones. We describe the main features of the input subsidy programmes and their effects and attempt to quantify them. We examine these subsidies in the light of the WTO rules and in this context we consider the input subsidies in the aggregate and calculate the non-product-specific AMS as a proportion of the value of agricultural production. Wherever applicable, we look at the programmes from the angle of 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 the British colonial rule the Central and State Governments have collaborated in making large public investments in river-valley and other large and medium projects during the period 1951- 2012. For a number of reasons, which we shall examine in the next section on lift irrigation, the relative importance of surface irrigation as a source of irrigation has been on a decline in the country. But in the past this 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 3500 billion Rupees, and it raised the irrigation potential from the pre-existing 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, principally due to thin-spreading of financial resources, at the end of the Eleventh Five Year Plan there were 337 projects that had spilled over from the previous Plan periods, including 36 from 1980 or earlier. Second, the gap has been growing between the creation and utilization of irrigation potential. Against the irrigation potential of 46 MHA mentioned above the utilization had reached only 35 MHA by the year 2011-12. 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 had, in its Report of September 1992, recommended that the rates of ISF should be so fixed as to allow the full cost recovery, covering operation and

maintenance, depreciation as well as interest on capital employed (GOI 1992). The Committee had acknowledged the need for progressive phasing in of compliance with its recommendation simultaneously with an improvement in the quality of service. In the first phase it recommended full recovery of the Operation and Management (O&M) cost plus one percent of the 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 are not periodically revised to take inflation into account, and there are substantial shortfalls in the collection even of the low rates fixed. In the result they cover a diminishing proportion of the O&M expenses and depreciation. The National Accounts Statistics contains an estimate of imputed subsidies in the working of Departmental Enterprises of Central and State Governments. Imputed irrigation subsidies, calculated on the basis of O&M expenses plus depreciation less gross receipts constitute the bulk of the subsidies in the working of Departmental Enterprises. Table 3 shows the level of imputed subsidies in irrigation during the years 2007-08, 2008-09, and 2009-10, 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

There is little doubt that irrigation from public irrigation projects has been a major factor behind the increase in agricultural production in the last six decades, during

which the production of food grains alone has risen from 50 million MT to about 250 million MT. Assured irrigation has not only provided water for the crops but has also facilitated increasing use of fertilisers, high yielding seeds and insecticides, which have all led to increased production. However, we must note that the time and cost overruns in projects taken in hand as well as the growing gap between the irrigation potential created and utilized have limited the benefits to flow to the farms and farmers. The abysmally low water rates and still lower collection has had adverse consequences as well. The requirement of development expenditure in general already puts the finances of State governments under strain and inadequate returns from the large capital expenditure in irrigation projects compound the problem. One of the consequences is that the States are unable to undertake new irrigation projects or even complete the ones in hand. What is worse the repair and maintenance of existing projects is neglected, resulting in broken down distribution systems and silting of canals, reducing the irrigation potential. Inadequate expenditure on O&M is an important reason for the substantial under utilization of the irrigation potential created --33.74 out of 42.35 million ha up to 2007 (IIMB Study 2008 pages 213-14). The Draft Twelfth Five Year Plan cites another study by IIM Lucknow to state that 'more than 50 per cent of the farmers in major irrigation projects are willing to pay extra charges for assured water supply indicating that access to water is more important than its cost.' Further, the low water rates encourage farmers in the head reaches to waste water through excessive irrigation. Overuse of irrigation and wastage of water on account of disrepair in the irrigation and drainage system result in environmental degradation through water logging and salinity of command areas. Under pricing of water also results in inequities in the distribution of water between farmers at the head of the system and those at the tail end. The former are inclined to undertake intensive watering, leaving the latter with reduced supplies. Absence of volumetric measure of the water used in irrigation also results in wasteful use of water.

One of the institutional initiatives undertaken in India is that of participatory irrigation management, made effective by setting up water users association 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 which 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 be having no, or at most minimal, trade distorting effects or effects on production. The list includes infrastructural services such as water supply facilities, dams and drainage schemes. It is specifically provided as follows:

'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 for the latest three years for which the data is available. This is estimated by deducting depreciation from the gross figures of imputed subsidies (O&M expenses less gross receipts) given in the National Accounts Statistics.

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	NDP	Depreciation (Col. 5- Col. 6)	Irrigation Subsidy (Col.4- Col. 7)
				From Departmental Enterprises (Agriculture)			
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

Long delays in the construction of irrigation projects, the substantial gap between the creation and utilization of irrigation potential, 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 sustainability in the use of water resources in the country.

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 made lift irrigation possible 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	Other Sources	Total
	Government	Private	Total				

					Wells		
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

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. Deficiencies in the quantity and quality of power supplies have made farmers reliant on diesel pumps to a substantial extent.

The inexorable rise of groundwater irrigation is due to the fact that in using this source of irrigation the farmers are in full control, unlike in the case of surface irrigation. Groundwater irrigation enables the farmers to obtain water just in time and draw only the volume required for the standing crops. As the country makes progress towards high value agriculture and precision farming, and there is a need for using micro-irrigation (sprinkler and drip-irrigation) for greater efficiency in water use, lift irrigation will grow further in importance.

While diesel pumps are in greater use in the country as a whole, the 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.

While the production of electricity for captive use is allowed to the private sector mainly for industrial use 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 the 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 still the average rates charged by State Electricity Boards are much below both the cost of production and 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	0.101	0.100	0.101	0.106	0.102
Average rate of sale	0.076	0.071	0.070	0.079	0.079
Average rate for agriculture	0.019	0.021	0.021	0.027	0.032
Average rate for industry	0.103	0.094	0.095	0.105	0.104
Average rate for domestic	0.060	0.055	0.058	0.066	0.067
Average rate for commercial	0.123	0.111	0.111	0.123	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) as well as 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 percent in 2011-12 and this is much beyond the level that may be technically justified. The latest Annual Report on 'The Working of State Power Utilities' points out that the employment 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 the operation and maintenance functions, resulting in deficiencies in both the quality and quantity of supplies to all categories of consumers, and perhaps the agricultural consumers more than others. The irony is that it is the subsidised rates for supply of power to agriculture that constitutes the principal factor 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 sales of power has hovered around 22-23 percent, while the share of agriculture in the revenue has been in the range of 6-9 percent. 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

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 supplies is also poor and burnout of motors in pumping sets is a common occurrence due to

voltage fluctuation. Gulati and Narayanan (2003, p 119) quote the National Sample Survey (NSS) of 1997-98 as saying that ‘a whopping 48 percent 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 percent of the sample’. With the deficiencies in the quantity and quality of power supplies, farmers in several agricultural states are known to be using both electrical and diesel pumping sets, which practice results in higher capital and operational cost. There is some evidence to suggest that the farmer 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 Rs. 1.20/unit rather than the Re 0.50 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).

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 and identifies the administrative units (blocks) in which the water pumped out exceeds the utilisable recharge (over exploited), those in which the level exceeds 90 percent (critical) and those in which it is between 70 and 90 percent (semi-critical). The monitoring results of 2007 show an alarming situation in 5 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 agricultural consumption 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

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.

Figures in Column (5) are calculated following the table "Calculation of Electricity Subsidy (Cost-Difference)" in page 35 of WTO Notification (G/AG/AGST/IND/Vol.2).

*That is, excluding domestic consumption

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 the revenues are foregone without being reflected in the budget, in fertilisers the subsidy is provided through budgetary provisions voted by the legislature. 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 rise in input prices, consequent upon the increase in petroleum prices, particularly since 2007. As a result the magnitude of fertiliser subsidies is such that its contribution to the fiscal deficit of the central government is a major cause of macroeconomic instability.

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 Basin 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 non-existence of potash deposits India has been substantially dependent on imports of phosphatic and potassic fertilizers. Table 9 shows that the consumption, domestic production as well as imports of fertilisers have increased fourfold in the last 30 years.

Table 9: Consumption, Production and Imports of Fertilizers in India

(00,000 MT)

Year	Consumption				Production				Imports			
	N	P	K	Total	N	P	K	Total	N	P	K	Total
1981-82	41	13	7	61	31	10	0	41	11	3	6	20
2000-01	109	42	16	167	110	37	0	147	2	4	15	21
2007-08	144	55	26	226	109	38	0	147	37	13	27	76
2008-09	151	65	33	249	109	35	0	143	38	29	34	101
2009-10	156	73	36	265	119	43	0	162	34	28	29	91

Source: Annexure-V, Annual Report 2010-11, Department of Fertilizers, Ministry of Chemicals and Fertilizers, Government of India.

Modality of fertiliser subsidies

For many decades the principal modality of granting fertilizer subsidy has been for the Government of India to fix the Maximum Retail Price (MRP) of various types of fertilizers through statutorily controlled prices and then to compensate the manufacturers and importers with the difference with the cost of production or cost of imports. In order to encourage domestic production of urea, ammonium sulphate and calcium ammonium nitrate, in 1977 the Government of India introduced the Retention Price Scheme (RPS) which guaranteed a reasonable rate of return to the investors after taking into account the fixed and variable costs of each unit. The variable cost differed widely from unit to unit depending on inter alia the feedstock used and was the lowest where natural gas was used. The RPS also bred malpractices such as what has come to be known as 'gold-plating', whereby the manufacturers inflated their capital cost with a view to getting a higher retention price fixed unfairly for their units- 'gold-plating' and individual units inflated their capital costs. In 1979 the RPS was extended to apply to phosphatic fertilizers 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. The Hanumant Rao Committee (1998) suggested abolition of the unit-wise RPS and advocated a uniform Normative Referral Price for gas-based urea units and also for (Di-Ammonium Phosphate (DAP) units and a feedstock Differential Cost Reimbursement to be given to non-gas-based urea units. Subsequently the Expenditure Reforms Commission (2000) suggested replacement of RPS with a concession scheme for six groups of units based on feedstock use and the vintage of plants. The recommendations of the Expenditure Reforms Commission were implemented and further reforms were carried out in stages in rationalizing urea prices produced by groups of urea units and the New Pricing Policy is now in its third stage (NPS III). 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 the 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 would be made to domestic urea manufacturing units at a single rate. Progress towards change of feedstock is held up because of shortage in supply of indigenous natural gas.

As for phosphatic and potassic fertilizers, these were decontrolled in 1992 and imports were freely permitted. This put competitive pressure on the domestic units manufacturing Di-Ammonium Phosphate (DAP), and protection was offered to them through a flat rate subsidy of Rupees 1000 per MT, which was to compensate them for the higher costs of raw materials. The subsidy rates went through successive changes in the following years until April 1, 2008 when it was decided to equalize subsidies on imports and domestically manufactured DAP. The domestic DAP units now have a protection equal to the import tariff of 5 percent.

One big change in the modality of fertiliser subsidy, which has been made operational already for the 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 ideal ratio of 4:2:1) in the use of fertilizers by subsidizing fertiliser products uniformly on the basis of nutrient content, instead of setting separate MRP for each product and subsidizing them differentially. For phosphatic and potassic fertilisers the NBS has already been introduced with effect from April 1, 2010, so that statutory MRP is no longer applied and the farmer pays the market price less per unit NBS. The manufacturers and importers still indicate an MRP on the bags but this is only the price recommended by them as a measure of consumer protection. One of the objectives of the NBS scheme was to obtain a fixity in the per unit subsidy for various fertilisers. However, as Table 10 shows, the subsidy is being varied from year to year. After the changeover to NBS, world prices of DAP and the 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. The NBS fixed from year to year on the basis of the

recommendations of an inter-ministerial committee reflects the changes in the market price only partially.

Table 10: 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 Twelfth Plan document describes three hurdles in extending NBS scheme to urea. First, decontrol of urea and equalization of subsidy for imported and domestic urea would result in a windfall gain for domestic units, whose average unit subsidy is half of that on imported. Second, the high cost producers who use feedstock other than natural gas would become unviable. Third, since the price of urea after decontrol would rise steeply to international levels, the 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 the 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 the farmer is using more of the cheaper N and less of the costlier P and K.

Another potential reform initiative was announced by the Finance Minister in the Budget speech for 2011-12, to shift to a system of conditional cash transfers to individual farmers, apparently this has been put off indefinitely.

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 increase in the market price and keep the MRP unchanged for long periods. As the table at Appendix A.1 shows the MRP of the main fertilisers, urea, Di Ammonium Phosphate (DAP) and Muriate of potash (MOP) has remained constant or has changed only marginally, while international prices have risen and fluctuated widely in recent years. In 2003-04 the MRP for DAP was almost equal to the international parity price but in 2008-09 it was less than one-fourth; for MOP it was about 20 percent less in 2003-04 and in 2008-09 only one-eighth, and in the case of urea it was slightly above 40 percent less in 2003-04 while in 2008-09 it was one-fifth. The steep increase in international prices and the lack of adjustment in MRP resulted in 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 11. It should be noted that, as indicated above, 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 11: 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 fertilizer Scenario, 2010. Department of fertilizers, Ministry of Fertilizers and Chemicals, Government of India.

The farmer paid only about two-fifth of the price of DAP and one-fourth of 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 for Group I (Pre -1992, gas feedstock) was in the range of US 97- 121, for Group II (Post 1992, gas feedstock) US 133-154, for Group III (Pre 1992- naphtha feedstock) USD 258-356, for Group IV (Post 1992- naphtha feedstock) USD 249-251, Group V(FO/LS/SH feedstock) USD 187-287 and for Group VI (mixed feedstock) USD 173-209). One of the main reasons for the lower cost of production of the gas-based units is that they receive assured supplies of indigenous natural gas and the administered price mechanism applies to these supplies, under which the price that they have to pay is much lower than that of imported natural gas or liquefied natural gas (LNG).

In the foregoing analysis we have referred to the objective of the Government of India not only to subsidise fertiliser use by farmers but also to support indigenous production of fertilisers. The subsidy given to each manufacturing unit was on the basis of the difference between the retention price or concession rate and the MRP. To the extent that the retention price or concession rate for an individual unit was higher than the import parity price, clearly the beneficiary of the subsidy was the manufacturing unit and not the farmer. For many years in the 1980s and 1990s the import parity price of urea remained below the cost of production of domestic units and 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 fertilizer prices in recent years the position has changed considerably and now the farmer is the main beneficiary of the subsidy on urea. In 2010-11, only one urea unit out of 27 had a concession rate that was higher than the import parity price of USD 324/MT. In the light of this analysis it would seem appropriate to treat the entire budgetary subsidy on urea to be benefiting the farmer.

Quantification of fertiliser subsidies

It is easy to quantify 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 12 below we have added the value of the bonds to the budget provision to arrive at the total subsidy during recent years.

Table 12: 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 fertilizers, Ministry of Fertilizers 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 above the level of 6 per cent of the GDP in recent years. As Table 13 shows a big contribution to the fiscal deficit has come from fertiliser subsidies.

Table 13: 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.

Effects of fertiliser subsidies

It must be recognized that chemical fertilizers 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 fertilizer that helps 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 approximating to 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 14, but the picture of fertiliser use in the two major agricultural states of Haryana and Punjab is still far removed from the optimum. Disproportionately high use of N is the consequence of relatively high subsidies on urea.

Table 14: 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 fertilizer Scenario, 2010. Department of fertilizers, Ministry of Fertilizers 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.

But the increased use of fertilisers in recent years has not resulted in a commensurate rise in the production of food grains. Table 15 shows total fertilizer consumption in the country increasing more steeply than food grain production.

Table 15: 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.

Comparison of consumption of fertilisers and the corresponding yields in wheat and rice in the principal producing countries (see Tables 16 and 17) also points in the direction of overuse of fertilizers in India, stimulated without doubt by the high subsidies.

Table 16: Fertilizer Consumption vis-à-vis yield of Wheat in Some Major Producing Countries

Countries	2007		2008		2009	
	Fertilizer Consumption	Yield	Fertilizer Consumption	Yield	Fertilizer Consumption	Yield
	Kg/Ha					
Australia	41.3	1078.8	33.9	1583.1	29	1570.6
Canada	60.6	2322.1	55.1	2852.1	46.8	2785.5
China	486.9	4607.6	467.7	4761.6	488.4	4739

France	207.7	6254.2	151.9	7101.8	148.3	7446.9
USA	123.5	2704.6	106.1	3017.5	109.3	2989.7
India	142.7	2707.9	157.9	2802.2	167.8	2907.4

Source: Figures for Yield are from FAOSTAT website accessed on 20.07.2012

Figures for fertilizer consumption are from
<http://data.worldbank.org/indicator/AG.CON.FERT.ZS> accessed on 20.07.2012

Table 17: Fertilizer Consumption vis-à-vis yield of Rice in Some Major Producing Countries

Countries	2007		2008		2009	
	Fertilizer Consumption	Yield	Fertilizer Consumption	Yield	Fertilizer Consumption	Yield
	Kg/Ha					
China	486.9	6422.3	467.7	6553.5	488.4	6582
Indonesia	168.1	4705.2	183.2	4894.8	181.4	4998.5
Japan	350.5	6511.1	278.2	6778.6	235.1	6520.9
Thailand	136.8	3008.7	130.5	2962.6	125.1	2882.6
India	142.7	3292.4	157.9	3416.9	167.8	3194.7

Source: Figures for Yield are from FAOSTAT website accessed on 20.07.2012

Figures for fertilizer consumption are from
<http://data.worldbank.org/indicator/AG.CON.FERT.ZS> accessed on 20.07.2012

High subsidies on fertilizers have also led to leakage of benefits to unscrupulous traders who have been smuggling fertilizers to the neighbouring countries. 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. Further, one of the adverse environmental consequences of overuse has been that fertilisers have leached into the aquifers and made the ground water unusable as drinking water. 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. These effects taken together give rise to serious concerns on the sustainability of high fertilizer subsidies.

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 percent, Cooperative 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 lending to the priority sector lending (which included agriculture and small-scale industries). The opening of a large number of branches of nationalized commercial banks in rural

areas further helped to increase the access of farmers to institutionalized agricultural credit. The Kisan Credit Card (KCC) scheme introduced in 1998 was yet another big step forward by 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 KCC scheme are provided with a credit card cum pass book giving the name and address and the particulars land holding, which helps them to secure loans annually without the need for a fresh enquiry on the assets and assessment of the 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 the 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. 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 the reduced rate of seven percent, and to facilitate this it 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 Cooperative Banks at 2.5 percent and to RRBs at 4.5 percent. In 2009-10 government announced an additional subsidy of 1 percent for farmers who repaid the loans in time and the incentive was raised to 2 percent in 2010-11 and further to 3 percent in 2011-12. Thus the effective rate of interest for farmers for loans up to a ceiling of Rs 300,000 (approx USD 6629.83) is 4 percent.

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

1. All agricultural loans disbursed by scheduled commercial banks, regional rural banks and cooperative 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 onetime settlement (OTS) for all loans that were overdue on December 31, 2007 and which remained unpaid until February 29, 2008. Under the OTS, a rebate of 25 percent was given against payment of balance

of 75 percent 30 June 2009. The last date of payment was subsequently extended to December 2009 and later to June 30, 2010.

The decision for agricultural debt waiver in May 2009 was clearly against sound banking principles as it sought to benefit those who had not repaid the 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 absence of institutional credit institutions. In the last five decades of the 20th century the situation has changed considerably as can be seen from Table 18.

Table 18: Trend in the Share of Debt of Cultivator Households from Different Sources (%)

Sources Of Credit	1951	1961	1971	1981	1991	2002
Institutional	7.3	18.7	31.7	63.2	66.3	61.1
Cooperative Societies/Banks, etc	3.3	2.6	22	29.8	30	30.2
Commercial Banks	0.9	0.6	2.4	28.8	35.2	26.3
Non-Institutional	92.7	81.3	66.3	36.8	30.6	38.9
Moneylenders	69.7	49.2	36.1	16.1	17.5	26.8
Unspecified	-	-	-	-	3.1	-
Total	100	100	100	100	100	100

Source: 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 18 gives the trends of institutional credit for agricultural loans since 2002-03. The trend of 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 23.3 percent, which is more than the CAGR of 18.9 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 of the benefit of subsidized interest. In fact the large difference between the market rate of interest and the rate at which it is available to farmers may have created the temptation for farmers to re-lend the funds instead of using them for agricultural operations and some evidence has been found of such diversion (Barik 2011).

Table 19: 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 provides that the value of input subsidies shall be measured using government budgetary outlays or, where the use of budgetary outlays does not reflect the full extent of the subsidy concerned, the basis for calculating the subsidy shall be the gap between the price of the subsidized 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 has a preference for this alternative. 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 percent 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 making the above estimation 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 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 20.

Table 20: 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 percent 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 (USD 15.58 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. Government of India has been reimbursing the cost of debt waiver and debt relief to the lending institutions and Table 21 shows the amounts reflected in the expenditure budgets of subsequent years.

Table 21: 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 estimation of the proportion out 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 20. It is observed that in recent years about 70 percent 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. 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 22.

Table 22: 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 3 is calculated using tables 22 and 20 of the current document, for obtaining the figures in Column 4, figures mentioned in the Budget Speech 2008-09 are used.

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 product-non-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 of farms, based on an area approach. Farmers who have taken loans are covered on a compulsory basis and for others the scheme is voluntary. At present the scheme is being implemented by 25 States and 2 Union Territories. The scheme covers all food crops, oilseeds and annual commercial/horticultural crops. The premium rates range between 1.5 and 3.5 percent for food and oilseed crops but actuarial rates are charged for commercial and horticultural crops. A 10 percent 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.

Indemnity 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 percent of premium in case of horticultural and commercial crops, as well as 10 percent subsidy for small and marginal farmers, bank service charges and 20 percent of the administrative and other expenses is reimbursed by the state and central 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 23: 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 percent. 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 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 losses of production. The WBCIS is based on actuarial rates of premium but as a promotional measure the lower premium rates (1.5 to 3.5 percent) of NAIS are being charged. The State governments and the Central government bear the difference between the actuarial rates and the premium actually paid.

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

Table 24: Reimbursement of premium differential in WBCIS by State and Central Governments

(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 percent 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 increasing its attention on 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 percent in certain states for certain crops, against the desired norm of 25 percent for self-pollinated crops, 35 percent for cross-pollinated crops and 100 percent for hybrids. At the centre of some of the assistance programmes related to seeds is therefore 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 (SFCl), 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 the 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 organized by State Governments through State Seeds Corporation, Departmental farms and cooperatives. The NSC and the SFCl 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 high value and low volume seeds of maize, sunflower and cotton, but is the strongest in vegetable seeds and planting materials of 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 titled the development and strengthening of infrastructure facilities for production and distribution of seeds.

The four 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 viz., financial assistance for distribution of foundation/certified seeds at 50 percent of the cost of the seed for production of certified/quality seeds; training is provided to farmers on seed production and technology; and financial assistance of 25-33 percent of the cost is given for procuring or making seeds storage bins. The expenditure under these heads during the years 2007-08 to 2010-11 is given in Table 25.

Table 25: 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 product non-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 of the central government, which envisages support for farmers setting up drip irrigation, sprinkler systems and irrigation systems for protected irrigation such as greenhouses. The central government meets 40 percent of the cost, the state government 10 percent and the beneficiary is expected to bear 50 percent. 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 26: 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

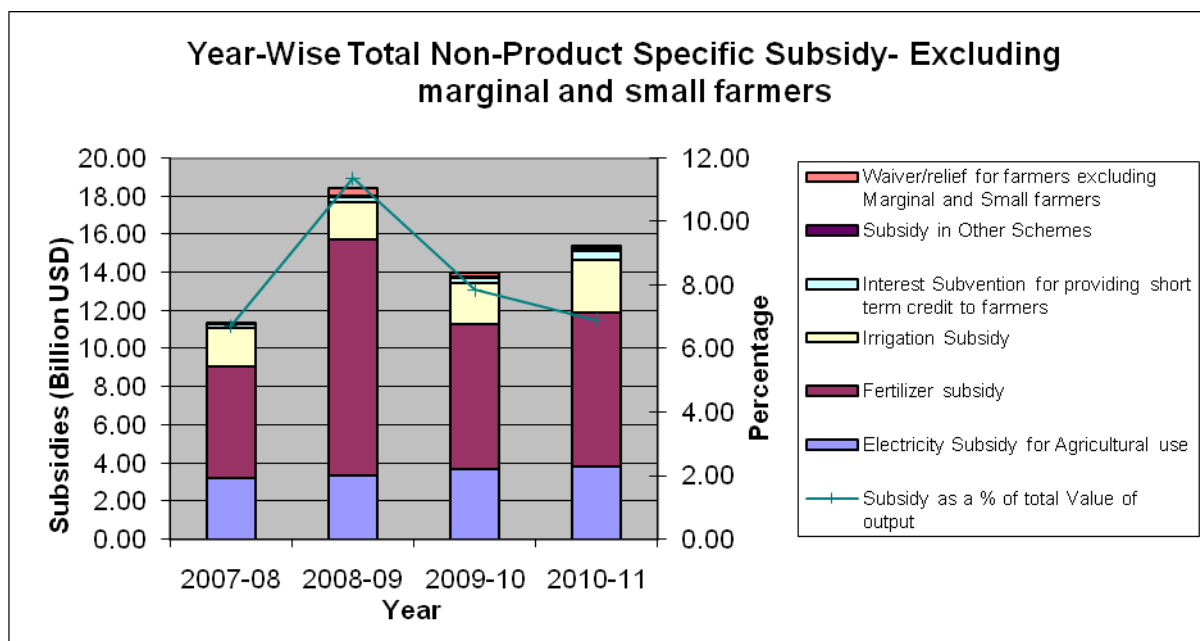
Source: Expenditure Budget, Volume 2, different years.

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 product-non-specific AMS.

2.1.1.8 Total Non-product-specific subsidies and WTO obligations²

In the foregoing analysis we have considered inter alia a number of product-non-specific subsidy programmes. Now we see how these programmes stack up against the obligation that the product-non-specific subsidies must not go above the de minimis limit of 10 percent, considering the fact that India has a commitment to maintain its Current Total AMS at the base period level of zero. In making the estimation 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 and resource poor farmers from domestic support reduction commitments. It is true that most of the programmes are available to all farmers, but it is certainly arguable that so much of the subsidy as is availed of by the low-income and resource-poor farmers can be excluded from the calculations of total subsidies covered by reduction commitments. A question arises on the size of holdings in India which can entitle the farmers to be designated as resource-poor or low-income. In its last notification of non-product-specific AMS India has noted that 98.97 per cent of its farm holdings (presumably below 10 hectares) are of low income and resource poor farmers, covered by the exemption of Article 6.2. Views may vary on the size of the farm holdings to be deemed to be of low income and resource poor farmers but the adoption of a benchmark would be incontestable, purely for the sake of testing whether India's non-product-specific AMS is within the de minimis limit of 10 per cent. In this spirit we have adopted a the conservative benchmark possible and have put only marginal farmers (less than 1 hectare) and small farmers (1.0 to 2.0 hectares) in this category. If India passes the test on the basis of only small and marginal farmers being treated as low income and resource poor farmers then certainly it would pass the test if even larger holdings are deemed to be exempt. Since small and marginal farmers own 41 percent of arable land in the country, we have reduced the total subsidies by a factor of 0.59 in order to exclude the subsidies that benefit those farmers. The result of our calculations is given in Table A.4 and Figure 6. It is seen that in recent years, non-product-specific subsidies as a percentage of the total value of agricultural output has remained below the cut off level of 10 per cent and is to be treated as de minimis. However, during 2008-09 the level was crossed mainly because of the increase in the fertilizer subsidy.

Figure 1: Year-Wise Total Non-Product Specific Subsidy- Excluding marginal and Small farmers



2.1.2 Product Specific Support

2.1.2.1 Minimum Support Price

A 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 the 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 on the basis of 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.5 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 much difference. Table A.6 gives the data on

procurement by the Food Corporation of India, the Cotton Corporation of India, both State Trading Enterprises and by 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 organized 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.7 shows great disparity in the level of procurement activity in the principal states producing rice and Table A.8 shows the same features in respect of wheat. If this disparity is reduced or even eliminated, it is possible that there would be higher production of food grains in this region.

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 analyze 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 for importing large quantities of food grains, in 2007-08 the Government of India launched the National Food Security Mission (NFSM) aimed at increasing the production of rice, wheat and pulses by 8 million MT and pulses by 2 million MT, 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.

The NFSM envisages eight substantive interventions³:

- Demonstration of improved package of practices for rice and wheat;
- Financial assistance to seed producing agencies for production and distribution of hybrid rice seeds (Rs 1000 or USD 24.84 approx per quintal for production and 50 percent of cost or Rs 50,000 or USD 1241.93 approx), whichever is less for supply), seeds of high yielding varieties of rice and wheat (Rs 500 or USD 12.42 approx or 50% of the cost, whichever is less), to research agencies for production of breeder seeds for pulses and to public and cooperative sector agencies for production of foundation and certified seeds (Rs 1000 or USD 24.84 approx per quintal) and for distribution of certified seeds(Rs 1200 or USD 29.81 approx per quintal or 50 percent of the cost, whichever is less);
- Financial assistance for nutrient management or application of soil ameliorants such as micronutrients for rice and wheat (Rs 500 or USD 12.42 approx per ha or 50 percent of the cost whichever is less); lime for rice, gypsum for wheat (Rs 500 or USD 12.42 approx per ha or 50 percent of the

cost whichever is less); and integrated nutrient management of pulses involving all these nutrients (Rs 1250 per ha);

- Financial assistance for mechanization for cultivation of rice and wheat in the form of subsidies for purchase of three types of farm implements viz., cono weeders for weeding between rows of paddy crops (50 percent or Rs 3000 (USD 74.52 approx) , whichever is less), zero-tillage machines (Rs 15,000 (USD 372.58 approx) or USD or 50 percent, whichever is less) and roto weeders suitable for inter row weed control (Rs 30,000 (USD 745.16 approx) or 50 percent, whichever is less);
- Financial assistance of 50 percent for the purchase of pump- sets for wheat subject to a maximum of Rs 10,000 (USD 248.39 approx);
- Financial assistance of 50 percent for sprinklers sets for pulses subject to a maximum.
- Financial assistance for plant protection of rice and pulses;
- Training of farmers.

Quantifying subsidies under the NFSM under the WTO rules

Out of the elements of the NFSM described above demonstrations, plant protection and training fall under the green box under the WTO Agreement. However, financial assistance for production or distribution of seeds and for nutrients qualifies as product specific input subsidies and financial assistance for mechanization, purchase of pump and sprinkler sets 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 27 we compile the aggregate subsidies, 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.

Table 27: 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 the crops in which domestic production in the country is well short of the demand, by encouraging the use of improved seeds for supply of certified seeds, nutrient management, and irrigation through sprinkler systems. The main interventions adopted are assistance for production and distribution of quality seeds (Rs 500 or USD 12.42 approx per quintal for certification and Rs 800 or USD 19.87 approx per quintal), plant protection, demonstrations, farmer's training, and subsidies for use of nutrients (Rs 500 USD 12.42 approx per ha for gypsum) and for setting up sprinkler systems.

Table 28: Seed Subsidy under ISOPOM

Crops	Category	2007-08	2008-09	2009-10
		in US Dollar Billion		
Oilseeds	Seed Subsidy	0.0353	0.0200	0.0154
	Other Input Subsidy	0.0062	0.0072	0.0032
	Sub-Total	0.0415	0.0272	0.0185
Pulses	Seed Subsidy	0.0032	0.0026	0.0011
	Other Input Subsidy	0.0022	0.0011	0.0004
	Sub-Total	0.0055	0.0037	0.0015
Maize	Seed Subsidy	0.0000	0.0007	0.0002
	Other Input Subsidy	0.0007	0.0000	0.0000
	Sub-Total	0.0007	0.0009	0.0002
Total		0.0479	0.0315	0.0202

Source: Author's calculations based on Component wise Operational Guidelines for ISOPOM 2004-05 and Outcome Budget, Ministry of Agriculture, Government of India, Various Years.

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 the States to increase their own spending in agricultural and allied sectors. Table 29 shows the annual expenditure on RKVY during the years 2007-08 to 2010-11.

Table 29: Expenditure on Rashtriya Krishi Vikas Yojana (RKVY)

(In USD Billion)

Project	2007-08	2008-09	2009-10	2010-11
RKVY	7.17	8.18	14.16	17.14

Source: Twelfth Five Year Plan, Planning Commission, 2013

A feature of RKVY was that the States were given full flexibility in the utilization of funds. According to available information the State programmes have highly diversified and have included interventions in crop development, horticulture, animal husbandry, dairy development, fisheries, natural resource management, agricultural mechanization, micro-irrigation, seeds, fertilizers, 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 aimed at enhancing 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 and farmer's training, the following are the main interventions for which financial assistance and subsidies are included:

- Setting up nurseries for production of seeds and planting material;
- Setting up infrastructure for production of vegetable seeds ;
- Setting up new gardens and rejuvenation of senile plantations;
- Creation of water sources and for protected cultivation;
- Developing precision farming;
- Developing facilities like disease forecasting unit, plant health clinics, leaf/tissue analysis laboratories and bio-control;
- Undertaking organic cultivation of vegetables;
- Bee-keeping;
- Setting up post harvest facilities, such as pack-houses, ripening chambers, cold storage units etc.;
- Setting up of new infrastructure projects for marketing of horticultural commodities.

The expenditure on the National Horticulture Mission during recent years is indicated below:

Table 30: Expenditure in the National Horticulture Mission

(Billion US Dollar)

Description of project	2007-08	2008-09	2009-10	2010-11
National Horticulture Mission	0.2235	0.2174	0.1686	0.2129

Source: Expenditure Budget, Volume 2, different years.

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 added to the product specific AMS for horticultural products.

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 Total AMS with respect to product-specific domestic support does not exceed 10 percent of the value of production of the product concerned.

According to the 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 inter alia '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 AMS is the Indian Rupee, and the ERP has been shown in terms of Indian Rupees per ton and therefore for assessing India's Current AMS with respect to product-specific domestic support we use this currency.

Table 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 adjustments in the MSP for the levels of inflation. 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 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), for undertaking on its behalf purchasing of paddy and wheat in support of the MSP. In addition to purchases in support of 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 percent in various states). The levy programme is also handled by the FCI. In 1997-98 the scheme of Decentralized Procurement was introduced whereby the States conduct the procurement operations on behalf of the Government of India. At present 10 States and Union Territories are undertaking direct purchases 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 31:

Table 31: Rice and Wheat Procurement (according to marketing year):

(Quantities in Million Tonnes)

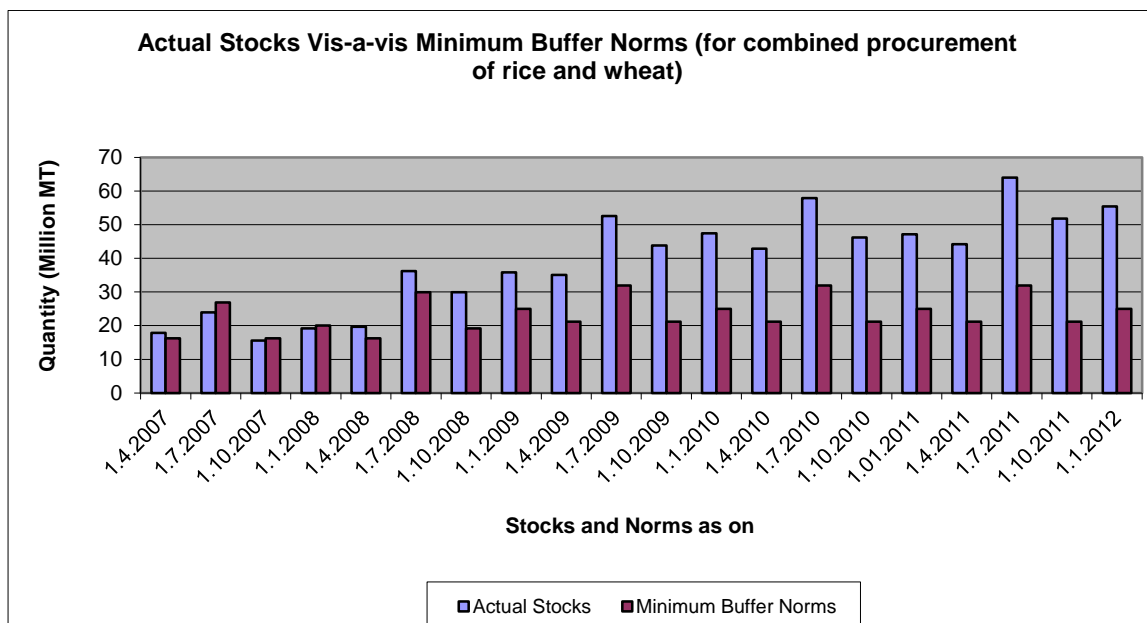
Crop	2007-08	2008-09	2009-10	2010-11
Rice	28.73	33.68	26.82	32.35
Wheat	11.19	26.04	27.94	22.08

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, the purchases made in support of 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 another begins. Figure 2 (detailed data available in Appendix Table A.2) compare the stock position in relation to the norms for combined buffer stocking for rice and wheat.

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



2.1.3.3 Public Distribution System

The food grains acquired by the FCI as a result of substantial 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 populations falling below the poverty line (BPL). As a transitional measure food supplies were continued for the populations above the poverty line (APL) but at a higher price. In 2000, a decision was taken that the central issue price of the food grains for the BPL sections would be 50 percent of the economic cost (MSP plus procurement and distribution costs) while for the APL sections at 100 percent 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 also 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 and mothers in low income and disadvantaged communities at government cost for children below six years 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 1.4.2002 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. 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 32. It would be observed that while the economic costs have been on an uptrend the issue prices have remained unchanged for many years. In fact for the APL categories the issue prices were brought down somewhat after being initially set at the level of the economic cost. In the result the divergence between the two has increased and the subsidy burden on the government has risen.

Table 32: 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	AAV	Economic Cost	APL	BPL	AAV
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. Sugar in India is under partial control and producers have to deliver 10 percent of the production to the government and the levy-sugar as it is called is 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 33. This includes expenditure on procurement, stocking and distribution and includes the difference between the economic cost and the central issue price.

Table 33: 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.

On the basis of 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 34:

Table 34: Costs incurred by FCI in procurement, stocking and distribution of food grains

(In USD/MT)

Year	Pooled Cost of Grain		Procurement 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 35 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 35: 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.

Considering the large proportion of expenditure on procurement incidentals, distribution costs and carrying costs as we have seen in Table 35 above it is difficult to tell by how much the consumer subsidy is inflated by inefficiencies in the operations of the FCI.

The biggest concern on food subsidy is the leakage of public funds in massive procurement and distribution operations. 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 subsidized 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 subsidized 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 subsidized 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 36: Contribution of Food subsidy to India's Fiscal Deficit

(Billion US Dollar)

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.

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 subsidized 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.9 and A.10.

2.1.3.4 National Food Security Bill

A recent initiative of the Government of India is the National Food Security Bill (NFSB), which was introduced in the Parliament in 2011. This is an ambitious document, which envisages a steep increase in the food subsidy programme. It 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. For persons belonging to priority households it provides a legal entitlement to receive food grains at subsidized prices. More importantly it provides for supply of cereals at subsidized prices to 75 percent of the rural populations and 50 percent of the urban populations. 46 percent of the rural population and 28 percent of the urban population will constitute priority household. Priority household will be supplied

subsidized food grains at the rate of 7 kg per person and the general household will receive 3 kg per person. The NFSB also envisages the subsidized price for priority households to be fixed in the law at Rs 3 (US cents 5.5) per kg for rice, Rs 2 (US cents 3.7) per kg for wheat and Re 1 (US cents 1.8) for coarse grains. For general households the proposed price is 50 percent of the MSP for wheat and 50 percent of the derived MSP for rice.

The NFSB has been criticized for a number of reasons. It imposes a highly centralized model, perpetuates the 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 the government to increase public investment in agriculture and would result in virtual state takeover of food grain economy and cripple competition. An anomaly in the provisions of the Bill is that while it creates an entitlement for certain sections of the population to receive subsidized food grains, it grants immunity to the Central and State Governments from claims in force majeure conditions, which are rather broadly defined to include floods and droughts. The fact is overlooked that in these conditions there is greater need for the affected populations to access basic foodstuffs.

More importantly, the NFSB suffers from two fundamental flaws. First, the Bill proposes to place reliance on the decrepit machinery of TPDS, which is resulting in a massive leakage of subsidized food grains. Second, it ignores the current fiscal predicament of the country by proposing to raise by Rs 230 billion (Times of India, Feb 9, 2013) the annual expenditure on food subsidy from the existing level of Rs 728 billion at current prices, according to the Revised Budget Estimate for 2011-12. The scheme put forward in the NFSB is designed to result in the expenditure ballooning up in future years as the issue price for priority households would be fixed in law at the rates mentioned above while the economic cost of food grains will go on rising.

Having regard to the level of incomes in India, giving subsidized food grains to 40 percent of the population and somewhat less subsidized food grains to another 27 percent 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 is contributing 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 both to 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 the GDP. Without fiscal consolidation the consequences 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 is 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.

2.2 Market Access

For all of the 60s, 70s and the 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 sea change in India's import trade barriers. On industrial products the peak tariff levels were progressively brought down from 150 percent or more to 10 percent by 2007, except for 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 did not, however, undergo a parallel process of liberalization. The rules of the WTO Agreement permitted India to maintain quantitative restrictions on agricultural products under the balance-of-payments exception and during the negotiations they were allowed to offer ceiling bindings on the products on which such restrictions were maintained. Consequently India bound its agricultural tariffs at 100 percent for commodities, 150 percent for processed products and 300 percent 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. Even so, the applied rates of duty trended lower. 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 tariff 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 percent for skimmed milk powder, from zero to 60 to 80 percent for maize, rice and certain other cereals, and from 45 to 75 percent 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 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 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).

The Schedule Rates of Customs Tariff, which are generally the applied rates, 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 37: 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	45-300	0-7.5	Zero for crude oil	

oils	TRQ of 150,000 for rape, colza and mustard oil at 45		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 rates (known as the Schedule rates of customs duty) 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 liberalized 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 has been eliminated by lowering the Schedule rates. This liberalization has greater stability as it cannot be reversed except with the approval of the Parliament. The elimination of duty on pulses has less stability as it was done through an exemption notification in 2007-08
- Imports of industrial raw materials have been liberalized 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 criticized. Why does not India bind its tariffs at a level nearer the applied levels? 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) can be expected to reduce the gap. While the application of flexibilities given to developing countries

would no doubt tend to make the reductions in bound rates modest (see Gopinath and Laborde), it must be observed that India's trading partners would also have the opportunity to obtain commitments for deeper reductions in selected products through reciprocal bilateral negotiations.

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 on global markets at 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. While economists cannot accept the concept of self sufficiency, the current long term outlook on the international food prices front provides the political context for the continuing efforts in India to achieve maximum possible self-sufficiency in the production of food grains. Needing to feed a population of 1.2 billion, a large country like India cannot be expected to depend substantially on trade for its food supplies. However, the instrumentalities must be efficient and effective in achieving these objectives and must also fulfill the attainment of sustainable development goals. In Section 2 we have identified and analyzed 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 the full benefit from the 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 percent of the O&M costs. We have seen earlier that the Vaidyanathan Committee had recommended that the water rates should cover O&M costs and one percent of the cumulative capital cost. From the point of view of the farmer's ability to pay there can be no impediment to raising the water rates gradually to the level that would cover the O&M costs. Recovery of one percent of the capital cost may be problematic for new projects because of the highly inflated capital costs on account of inefficiency in construction. Moreover, 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 the society to bear the capital related charges fully in return for the assured availability of locally produced basic foodstuffs. The target for increasing water rates must therefore be to cover O&M cost only and capital related charges must be excluded from the equation. There is some evidence to suggest that farmers would be willing to pay a higher price for assured access to water.

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 for collection of water charges as well for the O&M of the canal system should be handed over to Water Users Associations (WUAs). They should collect the water rates and deposit the proceeds with the government or government agency, and then receive back on a guaranteed basis a major proportion for meeting the expenses on O&M. The WUA at the minor level is the most crucial but the attempt should be to promote the formation of WUAs at the distributary, canal and project levels as well. The WUAs at the project and canal level can control and check the overuse of irrigation water at the head of the canal system and ensure that the farmers at the tail end receive the irrigation water on an equitable basis.

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 if the farmer uses lesser volume than her past record.

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 are under construction for 30-40 years. The ongoing projects should be prioritized according to the stage of completion and annual financial allocations concentrated on the projects which are in the last mile stage and for which benefits can start flowing immediately. With such a large number of projects under construction, the appropriate course is to impose a moratorium on undertaking new major or medium irrigation projects for some time. The Twelfth Plan envisages a similar course of action but the proof will lie in implementation.

3.2 Power and lift irrigation

Power is used by the farmers mainly in lift irrigation. 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 full responsibility for the collection of water charges as well as for the operation and maintenance of the system, for which the collected water charges should be ploughed back to them on a guaranteed basis.

Farmers owning private tube wells, who are the main users of power for agriculture in India, are victims of appalling inefficiencies of the State Electricity Boards (SEBs), which have a monopoly on distribution of electricity in the country. We have seen that they suffer from interruptions in power supply at times when they need it most and burn out of motors in pumping sets due to voltage fluctuation is a common occurrence. These inefficiencies are the result of several, mutually reinforcing factors, including the poor governance levels in the states, virtually unchecked theft of power, high transmission and distribution losses, inadequate supplies of coal, low plant load factor, the employment of large numbers of unproductive staff and the poor financial health of the SEBs. One of the main reasons for the dire state of the finances of the SEBs is that power is supplied free or at nominal rates for agricultural operations. In Table 5 we saw that the rate of sale of electricity is less than one-third of the average cost per unit of power, and in Table 6 we noted that the subsidy to agriculture accounts for four-fifths of the commercial losses of the SEBs. For improving the performance of the SEBs there is no alternative to gradually increasing the rate for agricultural use to approximate more closely to the average cost of supply.

The proposal for raising power charges for agricultural consumers will have little chance of acceptability by the farming community unless it is accompanied by improvements in supplies of electricity to the agricultural sector. Overall improvement in the functioning of SEBs can be brought about only by addressing the multifarious problems referred to above but making suggestions for a holistic solution to the problems of the SEBs is beyond the scope of this paper. However, the example of Gujarat has demonstrated that considerable amelioration in electricity supplies to the rural agricultural sectors 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 for bringing similar results in other States.

One of the results of free supply of electricity or of the supply without meter (on the basis of the capacity of pumps) as is the practice in many states is that water pumps

can be run at no cost or no 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.

In the past regulatory approaches for containing over-exploitation of ground water resources have received attention but have not made progress. Attempts made by the central government in the past to persuade state governments to enact an appropriate legislation for the purpose have met with only limited success. The Twelfth Plan proposal is to make another attempt to draft a National Water Framework Law and then to try to evolve a consensus among States.

3.3 Fertilizers

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 fertiliser subsidy can only be brought about gradually so as to allow farmers to adjust to new conditions. The first task before the Central Government is clearly to extend the NBS scheme to urea so as to end the skewed use of nitrogenous fertilisers. The way to ensure that the gas-based domestic urea manufacturing units do not get windfall profits from the uniform levels of NBS is to raise the administered price of domestic gas supplied to these units. Charging them on the basis of a pooled price, which takes into account the import parity price of LNG has been suggested as the way out. 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. If the price of fertilizers increases by a large margin in a particular year upward adjustment of the MSP could be considered, although it would be unwise to increase it beyond the prevailing international price. 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. Going by the Finance Minister's speech while presenting the 2012 Budget proposals, such a scheme is in the zone of consideration by the Government although its implementation seems to have been put off indefinitely. Direct payments made to farmers on the basis of the area under cultivation could 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 dampen 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 lending (which included agriculture and small-scale industries) expanded lending by these banks for farm operations. The opening of a large number of branches of nationalized commercial banks in rural areas further helped to increase the access of farmers to institutionalized agricultural credit. The Kisan Credit Card scheme introduced in 1998 was yet another big step forward for expanding agricultural credit by simplifying the procedures and making it hassle free. To the extent that subsidized credit reaches the farmer there can be no doubt that it reduces the cost of credit and increases the income of farmers. However, one has to take into account the systemic effect of subsidization. Mandates from government for lending institutions to give farm loans on subsidized interest rates usually result in a disincentive for the lenders to advance such credit as they are seldom compensated fully for advancing loans at the subsidized rates. On the other hand the big difference in the subsidized lending rates and the market lending rate creates a temptation for the farmers to re-lend the subsidized loans at market rates and pocket the difference instead of utilizing 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 the agricultural credit subsidies are phased out. .

3.5 Minimum Support Price

The trend worldwide has been to move away from market price support and towards decoupled income support and a preference for the latter is implicit in the rules of the WTO Agreement. The reason for this is that in theory market price support distorts trade and production whereas such effects are minimal for decoupled income support. Having regard to the numbers of people dependent on agriculture in India and the absence of updated information regarding title and ownership in land records in the country it may not be feasible to move away from market price support in the near term. What we have to see, however, is whether the levels of MSP adopted from year to year diverge too much from international prices, as was the practice in the EC in the pre-Uruguay Round era. Our analysis has shown that in respect of the two major crops that we have examined, wheat and rice, this is not the case. In fact, generally, though not at all times, the MSP has been below the international price of the commodity. The fact that the MSP has remained much below the inflation adjusted external reference price as committed by us under the WTO Agreement on the basis of the base price in 1986-88 (as demonstrated in Tables A.8 and A.9) implies that India has not been adjusting the MSP fully to

account for even inflation.

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 what is 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 for purchasing large quantities of food grains could ease considerably. For the private sector to be able to enter the food grain market in a big way, the scale of purchases to support minimum support prices can be reduced in this fashion only if there is a simultaneous government decision to provide increased opportunities to the farmers to sell their products in 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 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 zonal movement and on stocking of food grains by 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

We have seen that the Public Distribution System is costly to maintain and riddled with loopholes. The least that needs to be done is to minimize the cost of delivery of the benefit of subsidized food. The operations of the Food Corporation of India (FCI), which is responsible for procurement, storage and distribution of food grains, are expensive. Procurement incidentals and the distribution costs add up to as much as 40 percent to the MSP and inflate the economic cost of the food grains handled by the FCI.

We have seen that in 2010-11 against the economic cost of Rs 19,831 (USD 435.27 approx) for common rice the issue price was Rs 7930 (USD 174.06 approx) for APL, Rs 6550 (USD 143.77 approx) for BPL and Rs 3000 (USD 65.85 approx) for AAY categories of beneficiaries. For wheat the economic cost was Rs 14,943 (USD 327.99 approx) and the issue prices Rs 6,100 (USD 133.89 approx) for APL, Rs 4150 (USD 91.09 approx) for BPL and Rs 2000 (USD 43.90 approx) for AAY categories. During the period since 2000, while the economic costs have nearly doubled, the central issue prices have remained unchanged. Such a large subsidy increases the chances of diversion of benefits increase manifold and large leakages become

inevitable. A Planning Commission Report of 2005 has estimated that leakages account for 36.38 per cent and diversion to unintended beneficiaries for another 21.45 per cent of the subsidized food grains.

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 the government to handle food grains through the public distribution system. The only administrative burden for the government is to identify the populations in the targeted groups and to arrange for a transfer of funds (Josling 2011; page v). The Report of the Task Force on an IT Strategy for PDS and an implementable solution for the direct transfer of subsidy for food and kerosene, (GOI 2011) submitted in October 2011 has proposed the establishment of a Public Distribution System Network (PDSN) for the use of information technology to improve the TPDS. The use of information technology and end to end computerization will result not only in an improved targeting of the deserving categories for supply of subsidized food grains but will also bring about a reduction in the food subsidy expenditure.

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 fertilizers subsidy in 51 districts in 15 states with effect from January 1, 2013. For cash transfers scheme to go forward there are two requirements; individual beneficiaries must have a Unique Identity Card (Aadhar) number and an account in the bank, 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 would be covered. There is a problem in that the commercial banks do not have 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 the states and they may have to be given flexibility in the application of the scheme. In remote and food deficit areas the 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 the cities with a population of one million plus and in the cereal-surplus states (Gulati et al, 2012).

3.7 National Food Security Bill

We have seen that the proposals in the Food Security Bill envisage a deepening and expansion of the program for supply of subsidized food grains. We have already observed that with the levels of poverty and deprivation prevalent in the country the proposals for increasing the subsidized supply of food grains are not unreasonable. However, the roll out of the expanded food subsidy programme needs to be delayed until adequate budgetary resources are available to finance the programme. At this time when the central government is in a state of fiscal stress the need of the hour is fiscal consolidation. Since the avenues for augmenting the financial resources of the central government are limited it is imperative that cuts are made in subsidies. In this situation there is no alternative to deferring implementation of the Food Security Bill. Rather, as argued in the previous section, full attention needs to be given to the implementation of a system of direct cash transfers to improve delivery of benefits as well as reduce costs.

3.8 Market Access and Export Controls

A common criticism of India's import tariffs on agricultural products is that there is a big difference between the bound and applied tariffs. The main reason for this difference is that during the Uruguay Round developing countries were given the flexibility to bind tariffs at ceiling levels and India availed of this flexibility. We have seen that since then on many important agricultural products India has reduced the applied levels of tariffs and sometimes this has increased the divergence. For instance in the case of certain edible oils, the duty has been eliminated although the bound level is as much as 300 percent ad valorem. India needs to be applauded rather than criticized for bringing down its applied tariffs on major foodstuffs, even if this has increased the divergence between the bound and applied rates. The opportunity for lowering bound duties comes only during negotiations and the impasse of the Doha Round has deprived India of this opportunity.

High bound or statutory applied tariffs on some basic foodstuff products are needed in India in the context of high volatility in international commodity prices, which in the past has been exacerbated by the domestic support and export subsidy practices of industrialized countries. India cannot afford to allow a situation to develop in which a sudden drop in international prices threatens to rob millions of farmers of their livelihood. Once special agricultural safeguards have been agreed in the WTO, during future multilateral negotiations there would 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 the statutory rates to the 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 been criticized 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

objective of the Government of India in adopting quantitative export control measures on foodstuffs is to protect consumer interest and in the case of fibres to protect the interest of domestic industry. However, these objectives can be met adequately by imposing export duties instead of quantitative restrictions. 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 has therefore come for government to decide that when it becomes imperative to limit exports, the objective should be accomplished through export duty rather than by means of prohibition or quantitative restriction.

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 would, however, 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 utilized. From the financial angle it is important to ensure that benefits start flowing from these projects. As the gap between irrigation potential created and utilized is resulting in wastage of water resources this is 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 the 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 project for undertaking lift irrigation schemes for micro-irrigation.

Stimulating groundwater regeneration

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 remain only half measures. What is needed is to make it possible for the farmer to rely more on this resource rather than less, by the Central and the States 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 revitalized by coordinating its implementation with that of 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 stabilization 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 the available rain 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)

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 simultaneously steps are taken 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 RKVY the Central Government has initiated a number of interventions for ushering in 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 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 and soil organic carbon.” These measures are needed to check soil degradation that has been brought about by the overuse of chemical fertilisers.

Appendix

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 million MT)

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	14.0	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 A.3: 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 Schemes ^b	Sub-Total	Subsidy excluding Marginal and Small farmers ^c	Waiver/relief for farmers excluding Marginal and Small farmers	Total Subsidy excluding Marginal and Small farmers	Subsidy as a % of total Value of output
Billion US Dollar											
1	2	3	4	5	6	7	8=3+4+5+6+7	9=8*(59/100)	10	11=9+10	12=(11/2)*100
2007-08	169.30	5.54	9.93	3.34	0.42 ^a	0.04	19.26	11.36	0.00	11.36	6.71
2008-09	164.58	5.72	21.00	3.28	0.57 ^a	0.03	30.61	18.06	0.63	18.69	11.36
2009-10	180.90	6.30	12.91	3.67	0.42	0.08	23.39	13.80	0.37	14.17	7.83
2010-11	225.64	6.52 ^a	13.67	4.70	0.77	0.20	25.86	15.26	0.29	15.55	6.89

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 43.88 percent of total area is owned by marginal and small farmers (NSSO Report No. 491), the subsidy considered is 56.12 percent of total input subsidy calculated.

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 12, 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 20, From Statement 5, Volume 1 of Expenditure Budget, Government of India, Various Years;

Column 7: See Table 23 and 24 From Annual Report, Agriculture Insurance Corporation Ltd, Various Years and Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India;

Column 10: See Table 22, calculated using Statement 4, Volume 1 of Expenditure Budget, Government of India, Various Years

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	162.20	-	167.45	120.06	124.48	133.53	1340.22	-	355.70
2001-02	157.78	204.21	163.58	125.14	124.18	127.57	964.47	1072.80	344.65
2002-03	177.49	202.11	170.67	154.00	132.84	133.10	1108.02	1057.98	359.58
2003-04	188.06	216.96	182.05	150.46	152.89	139.02	1482.27	1396.68	380.66
2004-05	241.09	235.89	186.95	153.69	157.77	142.44	1252.21	1250.29	391.71
2005-06	265.70	244.32	193.12	157.82	172.46	158.11	1245.55	1100.20	397.53
2006-07	282.31	254.77	205.53	198.19	199.76	187.85	1266.00	1149.60	391.16
2007-08	316.47	322.33	277.57/316.69~	308.56	238.27	248.38	1492.90	1409.93	447.09
2008-09	529.61	340.63	293.52	280.98	225.22	234.82	1456.14	1469.85	543.56
2009-10	459.95	364.43	316.17	215.03	246.47	231.86	1526.88	1458.93	526.94
2010-11	438.61	401.52	329.22	257.35	254.56	256.79	2978.80	2425.25	548.70
2011-12	521.04	-	338.04	303.36	234.31	268.14	2739.84	-	584.27

*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=1986-87)	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	407.82	3520	14355.2	96.69	28.73	-91.37	0.1	-91.26	-8.45
2007-08*	8500	12750	407.82	3520	14355.2	96.69	28.73	-46.12	0.1	-46.01	-3.73
2008-09	9000	13500	440.7	3520	15512.48	99.18	33.68	-67.78	1.48	-66.3	-4.95
2009-10	10000	15000	457.48	3520	16103.44	89.09	26.82	-29.59	2.94	-26.66	-1.99
2010-11 **	10000	15000	501.2	3520	17642.37	95.33	32.35	-85.48	1.63	-83.85	-5.86

*From 12.06. 2008 **Fourth Advance Estimates as released on 19.07.2011(2010-11 production figure) #Uses 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=1986-87)	Fixed External Reference price (ERP)	Inflation Adjusted ERP	Production of Wheat	Procurement of Wheat	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	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	407.82	3540	14436.77	78.57	11.19	-49.67	1.07	-48.59	-6.18
2008-09	10800	440.7	3540	15600.62	80.68	26.04	-125.02	1.9	-123.12	-14.13
2009-10	11000	457.48	3540	16194.93	80.8	27.94	-145.13	2.75	-142.37	-16.02
2010-11	11700	501.2	3540	17742.61	85.93	22.08	-133.41	1.27	-132.15	-13.14

#Uses 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

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Endnotes

¹ The concept of food security has evolved over 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 subsidized 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 fertilizers, but reduced it on the basis of the import parity price, the remaining portion being treated as subsidy to the 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.

³ Since the scheme was introduced in the year 2007-08, in converting Indian Rupees to U.S\$ we have taken the exchange rates of that year (1 USD=40.261 Rupees). In Table 26 we have taken the exchange rates of the year to which the data relate.