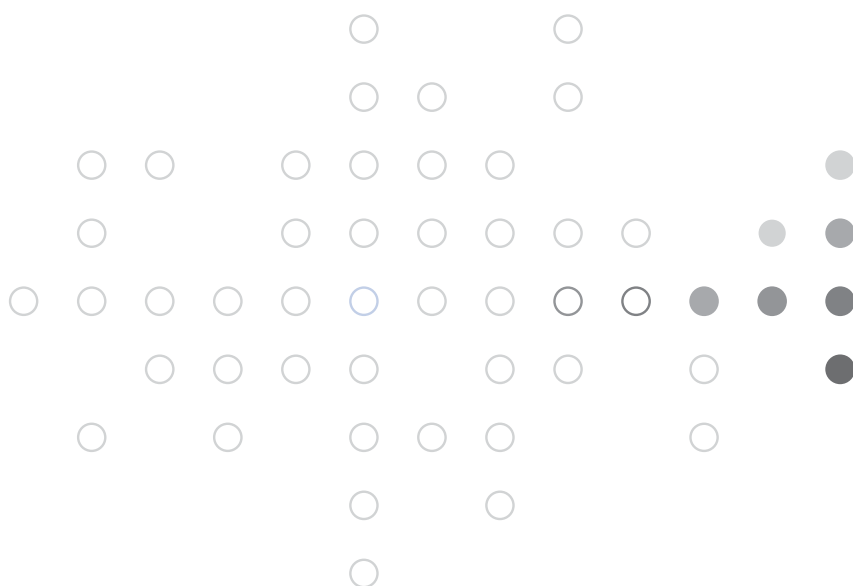


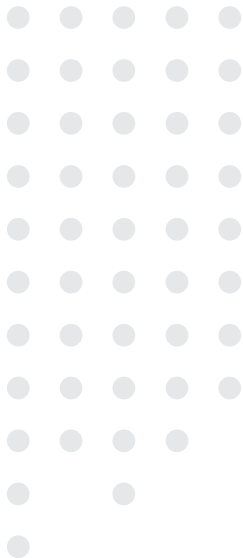
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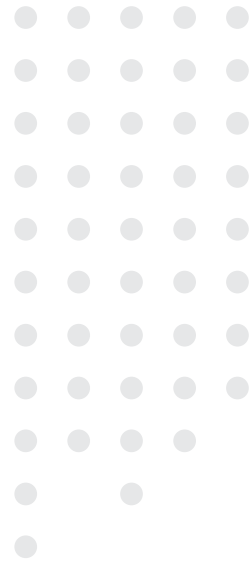
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Aims and Scope

THE JOURNAL IS AIMED AT PROVIDING A FOCAL point for dissemination of empirical information and research findings in the broad areas of applied economics. A major emphasis is on policy analysis and application of modern quantitative techniques to developmental issues. It is, therefore, intended at encouraging economic research and analysis to bring home a deeper understanding of the dynamics of development process, needed for policy-making. The journal publishes only original and high quality papers.

THE NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH (NCAER) was established in 1956 as a registered society. It is an independent, non-profit research institution earning nearly all its income from the fees charged for sponsored studies. It consists of an interdisciplinary body of researchers, capable of generating large-scale primary data. The Council is committed to assist government, the development community and the private sector to make informed policy choices. NCAER has done pioneering research work in the areas of industry and infrastructure development, macroeconomic analysis and human development.

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Global Liquidity and Emerging Markets

Manas Chakraborty

There has been a further easing of the interest rates, of late. The average domestic deposit rate offered by the major banks on deposits of more than one year has come below six per cent. The prime lending rate, however, does not show any change. Most changes in credit deployment between March and August 2003 in the commercial sector have taken place in the industrial sector, housing and the other priority and non-priority sectors.

MANY OF US SEEM to be labouring under the fond belief that government policies and local corporate results are responsible for the rise in the stock market in the last couple of years. Newspaper editorials have gone to the extent of praising the UPA government's policies for engineering a turnaround in the equity market since the meltdown in May last year. But that is very far from being the whole truth. Rallies and downturns in emerging markets across the world are increasingly correlated to policies followed by the developed world, in particular the US. The rise in the Bombay Stock Exchange (BSE) Sensex in the past year is, therefore, part and parcel of a similar rising trend in emerging markets worldwide. And when the cycle turns, and it has already shown many signs of doing so, the Indian market is likely to follow other emerging markets down. Sure, good corporate earnings are a big help, as are market-friendly government policies, but, during the last two years, most of the heavy lifting in markets worldwide has been done by the flood of global liquidity.

ECONOMIC GROWTH VERSUS GLOBAL LIQUIDITY

Isn't the money flowing into India, via foreign institutional investors, (FIIs) the result of a faster growth rate in the economy,

• The author is Financial Editor, *Business Standard*

which translates into higher earnings growth for corporates which in turn makes investing in them attractive? If that reasoning is right, then the Sensex should have gone up far more than its peak during the previous cycle.

At first glance, there does seem to be a lot of truth in that assertion, if we compare stock prices with the peaks reached during the previous market cycle. The Sensex reached a high of 6954 in March 2005, well above its earlier peak of 6150 during the last bull run in February 2000. In fact, even after all the uncertainty prevailing today, the Sensex is still above its 2000 peak. Contrast that with the Dow, which is well below its 2000 peak of 11,908, or with the FTSE, which too has been unable to go anywhere near its January 2000 level of 6930. The reason, point out equity strategists, is that India is growing so much faster.

Take a look at Table 1, and that comforting theory takes a big knock. Brazil's Bovespa index, for example, is currently 33 per cent above its 2000 peak, compared to the Sensex's five per cent. The Jakarta index is up 52 per cent compared to its 2000 highs. The Argentine index, however, takes the cake. In spite of that country becoming a defaulter to the International Monetary Fund (IMF) in the intervening years, the index is up 117 per cent compared to its 2000 peak.

The consolation is that most other Asian indices, including the Hong Kong, Singapore, South Korean and Taiwan indices, as of the time this is being written, are well below their 2000 highs. As for China, the Shanghai Composite is currently about 37 per cent below its 2000 highs. But then, China's market is more a casino than a stock exchange.

TABLE 1

INDEX PER CENT ABOVE (+) OR BELOW (-) 2000 PEAK	(AS ON MAY 9)
SENSEX	+5.3
DOW	-12.8
FTSE	-29.1
SHANGHAI	-37.6
HONG KONG	-23.4
SINGAPORE	-16.1
KOREA	-12.2
TAIWAN	-42.5
MALAYSIA	-11.7
INDONESIA	+52.7
BRAZIL	+33.6
ARGENTINA	+116.9

THE TSUNAMI OF LIQUIDITY

In short, if one were asked to sum up the reason for the global market rally in the last couple of years in one word, that word would be “liquidity”. After the technology bubble popped in 2000, the US Federal Reserve decided to avoid a recession in the US by drastically reducing interest rates and by pumping in huge amounts of money. Central bankers all over the world followed suit, and the result was a tsunami of liquidity that washed over all asset markets across the world, lifting not just stock prices but also the price of practically every asset class — gold, commodities, bonds, houses. At the same time, the low interest rates supported a consumption binge in the US, which had become the engine of the world economy. Together with massive US federal deficits, this flood of liquidity lifted the US economy out of a brief recession into solid growth.

Apart from asset markets, other economies too benefited from the US splurging. Asian countries, in particular, were able to build up huge surpluses by exporting to the US. The dollars they received were recycled back into US treasuries, helping keep US interest rates low and the US consumer happy. Asian economies, in particular China, Japan, and to some extent India, built up massive foreign exchange reserves as a consequence of their central banks mopping up dollars in an effort to keep their currencies from appreciating. These reserves were then invested back into the US, financing its enormous current account deficit. To put it simply, Asia produced and US consumed.

Hedge funds were quick to take advantage of the abnormally low interest rates to borrow and use the money to invest in assets across the world. The boom in asset prices led to stellar gains for investors, much of which was invested back into the market. Assets under hedge fund management have crossed a trillion dollars.

The rise in the Indian stock market has been part and parcel of this global trend. To be sure, it has helped that Indian economic growth has been strong, and that the India story has been sold well, but the main reason for the boom has been money pumped in by FIIs. In contrast, it is only now, two years after the rally, that domestic mutual funds have become net buyers in the market.

The FII flows have not only propelled the equity market to new highs, but have also had an enormous influence on the debt and currency market. Dollar inflows have resulted in upward pressure on the rupee, and the Reserve Bank has had to buy dollars hand over fist in an effort to keep the rupee down. This has, in turn, led not only to a rapid increase in foreign exchange reserves, but also to higher liquidity in the money markets, as the dollar buying by the RBI releases rupees into the system (Table 2 shows the rise in net foreign exchange assets in the banking sector in the last few years, which has been a major component in the growth of M3). The upshot has been massive placements in the RBI’s reverse repo window, and a cap on interest rates, in spite of record credit offtake. Clearly, it is not just the equity markets that will be affected should the foreign inflows slow down.

TABLE 2

NET FOREIGN EXCHANGE ASSETS OF THE BANKING SECTOR	Rs/crore
APRIL 29, 2005	6,52,299
APRIL 30, 2004	5,50,900
MAY 2, 2003	4,08,458
MAY 3, 2002	3,23,110

ENDING THE PARTY

So what can spoil the party? Many economists, Morgan Stanley's Stephen Roach being one of the most vocal among them, have for long been pointing to the mounting global imbalances, with the bloated US current account deficit being the main point of concern. The argument is simple — central banks in Asia, notably those of Japan and China, have been financing the US current account deficit and losing money in the bargain, because the dollar has been falling. There will come a time, so warn these economists, that Asians will no longer be willing to recycle their dollars to the US. The dollar will then plunge, US interest rates will rise, the overextended mortgage market in the US will collapse, and the US economy will slump. Needless to say, risky assets like emerging market equity and debt will be dumped. And since America has been the engine of the world's economy, the rest of the world will then follow the US into an economic Armageddon.

In short, if capital markets everywhere are based on the London Inter Bank Offering Rate (LIBOR), if currencies and key commodities everywhere are traded in dollars, and if equity managers everywhere increasingly are benchmarked to common indices, then the actions of the key central bank in the system will have a disproportionate effect. These effects increase with leverage and dependence on credit spreads, all of which has led to fantastic returns for emerging market investors over the past couple of years, but could start hurting when interest rates go up and liquidity becomes less abundant.

THE 1994 PRECEDENT

Why are US interest rates so important? Well, in March 1994, when the US Federal Reserve signalled an about turn in monetary policy and switched to the tightening mode, there was an immediate 10.1 per cent decline in the IFCI Emerging Markets index, which is the global index for emerging markets. The index wilted further as the US Fed continued to increase US interest rates, the cumulative drop in the index being 29.1 per cent between September 1994 and March 1995. The index fell 10.3 per cent in calendar 1995. That pullback, point out market watchers, is closely linked to the rise in the Federal funds rate from three to six per cent during 1994-95.

Ten years later, many observers pointed out that the conditions in the bond and

stock markets were similar to 1994. The IMF's Global Financial Stability Report for April 2004 pointed to the similarities: 1) the increase in short-term interest rates priced into futures markets at the beginning of 2004 was broadly comparable to the increase priced in a decade ago for shorter-dated contracts. For longer-dated contracts, the magnitudes of interest rate increases expected at the beginning of 2004 exceed those of 1994; 2) the US treasury yield curve was exceedingly steep in 1994 and at the beginning of 2004; 3) the curve's steepness is an incentive for carry trades, where traders borrow at short-term rates and build up positions at the long end. Putting it simply, markets are more leveraged than in 1994; 4) there is a marked compression of corporate credit spreads in 2004, as was the case in 1994.

To be fair, the IMF also pointed to the dissimilarities between 1994 and 2004. These are: 1) real interest rates were far lower than in 1994; 2) inflationary pressures were far more subdued in 2004 compared to 10 years ago, thanks to high productivity, softness in the labour market and low capacity utilisation. In spite of these mitigating factors, the IMF warned the US Fed to prepare the world for a rise in US interest rates. And among the risk factors the IMF was too polite to harp on, were the record US fiscal deficit, the imbalance in its current account deficit, and the flood of money pushing up the world's stock markets. Simply put, observers in early 2004 worried that when monetary policy in the US tightened, what would happen to markets addicted to their daily fix of foreign inflows?

The record shows that the net FII flows to India fell sharply in mid-1994 and continued to be low in 1995. The Sensex, which had moved up smartly in 1993-94, fell from around the 4200 levels in March 1994 to around 3600 in February 1995 and thereafter to around 3000 by December 1995. A paper on portfolio flows into India by James Gordon and Poonam Gupta for presentation at NCAER in October 2002 concluded that the key variables influencing FII flows are "external interest rate and lagged domestic stock market return."

The message from 1994 is clear — market watchers have for long preached the virtues of investment in emerging markets as a source of portfolio diversification for US and other developed world investors. But, contrary to theory, emerging markets have always reacted to changes in developed countries.

MAY 2004

The first sign that the party was ending came in May last year, when emerging market assets were dumped. The Indian market was one of the worst hit, with the Sensex falling 16.6 per cent on two trading days, May 14 and May 17. Of course, part of the reason was the unexpected change in government at the Centre and the irresponsible talk by the Left, but it is important to realise that the fall in the Indian market was part of a global phenomenon in all emerging markets. As a matter of fact, if we set aside the

events of May 17 as being a typical case of markets overshooting, and consider the market movement in the month to May 26, 2004, a clear pattern emerges. Between April 28, 2004 and May 26, 2004, the Sensex fell by 11 per cent, but some other indices fell even more, with the Indonesian index falling by 12.2 per cent, while the Korean Kospi went down even more, by 13 per cent. Emerging markets across the world tottered, and the MSCI Emerging Markets Free Index lost 8.7 per cent over the month. The panic had been fuelled by fears that a rise in US interest rates would lead to a re-enactment of 1994, when Fed rate hikes led to a cessation of fund flows to emerging markets, and markets dropped as a result.

Since May 2004, with the US Fed Funds rate having gone up from one to three per cent, with hedge funds unwinding the “carry trade”, with foreign institutional investors selling in the Indian market, the risks have been rising. On two occasions this year, emerging markets have been hit by a wave of nervous selling. The first hit was in January, when the dollar started strengthening after declining for the last couple of years. The second was in April, when the US Federal Reserve’s talk of higher inflation led to investors dumping riskier and leveraged assets, in anticipation that the Fed would adopt a more aggressive tightening policy.

MARKETS BOUNCE BACK

However, after the initial debacle in May 2004, and in spite of the fact that the US Fed Funds rate increased in the meantime from one to three per cent, emerging markets today are higher than they were in May last year. Table 3 shows the extent of the bounce.

TABLE 3

MARKET	PER CENT RISE (Between May 26, 2004 and May 11, 2005)
MSCI EMERGING MKTS INDEX	27.4
INDIA	26.8
INDONESIA	47.2
SOUTH KOREA	17.8
THAILAND	12.3
BRAZIL	29.5
ARGENTINA	48.6
EMERGING MKTS BOND INDEX PLUS (JP MORGAN CHASE)	18.6
<i>THE ECONOMIST</i> COMMODITY PRICE INDEX (DOLLAR) (AS ON APRIL 27TH)	30.0
METALS INDEX	47.1
GOLD (PER OZ)	18.6

So why hasn't there been a repeat of 1994? Does it mean that the long-hoped for decoupling of the emerging markets from the US markets has finally occurred?

The Bank of International Settlements tells the story succinctly: "There are at least two reasons for the markedly different behaviour of bond markets in 2004 compared to 1994. One is that the Federal Reserve now communicates more fully and widely about its intentions Market participants were reassured by the likely "measured pace" of future rate rises indicated by the Fed starting with its statement of 30 June 2004. A second reason is that the economic news released in the weeks following the June rate increase indicated a far less robust economy than seemed the case following the 1994 increases. The US employment reports released in early July and August were both far weaker than expected, triggering a sharp fall in bond yields across the world." And further, "in emerging debt markets, investors even turned bullish despite signs of global economic weakness. Most of the weakness in emerging market spreads seen in April and May had reversed by August." These were also the reasons why stock prices rebounded, comforted by the assumption that the Fed would not dare to raise interest rates sharply, because that would lead to the collapse of the over-leveraged housing market in the US. There's also a body of opinion that believes that with the US monetary and fiscal stimulus now removed, growth in the US economy is bound to slow, which would signal the end of the Fed's cycle of rate increases.

The bond markets also, to a large extent, seem to believe in that story. Consider the data in Table 4, which shows that, in spite of interest rate increases by central banks across the world, money supply in the developed world has not been squeezed.

TABLE 4

	BROAD MONEY GROWTH PER CENT CHANGE ON YEAR AGO	
	MAR/APRIL 2005	MAR/APRIL 2004
UNITED STATES	4.9	4.9
EURO AREA	6.5	6.3
UK	10.3	7.7
JAPAN	1.9	1.9

The surprising fact is that money supply growth has not been squeezed in spite of higher inflation, which confirms the impression that the US Federal Reserve, in particular, is well aware of the imbalances that have built up in the global economy as a result of its cheap money policy, and it is acting very cautiously in raising rates, in order to ensure that it manages an orderly end to the party. That's the reason for the criticism that the US Fed is well "behind the curve."

Table 5 shows how inflation has picked up in the developed world. Note also how, in spite of rising inflation and an increase in short-term rates by central banks, long-

term bond rates have not only not risen, but yields have in fact dipped compared to a year ago. The upshot has been a flatter yield curve, which, as everyone knows, is an indication of slower economic growth ahead. Also, real interest rates are in fact lower than they were a year ago.

TABLE 5

PER CENT	CONSUMER PRICES		10-YEAR GOVT BONDA YIELD	
	MAR/APRIL	YEAR AGO	MAY 11	YEAR AGO
USA	3.1	1.7	4.2	4.8
EURO AREA	2.1	2.0	3.3	4.3
UK	1.9	1.1	4.5	5.1
JAPAN	-0.2	-0.1	1.3	1.5

Last June Dr Ed Yardeni, who was at the time Chief Investment Strategist for the Prudential Equity group, wrote a paper titled 'Super Money and Global Booms', in which he said that Super Money, which is the sum of the US monetary base and the international reserves held by foreign central banks, is a true indicator of global liquidity and it is global liquidity that drives what he called Global Synchronised Booms and Busts.

Now consider the movement in the foreign exchange reserves of countries. The countries with the largest forex reserves are Japan, China, India, Korea, Taiwan, Singapore and Russia. The reserves of these countries rose by US\$ 430 billion between January and March last year, raising markets across the globe. The rise decelerated to US\$ 30 billion in the second quarter, a period when emerging markets tottered in anticipation of the first Fed rate hike. The meltdown in May 2004, accordingly, can be seen as the result of the abrupt drying up of global liquidity, as measured by the accretion to forex reserves.

Now consider how the markets bounced back on rising liquidity in the second half of the year. In the last quarter of 2004, between September and December, the forex reserves of Japan and the other countries excluding China rose by a huge US\$ 100.5 billion. Chinese reserves also rose by US\$ 95.4 billion in this period. At the same time, the growth in US broad money, which was 4.8 per cent in September, rose to 6.2 per cent in December. The net result of all this super money sloshing around was the wave of liquidity that hit the shores of emerging markets and raised their stocks sky-high in December.

There's one last bit to the liquidity story. It doesn't matter so much when liquidity is high and the economy is growing, because part of the higher liquidity could be used up for the growing economy (so long, of course, as there is unutilised capacity). But consider how growth has slowed down in the developed world at the same time as money

supply growth has risen (Table 6). That's an indication that there's excess liquidity left on the table, which can go to raise asset prices.

TABLE 6

GDP GROWTH	LATEST	YEAR AGO
US	3.6 Q1	4.9 Q1
EURO AREA	1.8 Q4	1.3 Q1
UK	2.8 Q1	3.0 Q1
JAPAN	0.8 Q4	5.4 Q1

GOING FORWARD

Looking ahead, therefore, will the flows to emerging markets reverse? The latest scare to hit emerging market flows occurred in April, on worries that the US Fed would increase interest rates at a faster pace. This is what Emerging Portfolio.com, a research outfit that tracks fund flows to emerging markets pointed out in its March 25 bulletin, "US consumer inflation data and the Federal Reserve's expression of concern about inflation pressures in the economy caused global investors in the week ending March 23 to stage a widespread retreat from funds investing in riskier assets such as high yield bonds and emerging markets equities and bonds." And further, "The combined emerging market equity funds tracked by Emerging Portfolio Fund Research (EPFR) posted net outflows of US\$ 761.9 million, their worst week of outflows since May 2004. The geographically diversified GEM Equity Funds saw outflows of US\$ 278.4 million during the week while Asia ex-Japan Equity Funds showed modest outflows of US\$ 52 million. The high-flying EMEA Equity Funds, which had been receiving record-setting inflows in recent months, lost US\$ 350.2 million while investors pulled US\$ 81.3 million from Latin America Equity Funds, the worst week of outflows for both fund groups since May 2004."

Except that was some time ago. In its latest bulletin, Emerging Portfolio.com notes that there has been a resumption of flows to emerging markets, in particular to emerging market bond funds. On May 20, it pointed out that, "With yet another week of inflows, emerging market bond funds through mid-May have taken in more money from investors than during any comparable period since EPFR began tracking fund flows in 1995." And, "In addition, global equity funds took in healthy flows from investors in the week ending May 18 while emerging market equity fund flows were flat — GEM fund outflows offset inflows into all the major regional fund groups. Investors were net buyers of Japan equity funds during the week while pulling money from US and Europe equity funds." Clearly, some of the worst fears have been allayed, and liquidity continues to be adequate. On the back of the fund flows, emerging equity mar-

kets, including India, have posted handsome gains since the end of April.

However, the worries remain. Will the US economy be able to produce decent growth so that it continues to act as the engine of world growth? Will the other engine, the Chinese economy, be able to manage a soft landing? Will oil prices remain manageable? What about rumours of considerable losses by hedge funds? Will the strengthening dollar lead to non-US assets becoming less attractive? What about the latest US Treasury data, which show that China and Japan have been net sellers of US securities in March — does it mean that they are diversifying their reserves away from the dollar? These are some of the questions that market participants are concerned about.

One look at the data shows that the markets have already started reflecting these worries. Consider Table 7, which shows the growth in the Morgan Stanley Capital Indices this year.

TABLE 7

AS ON MAY 20, 2005	(Per Cent Growth)	
	QUARTER TO DATE	YEAR TO DATE
WORLD INDEX	0.232	0.243
EMERGING MARKETS INDEX	-1.119	1.28
EMERGING MARKETS ASIA	-0.613	0.758
INDIA	-0.393	-2.369
INDONESIA	-1.53	5.819
KOREA	-1.335	6.199
THAILAND	-1.269	-0.477

Now consider the rise in the MSCI indices in the last few years.

TABLE 8

	(Per Cent Growth)		
	DEC 31, 2004 YTD	DEC 31, 2003 YTD	DEC 31, 2002 YTD
WORLD	9.486	22.755	-25.198
US	8.803	26.78	-23.97
EMERGING MARKETS		13.207	42.34 -9.071
EMERGING MARKETS ASIA		5.055	44.938 -10.339
INDIA	10.956	65.49	5.836
INDONESIA	59.302	59.956	18.85
KOREA	4.223	33.208	-2.996
THAILAND	-5.914	115.354	21.146

Table 8 shows that, if the rise in the markets is considered from the beginning of the year, instead of from May 2004, then last year had seen a considerable deceleration in growth. Note how, for markets across the world, but for emerging markets in particular, 2003 was the year in which investors received stellar returns. By the end of 2004, the pace had slowed perceptibly. And, as seen from Table 7, this year the markets are struggling to remain in positive territory.

In India, FII inflows have turned negative during the last couple of months. Table 9 shows net FII inflows into equities, and the resulting impact on the BSE Sensex.

TABLE 9

	NET INFLOWS US \$ MN	SENSEX
MONTH to MAY 20	-149.50	6499.50
YR TO END-2004	+8518.90	6602.69
YR TO END-2003	+6594.90	5838.96
YR TO END-2002	+740.30	3377.28
AS ON Dec 31, 2001		3262.33

Note how the Sensex has risen higher on the back of strong FII flows, and turned down after FII selling in April and May. The Indian equity market has also been buoyed in recent times by a host of mutual fund IPOs, and buying by domestic mutual funds has more than offset selling by FIIs, cushioning the market.

As Bill Gross, US bond guru and Managing Director of PIMCO has put it, “The fact is that this real interest rate journey to its current destination has pumped up all asset prices because they are all being discounted by an extremely low real interest rate. The current level has produced double-digit annual rates of appreciation for different asset classes at varying cycles—stocks and bonds first—commodities, collectibles and housing with a lag. The important point and critical element in a future forecast, however, is to recognize that real yields, whether they be short-term or further out the curve, bottomed in 2003 and have been moving higher ever since. Not only has the downward journey ended, but a mini up-cycle appears to be underway which ultimately reduces bond prices, stock P/Es and casts a negative pall on other asset classes.”

To be sure, as recent buoyancy in emerging market bonds indicates, improvements in the fundamentals of the emerging market economies, with many being upgraded to investment grade, has led to a possible decoupling of this asset class from high-yield US bonds. But hard evidence of a similar decoupling of emerging market equities from the US stock market is lacking. What’s more, it is clear that the “sweet spot” for investments, a climate in which economic growth was buoyant, liquidity was high, interest rates were low and inflation was benign, is now behind us.

What about global liquidity trends? The most recent data indicate that the pace of addition to foreign exchange reserves has slowed down considerably, although China added around US\$ 50 billion in the first quarter of 2005. There is every indication that the US Fed will continue to tighten, albeit at its measured pace. The dollar has continued to strengthen. And global imbalances like the debt-financed consumer binge in the US and the resulting current account deficit, continue to grow, adding to risks in the market.

The contrary view, as BCA Research points out in its latest update, is that relative earnings trends have been the primary driver for the outperformance of non-US markets — profit recovery has been much stronger outside the US. The research outfit says that despite their outperformance, non-US equities also offer more attractive valuations, selling at a 15 per cent discount to US stocks. That should help cushion emerging market stocks.

Furthermore, what the last one year has shown is that while the cycle has turned, the US central bank has so far been able to ensure a slow and steady deceleration, without much disruption to either global growth or global markets. Perhaps the most likely scenario will be a continued deceleration in the next few months, punctuated by bursts of volatility as a result of heightened market nervousness. Some equity strategists assert that the last stage of a bubble, the mania, is yet to come. But it won't hurt to keep one's fingers crossed.

Now consider what happened to US money supply after December. Broad money growth fell to 5.9 per cent in January and to 5.5 per cent in February, indicating substantial tightening. At the same time, data from Japan show that its reserves declined by US\$ 3.9 billion between December and February. The forex reserves of the other countries, excluding China, increased by US\$ 23.6 billion in these two months. In other words, Japan plus the other countries excluding China saw an increase of just US\$ 19.7 billion in the first two months of 2005. (The data on Chinese reserves are published quarterly, and the latest available figures are for December 2004). But even if we assume that Chinese reserves grew at the same pace as in the previous quarter, a wildly optimistic assumption, the growth of total reserves will be much lower than in September-December.

Stepping up FDI into India

N Chandra Mohan

Current FDI inflows of US\$ 4.5 billion warrant more pro-active strategies. The government must reduce procedural hassles at the state-level, which is the real battleground for investments in the country. It must also shed the delusion that foreigners are desperate to invest here. One suggestion is to address problems faced by the 'flagship' investors — Siemens from Germany, Suzuki from Japan to name a few. Risk-averse SMEs will turn out in larger numbers when the decks are cleared by flagship ventures, boosting the prospects for more FDI, at least more than the current trickle of US\$ 4.5 billion.

INTRODUCTION

WHILE PORTFOLIO inflows continue to surge into India's stock markets, foreign direct investment (FDI) inflows are only trickling in and remain much below our requirements. This disparity is glaring, despite efforts at the highest levels of the UPA government to roll out a red carpet to welcome overseas investors, including the NRI diaspora. When the need is for inflows close to eight to ten billion dollars to underpin the targeted seven to eight per cent GDP growth every year, actual inflows were only US\$ 4.5 billion during the first 11 months of 2004, according to a broader new definition of FDI.¹

Our track record also pales in comparison with China's success in garnering US\$ 53.8 billion in FDI in the first ten months of 2004. It was actually in response to a finding of the International Finance Corporation' (IFC's) Chief Economist Guy Pfeffermann in 2002 that the gap between China and India was much narrower than popularly thought that triggered India's official efforts to expand its definition of

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¹This includes reinvested earnings and other capital in addition to equity investment in line with international best practices. The Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, in consultation with the RBI, had constituted a committee in May 2002 to look into this matter and recommended such changes.

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FDI. But even if wishes were horses, this new definition still doesn't reduce our growing gap with the dragon, even when all the factors responsible for the latter's relatively high FDI inflows are taken into account.²

The FDI gap in China's favour is still substantial at 6:1. Redefinition has perhaps only made a difference of 70-80 per cent to India's numbers. The trickle into the Indian economy underscores the need to pro-actively step up FDI as it can easily absorb inflows three times higher than the current levels. The requirement to build our infrastructure alone is as high as US\$ 150 billion or US\$ 15 billion per annum. To be sure, meeting this requirement calls for wide-ranging reforms to improve the overall climate for investments. Only then is there a reasonable basis to expect higher FDI inflows.

The point to recognize is that we are not there yet even though, there are elements within the UPA government who believe to the contrary. Union Commerce Minister Kamal Nath, for instance, exudes optimism that India can attract US\$ 15 billion of FDI in 2004-05. There is also a persisting delusion among India's officialdom that the rest of the world is queuing up to invest here. Nothing can be further from the truth. Such optimism, moreover, is no substitute for reforms that improve the overall environment for investments. This is indeed the major challenge before the government.

LIBERAL REGIME?

The relatively meagre FDI inflows warrant a more detailed examination as they appear inconsistent with the government's claim that the regime is "one of the most liberal, with very few barriers."³ The regime is also claimed to be transparent and investor-friendly, wherein FDI up to 100 per cent is allowed under the automatic route for most sectors, barring a small negative list. Cases requiring prior government approval are considered by the Foreign Investment Promotion Board (FIPB). When the UPA government came to power, it also established an Investment Commission to pro-actively seek greater investments.

While all of this sounds fine on paper, foreign investors appear to be aware of a somewhat different reality. Notably, of a deep-seated resistance within segments of the ruling coalition such as the Left parties to a larger presence of MNCs in the economy. Even in the previous NDA government, there was a xenophobic fringe which opposed any truck and barter with the foreigners. This forces the ruling party to introduce more liberal FDI norms in sectors like telecom, insurance and banking through stealth or after higgling-haggling with the Left. Yet, the latter still opposes such reform.

There is also resistance within segments of India Inc. to FDI. For the record, the apex chambers of commerce and industry bend over backwards to welcome any liberal shift on

² Roundtripping or re-cycling of Chinese black money back into the mainland as FDI is believed to account for half of China's foreign investments.

³ *Economic Survey 2004-05*, pp 160

FDI and reforms as historic! But behind the scenes, there is often intense lobbying to thwart a larger presence of MNCs. For instance, consider the fairly recent statement of Tata Steel MD in cautioning Jharkhand against inviting “one and all” to set up steel projects in the state; that it should check their “heritage, track record and shareholding pattern before allowing it to tap the state’s iron ore reserves and set up a project.”⁴

The MD’s statement gains significance in the light of recent reports that the world’s largest steel manufacturer, Lakshmi Nivas Mittal, is considering building his first plant in that part of the country. Three of Mittal’s executives have already met government officials in that state which has a fifth of India’s iron ore reserves. Other steel industrialists have also lobbied against the single largest big-ticket FDI deal to set up a 12 million tonne steel plant in Orissa. To his credit, however, Jharkhand’s chief minister Arjun Munda remarked that in a globalised era, investments cannot be shut out.

To lobby for his industry, the president and CEO of Wal-Mart, the world’s largest retailer, recently met Prime Minister Manmohan Singh and held out the possibility that his company would invest “significantly” both for opening stores and outsourcing from the market, including setting up a cold chain in the country. However, different lobbies are also working against liberalising FDI norms in retail trade holding out fears that lakhs of family-run stores will be forced to shut down. True to form, the Left also vehemently opposes this reform that can potentially address a lot of problems in this sector.

As if all this opposition to FDI wasn’t bad enough, the government for some strange reason assumes that foreigners are desperately seeking access to our vast domestic market. The fact remains that MNCs have a lot of options to invest in various emerging economies and they will go to even a small country like Slovakia if the investment climate is more inviting there. What is indeed worrisome is that scarcely a day passes without MNCs like Intel or Novartis indicating that they prefer China over India as possible locations for their investments. But is the government listening?

What makes matters worse is the penchant of the UPA government to appoint commissions at the drop of a hat. For all the claims of the FDI regime being most liberal, won’t foreigners be puzzled at yet another Commission headed by a leading industrialist to facilitate more FDI? This Commission has its roots in an interview that Union Finance Minister P Chidambaram gave to a TV channel in end May 2004, in which he indicated that he wanted to be seen as a minister for investments. No finance minister in recent memory has so defined his mission statement to get people to invest.

While that may have been the intention, this proposal only progressed fitfully as there were different voices within the government on this matter: This didn’t make it to the Union Cabinet in mid-October 2004 due to doubts raised by the Udyog Bhavan and Planning Commission. The former’s doubts were more in the nature of defending turf while

⁴ *The Hindu*, May 13, 2005.

the latter raised deeper questions about the proposal in its initial formulation. Such queries were inevitable as there was confusion regarding what it was intended to do. Was it to woo only MNCs? Or was it more broadly expected to woo domestic investors as well?

If it does exactly that, in terms of striking deals with MNCs, then won't it be a Foreign Investment Promotion Board (FIPB) by another name? Why is there a need for another Commission when Mr Chidambaram himself told foreign investors that FDI proposals would be cleared by the Cabinet Committee on Infrastructure in seven days? The proliferation of committees and commissions since the UPA government came to power is naturally bound to trigger doubts among foreigners regarding the utility of yet another Commission, even if it also covered domestic investors in the country.

But to his credit, the Finance Minister stuck to his original formulation — right from his Union Budget speech for 2004-05 and elsewhere — and fiercely defended the Commission as not being another FIPB of sorts. In Parliament, he patiently told the Opposition that the FIPB was a different body although it has within it investment promotion. That it was only a one-stop service station, where all applications were received and approvals of various ministries and departments obtained and then communicated to the applicant. But it was not a pro-active investment seeking body like the Commission.

The crucial point is that the Commission is a pro-active investment seeking body unlike the FIPB. That its mandate is to act as the government's interlocutor with the private sector to facilitate much greater foreign investments of the order of US\$ 150 billion for the country's airports, railways, power and telecom over the next ten years. But as it is headed by the private sector, foreigners are bound to worry regarding potential conflicts of interests. For instance, in the light of Tata Steel MD's recent statements will the chairman of the Commission, Ratan Tata, enthusiastically pitch for FDI from LN Mittal?

PROBLEMS OF DATA

The current FDI levels of US\$ 4.5 billion appear respectable only due to a more liberal definition of FDI, which includes reinvested earnings and other capital in line with international best practices. With this new definition, inflows are 70-80 per cent higher than they were before⁵, but the point is that they are still below what India requires or can potentially attract. Being somewhat difficult to collate — like reinvested earnings for example — the data naturally appear with a lag. For instance, RBI's latest online database indicates FDI numbers with the revised definition for only 2003-04.

Overall FDI numbers also are somewhat aggregative to be of use to researchers. The FDI approvals thus are available by broad industry groups at a 1-digit level of ISIC classification, by country of origin and by states of destination. Actual FDI, however, continues

⁵ RBI press release on 'Revised data on foreign direct investment', June 30, 2003.

to be available only through the administrative or institutional channels of inflow like FIPB, SIA, RBI route, NRI route and ADRs/GDRs. “Apparently even the concerned official agency does not seem to know — let alone monitor — how actual inflows are translated into capital formation, transfer of assets or change in managerial control.”⁶

This makes it impossible for researchers to use this data to examine in greater detail various hypotheses in the literature on FDI. Studies have indicated that FDI has an important role in promoting manufacturing exports. Although there is nothing terribly earthshaking in this finding, the actual FDI data is too aggregative for this purpose. Similarly with the proposition that the experience of US firms is observed to have a more positive impact on export-intensities of India’s non-traditional sector when compared to, say, Japanese firms. Short of surveys, how can one take all of this forward?

If true, such research also makes the life of the Investment Commission somewhat difficult. Can one cherry-pick only those foreign investments which serve certain objectives better? Obviously not. The moral of the story is that the UPA government must work towards maximizing the contribution of all FDI, including Japanese, by promoting its integration with domestic firms. True, appropriate tariff and fiscal policies can facilitate this objective. But in an era of globalisation and reform, it is easier to work towards the maximization objective than cherry-pick the FDI we require.

BROAD PATTERNS

Despite problems with the data, however, they do point to some interesting trends. Sector-wise FDI approvals, between August 1991 to November 2004, amounted to US\$ 67.2 billion or five billion per annum. More than a quarter of such approvals were for long gestation power projects and oil refineries, followed by telecommunications with a share of 16.5 per cent. According to the latest *Economic Survey 2004–05*, actual FDI inflows over this period amounted to only US\$ 32.3 billion or US\$ 2.5 billion per annum, the highest share of which went to data-processing software and consultancy services, followed by pharmaceuticals, automobiles and telecommunications

Country-wise, FDI inflows are dominated by Mauritius (thanks to a taxation avoidance agreement), followed by the US and Japan. While this ranking appears impressive, the low absolute amounts involved again underscore the imperative of garnering more FDI. Cumulative investments from the US amount to only US\$ 4.4 billion while from Japan they stand at only US\$ 1.9 billion. To boost Japanese investments, Udyog Bhavan’s website boasts of a new Japan cell — important phone numbers and an FDI manual in Japanese. But is this sufficient to lift the profile of Japanese investors in India?

Whether the numbers show it or not, South Korea has been somewhat more willing to invest in this country than Japan, for instance. Unlike its neighbour, it doesn’t keep sending delegation after delegation with lists of endless demands. Once they have taken a

⁶ For a succinct description of the problem see Nagaraj, R. (2003). ‘Foreign direct investment in India in the 1990s: Trends and issues’, *Economic and Political Weekly*, April 26.

strategic decision, Korean investors step up their exposure with a surefootedness that upsets rivals. *Chaebols* like Samsung, Hyundai and LG moved into India during the latter half of the 1990s and have occupied leadership positions. They will, of course, vault to the top of the FDI list when Posco's steel plant in Orissa takes off.

State-wise, Maharashtra, Delhi, Tamil Nadu, Karnataka and Gujarat have been the top recipients as they secured more than 48 per cent of total approvals in the country between August 1991 and November 2004. The FDI is no different from domestic investment patterns as both follow the Biblical axiom "to him that hath shall have" by flowing to states which have had a headstart in industrialisation. To some extent, this tendency also depends on the investment climate in various states and how they compete to woo FDI. This can sharply vary and influence the region-wise profile of FDI in India.

What should particularly concern the UPA government in this regard, however, are the latest World Bank-CII investment climate survey findings that the more advanced industrialised states like Gujarat and Tamil Nadu have become less attractive destinations for FDI of late, although they still rank as better climate states, along with Maharashtra, Delhi, Karnataka, Punjab and Haryana. There are no prizes for guessing what went wrong in Gujarat. These shifts in perception matter and will have a bearing on the Commission's efforts to raise more FDI.

While the Commission may be expected to roll out the red carpet for FDI through the promise of speedier central clearances, foreign investors obviously are aware that this is only the first gate. That most of the procedural constraints are indeed at the state-government level, running from pillar to post to get land, water, labour, power and environment-related clearances. The advantage that Tamil Nadu and Gujarat had earlier was precisely in making such formalities simpler and faster. Not so long ago, to attract MNCs like Ford to locate in Tamil Nadu, the latter offered tax breaks and other concessions that meant no benefit for the state exchequer for a decade.

STABLE POLICIES, LESS HASSLES

Like domestic investors, foreigners respond favourably to a stable policy environment, especially if they are assured of a regime of moderate taxation and investor-friendly regimes at the state-level. A point that has been hammered home in World Bank-CII surveys on the investment climate is that access to reliable power at reasonable cost is the most significant constraint facing business. Doing something about this is very much the responsibility of the states, most of whom cannot resist the political temptations of pandering to rural votebanks by providing them free or subsidized power.

What all of this entails in a wider Asian setting is truly disturbing. Manufacturers in this country face 17 significant power outages a month on an average when compared to one in Malaysia and less than five in China. Roughly, nine per cent of output is lost in this country due to power breakdowns. Under these 'dark' circumstances, 61 per cent of manu-

facturing firms here are coping through captive generator sets as against 20 per cent in Malaysia and 27 per cent in China. Besides availability, the real cost of blended power in the country is also 74 per cent higher than in Malaysia and 39 per cent higher than China.⁷

There are other significant costs on doing business as well. Dr Singh has repeatedly underscored the need to minimise the rigours of the licence raj. While such an antiquated regime may not be in evidence at the Centre, it is very much alive and kicking in the states along with a pervasive inspector raj. According to the World Bank's Doing Business Indicators, the median time to start a new business here is 89 days as against 41 days in China. Fourteen per cent of the time of Indian manufacturers is spent in dealing with government officials as against 8.1 per cent in China. Foreigners face the same problem.

True, there has been some progress in this regard as the number of visits of government officials a year has come down to 7.4 as against 11.7 in 2000. But this is poor consolation especially in comparison with much friendlier investment regimes in Malaysia and China. In terms of incidence, this problem disproportionately affects smaller rather than larger manufacturers. There is no warrant though, for Big Brother government to pervasively inspect the affairs of existing and prospective manufacturers in the country. The Commission's efforts will come to naught if this inspector raj stifles FDI in the states.

If accumulating capital faces such barriers, the outlook on the labour front warrants serious concern as well. A reasonable demand of any prospective entrepreneur is the flexibility to hire and fire labour in line with the cyclical imperatives of his or her line of business. Unfortunately, India's labour laws stand in the way of such flexibility and thus impede rationalization. World Bank-CII surveys indicate that Indian firms report excess labour of 11 per cent in 2003. True, this reflects progress in specific states, but for the vast majority of states exit is still a four-letter word!

The UPA government made a determined effort to push for greater labour flexibility in the recently passed Special Economic Zones (SEZ) Bill in Parliament. This was intended to follow China's example in getting more FDI in its manufactured export industry with flexible labour laws. Here again, the Left parties would have none of it! They forced an amendment to ensure that states take decisions on the extent of flexibility in labour laws. The Union Commerce Minister thus had no choice but to claim that the government would not allow any violation of labour laws in the SEZs!

Naturally, this makes a mockery of any effort to attract FDI into the SEZs. If there is no flexibility in labour laws, such investors would only go elsewhere. On what basis, then, does the minister claim that with this legislation, FDI inflows will be of the order of two billion dollars over the next three years and additional employment will be created for about 50,000 people in the next year? As has been noted earlier, Nath has been known to take bullish stands on what FDI India can hope to get this fiscal and the prospects of rubbing shoulders with the dragon after redefining our numbers!

⁷ Michael Carter, World Bank Director, India 'Improving the investment climate: Challenges for India', an address delivered at the OECD India Investment Roundtable in 2004.

GARNERING MORE FDI

Interestingly, whenever Craig Barrett, CEO of Intel, the world's largest microprocessor plant, visits India, speculation invariably surfaces in the Indian media regarding a big-ticket investment that it plans to make here. This is to set up a chip fabrication plant at a capital cost of two billion dollars. But Barrett carefully chooses not to confirm such investment intentions: "India is one of the several countries that we are evaluating for setting up this manufacturing facility." Even in 2002, the then Union minister for IT and communications put out a number of US\$ 130 million on Intel's investment plans.

But Intel's CEO didn't substantiate any of this! As for the chip facility, he mentioned then that there were no immediate plans because of the poor infrastructure in the country. Daniel Vasella, chairman and CEO of Novartis, similarly responded on India as a possible location for its third research centre: "Do we want an Asian research centre? Yes. Do you (India) have a chance? Absolutely. But boy, there is no assuring that it will be in India."⁸ To his credit, Barrett too has been remarkably consistent on Intel's plans for India. Reading their subtext, in fact, offers a clear insight as to why foreigners prefer China to India and why we are getting low levels of FDI.

The upshot clearly is that MNCs have 100 or more locations to set up shop and they will choose the locale that has the best infrastructure in terms of power, transportation, communications and so on. In a similar vein, Barrett elaborated that the choice of China as Intel's current manufacturing location was driven by favourable factors like manufacturing, transport infrastructure and ease of movement of products. The high-powered selling of India notwithstanding, the moral of the story is that foreigners will not come here unless we significantly improve our infrastructure, including mindset.

There is also no way that FDI will materialize unless the hassle-component of our regulatory apparatus is reduced. To get US\$ 150 billion over the next decade, India must indeed compete aggressively to get the Intels and other MNCs to establish their manufacturing facilities in the country. Becoming a technology lab is one thing, rivalling China as the world's factory is another. Besides creating pressure to improving our infrastructure, at both the Centre and various states, the Commission and the UPA government must also think out of the box to sharply step up FDI inflows into India.

One such strategy that can be adopted is to focus on the 'flagship' ventures of various countries and reduce the hassles that they possibly face. Overall, FDI levels into India find their counterpart in insignificant Indian shares in the total FDI of any country or MNC — right from the US to Japan. Their India exposure is typically less than one per cent or one-tenths of one per cent of the total — which invariably evokes a judgement that it is well below potential. Of course, there are bound to be exceptions as may be seen in the case of private equity investments of a tiny city state like Singapore through Temasek Holdings!

A good way to realize that potential is to take care of the problems of flagship ventures of any particular country. Which are these flagship ventures? In the case of Germany for instance, such a venture would be clearly be the likes of Siemens AG. For Japan, it is Suzuki Motor Corporation. For Norway,

⁸ *Businessline*, November 24, 2004

it is Norsk Hydro. For Finland, it is Nokia. The experience of these companies is crucial in sending back signals that India is or isn't a good place to invest. Such signals clearly convey in no uncertain terms why these flagship ventures have not been able to invest as much as they intended to.

In the mid-1990s for instance, Siemens contemplated investments of one billion deutschemarks in India. Finding out why that particular target couldn't be met and what sort of problems are being faced by that company perhaps is one way clearing the way for more German FDI. Thanks to the flagship factor, as it were, the overall level of German FDI in India since August 1991 cumulated to only US\$ 1.2 billion, with the numbers stuck at over US\$ 100 million per annum since 2000-01. If India is desirous of attracting a larger German presence in the country, the moral is to keep the flagship happy!

Japanese investors, for their part, also had a good excuse to sit on the wall as long as the Indian government faced off with Suzuki in the late 1990s over their joint venture in Maruti Udyog Ltd - the country's passenger car giant. The negative feedback was indeed overwhelming. No big-ticket FDI can come in under such circumstances. Once the two feuding partners buried the hatchet, matters improved for Japanese FDI although the amounts involved are still small: In 2003-04, inflows from that country touched a low of US\$ 78 million, which improved somewhat to US\$ 101 million in 2004-05 (up to November).

The big factor of change now is the willingness to invest more in India rather than read out the ODA charter! Among the states, for instance, they have shown high comfort levels in increasing their profile in West Bengal. It is in this sense that the recent visit of Japanese Premier Junichiro Koizumi was a missed opportunity for the UPA government in getting the FDI relationship back on track. While there were indications of four billion dollar worth of investments being held out, no agreements were signed. Clearly, the UPA government was unprepared for such an important visitor.

Mention was made of Norsk Hydro of Norway which wanted to get into mining in Orissa in the late 1990s but NGO opposition put paid to that effort. It was curtains thereafter for their India profile! That oil-rich Nordic country also has a lot to offer India in terms of deepwater exploration technologies, most of which is held by small and medium sized enterprises (SMEs) there. But how will they be enthused to come here when bigger players don't feel confident enough to invest here? This indeed is a familiar enough problem across-the-board for other countries as well.

Taking care of flagship ventures and their various problems sends an all-clear signal to SMEs from that country. The SMEs are typically risk-averse as they cannot absorb setbacks like bigger companies. Why is why they insist on a lot of conditions before foraying into unknown and often geographically distant markets like India. These include intellectual property rights (IPR) regimes in the country - patents, trademark, copyrights - among other things. They also worry about contracts and so on.

The SMEs will not have the confidence to come here when the flagship venture of their respective countries does not consider it worthwhile to invest here. For years, Nokia thus put off investing in this country as the volumes didn't justify any such commitment. But now with the cellular boom taking off, the Finnish giant is finally setting up a facility in Tamil Nadu. With the flagship venture's investment plans fructifying, can the SMEs

from that country be far behind? There is thus a good chance for more FDI into India, at least, more than the US\$ 4.5 billion level that came in last year.

CONCLUSIONS

There is no doubt whatsoever that FDI inflows into India are well below our requirements. The current level of US\$ 4.5 billion only appears respectable due to a more liberal definition of FDI, which includes reinvested earnings and other capital besides equity investment in line with international best practices. Though this new definition was inspired by the prospect of narrowing our gap with China, the numbers remain stuck at relatively low levels. The data is also coming with a lag with the RBI only including the estimates for 2003-04 in its latest online database.

This trickle must be seen in the light of India's requirement of eight to ten billion dollars to underpin a seven to eight per cent GDP growth trajectory. Our infrastructural requirements are also pegged at US\$ 150 billion or US\$ 15 billion every year over a decade to build our roads, ports, airports and so on. Clearly, there is a warrant for more pro-active strategies to seek more FDI than has taken place till now. Towards this end, an Investment Commission — headed by Tata, along with two other representatives from the private sector, — has been constituted by the UPA government to serve as a facilitator to garner more investments.

However, to get more FDI the government must reduce procedural hassles at the state-level — which is the real battleground for investments in the country. The number of days that it takes to start a business, the number of visits made by factory inspectors, the serious power shortages etc., are a pointer to what needs to be done in this regard. Like their domestic counterparts, foreigners prefer a stable and hassle-free policy regime in terms of a regime of moderate taxation and so on. A regulatory apparatus also must be in place. The Commission and the UPA government thus have their work cut out.

A change in mindset also works wonders. The government and its officials must shed a lingering delusion that foreigners are desperate to invest here. Far from it. The MNCs typically have many options to set up shop and they will go wherever they feel comfortable. The example of Barrett and Vasella was mentioned to demonstrate that it is far from certain that such big-ticket investors are in any hurry to establish their chip or research facilities unless the infrastructure in the country improves. They have the option of heading for China which is winning the FDI sweepstakes by a huge margin.

As mentioned earlier, one suggestion for getting more FDI is to address the various problems being faced by the flagship investors from various countries — Siemens from Germany, Suzuki from Japan, Norsk Hydro from Norway and Nokia from Finland, to name a few. It is only when their problems are addressed is there a chance for more investments to follow. More importantly, the risk-averse SMEs will turn out in larger number when the decks are cleared by the flagship ventures. This will certainly boost the prospects for more FDI, at least more than the trickle of US\$ 4.5 billion that came in to India last year.

Liberalising Indian Agriculture

Rajesh Chadha & Pooja Sharma

The agricultural sector has been subject to policy interventions and to policies providing preferential protection to the manufacturing sectors. As against investment in rural infrastructure, subsidies to farmers have sent distorted policy signals. The activities of state parastatals in crop procurement, marketing and international trade have not resulted in farmer-friendly outcomes. India's economic reforms and the proposed WTO Agreement on Agriculture (AoA), address such issues. India needs to play a more effective role in multilateral fora by using appropriate strategies and entering into strategic alliances.

INTRODUCTION

AGRICULTURE¹ AND allied activities contribute over 23 per cent to the country's gross domestic product or GDP, (nearly the same as industry). The sector, accounting for around 60 per cent of aggregate employment, is the country's biggest employer and agriculture growth performance has important implications for overall economic growth as well as alleviation of poverty among the rural poor.

Substantial progress has been made in increasing production and productivity of major crops during the last 50 years. Production increase, in the 1950s and 1960s, was mainly the result of bringing more land under cultivation rather than an increase in productivity or yield (output per acre) — the major emphasis was on institutional reforms, including land reforms. Following the onset of the Green Revolution in the mid-1960s, increase in public investment in agriculture in the 1970s, coupled with technical progress, provided further impetus to the production of foodgrains. Agricultural growth acceler-

• This article is based on a Report prepared by a team led by Dr. Rajesh Chadha, Chief Economist NCAER and Dr. Pooja Sharma (Consultant). They were assisted by Ms. Anjali Tandon (Analyst) and Ms. Tanaya Prasad (Research Assistant).

¹ Throughout this report, agriculture includes agriculture (crop and livestock) and allied activities of forestry and fishing, unless otherwise specified.

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ated significantly during the 1980s with a spread in growth across different regions of the country, crops and agricultural activities. However, a slow down in public investment in agriculture after the early 1980s led to a slow down in agricultural production and productivity during the 1990s, which has continued in the current decade.

The prevailing policy environment influences the growth of all sectors in the economy. Prior to 1991, policies pursued by the government discriminated against agriculture by providing excessive levels of protection to manufacturing. However, the programme of structural reforms initiated by the government in July 1991, which helped to speed up the slow process of liberalisation of the previous decade, introduced fundamental changes in the policy environment. In addition to domestically induced policy changes, multilateral trade agreements stemming from the Uruguay Round of trade negotiations also helped liberalise and lock in external sector policy reforms. This study is an attempt to assess the domestic and international policy changes affecting Indian agriculture and examine their impact on the performance of the sector.

The study is organised as follows. Section 2 provides a discussion of the important trends in agricultural production and productivity, consumption patterns and demand and supply projections, exports and imports, investment, technology and employment. Section 3 provides a description of important domestic and external sector policies related to agriculture. In Section 4, we conduct a broad comparison of the sector before and after the liberalisation in 1991, to gauge the impact on the performance of the sector. Section 5 provides a model-based analysis of WTO related policies. Section 6 concludes by outlining some measures needed to further strengthen the performance of Indian agriculture.

TRENDS

2.1 Importance of the sector

The importance of this sector cannot be undermined. (The key sector indicators are provided in Table 1). It is a source of wage goods for the industrial sector and of raw materials for many important industries, such as food processing, and textiles and clothing. It is also a source of demand for goods and services produced by non-agricultural sectors. It contributes significantly to industrial and overall economic growth, and to the rest of the economy through capital and foreign exchange supply - the sector accounts for about 11 per cent of total exports with increasing export potential arising from domestic and multilateral liberalisation efforts.

Agriculture growth acquires additional importance as a powerful factor for poverty alleviation in relatively poor economies like India with the population concentrated in rural areas. With expenditure on food accounting for 59.4 per cent (rural India) and 48.1 per cent (urban India) of the aggregate consumption expenditure in 1999-2000, growth in

the sector is central to increasing the welfare of millions of poor who live in rural areas and towards alleviating poverty.

According to Dholakia (1997), the overall growth rate of the Indian economy between 1985-86 and 1995-96 would have been five per cent instead of the observed 5.4 per cent, had the average growth rate of agricultural GDP remain unchanged. The reduction in overall GDP growth would be much greater than 0.4 per cent if indirect contribution, operating through inter-sectoral linkages, were taken into consideration, which could have resulted in lower growth in the non-agricultural sector.

The sector employed 235 million people as per the 2001 census. Despite the non-agricultural sector's increase in the share of overall employment in India, around 60 per cent of the labour force continues to depend on agriculture for their livelihoods. Moreover, the slow pace of growth of employment in non-agricultural sector indicates that performance of agriculture would continue to play a crucial role from the perspective of employment in the economy.

2.2 Production and productivity

Indian agriculture has undergone considerable changes during the past 50 years in terms of overall performance and the factors contributing to the changes in performance. In this sub-section, we look at the changes in growth rate of the sector, at different levels of aggregation. Although we cover the period from 1950-51 to 2003-04, emphasis has been laid on what may be referred to as the pre-reform period, 1980-81 to 1990-91, and the post-reform period, 1992-93 to 2003-04, (Table 2).² An understanding of the factors influencing agricultural production and productivity growth is important for formulation of appropriate policies to propel growth in the future.

In comparison to the pre-independence period, growth in agriculture and allied activities was much higher after independence.³ The introduction and spread of high-yielding varieties in the late 1960s and early 1970s resulted in steady output growth of food crops in the post-green revolution phase.⁴ However, growth was relatively modest until the 1980s. Growth in GDP, originating in agriculture and allied activities, increased from an annual average rate of growth of 1.8 per cent per annum during the 1970s to 3.5 per cent per annum during the 1980s. Along with other major sectors of the economy, there was a dis-

² Although the process of liberalising the Indian economy was begun during the 1980s, we take the period after 1991 as the post-reform period, when the reform process accelerated in a marked manner.

³ The performance of Indian agriculture in the period preceding independence was dismal. According to Blyn (1966), agricultural production in India was virtually stagnant during 56 years preceding Independence. Rao and Deshpande (1986) show that between 1891 and 1947, the annual rate of growth of production for all crops was 0.4 per cent, with foodgrains and commercial crops growing at 0.11 per cent and 1.31 per cent respectively.

⁴ Throughout this report, the period between 1950 and 1967 is referred to as the pre-Green Revolution period and that after 1967 as the post-Green Revolution period. Within the post-Green Revolution period, the period 1966 to 1981 is referred to as the first phase of the Green Revolution, while the period after 1981 as the second phase of the Green Revolution.

cernible acceleration in agricultural growth rate during the 1980s.⁵ While growth decelerated to three per cent per annum between 1992-93 and 2000-01, relative to the period 1981-82 to 1990-91, growth during 1992-93 to 1996-97 was significantly higher at 4.7 per cent. A sharp deceleration was observed during 1997-98 to 2000-01. However, 2001-02 to 2003-04 registered a higher growth rate of three per cent per annum.

During the 1990s agricultural growth displayed a peak in 1996-97, recording a year-on-year growth of 9.6 per cent, even though it fluctuated both before and after, seeing an absolute decline in production during 1995-96, 1997-98, 2000-01 and 2002-03. Adverse agro-climatic conditions affected the growth potential of the sector in the latter half of the 1990s and early years of the current decade. With about 60 per cent of the gross cropped area in the country dependent on rains for irrigation, variations in rainfall levels is one of the primary factors behind low and fluctuating yields in the country. According to Hanumantha Rao (1989), the new seed-water-fertiliser technology has raised the response of output to water. Thus, for a given variability in rainfall, the instability in output would be greater. However, when the new technology is applied under assured irrigation conditions, output growth would be stable.

The rate of growth in agriculture is modest in relation to the growth in other important sectors of the economy. There has been a gradual decline in the share of agriculture in all-India GDP from an average 55.9 per cent during the 1950s to 36.4 per cent in the 1980s and further to 29.1 per cent during the 1990s. In comparison to the overall growth in the economy at an annual average rate of growth of 5.7 per cent per annum between 1990-91 to 1999-2000, the rate of growth in agriculture has been much lower, averaging approximately 3.1 per cent per annum over the same period. The GDP originating in the industrial sector grew at 5.8 per cent and services at 7.3 per cent per annum between 1990-91 and 2000-01. The possible factors responsible for agriculture's relatively lower growth rate could be: lower income elasticity of demand for agricultural products, lack of external markets, and supply side constraints arising from policies restricting the flow of resources including capital to agriculture (Bhide *et al*, 1998).

The all-India performance masks important regional and state-level differences in Indian agriculture. A comparison of the growth performance at the state and regional levels reveals that some states and regions have performed better than other states and regions in different time periods. Uttar Pradesh, the largest state geographically, is also the most important state in the agricultural economy in India, while Orissa and Kerala are relatively the least important.⁶ According to Bhalla and Singh (1997), between 1962 and 1983, the impact of new technology was largely confined to the north-western and southern states.

⁵ For sub-periods, there was a decline in growth rates in the latter half of the 1970s, which recovered in the first half of the 1980s.

⁶ In general, Uttar Pradesh, which is geographically the largest Indian state, poses a problem in terms of regional classification as its western parts are similar to the northern states of Punjab and Haryana, but its eastern part is more like eastern India. Thus, including it either in the northern region or the eastern region of the country distorts the regional picture.

From the 1980s, not only did India witness an acceleration in the rate of growth of agricultural output but the growth also spread to several states which until then had lagged behind.

A comparison across regions shows that the central and western regions recorded relatively high growth during the 1980s (Table 3). The northern region continued to perform well too. There was an acceleration in the rate of growth of agricultural GDP in all the states in the western and central regions — Gujarat, Maharashtra, Madhya Pradesh, and Rajasthan. While states in the northern region performed outstandingly during the 1980s, growth slowed down in Haryana, Punjab and also in Uttar Pradesh during the 1990s. In the south, while Karnataka demonstrated acceleration in growth in the 1990s, Tamil Nadu and Andhra Pradesh witnessed a deceleration. In the eastern region, while West Bengal continued to show a high rate of growth, there was a deceleration in the rate of growth of agricultural GDP in Orissa and Bihar.

A variety of factors contributed to the differences in agricultural growth performance across regions and states, including agro-climatic, technological and institutional factors and incentive structures. Large populations, high irrigation potential and adequate rainfall appears to have positively influenced the performance of Uttar Pradesh and the central and eastern regions. However, inter-regional imbalances in growth have declined from the 1980s through improved use of infrastructure in the eastern regions and acceleration of growth in the central region with some revival of growth in the southern states, especially Karnataka.

In comparison to the 1970s, growth in crop output accelerated during the 1980s for all principal crops with the exception of jute (Table 4). The growth pattern within agriculture varies across different crop groups and crops. Throughout the period, the growth of foodgrain output was slower than the non-foodgrain crops. The value of output of non foodgrain and foodgrain crops, measured by the index of production, grew at a compound rate of growth of 4.8 per cent per annum between 1980-81 and 1990-91, while foodgrain output grew at an average annual rate of 3.2 over the same period. Growth in foodgrain output decelerated to 1.14 per cent between 1990-91 to 2000-01 and further down to 0.27 per cent between 2000-01 to 2003-04. There was a deceleration in the growth of commercial crops as well, to 1.3 per cent per annum during the 1990s. Within foodgrains, wheat maintained a high rate of growth of 2.37 per cent per annum during the 1990s followed by rice at 1.67 per cent per annum. Production of wheat as well as rice declined during 2000-01 to 2001-02. Output of coarse cereals and pulses, which registered negative growth during the 1990s, registered impressive positive growth during 2000-01 to 2003-04. Within non-foodgrains, output of oilseeds and sugarcane witnessed high growth during the 1990s, with oilseed growth decelerating sharply during the 1990s.

While extension of area under cultivation was responsible for much of the increase in foodgrain output in the 1970s and earlier, growth in the area under cultivation slowed con-

siderably after the 1970s. The area under foodgrain production increased from 97.3 million hectares in 1950-51 to 127.8 million hectares in 1990-91 and declined thereafter during the 1990s. This happened due to a switch from foodgrain to non-foodgrain crops. Within foodgrains, area under production of rice and wheat increased at the cost of coarse cereals, with area under pulses remaining stagnant. Among non-foodgrains, area under oilseeds and sugarcane witnessed the highest growth. According to NCAER (2001), one of the major factors behind the high growth rates for commercial crops like oilseeds and sugarcane during the 1980s was the expansion in the area under these crops. During the 1990s, area expansion slowed down.

Productivity in agriculture is generally gauged through measures of crop yield. Average growth in yield of all principal crops, measured as kg per hectare, accelerated from 1.37 per cent per annum during 1970s to 2.77 per cent per annum during the 1980s. However, growth in yield slowed down during the 1990s to 1.72 per cent per annum.

In general, yield increases contributed more to growth in foodgrain production, while increases in area appear to be more important for production growth in non-foodgrains.

Crop yield as a measure of productivity is, however, incomplete as it does not take into consideration use of inputs other than land such as capital and labour. Total factor productivity (TFP) is the true measure of economic efficiency as it is based on use of all inputs.⁷ Various studies have shown that the growth in net agricultural output between 1950 to 1967, was mainly due to the growth in factor inputs (land, labour and capital). However, the acceleration in the growth of the sector during the 1980s was largely the outcome of improvements in technology and input use efficiency. Technical change is invariably embodied in new inputs, including high yielding varieties of seeds and fertilisers as well as services like appropriate method and timing of input application.

According to Dholakia (1993), in the period preceding the Green Revolution (1950-1967), growth in factor inputs accounted for a little over three-fourths of the observed growth in output with growth in TFP contributing the remaining one-fourth. The share of growth in factor inputs accounting for observed growth in agriculture declined to approximately two-thirds during 1966 to 1981 and further to one-third after 1981. During the 1980s, growth in TFP contributed around two-thirds of the growth in agriculture. The use of modern inputs such as high yielding varieties especially in foodgrains (mid-1960s), irrigation and fertiliser use (mid-1980s) were the main determinants of the growth in TFP. Desai and Namboodiri (1997) find that TFP growth is most influenced by government expenditure on research and development followed by liberal tenancy regulation, rural literacy, land redistribution, through existing ceilings, rural roads, marketing and banking infrastructure, and balanced use of fertilisers combined with efficiently managed canal irrigation.

⁷ Total factor productivity or TFP is the residual productivity growth after accounting for the growth in output resulting from growth in total inputs.

However, NCAER (2001) finds evidence of a deceleration in productivity growth in recent years, which is corroborated by other studies on the crop sector that also find contribution of technology to output growth declining during the recent years. Studies point out that reduction in exploitation of early productivity gains from adoption of modern varieties and declining trend of public sector investment in agriculture are the main factors responsible for deceleration in TFP growth. Increasing soil salinity and water logging in some parts of the country have also contributed to the decline in productivity (Table 5).

2.3 Consumption pattern

National Sample Survey (NSS) data on consumption expenditure for India reveals interesting changes in the pattern of consumption over time. Changes in tastes and consumption habits, with a rise in per capita income, have led to a shift in per capita consumption from food items to non-food items. Within food, there has been a substitution away from cereals towards non-cereal items including milk, eggs and meat and within cereals away from coarse cereals towards wheat and rice. Although the shift is more pronounced for the richer groups of the population, it is not limited to them. In effect consumer diet has become more diversified over time and consumers are choosing quality over quantity even at lower levels of income as suggested by the shift away from coarse cereals.

While there has been an increase in expenditure over time due to the general price rise, the share of expenditure on food items has declined substantially between 1972-73 and

FIG 2.1: PERCENTAGE EXPENDITURE ON DIFFERENT ITEMS OF FOOD TO TOTAL EXPENDITURE, INDIA, RURAL

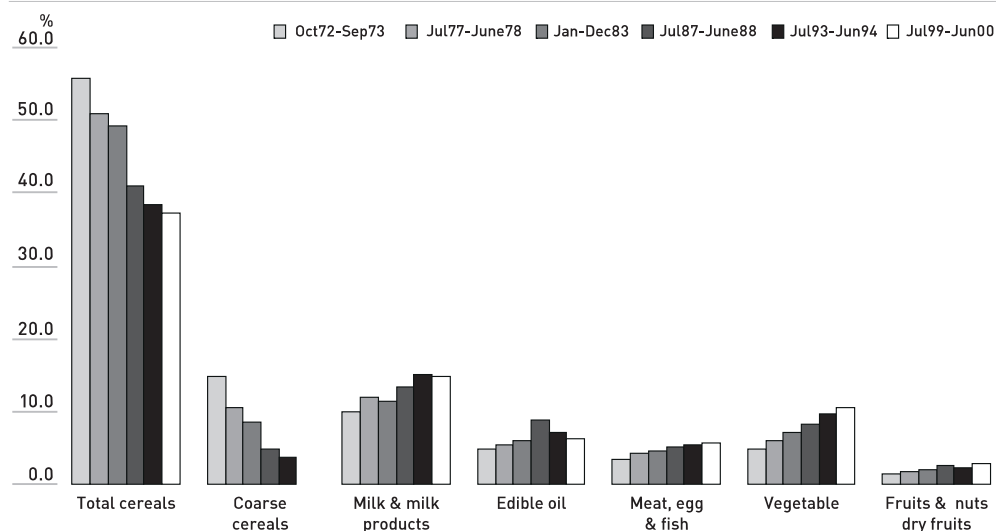
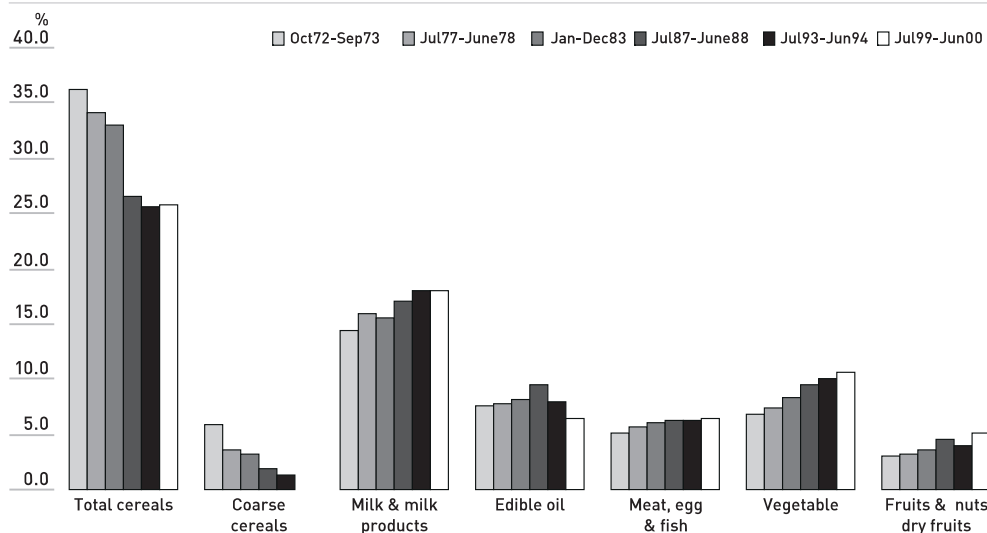


FIG 2.2: PERCENTAGE EXPENDITURE ON DIFFERENT ITEMS OF FOOD TO TOTAL EXPENDITURE, INDIA, URBAN



1999-2000. Food expenditure proportions fell from 72.81 per cent in 1972-73 to 65.57 per cent in 1983 and further to 59.4 per cent in 1999-2000 in rural areas at the all-India level. Within food groups, the share of expenditure decreased consistently over the period for cereals while increasing on milk and milk products, vegetables, meat, eggs and fish and sugar, salt and beverages. The proportion of cereals in total food expenditure declined from 36.2 per cent in 1972-73 to 25.7 per cent in 1999-2000 in rural areas. A similar change in the consumption pattern is found in urban India. The proportion of expenditure on food fell from 64.49 per cent in 1972-73 to 59.12 per cent in 1983 and further to 48.06 per cent in 1999-2000 in urban India. The share of expenditure on food is higher for the bottom group of the population followed by the middle group and the top group. The share of expenditure on food in total expenditure declined for all population groups in both rural and urban areas between 1972-73 and 1999-2000.

The per capita quantity of consumption of cereals declined from 15.26 kg in 1972-73 to 12.72 kg in 1999-2000 in rural areas at the all-India level. This is largely attributable to the decline in consumption of coarse cereals. There was an increase in per capita consumption of rice and wheat between 1972-73 and 1999-2000, increasing the percentage share of rice and wheat in total cereals. However, the share of cereals in quantity terms in the bottom group of the population increased between 1972-73 and 1999-2000. A similar change is observed in the urban areas at the all-India level with a decline in quantity consumption of cereals from 11.24 kg in 1972-73 to 10.42 kg in 1999-2000. The percentage share of rice and wheat in total cereals increased over the period.

A decline in cereal consumption at the all-India level could mask regional variations. Meenakshi (1996) finds that not only is there a decline in the per capita consumption of cereals on average, but also among the poorest 25 per cent of the population in four out of a total of six regions.⁸ In the eastern and southern states, the quantity consumption of cereals witnessed an increase. While high incidence of poverty in the eastern states may explain the increased consumption of cereals, in southern states the explanation is indicated to lie in consumption of roots and tubers, which fact is not adequately captured by the NSS data. The study concludes that in the eastern and southern regions of rural India, the poorest 25 per cent appear not to have achieved dietary adequacy.

Various studies — Suryanarayan (1995), Radhakrishnan and Ravi (1992) and Meenakshi (1996) — offer explanations for a shift in consumption pattern away from food to non-food items, from cereal to non-cereal food items and from coarse cereals to superior cereals like rice and wheat. Growth in real average per capita expenditures have contributed to the decrease in food budget shares and an increase in budget shares of non-food items. Changes in consumer tastes have been found to be an important factor explaining the decline in cereal consumption. Compositional change in the cereal consumption basket in favour of superior cereals like rice and wheat were mainly a result of a decrease in the availability of coarse cereals.

Despite the decline in the share of expenditure on food items, food items continue to dominate household budgets. Moreover, there are important regional differences in consumption patterns with indications of dietary inadequacy especially in the eastern region of the country. Thus more effective targeting is required to address the problem of food security through either price interventions or a more effective public distribution system (PDS).

2.4 External trade

Agriculture and allied products accounted for approximately 11.7 per cent of the value of aggregate Indian exports and four per cent of aggregate imports during 2003-04. Indian agricultural imports are concentrated in edible oils, cashew nuts raw, pulses, wheat etc. and demonstrate large year to year fluctuations based on levels of domestic production. The major items of Indian agricultural exports include fish and fish preparations, rice, cashew kernels, oil cakes, tea and mate and, spices among others. In contrast to India's leading position in the production of several agricultural commodities, India has a minor position in world exports with a share of around two per cent. However, India's share in world exports of rice and tea and mate exceeds fifteen per cent. In

⁸ The study covers the period between 1972-73 and 1987-88, and divides India into the following six regions (based on geographic location, agro-climatic conditions and cropping pattern) Uttar Pradesh, and the northern, central, western, eastern and southern regions.

addition, India's share in world exports is upwards of two per cent for fish, crustaceans and molluscs, cereal and cereal preparations, coffee, tea, spices and tobacco and tobacco manufactures.

Agricultural exports are an important source of export earnings for India, constituting 12.5 per cent of aggregate value of exports during the triennium ending (TE) 2003-04. The share of agricultural exports in total Indian exports declined from 30 per cent in 1980-81 to 19 per cent in 1990-91 and further to 11.7 per cent in 2003-04. However, the growth in exports of agricultural commodities increased from an average of 3.4 per cent during the 1980s to seven per cent during the 1990s. Nonetheless, since the exports of manufactured goods witnessed a more rapid growth than agricultural commodities, the share of agricultural exports in aggregate exports actually declined. Overall exports grew at the rate of 8.3 per cent per annum and 9.8 per cent per annum during the 1980s and 1990s, respectively. Convertibility of the rupee on trade account, improved the balance in protection to manufacturing and agriculture, and liberalisation in the trade policy contributed to the improved performance of agricultural export. Reductions in the levels of protection accorded to agriculture in industrialised countries, as part of the WTO negotiations, are also expected to provide further impetus to Indian agricultural exports in the future.

Major agricultural exports include rice, spices, cashew nuts, oil cake/meals, tobacco, tea, coffee, fruits and vegetables and marine products (Table 6). The export basket has also undergone diversification. There have been marked declines in the share of tea, beverages and spices. On the other hand, share of rice, oil cakes, fish and fish preparations have witnessed a marked increase during the 1990s. Exports of processed foods, meat and meat preparations and fruits and vegetables have also witnessed increased exports in recent years.

Exports of rice changed significantly in composition during the 1990s. Traditionally India exports basmati rice but since 1995-96, exports of non-basmati rice have dominated rice exports. The share of non-basmati rice exports in total rice exports from India increased from two per cent in the late 1980s to 85 per cent of total quantity of rice exported in late 1990s. Wheat exports displayed large year to year fluctuations. In recent years, decline in international prices of grains and increase in domestic prices (due to increases in support and procurement price) have eroded the competitiveness of Indian exports such as rice and even more sharply for wheat (Acharya 2001).

Agricultural products accounted for only four per cent of the country's total imports during 2003-04 (Table 7). The share of agricultural imports in total Indian imports ranged between 2.7 per cent in 1990-91 and 8.1 per cent in 1998-99 during the 1990s. Indian agricultural imports are concentrated in edible oils, cashew nuts raw, pulses, wheat, sugar, fibres and other fruits and nuts. Annual imports of agricultural products account for a relatively small proportion of aggregate imports and fluctuate on a year-to-year basis depending on domestic climatic conditions.

2.5 Demand/supply projections

A number of studies provide projections of demand for different foodgrains or food groups in India for 2020. The results suggest an appreciable acceleration in the demand for foodgrains with the anticipated increases in per capita incomes. The rates of increase in demand rise faster if India is successfully able to tackle poverty and malnourishment. The studies indicate that demand for cereals is likely to outstrip the supply. This is in contrast to other studies (Rao and Gulati, 1994), which suggest decline in the domestic demand for foodgrains and thereby increased exports of rice and wheat. We discuss the above-mentioned studies briefly in this section.

Different studies provide different estimates of demand and supply based on the underlying models used for estimation. Projections are based on econometric models, which consider past demand as a function of income and prices and use the model to project future demand based on assumptions with respect to likely income and price trends. The key parameter used in demand projections is the income elasticity of demand. The estimate of expenditure elasticity varies substantially depending on the method of estimation. This has resulted in substantial differences in the associated demand projections. Table 8 presents demand projections for food in 2020 by Bhalla *et al* (1999), Kumar (1998) and Rosegrant *et al* (1995).

Bhalla *et al* (1999) project cereal demand to 2020 under alternative scenarios for income growth, livestock feeding practices and reductions in poverty. The total food demand for cereals is projected to increase to 246 million tonnes or 267 million tonnes by 2020 depending on either a 3.7 per cent or six per cent annual growth in national per capita income. The total food and feed demand is projected at 296 million tonnes and 375 million tonnes respectively. They find much higher levels of food demand if instead of Indian feed coefficients, either Chinese or Indonesian feed coefficients are used. They also provide estimates under the assumptions of poverty removal and well-fed India. They find that whether India will have a manageable cereal demand in 2020 would depend critically on the livestock sector. If livestock feeding systems change to meet rapidly growing demand for livestock products, cereal demand could grow alarmingly. Rosegrant *et al* (1995) projects a total food and feed demand of over 237 million tonnes by 2020. Corresponding, Kumar's (1998) projections of food and feed demand of cereals for 2020 are projected to be 254 million tonnes.

Bhalla *et al* (1999), Kumar (1998) and Rosegrant (1995) also provide supply projections and the demand supply gap for cereals for the year 2020.⁹ Rosegrant *et al* (1995) project a cereal production of 256 million tonnes by 2020 based on endogenous determination of the area under cultivation and part exogenous and part endogenous determination of

⁹ Requirements for seed and wastage are deducted from total production to obtain available supply for food and feed.

yield growth. The exogenous component is based on various assumptions about the future conditions in public and private research and extension, spread of markets, infrastructure and irrigation. The endogenous yield growth component is based on price response. Kumar (1998) examines two alternative scenarios: (i) sustained growth in productivity at the levels prevailing in the 1980s through recovery in public investment in agriculture and (ii) continued decline in productivity due to further slowing down of public investment in agriculture. Total cereal supply is projected to rise to 309 million tonnes and 270 million tonnes respectively, under the two above-mentioned scenarios. Bhalla *et al* (1999) provide projections of cereal production under alternative assumptions about expansion in use of inputs like fertilisers and irrigation and genetic and technical efficiency improvements and land degradation. They project Indian cereal production to be at most 280 million tonnes, or 260 million tonnes excluding seed and waste, by 2020.

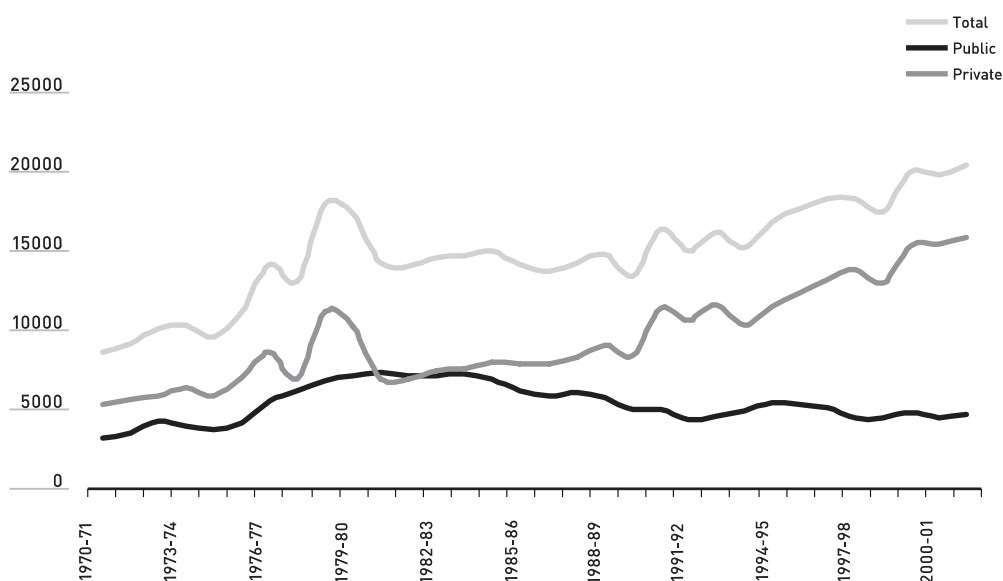
The projections above indicate that the deceleration on productivity from declining investment in agriculture is a serious cause for concern. The demand and supply projections taken together indicate that demand for cereals in future is likely to outstrip increase in available supply, with continued deceleration in productivity. However, if productivity growth is maintained to previously achieved levels, India could be in a strong export position. Increases in productivity through investment in agriculture are thus crucial to maintaining productivity growth at historical levels. According to Bhalla *et al* (1999), manageability of cereal demand in India would depend critically on what happens in the livestock sector. Rapid economic growth with shifts in consumption pattern towards milk, meat and eggs would increase the demand of cereals for feed and further widen the cereal gap.

2.6 Investment

The preceding analysis of growth in agricultural production points to a deceleration in the rate of growth of output in recent years. Several measures are required to improve growth outcome including an increase in the level of investment in the sector. However, broad trends in agricultural investment reveal a decline in the gross capital formation (GCF) in agriculture since the 1980s. The decline in overall investment in the sector is largely attributable to a decline in the rate of public investment vis-à-vis that of private investment in agriculture. However, growth in the rate of private GCF has been inadequate to stem the fall in aggregate GCF in Indian agriculture. The share of agriculture in total GCF fell from 14.3 per cent in 1970-71 to 7.5 per cent in 1999-2000 and further to 5.6 per cent in 2002-03.

Gross Fixed Capital Formation (GFCF), which accounts for the bulk of gross capital formation in agriculture, at 1993-94 prices, increased from Rs. 7,902 crores in 1970-71 to Rs. 13,721 crores in 1980-81, stagnated during the 1980s, increasing slowly to Rs. 17,543 crores by 1999-2000. The share of agricultural GFCF in aggregate GFCF declined from approximately 14 per cent to around seven per cent over the same period. Agricultural

FIG 2.3: GROSS CAPITAL FORMATION IN THE AGRICULTURE SECTOR, AT 1993-94 PRICES IN RS. CRORE



GFCF grew at the rate of 5.9 per cent per annum during the 1970s. However, the rate of gross fixed capital formation in agriculture decelerated sharply during the 1980s, to 1.8 per cent per annum and further to 1.3 per cent per annum during the 1990s.

The decline in overall GFCF in agriculture is mainly attributable to a decline in public GFCF in agriculture (Table 9). Public GFCF grew at an average annual rate of 12.3 per cent per annum during the 1970s but declined in real terms during the 1980s. Public investment also declined between 1991-92 and 1999-2000 at a rate of -0.3 per cent per annum. To an extent private investment has substituted for public investment in agriculture. Agricultural GFCF on the private account accelerated during the 1980s in comparison to the 1970s. Private GFCF in agricultural grew at an average of rate of 2.5 per cent, 6.3 per cent and 2.1 during the 1970s, 1980s and the 1990s, respectively.

According to Gulati and Sharma (1997), one of the reasons for the decline in public sector investment during the 1980s was the growth in input subsidies. They found that during the early 1980s, for every rupee of planned expenditure in agriculture, a little over half a rupee was being spent on subsidies. By the mid-1990s, nearly one and a half rupees were being spent on subsidies for every rupee of planned expenditure in agriculture. They found evidence of a negative relationship between input subsidies and public sector investment and concluded that increasing input subsidies are crowding out public sector investment.

In fact, the expenditure on government subsidies to agriculture was 2.8 times the public-sector Gross Capital Formation (GCF) in agriculture in 1993-94. The number went up to 3.6 times in 1996-97 and further to 4.2 in 2000-01. It stood at 4.0 in 2001-02 (Table 10).

In recent years, there has developed a controversy on the complementarity between public and private investments in agriculture. While both public and private capital investments in agriculture were increasing in step till the end of the 1970s, public investment began to decline while private investment increased during the 1980s and 1990s. Different studies (NCAER 2001, Chand 2001) have shown that improvements in terms of trade for the agricultural sector and flow of medium and long-term institutional credit are more important factors contributing to growth in private sector investment as opposed to public sector investment in agriculture. Nonetheless, the importance of public investment in agriculture and rural infrastructure such as roads and electricity to promote long-term agricultural growth should not be undermined.

Over the previous decade the government also permitted foreign investment in the food processing industry to attract capital, technology and managerial skills in the industry. Private, public and co-operative sectors are all involved in the growth of the food processing industry. Since July 1991 till December 2001, 6597 Industrial Entrepreneur Memoranda (IEMS) envisaging an investment of Rs. 53,865 crores and direct employment of approximately 11.61 lakh persons were received for various sectors of the food processing including edible oil, oil seeds and sugar (Ministry of Food Processing Industries, 2002). The actual inflow of foreign investment in the food processing industry was around Rs. 2,810 crores, between July 1991 and December 2001. The industry accounted for less than three per cent of total FDI inflow during the period.

2.7 Technology

India has made significant investment in agricultural research and extension for development of improved crop technology. Improved agricultural technology, embodied in new crop varieties, fertilisers, controlled irrigation with better use and management of these inputs, contributed significantly to TFP growth in the past. The country has been able to achieve self-sufficiency in cereals based on new technology use. Near exhaustion of land for agricultural purposes and a shift in area, under foodgrain to non-foodgrain production indicates that increases in productivity would be crucial to expanding foodgrain output in the future. Technological progress, through increased investment in research and extension, would be instrumental in achieving the required growth in productivity.

Indian agriculture underwent a technological transformation with the introduction of the new high yielding varieties (HYVs) in the mid-1960s. New high-yield seeds were developed from genetic research, use of chemical fertilisers, plant protection measures and required more dependable water supply and subsequently mechanical technology. Modern varieties of wheat and rice acted as the basis of the Green Revolution. Consumption of modern inputs, irrigation and agricultural machinery also increased markedly. Area under high-yielding varieties witnessed a steady growth (Table 11). At present, 90 per cent of the

area under wheat is covered with HYVs, increasing from 35 per cent in 1970-71 to 72 per cent in 1980-81 and 86 per cent in 1990-91. In 1996-97, 77 per cent of the area under rice was covered with HYVs, increasing from 15 per cent in 1970-71. The growth of area under modern varieties of wheat slowed down in 1980s while the area under modern varieties of rice experienced a steady increase. Also, new varieties were either not available or found unsatisfactory in several crops including coarse cereals, pulses and oilseeds. Modern varieties of soybean, sunflower and cotton were also introduced but there are almost no improved varieties of pulses (Evenson *et al*, 1999). Due to its dependence on irrigation, new technology was not suitable for rainfed areas.

The central and state governments have made substantial investments in agricultural research and development through the Indian Council of Agricultural Research (ICAR), state agricultural departments and state agricultural colleges. The ICAR is responsible for overall planning and co-ordination. The private sector and international centres have also contributed to agricultural research in India. While growth in government research expenditures was moderate till 1968, it was rapid from 1968 to 1980, but slowed down in the 1980s according to Evenson *et al* (1999) — total expenditures on agricultural research by the central government, state governments, private companies and foundations averaged Rs. 236 crores per year in 1983-87. Although India's agricultural research expenditure is exceeded only by Brazil, and possibly China, among developing countries, India's investment in agricultural research as a proportion of agricultural GDP (0.5 per cent in 1989-90) is lower than the average for developing countries (0.7 per cent). Private sector investment is channelled in development of embodied technologies like mechanical and chemical technologies traditionally and recently in biotechnology (Pal *et al*, 1997).

According to Sawant (1997), growth in crop yield could be increased in the future by extension of existing seed-fertiliser technology to new areas lagging in extension. This would be achieved through introduction of new HYVs with higher genetic yield potential and increase in farm-level efficiency of use and management of all to narrow the gap between the potential and actual yields of HYVs and finally through training and education of farmers. Sawant further argues that the available new HYVs in all cereals except wheat, are not suitable to location-specific resource conditions and priority to yield-enhancing technologies are crucial to promote growth in low-yielding rainfed areas with a faster extension of irrigation to such areas.

The government has approved a technology mission for integrated development of horticulture in north eastern states. The mission seeks to ensure adequate linking of production, post harvest processing and consumption chain for rapid growth of the region. It aims at providing basic seed and planting material of horticulture crop, standardisation and refinement of technologies, increasing the production and productivity of horticulture produce and providing infrastructure facilities for post harvest management, marketing and export.

Technical inputs to the livestock sub-sector are provided by the State Animal Husbandry Department and by co-operatives and NGOs. Government departments are not able to provide cost-effective quality animal and production services (Ranjhan, 1997). According to Birthal and Rao (2002), despite the low intensity of investment in research, animal science research over the last few decades has generated a number of technologies. These include genetic enhancement of indigenous breeds through cross breeding with exotic breeds, improvement of nutritive quality of feed and fodder through biological and chemical treatments, development of vaccines against animal diseases, improved livestock management practices and post harvest management and processing technologies. However, the application of many of these technologies in the field remains limited. The level of adoption of breeding, feed and nutrition, and health related technologies are low. The poultry sub-sector has responded well to technological changes and grown faster than the dairy and ruminant meat sector as a result of investments by the private sector in specialised peri-urban /urban poultry systems. One of the major constraints to raising livestock production and productivity is the low quantity and quality of feed and fodder especially in the semi-arid areas in the north-west and densely populated areas of the Central plateau (World Bank, 1999 b). A constraint to large-scale adoption of improved nutrition technologies and effective livestock health management has been the lack of information to users.

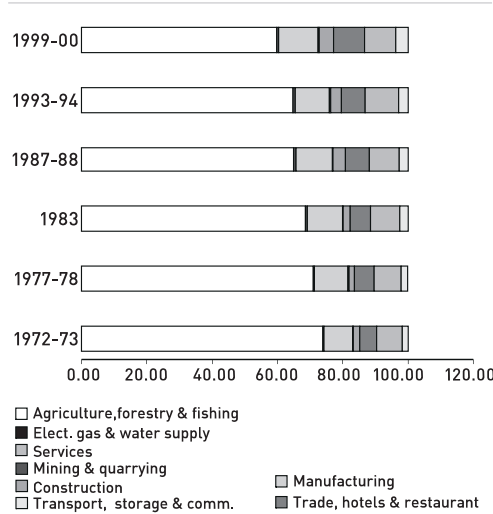
2.8 Employment¹⁰

One of the most important problems facing the Indian economy at present is the acceleration in the rate of growth of the economy, on the one hand, and the slow pace of employment growth, on the other. Despite GDP growth accelerating from 5.2 per cent between 1983 and 1993-94, to 6.7 per cent between 1993-94 and 1999-2000, employment growth declined sharply from 2.04 per cent per annum to 0.98 per cent per annum over the same period. The economy's employment generating capacity (measured in terms of employment elasticity) declined from 0.41 to 0.15 over the same period.¹¹ Even if allowance is made for a slow down in the labour force participation rates, rate of growth of the labour force (1.03 per cent) exceeds the rate of growth of employment (0.98 per cent), implying that employment growth has been inadequate.

¹⁰ There are two major sources of employment data in India: data from the Census of India, and data from the "Employment and Unemployment in India" quinquennial, large-sample survey of the NSSO. We have used the NSSO data in this section, because not only is the NSSO data superior in capturing the complexity associated with employment, it also comes out with greater regularity (every five years). The NSSO provides four different measures of employment: Usual Principal Status (UPS), Usual Principal and Subsidiary Status (UPSS), Current Weekly Status (CWS) and Current Daily Status (CDS), this section is based on the estimates for UPSS. See NSSO (1999-2000) for the specific advantages associated with UPSS for examination of trends in employment.

¹¹ The elasticity of employment gives the percentage change in employment from a one per cent growth in GDP. The low elasticity in the 1990s reflects the fact that employment growth decelerated during the period while GDP growth accelerated. This in turn reflects the acceleration in the growth of productivity per person employed.

FIG 2.4: SECTOR-WISE DISTRIBUTION OF WORKERS (%)



The deceleration in the overall employment growth in the period between 1993-94 and 1999-2000 in comparison to the preceding period is largely attributable to slower growth in agriculture. The absolute number of workers employed in agriculture actually witnessed a decline for the first time from 242.46 million in 1993-94 to 237.56 million in 1999-2000. The share of workers in agriculture declined from 64.5 per cent to 59.9 per cent over the same period. Employment in sectors like trade, construction, financial services and transport and storage increased faster than average. The employment generating capacity, per unit of output, declined by more than three times in the late 1990s in comparison to the early part of the decade.

Employment elasticity in agriculture declined significantly from 0.50 between 1983 and 1993-94, to 0.006 between 1993-94 and 1999-2000, largely due to changes in the intra-sectoral composition within the sector (with relatively slow growth in labour-intensive sub-sectors) and significant mechanisation in other sub-sectors (Planning Commission 2002). The decline may also reflect some reduction in under-employment in the agricultural sector leading to expansion of output without an increase in measured employment.

In spite of a decline in the share of workers employed in the agricultural sector, agriculture accounts for a little less than 60 per cent of the work force. The sector, which has traditionally served as a residual employer, is characterised by considerable under-employment. While there has been a significant decline in the contribution of agriculture to the national product over the past few decades, the economy continues to depend on agriculture as the primary source of employment. Between 1983 and 1999-2000, the share of agriculture in total employment declined by less than seven percentage points, while its share in GDP fell by over 13 percentage points over the same period. Agriculture's share in employment and GDP fell from 63.2 per cent and 38.7 per cent, respectively in 1983 to 56.7 per cent and 25.2 per cent in 1999-2000, respectively.

With just under 60 per cent of the work force producing less than a quarter of the GDP, the productivity of workers in agriculture is less than one-fourth that in the non-agricultural sector. The gap in labour productivity between agriculture and non-agricultural activity widened despite the increase in agricultural labour productivity during the 1990s. The ratio of the value of output per worker in the non-agricultural sector compared to the agricultural sector went up from 3.49 in 1983 to 4.41 in 1999-2000.

POLICY FRAMEWORK

The Indian agricultural sector was virtually free from government intervention until the early 1940s. Shortages in food availability, resulting from the disruption of trade during the Second World War and the subsequent Bengal famine, led to the formulation of a comprehensive food policy. The Foodgrain Policy Committee 1943 recommended the creation of a central foodgrain reserve to manage food supply (NCAER, 2001). Domestic procurement was low until the 1960s and government operations consisted largely of procurement and distribution of imported foodgrain. Over the following two decades, government approach shifted between liberal and strict controls. A preference for strong government presence emerged by 1965 (World Bank, 1999).¹² Introduction of high-yielding varieties in the early 1960s led to the programme of support prices to encourage adoption of new technology.

During the 1970s and 1980s, Indian agricultural policy was driven by the objective of self-sufficiency in production and food security. The government aimed at providing adequate incentives to farmers to adopt new technology, while ensuring food supply to consumers at reasonable prices. As a result growth in the sector was based on extensive government intervention in product as well as input markets and domestic as well as international trade. Policies included provision of price support, procurement and public distribution at subsidised prices, input subsidies including subsidised fertilisers, irrigation, electricity and credit. State policies played an important role in shaping the pattern of output across the country. State government responsibilities cover areas such as water management, supply of other inputs such seeds, rural credit, electricity and land improvement.

The policy environment pertaining to the agricultural sector witnessed changes along with the rest of the economy during the 1990s as a result of two important events. The process of economic liberalisation launched in July 1991 introduced structural changes in the overall economy, including in agriculture. Although no major reforms were initiated specifically in agriculture in the first year and half, agriculture benefited from the reduction in protection levels accorded to manufacturing and from the devaluation of the Indian rupee. The second important event that influenced the process of liberalisation in agriculture stemmed from the Uruguay Round Agreement on Agriculture. Several initiatives were taken to liberalise trade in agricultural products and benefit from the increased potential for exports of Indian agricultural and agro-based products.

3.1 Domestic price and marketing policies¹³

The government in India, as elsewhere in the world, intervenes in the agricultural market through price instruments to ensure remunerative and stable prices for agricultural

¹² See World Bank (1999) for greater details on the evolution of foodgrain policy in India.

¹³ This section has drawn from NCAER (2001).

commodities.¹⁴ The overall framework of the policy was specified in the terms of reference of the Agricultural Price Commission which was set up in 1965 and later re-named as the Commission for Agricultural Costs and Price (CACP). The policy aimed at providing incentives to farmers for the adoption of HYVs of wheat and rice to raise production while maintaining stable prices of agricultural commodities. The role of the Commission was revised in 1980, and further reviewed in 1986, with the emergence of the balance in demand and supply of foodgrain, from maximising production to developing a production pattern consistent with the country's requirements (Acharya 2001). At present, while framing its recommendations, the CACP takes the following factors into consideration: provision of incentives to producers for adopting improved technology and production pattern consistent with the country's requirement, rational utilisation of land, water and other productive resources, likely effect on cost of living, wages and industrial cost and terms of trade between agriculture and non-agriculture sectors.

The instruments used as part of the government's agricultural price policy include minimum support prices for selected commodities, statutory minimum prices for sugarcane, procurement levies for rice and sugar, open market sales at fixed prices, buffer stocking of rice and wheat, central issue prices for cereals for sale under the PDS.¹⁵ The nodal agencies responsible for the implementation of the policies consist of the Food Corporation of India (FCI) for cereals, National Agricultural Cooperative Marketing Federation of India (NAFED) for oilseeds and Pulses, Cotton Corporation of India (CCI) for cotton, Jute Corporation of India (JCI) and the Tobacco Board.

At present 22 commodities are covered under the minimum support price (MSP) programme (Table 12). The MSPs are uniform throughout the country and season and recommendations are submitted by the CACP to the government well before the sowing season. The CACP estimates MSPs based on the cost of production and a reasonable margin of profit to ensure adequate incentive to farmers for investment in and adoption of improved technology. The MSPs inform the support programme as implemented by state governments. Under the system of support prices, the government would intervene to buy at the set MSP should the market price fall below the specified level.

In the case of rice, in addition to the price support for paddy sold by growers, there is a system of levy on rice millers. Various state levy control orders require that rice millers sell a specified percentage to the FCI and state governments for the PDS and buffer stocks. The procurement levy on rice varies from 25 per cent in Karnataka to 75 per cent in Pun-

¹⁴ In general, the need for intervention in pricing of agricultural products arises from the need to balance the allocative and distributive goals of government policy. In other words, to maximise producer incomes while maintaining stabilising consumer expenditures. The nature of agricultural production and consumption of food items, in addition to issues related to livelihood and food security, also leads to government intervention. These include fluctuations in annual output with relative price inelasticity of demand as well as the seasonal and perishable nature of output and regional variations in price due to the pattern of production and transportation costs (APO, 1998).

¹⁵ In the past, a distinction was made between the minimum support price, which ensured producers of specified commodities a minimum price should the market price fall below a certain level, and the procurement price, which entitled producers of specified commodities to sell their produce at a price declared in advance by the government.

jab and Haryana. The millers are paid a state prescribed levy price based on the MSPs for paddy plus average rice milling costs. The progress in the reduction of levies has been slow and only rice meant for exports was exempted from procurement levy in October 1994. The government also procures a specified amount of the sugar milled. The procurement price is derived from the Statutory Minimum Price (SMP) of sugarcane, which is fixed by the government and is payable by sugar factories to cane growers. However, the actual prices paid by the mills are determined by State Advised Prices, which are much higher than the SMPs and result in losses for the mills. The sugar mills are permitted to sell the remainder of their output in the free market. The ratio of levy and free sale sugar has declined from 45:55 before 1992-93 to 30:70 in 1999. Price support operations for other crops like pulses and oilseeds have not been extensive in general. Rice and wheat procured under the levy and price support system are supplied to consumers under the PDS at prices lower than their economic costs. The price at which the foodgrain is issued to the state government agencies is known as the issue price. The level of the issue price thus determines the food subsidy. The objective of the PDS is to provide food to the consumers at reasonable prices.¹⁶ Since 1997 the government has been providing 10 kg of foodgrain at half the issue price to about 65 million households below the poverty line.

The difference between the procurement price of foodgrain and their issue price under the PDS, as well as the policy of buffer stocking, imposes a burden on the state, which is met through the food subsidy. The FCI is the nodal agency responsible for procurement, storage, distribution and imports of foodgrain and is reimbursed by the government for the subsidy to the consumers of foodgrain and the carrying cost of buffer stocks. On account of both the quantities handled and economic cost of foodgrain purchases and distribution, the food subsidy has increased over the years from Rs. 2,476 crores in 1989-90 to Rs. 17,499 crores in 2001-02 and further to Rs. 25,200 crores in 2003-04 (Table 13). To more effectively target the poorer sections of the society, Targeted PDS (TPDS) was introduced in 1997, under which households below the poverty line are provided foodgrain at highly subsidised prices, relative to the subsidy to the households above the poverty line.

To support the food distribution and price stabilisation programme, the government also intervenes in agricultural trade through restrictions on the movement and storage of agricultural commodities. To supplement buffer stocks created through imports, the government used zoning restrictions on interstate or inter-zone movement of various commodities. These restrictions had the effect of lowering prices in surplus regions, thereby facilitating procurement by government at lower prices. With the accumulation of large stocks of cereals, formal movement restrictions were abolished in 1978. However, informal controls, such

¹⁶ The PDS originally developed as a system to distribute foodgrain equally across regions but after the Green Revolution, it evolved into a programme of poverty alleviation.

as roadblocks, limiting supply of railway wagons, pressure on traders not to bid against the FCI, continued till 1993. Sugar was the first commodity on which controls were abolished in December 1991. Restrictions on foodgrain movement were removed in March 1993 by the central government but some states continue to impose restrictions on the movement of rice. There are no formal restrictions on the movement of pulses, oilseeds and cotton. However, because of the Maharashtra Cotton Growers Federation monopoly on procurement of cotton in the state, out-of-state sales are not permitted. Also, Gujarat and Orissa, at times, do not allow out-of-state sales of groundnut, groundnut oil and non-traditional oilseeds.

An important feature of the liberalisation of agricultural commodity markets during recent years has been the re-introduction of futures trading in agricultural commodities. Commodity futures hedge risks faced by farmers and traders from seasonal and cyclical fluctuations in agricultural commodity prices. Futures markets are important instruments of price discovery and price risk management. Futures trading is an important tool to help manage risk in agri-business, especially in the face of the liberalisation of agricultural trade, which has led to greater market determination of agricultural commodity prices. The reduction of government intervention in agricultural pricing coupled with greater integration with world markets has led to the need for new mechanisms to manage risk. Commodity futures market promotes more efficient production, storage, marketing and overall agricultural marketing performance.

In India, the first organised futures market was established in 1875 for trade in cotton futures by the Bombay Cotton Trade Association (Naik and Jain, 2002). Futures trading in Indian agriculture was subsequently introduced in oilseeds and foodgrains but later stopped for several commodities with the outbreak of World War II. After independence, the government enacted the Forward Contract (Regulation) Act, 1952 and set up the Forward Markets Commission in 1953. However, trading was again banned or suspended in the 1960s and 1970s for several commodities with the exception of pepper and turmeric. In the 1980s, futures trading was permitted in some commodities like potato, castor seed and jaggery. The Khusro Committee and subsequently the Kabra Committee, set up in 1993, helped to resume futures trading in several commodities. Futures trading in all agricultural commodities and their by-products has been now been permitted. Futures trading in any commodity can be organised through any recognised/registered commodity exchange under the Forward Contract (Regulation) Act, 1952.

However, the Indian futures market for agricultural commodities is yet to develop fully as efficient mechanisms for risk management and price discovery (Naik and Jain, 2002). According to RBI (2003), Indian commodity futures markets are still at a nascent stage, being largely dispersed and fragmented with small turnover and catering to separate trading communities in different regions. The markets suffer from a number of constraints, including physical and infrastructure constraints, such as limited online trading, surveillance and monitoring and the unavailability of efficient legal system of contracts. The RBI has recom-

mended granting of industry status to commodity futures. Thomas (2003) finds that existing futures markets do play a role in price discovery in India and that their development would have a positive impact on the development of the agricultural commodities markets. However, volumes in existing markets are very low and in addition split across multiple exchanges, adversely affecting the viability of an exchange and impeding investments in technology and human capital, required to becoming credible players in the market.

The removal of some restrictions on the movement of commodities has been a welcome sign of the reforms in agricultural markets since the onset of the economy-wide liberalisation process in 1991. However, the remaining restrictions, especially the cotton procurement monopoly in Maharashtra, need to be addressed urgently as they create a significant distortion in domestic cotton markets since Maharashtra accounts for over 22 per cent of cotton production in the country.

Wholesale trade in agriculture is also subject to licensing and stocking requirements. Stocking limits also apply to retail trade. These restrictions are part of the Essential Commodities Act 1955 and of a number of GOI and state orders, which constrain the movement of specific commodities.¹⁷ Beginning in September 1994, states were advised to remove licensing requirements for wholesale trade and stockholding limits on rice and wheat. However, some state governments continue to maintain these limits.

Price support to the foodgrain sector has contributed to high levels of growth witnessed in foodgrain production and attainment of food security at the national level. While farm incomes have increased, prices of basic food items have remained relatively stable for the consumers. Cotton and sugarcane have also benefited from the policy of price support. However, price support to foodgrain has contributed to distortions in the production structure towards foodgrain and away from pulses, oilseeds, and other crops (Chand, 2002). These factors have resulted in huge surpluses of foodgrain, on the one hand, and a large share of domestic consumption of edible oils and pulses being imported, on the other. Continuous increase in procurement prices, with the obligation to purchase all grain offered at those prices, has resulted in the accumulation of huge stocks of wheat and rice. With the higher cost of procurement and distribution, foodgrain distributed through the PDS had to be distributed at higher issue prices resulting in lower offtakes. The price support system needs to be improved in terms of more effective implementation through strengthening of the public agencies involved. With the increasing integration of the Indian economy with world markets, the system of price support would need to be strengthened to protect domestic producers and consumers from volatility in world prices (APO, 1998). The procurement levy on rice adversely affects the performance of the milling sector. A reduction in the levy on common rice would result in a decline of the share of inefficient milling units like hullers and shellers and encourage mod-

¹⁷ The other regulatory measures include the Fruit Products Order 1955, 1997, Solvent Extracted Oil, Deoiled Meal and Edible Oil (Control) Order, 1967, Meat Food Products Order, 1973, Pulses, Edible Oilseeds and Edible Oils (storage control) Order, 1977, Vegetable Oil Product (Control) Order, 1977 and Milk and Milk Products Order, 1992.

ernisation of the rice milling sector and thereby increase the average price realisation. A reduction in the levy on common rice would also increase the role of the private sector at the cost of the FCI and thereby lead to reductions in expenditures on food subsidy.

The PDS has come under severe criticism on several grounds, including poor targeting and leakage to the open market. Different studies have found that there are large-scale leakages from the PDS — approximately 31 per cent and 36 per cent for rice and wheat, and 23 per cent and 55 per cent in the case of sugar and edible oils respectively (NCAER 2001). According to George (1996), PDS accounts for 10 to 14 per cent of total foodgrain availability. Only 20 per cent of the cereals distributed through the PDS reach the poor (Parikh 1994) and the poor depend on the open market as against the PDS for meeting their cereal purchases (Dev *et al*, 1991). Further, Bapna (1996) shows that if costs of low interest rates, lower freight rates, higher transaction costs, costs borne by the producers of surplus areas were taken into consideration, the PDS would fail the benefit-cost criterion. Other problems associated with the PDS relate to regional mis-targeting and high cost of operations of the FCI.

Despite its weaknesses, the PDS is considered an important instrument for price support to the producer and food security for consumer. Given these considerations, it has been suggested that the PDS needs to be much more effectively targeted to address the issue of exclusion of the poor from its ambit. However, attempts at identification of people below poverty line through a system of ration cards, has so far been ineffective.

The government announced the National Agriculture Policy (NAP) in July 2000, aimed at achieving a growth rate of four per cent per annum in Indian agriculture (Box 1). The NAP is comprehensive in its coverage and aims to provide direction for the next two decades. For the first time, here is a policy that encompasses environmental concerns with respect to agriculture as important in the policy arena. It aims for growth based on efficient use of resources and conserves soil, water and bio-diversity, growth with equity (across regions and farmers), growth that is demand driven and growth that is technologically, environmentally and economically sustainable. However, given the comprehensive coverage and the specific policy measures required to achieve the stated objectives in an effective and consistent manner the policy document is not clear on the priority areas. According to Thamarajakshi (2000), the discussion on the NAP drifts from one issue to another without relating with the objectives - the NAP neither prioritises nor leads to a cogent set of policy measures.

3.2 Input subsidies

In addition to output price support programmes, the government has also adopted subsidisation of agricultural inputs to promote productivity while maintaining reasonable commodity prices. The objective of promoting foodgrain self-sufficiency with the introduction of seed-water-fertiliser technology during the 1960s prompted the government to

subsidise the use of such inputs to promote adoption by farmers. The major input subsidies include fertiliser subsidy, and subsidies on the cost of electricity and, irrigation. Fertiliser subsidy is categorised as an explicit subsidy while electricity, irrigation and credit represent implicit subsidies accorded to the Indian agricultural sector. The central government is responsible for the fertiliser subsidy, while the state governments provide canal irrigation and electricity at subsidised prices to farmers through the irrigation department and the state electricity boards (SEBs).

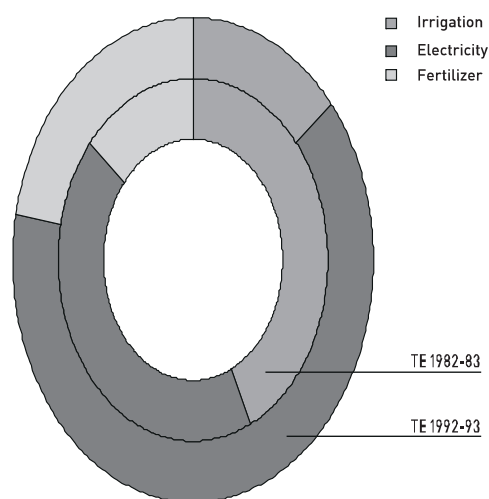
Approximately 85 per cent of the water consumption in India is for irrigation purposes. The power subsidy to agriculture, for exploitation of ground water and the irrigation subsidy for supply of surface waters have contributed heavily to the over-exploitation and inefficient use of a scarce resource like water. While the magnitude of the fertiliser subsidy is explicitly provided by the government, subsidies on power and irrigation, which give the excess of the service provision cost over the payments recovered from users, need to be computed and may be estimated in a variety of ways. We provide the estimates of input subsidies as presented in Gulati and Narayanan (2003).¹⁸ We also provide comparable estimates directly from government accounts.

The total expenditure incurred on major input subsidies, consisting of power, fertiliser and irrigation, was Rs. 377 billion in 1999-2000. Electricity accounted for the highest share (64 per cent), followed by fertiliser (16 per cent) and irrigation (14 per cent). The total expenditure on fertilisers, electricity and irrigation subsidies represented 8.8 per cent and 2.13 per cent of the agricultural and overall GDP, respectively in 1999-2000. Expenditure on major input subsidies increased from 0.64 per cent of GDP in 1980-81 to 2.13 per cent of GDP in 1999-2000. The subsidy on major inputs displayed a peak during 1995-96 and has been on a downward trend since. Expansion in usage as well as an increase in the rate of the subsidy has contributed to growth in the amount of the subsidy.

Prior to 1973, while fertiliser prices were under control by the government, the subsidy on fertilisers was negligible. However, fertiliser was provided at subsidised prices to the Indian farmers after 1973-74. This was mainly due to impact of the oil crises on fertiliser prices in the international market. With the diffusion of the HYVs, the government desired to prevent sharp declines in the demand for fertilisers. However, the major decision that impacted growth in fertiliser subsidy was the adoption of the Retention Pricing and Subsidy (RPS) scheme for nitrogenous fertilisers in 1977. The scheme was subsequently extended first to complex phosphatic fertilisers in 1979 and to Single Super-Phosphate in 1982, thereby covering the entire range of fertilisers used. The objective of the scheme was to promote domestic production of fertiliser. Under the scheme, domestic fertiliser manufacturers are reimbursed

¹⁸ For fertiliser subsidy, Gulati and Narayanan (2003) compute the difference between the actual price paid by farmers and what they would have paid otherwise under conditions of free trade, which is the farm gate cost of imported fertilisers. Irrigation subsidy is computed as the O&M cost supply plus one per cent of cumulative capital cost at historical prices minus receipts from operation of irrigation services. Power subsidy is computed as the difference between unit cost of power supply to all sectors and average tariff rate charged from agricultural users per unit, multiplied by the quantity of power supposedly supplied to agriculture.

FIG 31: INPUT SUBSIDIES IN INDIAN AGRICULTURE



a maximum retail price and provides a flat rate concession. While the flat rate concession is uniform for MOP, which is mostly imported, the concession is different for DAP in case of domestic and imported fertilisers. There have been revisions in the prices of fertilisers since 1992. Two committees submitted their recommendations related to the fertiliser sector during the 1990s. A committee was set up to review fertiliser pricing policy under the chairmanship of C. H. Hanumantha Rao, which submitted its recommendations in 1998. The Expenditure Reforms Committee also submitted its recommendations for the rationalisation of the fertiliser subsidy (see Annex 3.1 for a summary of the recommendations). However, the recommendations have not yet been implemented.

According to Gulati and Narayanan (2003), both farmers and the fertiliser industry are being subsidised by the way of the fertiliser subsidy in the ratio of 67.50:32.50 respectively. However, in case of farmers the subsidy is passed on to the consumers, as price support for foodgrain is negative. They estimate that total decontrol and decanalisation of the sector may lead to a decline in the output of foodgrain. However, the adverse effect on output may be minimised through increased investments in irrigation and a focus on nutrient balancing in fertiliser use as well as increase in procurement prices of fertiliser-intensive crops. Power for agricultural use is also highly subsidised in India and accounts for the largest share of input subsidies. The total power subsidy to agriculture stood at Rs. 263 billion in 1999-2000 rising from Rs. 3.7 billion in 1980-81. (Tables 14 and 15). Agricultural users are charged electricity tariffs at rates lower than the average cost of generation and supply. Industrial and commercial consumers are charged rates higher than the average cost of supply to them in order to cross-subsidise agricultural and domestic users. In addition, farmers are charged for electrici-

the difference between the price to the farmers and the normative cost of manufacture. The subsidy on imported fertiliser is computed as the difference between the cost, insurance and freight (c.i.f.) prices plus handling and the price charged by the farmer net of dealer's margin and sales tax.

Reforms in fertiliser were introduced with the decontrol of phosphatic and potassic fertilisers in 1992. While imports of urea continued to be restricted and canalised, imports of phosphatic and potassic fertilisers were put under the open general license (OGL). Urea remains under the RPS, with a fixed retail price that is uniform throughout the country. In case of decontrolled fertilisers, the government sets

ty on a flat rate system based on the horsepower of the pump used for drawing ground water, instead of actual consumption. Electricity consumption by the agricultural sector, as well as the costs of generation and distribution, have risen over time. Relatively low tariffs on the agricultural sector have contributed to the increase in electricity consumption in agriculture.

According to Gulati and Narayanan (2003), during 2000-01, the average tariff on agricultural power consumption was only 9.35 per cent of the unit cost of power supply. The average agricultural tariff was 28.42 paise/kwh, which was much lower than the estimated average all-India cost at 303.86 paise/kwh. Also, while agriculture consumed 32 per cent of the power in 1999-2000, it contributed only 3.36 per cent of the total sales revenue. Gulati and Narayanan (2003) find that, since agricultural power consumption is estimated on a residual basis, agricultural power consumption may be overestimated to the extent of 40 per cent. User charges for canal irrigation are inadequate to meet even operation and maintenance costs of irrigation networks. Aggregate subsidy for canal irrigation increased substantially from Rs. 4.12 billion in 1980-81 to Rs. 52.18 billion in 1999-2000. According to Gulati and Narayanan (2003), pricing of canal waters did not recover more than 20 per cent of the operations and maintenance expenses during the 1990s. During the 1990s, a number of recommendations were made to improve the functioning of canal irrigation and increase recovery rates. A Committee on Pricing of Irrigation Water, set up by the Planning Commission, recommended (in 1992) that water tariffs should be set in order to recover the cost of operations and maintenance and a one per cent interest on invested capital. The Tenth Finance Commission endorsed the recommendations of the Committee. A Group constituted by the Planning Commission recommended that the full cost of operations and maintenance be recovered in a phased manner over five years beginning 1995-96. The Group also recommended the formation of Irrigation and Water Pricing Boards by all states to oversee the regulation of the sector. The Eleventh Finance Commission recommended water tariffs consistent with recovery of operations and maintenance cost and some surplus as return on capital invested. The states have also been advised by the Working Group for the Ninth Plan to raise resources from the market and form public-private partnerships.

The policy of subsidisation of agricultural inputs like fertiliser, power and irrigation, has imposed an unsustainable burden on the finances of the central and state governments. Moreover, the subsidies on power and water have led to distortions in the cropping patterns in favour of water-intensive crops leading to over-exploitation of a scarce resource such as water. It has also been argued that increased expenditure on subsidies has contributed to the decline in public investment in agriculture adversely affecting the future growth potential of the sector.

3.3 Trade policy

External trade in agriculture was heavily controlled by the government parastatals through a web of quantitative restrictions, licensing and canalisation of exports and imports by

parastatals. Agriculture was not covered in the trade liberalisation measures taken during 1991 and 1992, apart from relaxation of some export controls (Pursell and Gulati, 1995).

The pace of the reform of external policies in agriculture picked up 1993-94. Since then significant measures have been taken to liberalise agricultural trade policy. Tariffs have been reduced, quantitative restrictions on agricultural trade removed and agricultural trade decanalised with the exception of mainly some edible oils and some cereals. However, the tariff regime continues to be complex.

At present, India has tariff bindings on all agricultural products based on the WTO definition of agriculture. Bindings were not made in the case of fish and crustacean products (Table 16). All tariff rates have been bound with tariff bindings ranging from zero per cent for primary products, 150 per cent for processed products and 300 per cent for edible oils. However, some of the bindings for a number of cereals have been renegotiated. The final average bound tariff as per India's commitments is expected to be 115.7 per cent. The average bound tariff is much higher than the MFN average applied tariff. The simple average applied tariff on India's imports of agricultural products (WTO definition) declined after the initiation of the reforms in 1991 to 35 per cent in 1997-98 but increased to 41 per cent in 2001-02 (WTO 2002).

Tariffs for some agricultural and allied products have been increased since 1997 as a result of removal of quantitative restrictions on imports. India was obliged to remove all quantitative restrictions on imports under the WTO dispute panel as it was no longer suffering from balance of payments problems. According to WTO (2002), tariffs were increased in 37.5 per cent of the cases in which quantitative restrictions were removed. The increases have occurred mainly in case of live animals, foodgrains, oilseeds and fats. The overall average tariff for agriculture is estimated to decline to 37.5 per cent in 2002-03.

In India, items covered under the OGL can be freely imported/ exported while commodities included in the negative list are subject to restrictions based on periodic notifications issued by public authorities. Trade restrictions may be categorised as follows: prohibited, restricted and canalised items. The restrictions are maintained mostly on grounds of health, safety and security. Prohibited items include imports and exports of certain fats, oils of animal origin and beef. As a result of a dispute with the United States, all quantitative restrictions previously maintained on balance of payments grounds were removed by April 2001. Tariff quotas are maintained on edible oils (crude sunflower seed and safflower oil, refined rape, colza and mustard oil), maize and milk powder. Export quotas apply to onions, whole and infant milk, pure milk and butter (except when exported as branded products in consumer packs not exceeding five kilos in weight), wheat and wheat products, coarse grains, sandal wood oil, brown seaweed and agarophytes (WTO, 2002). Canalised import items mainly consist of edible oils (coconut oils and other oils, copra) and cereals (wheat, rye, oats, maize, rice, grain sorghum, buckwheat, millet, canary seed, jawar, bajra, ragi and other cereals). The government has also undertaken to monitor imports of a list of sensitive items. The list includes milk products, fruit and nuts, coffee, tea, spices, cereals,

oilseeds and edible oils. Exports subject to licensing (and that are canalised) include cattle, milk, cereals, edible oils and pulses and exports of onions, niger seeds and maize (WTO, 2002). Products are also subject to minimum support prices and minimum export prices.

Exports of oilseeds and edible oils were restricted till the 1990s.¹⁹ In 1995, export controls were removed entirely from sunflower seeds and rape-mustard seeds but exports of all other oilseeds remain controlled. During the 1980s, imports of edible oils were canalised through the State Trading Corporations and Hindustan Vegetable Oils Corporation. Imports of oilseeds were also canalised although there were no imports. Imports of edible oils were gradually liberalised beginning March 1994 with imports of palmolein oil. In February 1995, all edible oils with the exception of coconut oil were put on the OGL with an import duty of 30 per cent. This was followed by reductions in the import duty till December 1999 when the duty was revised upwards. Imports of oilseeds were also liberalised from 1998 with imports of sunflower seeds and soybean. In May 1999, imports of all types of oilseeds were put under the OGL at an import duty of 40 per cent.

Before 1991, exports of sugar and molasses were canalised through the STC. In 1991, exports of both sugar and molasses were decanalised. Although exports of molasses were completely liberalised, following pressure from the sugar alcohol industry, exports were restricted in February 1994. Sugar exports were controlled under the Sugar Export Promotion Act. In January 1997, the controls were partially liberalised but quotas were set on exports. Sugar imports were restricted and molasses imports unrestricted but subject to high import duties till the 1990s. In March 1994, sugar imports were delicensed and import duty was reduced to zero. However, because of a fall in international prices and domestic lobbying, import duty was imposed on imports of sugar in April 1998 and raised further in subsequent years. In March 1995, import duty on molasses was reduced from 50 per cent to 10 per cent.

There was a ban on export of dairy products before 1991. In 1991, the NDDB was given a monopoly to export dairy products. This monopoly was withdrawn in 1993 but exports by the private sector were subjected to quantitative controls. Imports of dairy products were prohibited with the exception of imports by NDDB. In March 1995 imports of skimmed milk powder and butter oil were decanalised and delicensed.

Exports of fresh fruits and vegetables have been unrestricted with the exception of onions, exports of which are canalised through NAFED. Imports of fruits and vegetables however, remained restricted till recently, as part of the general ban on imports of consumer goods. However, import of a number of fruits and vegetables have been put under the OGL during the last two years.

The EXIM policy 2002-07 provides a thrust to agricultural exports by removing export restrictions on specific items and promoting floriculture and horticulture exports through

•¹⁹ The remainder of this section is based on NCAER (2001).

establishing 32 agri-export zones across the country. Non-actionable subsidies have also been provided for the export of fruits, vegetables, floriculture and poultry and dairy products. Imports of agricultural inputs such as pesticides, seeds and machinery were also liberalised during the 1990s. India also provides income tax exemptions for profits from exports under section 80 HHC of the Income Tax Act.

Basmati rice exports were put on the OGL in the late 1980s and thereby decontrolled. However, basmati rice exports were subject to a Minimum Export Price restriction till January 1994. The exports of non-basmati rice were completely canalised through the FCI. Liberalisation of exports of non-basmati rice were begun in early 1992-93 for the superfine long grain variety and in the latter half of 1994 export controls were lifted from all types of rice exports.

India is a strong supporter of multilateralism over regionalism in general. In recent years, nonetheless, India has increased action on strengthening regional and bilateral arrangements. India is a member of the South Asian Association for Regional Cooperation (SAARC) and a party to the Bangkok Agreement (Box 2).²⁰ As a SAARC member, India entered into a preferential trade agreement (PTA), SAPTA, with the other SAARC members with effect from December 1995 (WTO, 2002). This provides a forum for exchange of concessions on tariff and non-tariff barriers and promotion of trade and economic co-operation between member nations. The SAPTA has completed three rounds of trade negotiations and negotiations are ongoing for the creation of a South Asian Free Trade Agreement (SAFTA). According to Pursell and Pitigala (2001), a very low proportion of traded and tradable commodities are covered by regional tariff concessions and SAPTA is far from fulfilling the requirement of Article XXIV of the GATT rules for regional arrangements that require they cover “substantially all trade” between members.

The SAFTA was agreed to during the SAARC conference held in Pakistan in January 2004 and is expected to come into force in January 2006. India has also entered into bilateral trade arrangements with Nepal and Bangladesh and a free trade agreement with Sri Lanka operational since March 1, 2000 (WTO, 2002). India provides duty free access without quantitative restrictions to all Nepalese unprocessed primary commodities and manufactured products, barring a short negative list (Pursell and Pitigala, 2001). India also has an agreement with Bhutan, explicitly recognising free trade between the two countries. India is also exploring the possibility of entering into PTAs and strengthening economic co-operation with other trading partners including Singapore, Thailand, South Africa, Colombia, Egypt and the European Union (WTO, 2002).

India is currently negotiating preferential bilateral treatment for about 105 items under the “early harvest scheme” within its PTA with ASEAN. These include six agricultural items. The Indo-Thailand PTA has 11 agricultural items among 82 negotiated under the

²⁰ SAARC membership consists of the Bangladesh, Bhutan, Maldives, Nepal, India, Pakistan and Sri Lanka. The original signatories of the Bangkok Agreement consist of India, Bangladesh, Sri Lanka, South Korea and Laos.

“Early Harvest Scheme”.

ANNEXE 3.1

Hanumantha Rao Committee Report

Summary of recommendations:

- *The fertiliser industry should be deregulated and units be allowed to fix their prices subject to ceiling farm gate prices (FGP).*
- *Ceiling farm gate prices be notified annually to make fertilisers available to farmers at affordable prices.*
- *A normative referral price (NRP) be determined based on Long Range Marginal Cost (LRMC) method for the existing units for the purpose of arriving at a subsidy to be paid on the sale of fertilisers within notified ceiling FGP.*
- *Subsidy be given through the manufacturers uniformly. PMT of fertiliser sold to the extent of the gap between NRP plus dealers' margin and average freight, and FGP.*
- *The ex-factory NRP for urea be fixed at Rs. 6,050 PMT and for DAP at Rs. 11,900 PMT as on January 1, 1998, and at Rs. 6,500 PMT and at Rs. 12800 PMT respectively, after including dealers' margin and average freight.*
- *Feedstock differential cost reimbursement (FDCR) to the tune of Rs. 1,750 PMT and Rs. 1,300 PMT of urea sold, as on January 1, 1998, be given to fertiliser units using naphtha/coal and FO/LSHS respectively for a period of five years.*
- *The normative referral price and subsidy by suitably revised periodically.*
- *Imports of urea be canalised for a period of five years.*
- *Distribution of fertilisers be deregulated from Rabi 1998-99.*
- *Additional freight and inventory cost be reimbursed to units in respect of fertilisers distributed in remote and inaccessible places to be notified for this purpose.*
- *Output from new urea units set up due to strategic considerations be given an additional subsidy to cover their higher cost of production based on LRMC.*
- *Relative farm gate prices of fertilisers other than N be derived from the price of N in urea with reference to their relative productivity.*
- *The gap between FGP of MOP, which is fully imported, and its border price be bridged in stages.*
- *The subsidy on complex fertilisers, low analysis fertilisers and SSP be derived on the above basis with reference to their nutrient contents.*

Source: Report of the High Powered Review Committee, Department of Fertilisers, Ministry of Chemicals and Fertilisers, March 1998

Expenditure Reforms Commission (ERC), 2000

Fertilizer Subsidies, Major Recommendations

The Retention Price Scheme (RPS) has led to the development of a large domestic industry and near self-sufficiency. However, the unit wise RPS is a cost plus scheme. It results in high cost fertilizers, excess payments to industry and provides no incentives to be cost efficient. Besides, fertilizer subsidies have grown over the years. The package suggested to rationalise fertilizer subsidies takes care of the needs of small farmers and proposes to bring fertilizer prices to the level of import parity price in a gradual and phased manner over a period of time as follows:

- *To protect small and marginal farmers who consume a large part of their output, from a loss in their real incomes arising out of increase in farm gate prices of fertilisers two options are suggested: (a) introduction of a dual price scheme under which all cultivator households are given 120 kg. of fertiliser at subsidised prices, and (b) expansion of Employment Guarantee Scheme and Rural Works Programmes to provide additional incomes to small farmers.*
- *Dismantling of the control system in a phased manner, leading to a decontrolled fertiliser industry which can compete with import albeit with a small level of protection and a feedstock cost differential compensation to naphtha/liquefied natural gas (LNG) based units to ensure self-sufficiency.*
- *The ERC recommends a seven per cent increase in the price of urea in real terms every year from April 1, 2001. With this order of increase, open market price will reach Rs. 6,903 per tonne by April 1, 2006, a level at which the industry can be freed from all controls and be required to compete with imports, with variable levy ensuring availability of such imports at the farm gate at Rs. 7,000 per tonne of urea. While no concessions will be necessary from this date onwards for gas based, fuel oil/light sulphur heavy stock and mixed feed stock plants, existing naphtha plants converting to LNG, as also new plants and substantial additions to existing plants, will be entitled to a feed stock differential with that for LNG plants serving as a ceiling.*
- *The farm gate prices of nitrogenous, phosphatic and potassic fertilisers should be set to promote a desired balance of fertiliser use. In the circumstances it is suggested that once urea price is re-determined every six months, the prices of potassic and phosphatic fertilisers should be suitably adjusted to ensure the desired NPK balance. It will be useful if government could announce in advance the formula to be adopted for fixing the prices of P & K fertilisers with reference to a given urea price.*

BOX 1: NATIONAL AGRICULTURE POLICY

On July 28, 2000 the Government made public a National Agriculture Policy aimed at catapulting agricultural growth to over four per cent per annum by 2005. This growth is to be achieved through a combination of measures including structural, institutional, agronomics and tax reforms.

- *Privatisation of agriculture and price protection of farmers in the post-quantitative restrictions (QR) regime would be part of the Government's strategy to synergise agricultural growth. The focus of the new policy is on efficient use of resources and technology, adequate availability of credit to farmers and, protecting them from seasonal and price fluctuations. Over the next two decades the policy aims to attain a growth rate in excess of four per cent per annum in the agriculture sector.*
- *Private sector participation would be promoted through contract farming and land leasing arrangements to allow accelerated technology transfer, capital inflow, assured markets for crop production, especially of oilseeds, cotton and horticultural crops.*
- *Private sector investment in agriculture would be encouraged, particularly in areas like agricultural research, human resource development, post harvest management and marketing.*
- *In view of dismantling QRs on imports as per the WTO Agreement on Agriculture (AoA), the policy has recommended formulation of commodity-wise strategies and arrangements to protect farmers from adverse impact of undue price fluctuations in the world market and to promote exports.*
- *Government would enlarge coverage of futures markets to minimise the wide fluctuations in commodity prices as also for hedging their risks. The policy hoped to achieve sustainable development of agriculture, create gainful employment and raise standards of living.*
- *The Policy envisages evolving a "National Livestock Breeding Strategy" to meet the requirement of milk, meat, egg and livestock products and to enhance the role of draught animals as a source of energy for farming operations.*
- *Plant varieties would be protected through a legislation to encourage research and breeding of new varieties. Development of animal husbandry, poultry, dairy and aquaculture would receive top priority.*
- *High priority would be accorded to evolve new location-specific and economically viable improved varieties of farm and horticulture crops, livestock species and aquaculture. Domestic agriculture market would be liberalised.*
- *The restrictions on the movement of agricultural commodities throughout the country would be progressively dismantled. The structure of taxes on foodgrain and other commercial crops would be reviewed.*
- *The excise duty on materials such as farm machinery and implements and fertilisers used as inputs in agricultural production, post harvest storage and processing would be reviewed.*
- *Appropriate measures would be adopted to ensure that agriculturists, by and large, remained outside the regulatory and tax collection system.*
- *Rural electrification would be given high priority as a prime mover for agricultural development.*
- *The use of new and renewable sources of energy for irrigation and other agricultural purposes would be encouraged.*
- *Progressive institutionalisation of rural and farm credit would be continued for providing timely and adequate credit to farmers.*
- *Endeavour would be made to provide a package insurance policy for the farmers, right from sowing of crops to post-harvest operations, including market fluctuations in the prices of agricultural produce.*

Economic Survey, 2001-02, Government of India.

BOX 2: PREFERENTIAL ARRANGEMENTS

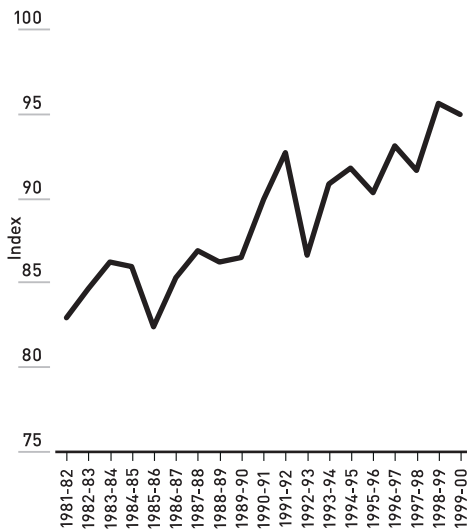
AGREEMENT	MEMBERS	GOODS COVERED	RULES OF ORIGIN
Regional			
South Asian Association for Regional Co-operation (SAARC)	Bangladesh, Bhutan, Maldives, Nepal, India, Pakistan, and Sri Lanka	Over 2,200 tariff lines at the HS six-digit level (generally preferences of 5-10 per cent of the standard tariff rate of duty to developing countries and 50-60 per cent to least developed country members)	Up to 40 per cent of the free on board (f.o.b.) value of the finished goods if produced in a single country; 30 per cent of less developed countries (LDCs); and 50 per cent if several members are involved
Bangkok Agreement	Bangladesh, India, the Lao Peoples' Democratic Republic, Republic of Korea, and Sri Lanka	56 items (generally 5 percentage points below the standard rate of duty).	Not less than 50 per cent of the ex-factory cost of the finished goods.
Preferential areas	Mauritius, Seychelles, and Tonga	19 categories of products (preferences ranging from 0-35 per cent).	Not less than 50 per cent of the ex-factory cost of the finished goods.
Bilateral			
Bhutan	n.a	All goods (preferential rate of 0)	No specific rules of origin
Nepal	n.a	Mutually agreed primary products and most industrial products (preferential rate of 0).	No specific rules; goods are considered to have been manufactured in Nepal if they involve manufacturing activity in Nepal.
Myanmar	n.a	Standard duty of 5 per cent for rice, pulses and beans, chana, mustard and rapeseed, ground nuts, fresh vegetables and fruit, garlic and onions, reed brooms, sesame seeds, betel nuts, turmeric, dried ginger, coriander, fried chillies, poppy seeds, and wood in the rough.	No specific rules of origin
Sri Lanka	n.a	Some 13000 tariff lines (0 rate of duty); 50 per cent preferential rate for all other goods except those on the negative list. Tariff quota rates of 50 per cent of the standard rate apply to garment imports; imports of tea are allowed at a preferential rate of duty of 7.5 per cent under tariff rate quota.	Minimum national content of 35 per cent; foreign content not to exceed 65 per cent of the f.o.b. value of the product (25 per cent if the raw material or inputs are sourced in either country subject to the condition that the aggregate value addition in the contracting parties is not less than 35 per cent of the f.o.b. value of the product).

Source: Trade Policy Review - India, WTO, 2002.

IMPACT OF LIBERALISATION

Widespread policy intervention in agriculture and other sectors of the economy created significant distortions in the domestic incentive structure resulting in misallocation of the country's resources. Prior to the initiation of the reform process, high levels of protection to the manufacturing sector, restrictions on exports of agricultural commodities and on domestic trade in agriculture, as well as an overvalued exchange rate discriminated against the Indian agricultural sector. According to Pursell and Gulati (1995), the nominal protection coefficient (NPC) for agriculture in

FIG 4.1: INDEX OF TERMS OF TRADE BETWEEN AGRICULTURE AND NON-AGRICULTURAL SECTORS, CACP
(TRIENNIUM ENDING 1988-91=100)



the aggregate between 1970-71 and 1987-88 was about half the nominal protection accorded to manufacturing (Table 17). The gap between agricultural and manufacturing widened in the early 1970s when agricultural protection declined steeply while protection to manufacturing increased. Although the gap narrowed subsequently during the 1980s, it remained high with an average NPC of 0.88 (1980-81 to 1986-87) and 1.42 (1986-87) for agriculture and manufacturing respectively. One of the most important outcomes of the policy reforms initiated in July 1991 has been marked improvement in the incentive structure for agriculture. Overall economic reforms, industrial deregulation, opening up of trade and exchange rate liberalisation contributed significantly to improving the prospects for agriculture than reforms specifically aimed at agriculture alone. According to Dholakia (1997), one of the most important outcomes of the 1991 policy reforms was the significant reduction in the anti-agriculture bias, through the general equilibrium effect of a more balanced degree of relative sectoral protection. Reductions in the protection accorded to manufacturing and increase in prices of farm products have contributed to improvement in the terms of trade of agriculture. Agricultural terms of trade, price of crops relative to non-agricultural goods, act as an indicator of the relative profitability of the agricultural sector as against the industrial sector. There has been a marked improvement in the agricultural terms of trade since the mid-1980s. Agricultural terms of trade were the highest in 1998-99 since 1974-75.

4.1 Overall impact

4.1.1 Prices

Prices of agricultural products, as measured by the index of wholesale prices recorded a higher growth than the overall weighted price index (WPI). Growth in agricultural prices was higher during the 1990s in comparison to the 1980s. There appears to be a bias within agriculture, with the index of prices of crops for final consumption like foodgrain increasing much more than for non-food crops like oilseeds, fibres and sugarcane. Regular increase in minimum support prices of major agricultural commodities has contributed to the increase in the relative price of agricultural products. The average rate of growth of minimum support prices for most commodities is significantly higher during the 1990s in comparison to the 1980s. Inflation of food items as well as foodgrains has been relatively low during the more recent period 2001-02 to 2003-04. The overall inflation in the economy has also been lower than what it was during the 1990s (Table 18 & 19).

Improvement in agricultural terms of trade, by increasing the profitability of investment in agriculture is expected to contribute to growth in the sector. However, literature on Indian agriculture has shown that although price factors are important for agricultural growth, it is the non-product-price factors that have been more crucial for growth in Indian agriculture (Misra, 1998 and Desai and Namboodri, 1997). The major non-price factors include access to HYVs, irrigation, fertilisers, electricity and credit. Public investments in agricultural technology development, research and extension, irrigation, rural infrastructure and human capital have been the major factors responsible for agricultural productivity growth in India. Public investment in irrigation also has a complementary relationship with private investment in agriculture. Despite the improvement in agricultural terms of trade, growth in the sector may be constrained in the absence of improvement in the non-price factors important for growth in Indian agriculture.

4.1.2 Investment

Improvement in the terms of trade of the agricultural sector is expected to positively influence private sector investment in the sector (Table 20). Private investment in agriculture witnessed significant growth during the 1980s and the 1990, although growth in private investment slowed down during the 1990s. Moreover, there is a complementarity between private and public investment in Indian agriculture. Public investment in the agricultural sector has been an important cause for concern during both the 1980s as well as the 1990s. The rate of gross capital formation in agriculture on public account, after recording high growth during the 1960s and 1970s, decelerated sharply during the 1980s and stagnated during the 1990s. The decline in overall investment in agriculture is attributable largely to

a decline in public sector gross capital formation (GCF). The positive trend in private sector GCF in agriculture has been offset by the decline in public investment so that total investment in agriculture has increased only at a modest rate.

Although there has been a modest improvement in investment in agriculture during the 1990s, public investment in agriculture-related infrastructure such as irrigation and drainage, land development, water conservation, development of rural roads etc. is the responsibility of state governments. The focus of reforms, therefore, needs to shift to the state-level, as state governments are responsible for public investment in agriculture. An improvement in the fiscal performance of the states also, through reduction of implicit subsidies, is required to achieve increases in public investment.

4.1.3 Production and productivity

A comparison of the average annual changes in agricultural growth rates reveals that agricultural growth decelerated in the post-reform period to three per cent per annum between 1992-93 and 2000-01 (Table 21). However, growth during 1992-93 to 1996-97 was significantly higher at 4.7 per cent per annum. Growth in agricultural productivity displayed a peak in 1996-97 in the 1990s recording a year-on-year growth of 9.6 per cent. Agricultural growth has fluctuated since 1995-96 with absolute decline in production during 1995-96, 1997-98, 2000-01 and 2002-03. Adverse agro-climatic conditions have adversely affected the growth potential of the sector in the latter half of the 1990s and early years of the current decade. According to Rao (1989), the new seed-fertiliser technology has raised the response of output to water implying a greater instability in output for a given variability in output. However, when the new technology is applied under assured conditions, the increase in output is on a stable path.

According to NCAER (2001), trends in growth rates of commercial crops, such as oilseeds and sugarcane, reveal that large increases in area under these crops was a major factor in contributing to their high rates of growth during the 1980s. Area expansion slowed down during the 1990s but there have been improvements in productivity growth. Growth in productivity is crucial to achieve high rates of growth of production in the future. Dholakia (1997) has estimated sources of growth in India's primary sector from 1960-61 to 1994-95. The study finds significant changes in the primary sector in the post-liberalisation period (1985-86 to 1995-96), as against the pre-liberalisation period (1960-61 to 1985-86).²¹ The findings reveal that during the pre-liberalisation period, labour was the biggest contributor to the observed growth of agricultural NDP accounting for 41 per cent of the growth followed by total factor productivity (TFP) and capital, which account-

²¹Dholakia (1997) takes the year in which liberalisation policies were initiated as 1985 which picked up pace in 1991, and finds 1985-86 as the cut off point at which the trend growth of agricultural GDP switched to a higher growth path.

ed for 29 per cent and 24 per cent respectively (Table 22). However, in the post-liberalisation period, growth of TFP has emerged as the most important source of growth accounting for 70 per cent of the observed growth in agricultural NDP, followed by labour and capital inputs, which accounted for 18 and 10 per cent respectively. The study attributes growth in TFP during the 1980s to significant improvement in the rate of capacity utilisation and technical progress based on modern inputs, as well as favourable weather conditions. Decrease in the contribution due to growth in total factor inputs (from 1.46 to 1.06) between the two periods reveals that resources were released from agriculture for productive deployment elsewhere.

NCAER (2001), however, finds evidence of a deceleration in productivity growth in the recent years, which is corroborated by other studies on the crop sector that also find contribution of technology to output growth declining during recent years. The studies point out that reduction in exploitation of early productivity gains from adoption of modern varieties and declining trend of public sector investment in agriculture are the main factors responsible for deceleration in TFP growth. Increasing soil salinity and water logging in some parts of the country have also contributed to the decline in productivity.

4.1.4 External trade

External reforms in agriculture are aimed at improving the sector's export performance (Table 23). An examination of the export performance of the sector in the post-reform period reveals that aggregate agricultural exports increased substantially from US\$ 3,265 million in 1992-93 to US\$ 6,146 million in 2001-02 recording a growth of over seven per cent. Agricultural exports grew at an annual average rate of 3.36 per cent per annum between 1981-82 and 1990-91. However, since non-agricultural exports have increased faster over the same period, the share of agricultural exports in total India exports declined from 19 per cent in 1990-91 to 14 per cent in 2000-01. Devaluation of the Indian currency and opening up of the economy contributed to the export growth in agricultural products. However, there was a decline in agricultural exports in the latter half of the 1990s probably due to the sharp reduction in international prices of agricultural commodities (Chand, 2002). While tea and mate recorded negative growth during the 1990s, exports of coffee, tobacco, sugar and molasses, rice, meat and meat preparations grew at a rate higher than those achieved during the 1980s. Agricultural exports also exhibited increased diversification during the 1990s. The share of tea and tobacco declined while that of fish and fish preparations, rice and oil cake increased. Exports of processed foods, meat and meat preparations and fruits and vegetables also increased during the 1990s. Items which contributed to improved export performance, include rice, fish and fish preparations and oil cakes. Within rice, exports of non-basmati rice recorded a sharp increase.

Datta *et al* (2001) examine changes in the composition, quantity and value of Indian agricultural exports between the pre-reform period (1986-91) and the post-reform period (1992-97). They find that of the 308 items exported by India during 1986-97, 26 were no longer exported in the post-reform period, while 28 new items had been added to the export list over the same period. However, most items that were added were primary products as against processed products — this implies a move towards exports of less value-added bulk items. Out of the 254 items that were found to be consistently exported during both the pre- and post-reform period, 120 are primary products and 134 are agro-processed items. Although the joint percentage share of primary and processed agricultural products, which witnessed growth in both quantity and value terms in the post-reform period, has increased in total agro-exports, only a few of these items displayed an elasticity greater than 1 (that is for which unit value realisation increases with a larger quantity of exports). In general, India has significantly increased the share of items whose relative unit value (unit value realised by India vis-à-vis the world average unit values) is less than 1 and declining. Datta *et al* (2001) conclude that the changing composition of agricultural exports requires a deeper probe by the Ministry of Commerce and associated agencies like APEDA. On the import side they find that in the post-reform period, India has not been paying relatively lower prices for a considerable proportion of agricultural imports against expectations.

4.1.5 Employment

Trade liberalisation, schemes to promote labour-intensive sub-sectors such as horticulture and floriculture, expansion of activities of the Rural Infrastructure Development Fund along with employment programmes to alleviate poverty, are all expected to have a positive influence on employment opportunities in agriculture and allied activities. On the other hand, modern technology and associated mechanisation through increased use of tractors and other matching implements is expected to adversely affect the employment creation capability of the sector.

The NSSO data reveals that the absolute number of persons employed in agriculture decreased from 242.46 million in 1993-94 to 237.56 million in 1999-2000 (Table 24). As a result, the proportion of workers employed in agriculture, which declined from 68.6 per cent in 1983 to 64.8 per cent in 1993-94, declined more from 64.8 per cent to 59.8 per cent between 1993-94 and 1999-2000. According to the Planning Commission (2002), employment elasticity in agriculture declined significantly from 0.50 between 1983 and 1993-94 to 0.006 between 1993-94 and 1999-2000, largely due to changes in the intra-sectoral composition within the sector (with relatively slow growth in labour-intensive sub-sectors) and significant mechanisation in other sub-sectors. The decline may also reflect some reduction in under-employment in the agricultural sector leading to expansion of output without an increase in measured employment.

4.1.6 Competitiveness

Indian agriculture has the advantages of diverse agro-climatic conditions, low import intensity and low labour costs. Trade policy reforms and exchange rate liberalisation contributed significantly to improving prospects for agriculture in the post reform period. Exports of agricultural products increased substantially in the post-reform period. The composition of exports has also undergone diversification in recent years, while the shares of tea and tobacco declined, those of fish and fish preparations, rice, oil cake and fruits and vegetables increased. Nonetheless, the pace of growth of agricultural exports slowed down during the latter half of the 1990s. Moreover, India lags far behind in its share of world exports of some major agricultural commodities, given its significant share in world production of those commodities. Transportation, marketing and processing costs and exchange rate valuations, and distortions caused by production and trade subsidy/tax at home and abroad also influence the competitiveness of Indian agricultural commodities in the world markets. A number of measures are required to improve the competitiveness of Indian agriculture, not only at the domestic level but also in the subsidisation of agriculture production and trade in industrial countries in the EU and the USA, to improve the prospects of Indian agricultural exports.

Gulati *et al* (1994) examined the export competitiveness of selected agricultural commodities. A simple measure of price comparison, the nominal protection coefficient (NPC) was employed to find out the crops in which the country possessed export competitiveness at the given level of technology and infrastructure.²² Results revealed that rice is a highly competitive crop of India and wheat has also become competitive after correcting for over-valued exchange rate. Indian rice and wheat prices were found to be 54 per cent and 17 per cent lower than comparable world prices respectively. The results were not encouraging in case of sorghum and maize in terms of export competitiveness. Onions and tomato were found to be highly competitive, while potato was moderately export competitive. Among Indian exports of processed foods, while canned mushroom was found to be highly competitive, tomato paste moderately competitive and mango paste just about borderline competitive. Gulati *et al* (1994) argue that to boost exports improvements need to be undertaken to streamline transport from production centres to ports of shipment, improving bulk storage and handling facilities at procurement centres/railway sheds and ports. Credit arrangements also need to be liberalised to aid the process. In case of cereals, the policy environment needs to be further liberalised through dismantling of remaining regulations and controls on cereal trade. While exports of fresh fruits and vegetables are largely free, the role of research and development was highlighted as crucial in increasing and maintaining

²² The NPC is the ratio of the domestic price (Pd) to the border price (Pb) i.e. $NPC = Pd/Pb$ of a given commodity and essentially measures the divergence between the domestic price of a commodity and the relevant international price after taking care of transportation and marketing cost involved.

higher yields, including research and extension for eco-friendly fruits and vegetables. The study found that severe infrastructural problems like inadequate storage (including cold storage) and handling facilities acted as major impediments to growth of exports of processed fruits and vegetables. Environment friendly packaging material for processed items was also found to be important for sustaining higher growth in agro-exports.

4.1.7 Consumer surplus

Increases in agricultural production, through increases in real agricultural wages, and greater diversification are expected to have a positive influence on consumer welfare. On the other hand, higher prices of agricultural commodities, unless accompanied by equivalent increases in income, are expected to influence consumer welfare adversely. Misra and Rao (2003) suggest that during the 1990s, as compared to the 1980s, the economic condition of the poor seems to have deteriorated, mainly due to the lower rate of increase in real agricultural wages for unskilled workers. They also find that inequality in per capita consumer expenditure increased during the 1990s. Chand and Jha (2001) examine the effects of trade liberalisation on welfare for selected commodities and find that estimates of welfare conform to conventional theory, to the extent that producer surplus increases while consumer surplus decreases for exportables and producer surplus decreases while consumer surplus increases for importables.²³ The PDS also acts as a powerful instrument of poverty alleviation. However, given the poor record of the PDS and lack of evidence on improvement in its performance in the post-reform period, the role of the PDS in improving welfare during the 1990s is expected to be limited.

4.1.8 Government revenue

Agriculture continues to remain largely untaxed, while accounting for a large proportion of government subsidies. Government revenue from agricultural income hardly accounts for anything. Political motivations of both the central and state governments, as well as practical administrative difficulties, have contributed to the limited implementation of agricultural taxation. Allocation of a larger share of public resources to agricultural subsidies also impacts productivity in agriculture adversely by diverting resources away from public investment in agriculture. Agriculture receives direct and indirect subsidies for inputs like fertilisers, irrigation and power and is not subject to direct taxes as paid by industrial firms.

Agriculture taxation is a state subject. Among direct taxes, agriculture is levied tax on land and agricultural income. Agricultural income tax is largely directed at plantations and big landlords. Stamp and registration duties are also levied on agriculture. The impor-

²³ The commodities comprise of rice, wheat maize, sorghum, (exportables) rapeseed-mustard, soyabean, arhar (importables).

tant indirect taxes pertaining to agriculture consist of excise duties, general sales tax and customs duties.

4.2 Policy impact

4.2.1 Trade policy

One of the most important outcomes of the policy reforms initiated in July 1991 has been the marked improvement in the incentive structure for agriculture. Opening up of trade and exchange rate liberalisation contributed more significantly to improving prospects for agriculture than did reforms specifically aimed at agriculture. According to Dholakia (1997), one of the most important outcomes of the 1991 policy reforms was the significant reduction in the anti-agriculture bias through the general equilibrium effect of a more balanced degree of relative sectoral protection. Misra and Rao (2003) find (i) that trade liberalisation, captured through reduction in tariff levels, has helped in the movement of terms of trade towards agriculture; (ii) reduction in tariff rates has played a very important role in increasing aggregate crop output, while encouraging private investment in Indian agriculture; (iii) opening up of international trade was found to have played an important role in increasing agricultural exports; (iv) devaluation of the rupee also played a key role in increasing agricultural exports. Also, to the extent that trade policy has influenced the terms of trade in favour of agriculture, it has an adverse impact on the rural poor due to higher prices of agricultural commodities (Misra and Rao, 2003).

Liberalisation of international trade leads to changes in domestic prices by aligning them with international prices. Domestic prices of commodities, which are below corresponding international prices are expected to increase, whereas domestic prices of commodities whose prices are above the corresponding international prices would tend to rise. Greater openness to international trade is also expected to affect domestic price volatility and farm incomes. Trade liberalisation would influence the cropping pattern in the country by shifting resources towards high value crops and fears of adverse effects on food security have thereby been expressed.

Gulati and Sharma (1997) examined the likely impact of the removal of QRs by comparing indicators of efficiency and protection of different commodities through government policies. Their analysis suggested that the production of rice, wheat, maize, sorghum, chickpea and cotton was expected to expand with complete liberalisation of external trade in agriculture as profitability and effective incentives would get tilted in favour of these crops, which were so far being effectively taxed by government interventions. On the other hand, production of edible oilseeds such as groundnut, rapeseed-mustard and sunflower may undergo deceleration or even contract at the margin as they were getting higher levels of protection than would be available in the free-trade scenario.

Tariffs for some agricultural and allied products have been increased since 1997 when India was obliged to remove all QRs on imports under the WTO dispute panel, as it was no longer suffering from balance of payments problems. India had notified a total of 2,714 tariff lines, including agricultural, textile and manufactured items, in May 1997 to the WTO, on which QRs were being maintained under Article XVIII:B of the GATT. Of these 1,285 items were freed by April 1999 and India was required to remove the remaining QRs on 1,429 tariff lines by April 2001 in a two-stage process. The QRs on at least 714 of the 1,429 tariff lines were required to be removed by April 2000 and on the remaining 715 by April 2001. According to WTO (2002), tariffs were increased in 37.5 per cent of the cases in which quantitative restrictions were removed. The increases have occurred mainly in case of live animals, grains, oilseeds and fats.

The government set up an inter-ministerial group to monitor actual imports of 300 sensitive items, including agricultural commodities, in the wake of removal of quantitative restrictions. The withdrawal of quantitative restrictions has, in general, not resulted in an import surge of agricultural commodities. The government also renegotiated the bound rates of duty in case of some sensitive items to increase the import duties applicable to these items. As indicated by the studies mentioned above, imports of edible oils have increased in recent years. Increase in imports of edible oils has contributed significantly to the growth in the imports of the 300 sensitive items overall. Within edible oils, while imports of crude palm oil have risen, imports of sunflower oil both crude and refined have declined. Among agricultural commodities, other items that have witnessed large volume of imports are cotton and fruits and vegetables. During April-November, 2002, imports of edible oils, fruits and vegetables and milk and milk products increased.

4.2.2 Technology

India has made significant investment in agricultural research and extension for development of improved crop technology. Improved agricultural technology, embodied in new crop varieties, fertilisers, controlled irrigation with better use and management of these inputs, contributed significantly to TFP growth in the past. A near exhaustion of land for agricultural purposes and a shift in area from under foodgrain production to non-foodgrain indicates that increases in productivity would be crucial to expanding foodgrain output in the future.

Indian agriculture underwent a technological transformation with the introduction of the new high yielding varieties (HYVs) in 1966-67. Area under high-yielding varieties witnessed a steady growth in the past. The growth of area under modern varieties slowed down in 1980s with area under modern varieties of rice experiencing a steady increase. While growth in government research expenditures was moderate till 1968, it was rapid

from 1968 to 1980, but slowed down in the 1980s (Evenson *et al*, 1999). According to Evenson *et al* (1999), total expenditures on agricultural research by the central government, state governments, private companies and foundations averaged Rs. 236 crores per year in 1983-87. Private sector investment is channelled in development of embodied technologies like mechanical and chemical technologies, traditionally and recently in biotechnology (Pal *et al*, 1997). Also, new varieties were either not available or found unsatisfactory in several crops including coarse cereals, pulses and oilseeds. Modern varieties of soybean and sunflower and cotton were also introduced but there are almost no improved varieties of pulses (Evenson *et al*, 1999). Due to its dependence on irrigation, new technology was not suitable for rainfed areas.

4.2.3 Production incentives

Incentives to producers of agricultural commodities have undergone a marked improvement during the decade of the nineties since the introduction of wide ranging trade reform and industrial deregulation in 1991. In the pre-reform period, excessive protection to the industrial sector increased the prices of industrial products relative to agricultural commodities, increasing the profitability of industry vis-à-vis agriculture. Prior to the initiation of the reform process, high levels of protection to the manufacturing sector, restrictions on exports of agricultural commodities and on domestic trade in agriculture as well as an overvalued exchange rate discriminated against the Indian agricultural sector. According to Pursell and Gulati (1995), in the aggregate between 1970-71 and 1987-88, nominal protection coefficient (NPC), a simple indicator of incentives or disincentives in place, for agriculture was about half the nominal protection accorded to manufacturing. While the protection to the industrial sector, in the form of tariffs, has gone down substantially, agriculture continues to benefit from government support in the form of minimum support prices, input subsidies, no taxation etc. MSPs for specific agricultural commodities have grown steadily in the post-reform period improving the terms of trade for the agriculture sector. Reduction in the protection granted to the industrial sector has contributed to the improvement in the relative profitability of agriculture.

4.2.4 Industrial policy

In the pre-reform period, excessive protection to the industrial sector is believed to have adversely influenced agricultural growth. According to Pursell and Gulati (1991) average nominal protection coefficient for agriculture was roughly one-third of nominal protection coefficient for the manufacturing sector during the seventies and early eighties. However, widespread economic reforms since July 1991 have led a substantial reductions in the relative protection accorded to the industrial sector. The Statement of Industrial Policy,

1991 helped to introduced greater flexibility in capacity creation/ addition/ reduction through abolishing licensing requirement in all but few industries which were of strategic importance or security oriented in nature. The terms of entry of FDI were also liberalised through the 1990s. Rapid progress has also been made in liberalising the system of trade and payments. Such changes have stimulated the growth of the agro-processing industry, which has strong backward linkages with agricultural commodity production.

It has been argued that while most of the reform measures during the 1990s directly targeted the agricultural sector, agriculture benefited from reduction in protection accorded to the industrial economy. There was considerable reduction in the anti-agricultural bias embedded in the industrial and trade regimes, prevalent before the 1990s. Terms of trade moved steadily in favour of the agricultural sector during the 1990s, improving the profitability of agriculture compared to industry and attracting greater private investment into the sector.

4.2.5 Financial sector reforms

A number of reforms have been implemented in the financial sector since 1992-93, including liberalisation of interest rates and private banking.²⁴ However, much remains to be done for a more complete liberalisation of the financial sector. Post-liberalisation developments in the financial sector have raised concerns in the area of rural finance. The financial sector plays a crucial role in the adoption of better technologies thereby leading to higher growth.²⁵ Macro level policies, including monetary policy, have played an important role in the movement of terms of trade towards agriculture, which in turn has contributed to the increase in aggregate crop output.²⁶ The new economic policy has, however, not led to an improvement in the flow of credit to the agricultural sector. Agriculture sector targets in priority lending have not been met.

Multiple institutions, including public institutions and state partnerships with co-operatives, have been promoted by the government to meet credit requirements of the rural economy. Some initiatives were taken to reform the rural credit system in 1992-93. In the same period, a Small Farmer's Agribusiness Consortium was established with the objective of promoting economic efficiency, environmental soundness and social equity.²⁷ Comprehensive restructuring of Regional Rural Banks (RRBs) was undertaken from 1994-95. Interest rate structure of co-operative banks was deregulated from 1994 and lending rates of RRBs were deregulated in 1996.

According to Gulati and Bathla (2002), several policy and institutional changes were

²⁴ Please refer to Hanson and K athuria [1999] for more on financial sector reforms.

²⁵ Singh (2002).

²⁶ [Misra and Rao, 2003].

²⁷ This section has drawn from NCAER (2001).

introduced in the 1990s, including re-capitalisation of regional rural banks, liberalisation of interest rates, increase in commercial freedom of the RFIs and credit flows to rural areas, development of local area banks, introduction of Kisan Credit Cards and efforts have been made to energise co-operatives by following a 'member driven approach' and micro-finance through formation of Self-Help Groups (SHGs). Gualti and Bathla argue that the rural credit market is faced with a paradox, wherein the informal sources of finance, (money lenders, landlords, traders etc.) which charge over 20 per cent interest and often keep land as collateral, have high recovery rates but the rural financial institutions (RFIs), that charge almost half the interest rate and do not take land as collateral, face high defaults. Several factors have been identified, which contribute to high incidence of over-dues in the rural credit system, such as natural disasters, inadequate income generation, high transactions costs, regulated interest rates, inability of financial institutions to cater to changing demands of the agriculture sector, limitations of the RFIs and limited reach. Gulati and Bathla (2002) find that between 1980 and 1998, recovery of loans in cooperatives, regional rural banks and commercial banks varied between 39-66 per cent. A higher level of recovery is observed after 1995.

The new economic policy has, however, not led to an improvement in the flow of credit to the agricultural sector. The agriculture sector target in priority lending has not been met.²⁸ Credit is targeted towards risk free irrigated areas, with the drought prone areas depending on informal sources (NCAER, 2001). According to Ramchandran and Swaminathan (2002), the flow of formal sector credit to the rural areas has seen a sharp withdrawal with the proliferation of informal sources and in the post reform period. The effects have been more serious on the landless labourers. According to NCAER (2001), the poorer the household, the greater the reliance on informal sources of credit in comparison to formal sources. While priority sector lending has not been reduced, the banks have exploited various rules and new institutions to reduce lending to the priority sector, mainly the agriculture sector. Permission to public sector banks to set off up to 1.5 per cent shortfall in priority sector agricultural lending against Rural Infrastructure Development Fund (RIDF), has been used. Moreover, the priority sector has been expanded to include the software industry, food and agro-processing, venture capital, small roads and water transport. According to Singh (2002), (i) in March 2000 only 163 lakh accounts were recorded for agriculture credit compared to 217.9 lakh in March 1994; (ii) the share of agriculture sector in total bank credit declined by 2.89 percentage points between 1992-93 and 1998-99; (iii) priority sector lending to agriculture declined from 16.2 per cent in 1990 to 11.6 per cent in 1999, increasing to 15.8 per cent in March 2000; (iv) there exists a bias against small borrowers within the agriculture sector; (v) a regional shift has

²⁸ Commercial banks are required to earmark 18 per cent of total annual lending to the agriculture sector as part of priority sector lending.

occurred in credit, with a decline in the share of the rural areas by 4.6 percentage points over the same period. Singh (2002) argues that traditional moneylenders are going strong in rural India, more subsidised credit is going under government schemes and not to the agriculture sector, and widening priority sector credit would adversely affect credit availability for the agriculture sector. It has been found that although the demand for credit is interest elastic over time, non-price factors such as technological change, density of RFI field offices, and incomes are more important determinants of demand for crop loans. (Desai and Namboodri, 1997).

AGRICULTURE AND THE WORLD TRADE ORGANISATION

5.1 The agriculture exception in GATT

International trade in agriculture remains highly distorted, especially relative to trade in manufacturing, through a variety of trade and domestic policy interventions. Agricultural tariffs in OECD countries are three times higher than tariffs applicable to manufacturing. There is also a high level of dispersion in agricultural tariffs across commodities with associated problems of tariff escalation and tariff peaks. Prior to the 1970s, agricultural commodities were the more important source of export earnings for developing countries, based on their comparative advantage in agricultural goods. However, increasingly high levels of protection to agriculture in industrial countries led to a decline in the share of agricultural exports from developing countries.

Multilateral trading rules were largely ineffective in the case of agricultural commodities since the beginning of the General Agreement on Tariffs and Trade (GATT), until the implementation of the Uruguay Round. Trade in agricultural products has been a source of problems in international agreements on trade since before the signing of the GATT on October 30, 1947 (Josling *et al*, 1996). Agricultural price and income support policies were adopted in a number of countries in the inter-war period to protect agricultural incomes. Most countries implemented measures to regulate trade in agricultural products during the Second World War. It was, therefore, anticipated that such measures would persist for some time after the end of the war in order to promote agricultural recovery. Protectionist demands from the US and subsequently from the European Economic Community during the 1950s led to the introduction of some special exceptions with regard to trade in agriculture in the provisions of GATT. Agriculture was accorded explicit exemptions from general rules on quantitative restrictions and export subsidies through Articles XI: 2 and XVI: 3 respectively, in GATT. The agricultural exemptions were specifically included to accommodate the agricultural support programmes of the industrial countries. (Please refer to Annexe 5.1 for greater details on the treatment of agriculture in the first seven rounds of GATT).

5.2 Provisions of the Uruguay Round Agreement on Agriculture

The pace and progress of the Uruguay Round of trade negotiations, which was launched in September 1986 at Punta del Este, Uruguay was largely determined by the negotiations pertaining to agriculture. The conclusion of the round got delayed on account of inability to reach an agreement over agricultural negotiations. The Final Act was signed in April 1994 at Marrakesh, Morocco and became effective from January 1, 1995. The provisions relating to agriculture are contained in the Agreement on Agriculture (AoA) and the Agreement on the Application of Sanitary and Phytosanitary Measures, which form part of the GATT (1994).²⁹ The quantitative commitments of the members on agriculture are contained in the agricultural component of the country schedules, which form part of the overall agreement reached in the Round, and form an important adjunct of GATT (1994). The stipulated reduction commitments, method of calculation and other details are specified in a separate Modalities document appended to the WTO Agreement. The AoA consists of a total of 21 articles and is structured around three major areas on which the negotiations were undertaken: market access, domestic support, and export competition. Apart from establishing rules and rates of reduction, the AoA also established the institutional mechanism in the form of the Committee on Agriculture to review the implementation of the AoA.

5.2.1 Market access

The most significant step taken in the UR was with regard to increased market access for agricultural products. This was achieved through converting all non-tariff measures (NTMs) into tariffs subject to agreed maximum rates known as tariff binding (Article 4:2).³⁰ In other words, tariffication of all NTMs is required as a result of which almost all NTMs on agriculture have been eliminated.³¹ As per the Modalities, in case of industrial countries, all tariffs must be reduced by an average of 36 per cent and a minimum of 15 per cent, over a six-year period, in equal annual steps. The average refers to non-trade weighted tariff lines (at HS 4 and HS 6 for fruits and vegetables). Other market access commitments included minimum access and current access provisions (Article 4:1). The minimum and current access commitments are in the form of tariff rate quotas, allowing imports of specified quantities at (in-quota) tariffs lower than the normal bound (over-quota) tariff rates.³² Both quota volumes and within quota tariffs are specified in the coun-

²⁹ Please refer to GATT 1993 for the text of the AoA and details of the Modalities respectively.

³⁰ These measures include import bans, quotas setting the maximum level of imports, variable import levies, minimum import prices, voluntary export restraints, discretionary import licensing, NTMs maintained through state-trading enterprises, and similar border measures other than customs duties.

³¹ Tariffication refers to the replacement of non-tariff barriers with equivalent bound tariffs.

try schedules. As per the Modalities, market access amounting to at least three per cent of domestic consumption in the base period of 1986-88 is to be ensured in the first year (with an increase to five per cent by the end of the transition period) or of imports in those years (current access), whichever is higher, for products that had been previously partially or completely banned. The modalities require current access in excess of stipulated minimum to be maintained. This was designed to ensure that market access was not reduced even if the tariff introduced were more restrictive than measures prevailing before the Round.

In comparison to the industrial countries, developing countries were required to reduce customs duties by 24 per cent (or two-thirds of the industrial country rate) on an average and by a minimum of 10 per cent (Table 25). In addition, as per the rules pertaining to Special and Differential Treatment, developing country members were allowed the flexibility of implementing all reduction commitments over a period of ten years (Article 15:2) instead of the six year period applicable to industrial country members. Developing countries also had the option of binding tariffs at ceiling levels provided that the tariffs had not been previously bound. Under non-agriculture specific provisions of the WTO, India along with six other countries was permitted to retain non-tariff measures on imports of agricultural products on the grounds of balance of payments problems (Article XVIII-B of the URA).

In the negotiations preceding the Uruguay Round, India had bound its tariff on a few agricultural products. India was not required to reduce customs duties with respect to the bound items during the ten-year period. In case of unbound tariffs, India set tariff bindings at ceiling levels of 100 per cent for primary products, 150 per cent for processed agricultural products and 300 per cent for edible oils.

5.2.2 Export subsidies

GATT estimated the aggregate level of export subsidies by industrial countries at US\$ 10 billion in the base period. Some products that receive the highest levels of subsidies include cereals, dairy and meat products. While export subsidies have not been banned, the new rules prohibit export subsidies except where indicated in a country's schedules (Article 8). Members are prohibited from providing new subsidies and export subsidies in excess of budgetary outlay and quantity commitment levels specified (Article 3 [3]). Countries that were not using export subsidies in the base period are prohibited from introducing them and countries that are currently using export subsidies are prohibited from applying them to any product to which they were not applicable in the base period. The AoA includes reduction in export subsidies as well as reductions in the volume of subsidised exports

³² Tariff rate quotas provide for the entry of a specified quantity of a commodity at a reduced tariff rate. Quantities in excess of the specified amount are permitted but subject to a higher tariff rate

(Article 9 [2]).³³ The Agreement provides a list of export subsidies that fall under reduction commitments (Article 9 [1]).³⁴

The Modalities agreed during the negotiations require that industrial countries reduce their export subsidies by 36 per cent with six equal annual rates and reduce the volume of subsidised exports by 21 over a six-year period beginning from the effective date of the Agreement. The base period for export subsidies was 1986-90. While processed foods are also subject to a reduction of export subsidies by 36 per cent, there is no corresponding requirement for reductions in subsidised export volumes.

The reduction rates for developing countries are 24 per cent and 14 per cent respectively (two-thirds of the reduction rates of industrial countries) over a period of ten years. The least industrial countries are completely exempt from any obligations to make the above reductions. For developing countries, subsidies on cost of export marketing and internal transport costs of export shipments were exempt from reduction commitments during the implementation period (Article 9 [4]).

At the time of the Agreement, India was not using any of the subsidies subject to reduction commitments. A type of subsidy available to Indian exporters is in the form of exemption of export profits from income tax under Section 80 HHC of the Income Tax of India Act. India also provides subsidies on cost of freight on export shipments of floriculture and horticulture products. However, these payments are exempt from reduction commitments in the case of developing countries. Recent exports of wheat by the FCI at subsidised rates have been claimed to be part of the category. In the base year 1986-88, India was using the Cash Compensatory Support scheme which according to Indian negotiators subsidised exporter's cost of marketing, including cost of international and internal (of export shipments) transport and freight costs. Although the scheme was discontinued by the close of the UR, India reserved the right to take recourse to the subsidy during the implementation period. India has however capped its export subsidies and is required to inform the WTO on its direct export subsidies periodically.

5.2.3 Domestic support

The AoA also covered the domestic support measures going beyond general GATT provisions. Different measures of domestic support were identified and categorised during the negotiations for measurement of the Aggregate Measure of Support (AMS). Three types of support were excluded from AMS calculations and were exempt from reduction commit-

³³ Targeting both the spending and volume of subsidised exports leads to more effective constraints. For instance, when world prices are relatively low then the spending constraint is more binding because the subsidy (wedge between internal domestic price and competitive export price) becomes larger. When the world price is high, the volume of subsidised exports becomes the binding constraint. Domestic policy adjustments (for example lower internal prices through domestic agricultural policy reforms) also influence the effective constraint imposed by the commitments.

³⁴ Export subsidies subject to reduction commitments include: provisions by governments or their agencies of direct subsidies contingent on export performance, sale or disposal for exports by government or their agencies of non-commercial stocks at prices lower than the comparable domestic price, subsidies to reduce cost of marketing of exports, internal transport and freight charges on export shipments and, subsidies on agricultural products contingent on their incorporation in exported products.

ments. These included de minimis, green box and blue box measures. De minimis support refers to support that does not exceed five per cent of the value of production for industrial countries. Green box measures cover policies that have no or minimal trade distortion effects or production effects. The green box is defined both in general terms as well as in terms of an illustrative list of eligible policies. The blue box exemptions, which were agreed at the Blair House Accord between the US and EC, exempts 'direct payments under production-limiting programmes' if such payments were based on fixed area and yields and made on 85 per cent or less of the base level of production (Article 6:5). These exemptions were designed to exempt the US deficiency payments and the new compensation payments under the Common Agricultural Policy of the EC from calculations of AMS.

Measures not included in the exempt categories, popularly known as amber box measures (subsidies that significantly distort production and trade), such as administered prices, input subsidies, and producer payments not accompanied by limits on production, were subjected to reduction commitments. The reduction commitments were implemented by defining an aggregate subsidy measure, the AMS. For calculating reduction commitments, the base level of AMS for each country and product for the period 1986-90 was calculated (Annex 3). The Modalities required governments to compute AMS separately for product-specific and non-product specific support, although the commitments themselves were not product specific but applied to the total AMS. Product-specific support is measured by the difference between administered prices (minimum support prices in India) and external reference price (c.i.f. prices for imports and f.o.b. prices for exports) and is expressed as a percentage of value of production of the relevant agricultural product. Non-product specific support refers to subsidies on inputs such as fertilisers, electricity and irrigation and expressed as a percentage of aggregate agricultural production. From the total base level AMS, countries had to derive the annual and final bound commitment levels for each year of the implementation period, by reducing the base level by 20 per cent by the year 2000 in equal annual steps. These commitments are reflected in the country schedules of each WTO member.

For developing countries, the de minimis percentage was set at 10 per cent (Article 6: 4 [b]). Investments and input subsidies generally available to low-income and resource-poor farmers in developing countries were exempted from reduction commitments (Article 6: 2). For developing countries, reduction commitment was set at 13.3 per cent over an implementation period of ten years.

In case of India, a number of measures provided by the government to support agriculture qualify as green box measures and are therefore exempt from reduction commitments. These include: general services such as research, extension and advisory services, pest and disease control, provision of livestock health facilities and infrastructure services, crop insurance schemes. Cost of buffer stocking operations by FCI and concessional sales through the PDS are also exempt (Table 26).

India was subject to commitment reductions on market price support measures in case of product-specific subsidies and non-product specific subsidies. However, computation for the base period revealed that aggregate product specific support for all crops covered by the market price support programme was less than the applicable *de minimis* of 10 per cent. The product-specific AMS for India was negative for 17 products out of the total 22 products for which India maintained market price support in the base period. The positive levels of support for crops like oilseeds, rubber and sugarcane were outweighed by negative support for some major crops like rice and cotton. The negative support (net taxation) is attributable to export and other restrictions, which helped to keep domestic prices for some major crops below the world prices. India also provided non-product specific subsidies such as subsidy on inputs like fertilisers, electricity, irrigation, credit and seeds. However, again the aggregate support was less than the 10 per cent *de minimis* limit in the base period. Investment and input subsidies generally available to resource poor farmers in developing countries were exempt from domestic support reduction commitments. In other words, India did not face any obligations related to domestic support commitments under the Agreement except to ensure that levels of domestic support did not exceed the *de minimis* level.

5.2.4 An assessment of the Agreement on Agriculture

Implementation of the UR over the seven-year period from 1995 to 2001 has led to little reduction in agricultural protection. Although UR commitments have not resulted in large reductions in agricultural protection, the UR made a breakthrough in establishing a framework for more meaningful reductions in the Doha Round (DR) and subsequent WTO rounds. According to Martin and Winters (1996), “the Agriculture Agreement was important for developing a set of rules as a basis for future liberalisation, but actual liberalisation was limited by the way that nontariff barriers were converted into tariffs...”

Some specific points on which the AoA came under criticism, and which are also disadvantageous to developing countries like India, may be summarised as follows:

- *The selection of the base year, for the conversion of NTMs, as 1986-88 (period of low world prices and generally high rates of protection) instead of the years immediately preceding the conclusion of the round, resulted in much higher levels of tariff barriers than the tariff equivalents applicable at the end of the Round. In addition the method used for the calculation of the tariff equivalent resulted in higher initial tariffs than what more objective calculations would have given, thereby leading to the so-called 'dirty tariffication' (Hathaway and Ingco, 1996).*
- *Many developing countries set tariff bindings completely unrelated to previous levels of protection.*
- *The rules requiring average reduction of 36 per cent in tariffs with a minimum reduction of 15 per cent also constrained the degree of liberalisation wherein, tariffs on items protected very little were cut by much higher percentage to offset the minimum cuts in protection of sensitive items.*

- *Although minimum access commitments were to be established on MFN basis, industrial countries were permitted to include special arrangements as part of their minimum access commitments. As a result, few new market access opportunities come about for efficient exporters from the Modalities related to minimum access commitments.*
- *The agreements related to domestic support commitments were weakened by the exemption of some important forms of protection used by the EU and USA resulting in actual increases in AMS in OECD.*
- *Domestic support commitments were also weakened by elimination of the need to cut subsidies on a commodity-by-commodity basis. Instead the US and the EU agreed to an aggregate measure of support for all products and to reduce the AMS without reference to specific commodities.*

Actual impact of the AoA was limited by the extent of the reductions and the way in which the reductions were implemented. The average global agricultural tariff (unweighted) is 62 per cent in comparison to four per cent for manufacturing (Burfisher, 2003). There is also substantial dispersion in tariff rates across commodities leading to high levels of distortions. Meat, dairy, sugar and tobacco face some of the highest tariffs. Diakosavva (2003) finds that (i) although nominal protection has declined in the OECD countries as a whole, domestic prices continue to be much higher than world prices; (ii) market openness in the OECD countries in the post-AoA period (1995-2000) is not discernibly significant from the pre-AoA period (1989-94); (iii) reduction in total AMS was accompanied by an increase in exempt support and while the composition of support has shifted from measures that support higher farm prices financed by consumers to payments financed by taxpayers, market price support and output related payments still dominate.

In a manner similar to the rest of the world, India did not utilise its commitments to the UR to significantly liberalise and tie-in its agricultural trade liberalisation. India exploited various clauses pertaining to developing countries on Special and Differential Treatment (S&D), (Articles 13 to 20) and, balance of payments problems to obtain exemptions from the AoA (Article XVIII: B).³⁶ The S&D treatment allowed lower rates of reduction commitments to developing countries over a longer phase-in period. Also, several domestic subsidies and export subsidies that are counted as such for industrial countries were exempted for developing countries. However, as in the case of other countries, the URAA seems to have set the direction of reform and India had to undertake tariffication of its remaining NTMs, previously permitted on balance of payments grounds.

³⁶ Article 15 allows a developing country lower rates of reduction commitments in the areas of export subsidies, market and domestic support, provided that the rate of reduction is no less than two-thirds of that applicable to industrial countries. It also allows developing countries a longer phase-in period of ten years instead of the six-year period applicable to industrial country members. Article 18 allows for exemption of government assistance to agriculture and rural development from calculations of total measure of support. Article 20 exempts developing countries from commitment on export subsidies during the implementation period.

5.3 Agenda for new negotiations³⁶

The WTO negotiations on agriculture were resumed in Geneva in March 2000 in accordance with the provisions of Article 20 of the AoA. The Article provided for the resumption of negotiations an year before the end of the implementation period of the URAA. Negotiations were to continue the process of reform on market access, domestic support and export subsidies, taking into account the experience with the implementation of the UR commitments, effect of reduction commitments on world trade, non-trade concerns (NTCs) like environmental issues, rural development, and food security and provisions for S&D treatment of less developed countries. The fourth ministerial meeting of the WTO, held in Doha, Qatar in November 2001 led to the launch of the broader new Round of negotiations to be concluded by January 2005 and agriculture became part of the single undertaking.³⁷ The new Round had been labelled the “Development Round” by the EU putting the interests of developing countries in agriculture at the forefront of negotiations. The Doha Declaration provides for “substantial improvements in market access; reductions of, with a view to phasing out, all forms of export subsidies; and substantial reductions in trade distorting domestic support.” Other issues related to agriculture include state trading, sanitary and phytosanitary rules, and environmental considerations. The Declaration sets a series of deadlines with a concluding date of no later than January 1, 2005.

The negotiations in agriculture, which began in March 2000, concluded their first phase on March 26-27, 2001. During this phase, 126 member governments (89 per cent of 142) submitted 45 proposals and three technical documents. Six negotiating meetings, officially called the “Special Sessions of the Agriculture Committee” were held. The Second phase of the negotiations was largely informal (WTO).

The new negotiations provide an opportunity to make substantial progress in agricultural policy reforms in global markets. India has great potential to gain from liberalisation of world trade in agriculture in terms of increased trade, given its share in the production and exports of several agricultural commodities. Commitment to multilateral agreements would also help to lock in external and domestic policy reforms in agriculture. Different experts have outlined different proposals for Indian negotiators at the WTO. Broadly speaking, the approach to negotiations, keeping in view the limited scope for increase in support to agriculture by the government under current fiscal constraints, suggested is to direct all effort to reduction in protection of agriculture in industrial countries. India provides relatively low levels of protection to its agriculture production and exports and thus

³⁶ This section includes suggestions on (i) how provisions of relevant WTO agreements, which are disadvantageous to the country, can be removed and (ii) how existing provisions can be used to our advantage and (iii) how existing provisions of the agreements can be used for the country's advantage.

³⁷ Agriculture negotiations were to be resumed by December 31, 1999 but ultimately began in March 2000. The attempt to launch a new comprehensive round of multilateral trade negotiations had been aborted at the previous ministerial meeting in Seattle in November 1999.

stands to gain significantly from reductions in domestic support to agriculture and subsidies to exports and import tariffs in industrial countries.

In terms of strategy, India would have to enter into effective coalitions to better achieve its objective. Historically, developing countries have played a relatively minor role in shaping the outcomes of negotiations vis-à-vis the US, EU and Japan. However, increase in the share of the developing countries in world production and trade and in membership at the WTO is increasing the scope for more effective participation of the developing countries in world trade negotiations. India would, nonetheless, need to build support for its demand among other like-minded members, such as the Cairns group and developing countries, to better achieve its objectives. The Cairns group has already submitted proposals calling for: (i) elimination and prohibition of all forms of export subsidies for all agricultural products; (ii) deep cuts in trade distorting domestic support, and (iii) significant increases across the board in market access for agricultural products.³⁸ According to Anderson (1999), bringing agriculture fully into the WTO would involve a complete phase-out of export subsidies and tariff rate quotas, removal of the blue box measures, drastic reduction in bound tariffs, and a quid pro quo would be to allow the green box measures, which are not directly boosting output and trade, to continue.

The S&D treatment can be used by developing countries to facilitate adjustment to more open markets. Developing country proposals include measures to exempt themselves from domestic support discipline, higher de minimis support levels and right to raise tariffs above bindings if import competition were to become disruptive. India also submitted its proposals on the “food security box”, market access, export competition and domestic support (Annexe 5.2). The EU, Japan and South Korea are against substantial liberalisation based on the concept of agriculture’s “multifunctionality”.

Bound tariffs and tariff rate quotas (or increase in the concessional access) are expected to decline in the Doha Round. There is a general demand for reducing tariffs, tariff peaks and tariff escalation.³⁹ There is also a call for reducing the complexity in the tariff regime implemented after the UR by the administration of the tariff rate quota system. The use of the tariff rate quota system generates quota rents, introduces scope for discrimination

³⁸ The group consists of 17 agriculture exporting countries: Argentina, Australia, Bolivia, Brazil, Canada, Colombia, Costa Rica, Fiji, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, Philippines, South Africa, Thailand and Uruguay. Its objective is to obtain application of same rules to trade in agricultural goods as those applying to trade in non-agricultural commodities. The Cairns Group proposals are supported by the US but strongly opposed by the EU, Japan, Korea, Norway etc. The Group’s proposals are also rejected by net food importing developing countries due to the potential increase in prices as a result of liberalisation. Opposing members have also advanced the concept of “multifunctionality” of agriculture as an argument against substantial liberalisation of world trade in agriculture.

³⁹ Historically, trade negotiations have occurred along two lines, the formula approach (e.g. reduction of tariffs by 20 per cent) and the request and offer approach. The formula approach can be of different types depending on whether it targets the level or dispersion of tariffs. A linear reduction formula reduces tariff levels by reducing all tariffs proportionately. In contrast a harmonisation formula aims at reducing tariff dispersion. One such is the “Swiss” formula, applied to manufacturing in the Tokyo Round, which led to proportionally larger cuts in higher tariffs. Given the existence of some very high tariffs in the current structure of global tariffs, a harmonisation approach would be more effective in liberalising trade (Burfisher, 2003). Another approach that has been used is the zero-for-zero approach wherein tariffs are completely removed for selected products. This approach would tend to increase the tariff dispersion across products. See Francois and Martin (2003) for a discussion of different formula approaches.

between countries and reduces welfare by more than similarly protective tariffs (Anderson 1999). There is a general call for phase-out of the tariff rate quota regime. Alternatively, market access can be expanded by either increasing import quotas, reducing over-quota tariffs or eliminating in-quota tariffs or a combination thereof (Burfisher, 2003).

In view of the relatively low levels of tariff rates actually applicable for most agricultural imports in India, and the relatively high rates of protection applicable in industrial countries for several agricultural commodities, India should strongly support substantial reductions in bound tariff rates for agricultural commodities. According to Gulati *et al* (1999), India should negotiate for a maximum tariff binding for any agricultural commodity at no higher than 50 per cent. Also, while minimum access commitments were to be established on MFN basis, countries were allowed to count special arrangements as part of their minimum access commitments. This allowed the EU and the US to allocate imports as under the earlier quota system and trade expansion occurred only in the case of rice from access commitments made by Japan and Korea (Hathaway and Ingco, 1996). Thus, very little additional access and trade resulted for efficient exporters, including developing countries like India. According to Gulati *et al*, 1999? India should negotiate for complete elimination of the tariff quota system.

Export subsidies are against the general GATT principles but have thus far been permitted, on agricultural commodities, although disciplined somewhat due to the implementation of the URAA. Subsidies on agricultural exports are highly concentrated wherein the bulk of the expenditure on exports subsidies for most products is incurred by two or three exporters. Overall, 90 per cent of all expenditure on export subsidies is attributable to the EU. As a result, given the limited support among the 135 WTO members for continuation of export subsidies, the potential for substantial progress in the elimination of agricultural export subsidies is significant and subject largely to the effect on EU trade policy. There is a general demand for the elimination of export subsidies. There is also a call for disciplining export credits, food aid, and activities of state trading agencies as monopoly exporters.

India should adopt a clear approach on export subsidies on agricultural commodities, considering their use by a concentrated group of countries and the adverse effect on rest of the world exports including Indian exports. India should demand and support the removal of all export subsidies. Moreover, according to Hathaway and Ingco (1996), export subsidies are only required when domestic prices are maintained above world prices, therefore if internal prices in the EU and the US were to decline to world levels, exports would occur without subsidies. One of the problems associated with the rules on export subsidies was the application of reduction commitments on commodity aggregates instead of individual tariff lines. Aggregation allows exporting countries flexibility in shifting export subsidy competition to products with greater value added, for instance by subsidising flour exports instead of wheat when both are included in the same commodity group. According to Gulati *et al* (1999), an alternative to demanding the complete removal of export subsidies would be to press for line-by-line reduction commitments on export subsidies.

In contrast to export subsidies, new rules on total agriculture support go beyond the general GATT rules by imposing some discipline on trade-distorting domestic subsidies. However, many forms of domestic support were exempted from reduction commitments in the form of green and blue box measures. While green box measures consist of funding for research, pest control, extension and advisory services etc., blue box measures refer to direct payments to producers such as decoupled income support etc. In the EU countries, market price support and input subsidies have been replaced by direct payments falling in the blue box measures. Also, the reduction commitments with respect to AMS applied at the aggregate level and not at the commodity level, which allowed overall reductions in AMS along with increase in support for specific commodities.

There is a general demand for reducing and simplifying trade-distorting domestic support measures. On the other hand, interdependence among domestic support and trade policy has led many to argue in favour of focusing on reducing tariffs and export subsidies and allowing tighter trade policy rules to reform domestic farm programmes. In the UR, rules on AMS created an uneven playing field wherein countries with relatively high levels of domestic support in the base period continue to have high AMS limits, while countries with no support in the base period are constrained from introducing it. According to Burfisher (2003), there could be two approaches to reforms in domestic support and lowering of aggregate levels or lowering of the dispersion across commodities. A reduction in a country's overall levels of domestic support could be achieved by requiring countries to further reduction commitments in the AMS ceiling. In the alternative, playing field would be levelled across countries and commodities by setting limits on commodity-specific support expressed as a percentage of value of production, assuming non-commodity-specific support is distributed across commodities based on shares in total farm production or historical program benefits.

India along with other developing countries should exert pressure for the reduction of the total AMS levels. In addition, India should support the Cairns group, which possibly supported by the US, is expected to push for reductions and elimination of the blue box supports against opposition from the EU. According to Gulati *et al* 1999, India should insist that for estimation of total AMS, product-specific and non product-specific support be summed up as in the current system. This is because some other members have proposed that negative product support should be treated as zero, which must be opposed by India. In India, prices of agricultural output have been kept low to make food available at reasonable prices, leading to overall negative commodity-specific support. Partly to compensate for this disincentive, cost of agricultural inputs has been subsidised leading to positive non-commodity-specific support. According to FAO (2002), several ambiguities with respect to calculation of AMS, such as the reference price, quantity eligible to receive administered price, interpretation of negative value of product-specific support, definition of low-income or resource poor farmers, should be clarified.

Martin and Winters (1996) have argued that the WTO agreement provides legally binding minimum standards for reforms and liberalisation, not the economically optimal ones and country's that liberalise their own trade policy are likely to accrue greater gains. Considering the concentration of workers in agriculture in India and the importance of the sector for growth and poverty alleviation, it is important that India unilaterally liberalise its agricultural economy out-pacing the agreements reached at the WTO. Domestic efforts at formulating an appropriate export strategy will have to match international outcomes to exploit the increased export potential especially in commodities like fish and fish preparations, rice, fruits and vegetables and their preparations.

TASKS AHEAD

During the first decade of economic restructuring, substantial progress was made in the introduction and spread of reforms in agricultural trade and non-farm sectors. Reduction in the protection accorded to industry and trade and exchange rate liberalisation had a positive influence on the agriculture sector. The index of agricultural terms of trade improved dramatically during the nineties. Private investment, as opposed to public investment, in agriculture witnessed an improvement as did agricultural exports and output. There also occurred diversification in the agricultural sectors with strong growth in the animal husbandry and fisheries sectors. Nonetheless, agricultural growth deteriorated during the latter half of the 1990s, indicating the limitations of reform in some areas. Technological progress in agriculture has slowed down. Little effort has been made to curtail the unsustainable burden of input subsidy and to improve the level of and pattern of public investment in irrigation, infrastructure and agriculture research and extension. The share of animal husbandry and horticulture in research allocation for agriculture need to be enhanced given the increasing importance of these sectors in domestic and export demand. Growth in agriculture production and productivity is crucial to meet the projected requirements for domestic demand and to exploit the comparative advantage India enjoys in exports of a large number of agricultural commodities.

The nature of the reform process is reflected in the performance of the sector. The improvement in agricultural terms of trade had a positive impact on private investment in agriculture in contrast to the public investment. While overall growth in agriculture decelerated during the 1990s relative to the 1980s, export growth witnessed acceleration during the 1990s. Agricultural sub-sectors with lower levels of government intervention such as fruits and vegetables, dairy and poultry and fish recorded higher rates of growth than food-grains. There occurred some diversification of agriculture from low value crops like food-grain to high value crops like horticulture and other activities like livestock and marine products. Thus, the slowdown in agricultural growth in the latter half of the nineties may not be attributed to overall trade and agricultural price policies. However, in the future,

progress in reforms within the sector is expected to be more important for agricultural productivity growth.

Non-price factors such as research and development and extension essential for spread of new technology and infrastructure, water, power have been found to be more important to agricultural growth. In these areas, as in the rest of the economy, the pace of reforms in the agricultural sector was slow and a number of areas remain to be addressed. Trends in public investment in agriculture demonstrated a poor performance with serious implication for private investment and future growth in production and productivity. Little progress was made in effectively curtailing the huge fiscal burden arising from subsidies to power, fertilisers and irrigation. Subsidies, as opposed to investment in research and extension, have not been found to contribute in important ways to the increases in productivity in Indian agriculture. There exist wide inter-state disparities in level of input use like fertilisers and extent of irrigated area and in agricultural growth. The PDS remains inadequate as an effective instrument of food security with high costs, low offtakes, poor targeting and large leakages and inter-regional imbalances.

The objective of agricultural policy is to promote growth in production through improvements in productivity with equitable distribution of gains across income groups and regions, while at the same time protecting the environment and preventing over-exploitation of scarce natural resources. Growth in production would centre around technology given the limits on expansion of inputs like land and labour in the sector. Increases in productivity would require substantial increase in public investment in agriculture research and technology transfer and rural infrastructure such as irrigation, water conservation, power and rural roads. Given the evidence on the inverse relationship between agricultural subsidies and public investment in agriculture, in combination with the increased unsustainability of the combined fiscal deficit, comprehensive reforms need to be pushed with urgency in case of input subsidies to agriculture for power, fertiliser and irrigation. The government needs to implement rational pricing of water, power and fertiliser. Subsidies on agricultural inputs have also led to adverse effects on the environment through creating distortions in cropping patterns and resource over-exploitation. Input subsidies need to be phased out. In addition there is need for careful fixing of the minimum support prices so that they are not overly misaligned with the market forces. There is a need for more effective targeting of the PDS to limit the expenditure on subsidy on food and to prevent adverse effects of rising food prices for the poor and vulnerable groups of the population.

An important component of future reforms in agriculture would need to be state level reforms given that agriculture is a state subject and the importance of the role of states in agriculture. The states are now required to make a concerted and determined effort in initiating reforms in agriculture by reducing subsidies to agricultural inputs and increasing public investment in agriculture. Subsidies offered to agricultural inputs, like fertiliser,

power and irrigation, are imposing an unsustainable burden on the finances of the state and union governments with a detrimental effect on capital investment in agriculture. The input subsidies lead to distortions in resource use and impose high environmental and social costs. The initial argument in favour of input subsidies to encourage use of new inputs and thereby productivity no longer applies. There is unanimity amongst experts in the area on the need to recover cost of inputs supplied for agricultural purposes and for better community management of resources like water. Institutional reforms would need to be implemented more effectively to increase cost recovery of input supply to the agriculture sector. Given the high political costs, the reforms in input subsidies would need to be phased in over a period of time. At the same time, measures need to be implemented to improve delivery and eliminate the leakages in input supply to non-agricultural uses. Concerns have been expressed on the adverse effect of subsidy reduction on input use and incomes of farmers. However, it has been argued that a large proportion of the subsidy in fertiliser is going to the fertiliser industry and in case of power to the non-agricultural sector. Moreover, the adverse effect on output may be minimised through increased investments in irrigation and other infrastructure facilities. It has also been argued that reduction in subsidy to Indian agriculture could have adverse effects on competitiveness of Indian commodities given the high support offered to farmers in the US and EU. However, India should take a stronger stand at the WTO for reduction and removal of export subsidies and domestic support in these countries.

India has a well-developed agricultural research and extension system but gaps exist in its efficient use. The public outlay on agricultural research and extension is very low given the potential benefits from investment in agricultural research and extension and in comparison to similar developing economies. The challenge in future is to attain optimal yields and to extend improved technology to the crops, farms and regions, which have so far not benefited from the green revolution. Research in agriculture needs to be re-focussed on crops and activities in dry lands, hills and other marginal areas. Research and extension also need to be strengthened in horticulture and livestock sectors. Improvements in post-harvest technology are also crucial to increase value addition and rural incomes. Public investment in basic infrastructure, irrigation, roads and power needs to be increased. A significant part of the available irrigation potential remains to be exploited. The policy environment should also promote private investment in storage, handling and transport facilities for agricultural commodities.

Farmers can also benefit a great deal by sharing risks with corporates through contract farming. Contract farming arrangements have the advantage of attracting greater private capital, deploying better technology and management practices, enabling diversification and providing assured markets and income but should be expanded cautiously to ensure fairness in contracts and adequate prices and control of farmers over their livelihoods. The domestic processing industry would need to be promoted and expanded so that the coun-

try could shift to increased export of higher value added agricultural exports instead of bulk exports, which are more susceptible to fluctuations in their prices. In view of the diversification in agriculture to high value sub-sectors and the rise in corporate activity in Indian agriculture, it is important to bring agricultural activities under the purview of income tax. The system of rural credit also needs to be strengthened. Greater credit can be facilitated through processors, input dealers and NGOs. Self-help groups of women for providing micro-credit are at present confined mainly to activities outside agriculture but proffer great potential for financing activities of small and marginal farmers in animal husbandry and horticulture.

While progress was made in removing domestic and external restrictions on movement and trade of agricultural commodities, some reforms remain incomplete, as in the case of the Maharashtra Cotton Growers Federation's monopoly on procurement of cotton in the state and the system of levies on rice and sugar. Such restrictions on domestic and external trade in agricultural commodities would need to be removed to impart greater competitiveness to the sector. The policy of procurement prices and operation of the PDS also need to be reviewed and made more efficient. Continuous rise in procurement prices, with the obligation to purchase, has led to large accumulated stocks of wheat and rice on the one hand imposing high procurement and storage costs with low offtakes. On the other hand, higher issue prices due to increasing food subsidy has made it ever more difficult for the poor to access the PDS, leading to low offtakes. Liberalisation of external and domestic trade and reduction in subsidies could lead to adverse effects on the most vulnerable section of the society. Thus, government policy would need to be reoriented to substantially improve the functioning and targeting of the PDS and other subsidisation programmes. Decentralisation of procurement and distribution activities has been proposed to improve the effectiveness of the PDS.

While the system of support prices would have to continue for some time, it should be ensured that it is much more aligned with the market forces. At the same time, the system of forward marketing should be strengthened and increased in its coverage. Given the increasing importance of foreign trade, development of futures market have been emphasised as futures trading at present is limited in its coverage in its geographic spread and low volumes. Futures trading in agricultural commodities aids in price discovery and allows producers in hedging of price risks. Opening up of forward trading in agriculture commodities needs to be implemented in a systematic manner and accompanied by suitable legal framework. The crop insurance programmes should also be made more comprehensive in its coverage.

In the context of increased integration with the world markets, the government would need a better co-ordination of domestic and trade policies. India would also need to play a more effective role in multilateral forums through devising appropriate strategies and entering into strategic alliances. India should argue for elimination of all export subsidies,

peak tariffs and tariff escalation. It should argue for reduction in domestic support in industrial countries. India should argue for aggregation of all subsidies as the aggregate measure of support to Indian agriculture is well below the de-minimis level. India should argue for calculation of the AMS as the sum of product-specific and non-product specific support, as the former is negative in case of India. India should argue in favour of exemption of input subsidies to resource poor farmers from reduction commitments. India should also negotiate for the protection of its food security concerns in a careful manner.

While there might be marginal gains to India through entering into regional trade agreements, the highest gains arise only from multilateral trade liberalisation. Thus, striving to achieve faster multilateral trade liberalisation of agriculture should be the policy of putting the best foot forward for India.

India has joined the race of signing free trade agreements (FTAs) with various countries. Such an exercise might load further on the utterly confused and complicated regime of the rules of origin and become a massive problem in trade facilitation. A careful approach towards signing FTAs can still be acceptable provided it is well thought of exercise.

Box 3 provides a summary of task ahead and expected benefits to the Indian agricultural sector.

BOX 3: TASKS AHEAD	
TASKS	BENEFITS TO THE SECTOR
1. Increase public investment	Competitiveness, up-gradation of technology, higher income, entry of private including foreign capital, higher foreign exchange earnings
2. Reduce input subsidies	Improved fiscal balances and positive impact on public investment
3. Complete process of liberalisation of domestic and external markets	Competitiveness, increase in consumer welfare, higher foreign exchange earnings
4. Strengthen crop insurance and futures trading	Risk reduction and stability in incomes, technology upgradation
5. Contract farming	Technology upgradation, higher foreign capital and foreign exchange earnings, greater employment generation, better management practices, better revenue collection
6. Formulate a long-term export strategy	Competitiveness, higher income and foreign exchange earnings, technology upgradation, higher private and foreign capital, adoption of better management practices, greater employment
7. Define a strategy for multilateral and regional interactions	Competitiveness, higher income and foreign exchange earnings, foreign capital, technology upgradation, better management practices, greater employment

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TABLES

TABLE 1: KEY INDICATORS, INDIAN AGRICULTURE

INDICATOR	1970-71	1980-81	1990-91	2000-01	2003-04
TOTAL POPULATION (millions)	548.20	683.30	846.30	1027.00	1073.00*
RURAL POPULATION (millions)	439.00	523.90	628.70	741.7	NA
SHARE IN TOTAL (%)	80.08	76.67	74.29	72.20	NA
TOTAL GDP AT CONSTANT PRICES (Rs. crore)	296278.06	401127.99	692871.50	1198685.00	1426700.00
AGRICULTURAL GDP AT CONSTANT PRICES (Rs. crore)	137028.10	159293.19	223114.42	285877.00	315600.00
SHARE IN TOTAL (%)	46.25	39.71	32.20	23.85	22.12
TOTAL EMPLOYMENT (million)	180.37	220.69	278.94	402.51	NA
AGRICULTURAL EMPLOYMENT (million)	129.96	151.88	186.20	235.76	NA
SHARE IN TOTAL (%)	72.05	68.82	66.75	58.40	NA
GROSS DOMESTIC INVESTMENT AT CONSTANT PRICES (Rs. crore)	60155.00	92186.00	166077.00	274917.00	287944.00
AGRICULTURAL INVESTMENT AT CONSTANT PRICES (Rs. crore)	8587.00	14233.00	16416.00	19451.00	24186.00
SHARE IN TOTAL (%)	14.27	15.44	9.88	7.08	8.40
TOTAL EXPORTS (US\$ million)	2031.00	8486.00	18143.00	44560.00	55716.70
AGRICULTURAL EXPORTS (US\$ million)	644.00	2601.00	3521.00	6256.00	6506.00
SHARE IN TOTAL (%)	31.71	30.65	19.41	14.04	11.17

* mid year population as on October 1, 2003.

Sources: *Census of India, Economic Survey, National Accounts Statistics.*

TABLE 2: ANNUAL AVERAGE GROWTH RATES OF GDP AT CONSTANT PRICES (1993-94)
(% per annum)

	AGRICULTURE, FORESTRY & FISHING	AGRICULTURE	FORESTRY & LOGGING	FISHING	INDUSTRY	SERVICE	TOTAL
1951-52 to 1960-61	3.1	3.4	0.3	5.5	6.3	4.3	3.9
1961-62 to 1970-71	2.6	2.5	3.1	3.6	5.5	4.8	3.8
1971-72 to 1980-81	1.8	2.1	-0.7	2.9	4.1	4.4	3.2
1981-82 to 1990-91	3.5	3.7	-0.1	5.9	7.1	6.7	5.6
1992-93 to 2000-01	3.0	3.1	1.2	5.1	6.4	8.0	6.1
1992-93 to 1996-97	4.7	4.9	0.1	7.8	7.6	7.6	6.7
1997-98 to 2000-01	0.9	0.8	2.5	1.8	4.9	8.5	5.4
2001-02 to 2003-04	3.0	3.0	1.2	7.0	5.6	7.9	5.6

Source: *National Account Statistics*, Central Statistical Organisation.

TABLE 3: STATE DOMESTIC PRODUCT AT CONSTANT PRICES ORIGINATING IN AGRICULTURE

STATE	AVERAGE SHARE		AVERAGE GROWTH RATE		
	IN ALL INDIA	IN SDP	OF SDP		
	(%)	(%)	[% per annum]		
	1997-98 to	1997-98	1971-72	1981-82	1991-92
	2001-02	to2001-02	to 1980-81	to 1990-91	to 2001-02
NORTH					
HARAYANA	3.6	33.0	3.0	5.3	1.9
PUNJAB	5.43	39.6	3.0	5.0	2.9
UTTAR PRADESH	13.1	33.4	3.3	3.2	2.3
EAST					
BIHAR	5.5	30.0	2.1	3.5	0.9
ORISSA	2.2	26.4	3.4	1.1	3.1
WEST BENGAL	6.7	23.9	3.6	4.4	5.4
CENTRE					
MADHYA PRADESH	6.3	26.6	3.9	4.9	2.6
RAJASTHAN	5.2	28.6	0.1	9.1	3.4
WEST					
GUJARAT	4.6	17.2	6.6	10.5	6.4
MAHARASHTRA	6.3	26.6	5.8	4.8	2.7
SOUTH					
KARNATAKA	5.7	25.9	2.2	2.8	4.8
KERALA	2.6	20.4	0.3	2.9	2.6
TAMIL NADU	5.0	16.8	0.0	3.3	3.6
AP	6.9	24.6	2.3	3.9	3.8
ALL INDIA	100.00	25.2	1.8	3.5	3.0

Source: Central Statistical Organisation.

TABLE 4: GROWTH RATES OF AREA, PRODUCTION AND YIELD OF PRINCIPAL CROPS/ GROUPS (CARG)

(Base: Triennium Ending 1981-82 = 100)

(% per annum)

	1970-71 to 1980-81			1980-81 to 1990-91			1990-91 to 2000-01			2000-01 to 2003-04~		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
ALL FOOD GRAINS	0.19	1.78	1.21	0.09	3.20	2.75	-0.54	1.14	1.20	-0.16	0.27	0.94
ALL CEREALS	0.22	2.24	1.56	-0.10	3.22	2.88	-0.24	1.56	1.37	-1.23	-0.53	0.85
RICE	0.68	2.48	1.79	0.61	3.32	2.67	0.47	1.67	1.21	-2.66	-1.47	0.88
WHEAT	2.02	4.31	2.24	0.82	4.26	3.41	0.63	2.37	1.73	0.43	-0.12	-0.53
COARSE CEREALS	-0.97	-0.54	0.33	-1.41	1.26	2.54	-1.81	-0.53	1.04	-0.59	3.48	3.54
PULSES	0.06	-0.87	-0.70	0.95	3.04	1.85	-1.91	-2.48	-0.62	4.78	8.01	3.22
NON FOOD GRAINS*	0.88	1.63	0.82	1.90	4.88	2.58	0.59	1.30	0.36	-2.92	1.35	2.40
OILSEEDS	0.45	-0.21	-0.54	2.24	6.56	3.16	0.02	-0.17	0.07	-0.93	5.17	5.02
SUGARCANE	0.31	1.98	1.65	3.28	4.56	1.24	1.59	2.07	0.47	-1.86	-6.79	-5.01
COTTON	0.27	3.93	3.64	-0.50	3.46	3.97	1.39	-0.33	-1.68	-4.95	10.22	15.97
JUTE	2.30	2.80	0.48	-1.88	1.98	3.93	0.63	1.64	1.01	0.81	1.54	0.83
ALL CROPS*	0.35	1.74	1.06	0.54	3.81	2.66	-0.23	1.21	0.84	-0.93	0.70	1.53

Notes: A - Area, P - Production, Y - Yield * Provisional for 2000-01 to 2002-03.~ For 2003-04, based on advance estimates as on 05.08.2004.

Source: *Agricultural Statistics at a Glance*, GOI, 2004.

TABLE 5: SOURCES OF AGRICULTURAL GROWTH

PERIOD	GROWTH OF OUTPUT	GROWTH (Contribution to growth of output)	
		TOTAL FACTOR INPUTS	TOTAL FACTOR PRODUCTIVITY
1950-51 to 1966-67	1.87	1.42 [75.88]	0.45 [24.12]
1966-67 to 1980-81	2.25	1.38 [61.47]	0.87 [38.53]
1980-81 to 1998-99	3.35	1.10 [32.90]	2.25 [67.10]
1980-81 to 1990-91	3.05	0.69 [22.60]	2.36 [77.40]
1991-92 to 1998-99	3.45	1.43 [41.49]	2.02 [58.51]

Source: NCAER, 2001

TABLE 6: COMMODITY-WISE AGRICULTURAL EXPORTS

COMMODITY	AVERAGE SHARE IN TOTAL AGRICULTURAL EXPORTS (%)			AVERAGE ANNUAL GROWTH RATE (% per annum)		
	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2002-03	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2002-03
COFFEE	7.0	5.6	3.3	7.9	10.4	-11.0
TEA AND MATE	17.4	8.0	5.4	13.3	0.1	-11.1
OIL CAKES	9.7	11.9	6.6	47.4	7.6	-6.8
TOBACCO	5.6	3.4	2.9	5.8	8.9	6.7
CASHEW KERNELS	6.9	7.3	5.9	34.9	7.0	3.3
SPICES	6.3	5.1	5.0	73.5	11.5	-1.2
SUGAR AND MOLASSES	2.0	1.7	5.7	98.5	195.9	117.1
RAW COTTON	3.8	2.4	0.1	105.1	67.5	-35.3
RICE	8.7	13.3	14.1	4.4	26.9	42.2
FISH AND FISH PREPARATIONS	13.5	19.1	20.3	28.1	11.2	2.3
MEAT AND MEAT PREPARATIONS	2.6	3.1	4.1	4.4	18.6	-4.4
FRUITS, VEGETABLES AND PULSES	4.0	4.2	5.2	50.3	12.9	0.0
MISCELLANEOUS PROCESSED FOODS	3.7	3.0	4.3	30.0	19.6	13.5

Source: *Economic Survey*, GOI, various issues and HANDBOOK OF STATISTICS ON INDIAN ECONOMY, RBI, 2003-04.

TABLE 7: COMMODITY-WISE AGRICULTURAL IMPORTS (% share)

COMMODITY	1990-91	1994-95	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
PULSES	39.25	9.98	4.87	2.21	4.12	19.44	15.54	10.28
WHEAT	2.01	0.01	8	4.82	0.02	0.01	—	0
RICE	3.25	0.14	0.04	0.19	0.15	0	0.01	0
OTHER CEREALS	0.02	0.01	0.01	0.71	0.13	0.02	0	0.01
MILK & CREAM	0.28	0.1	0.08	0.67	0.06	0.05	0.05	0.41
CASHEW NUTS	10.98	11.64	6.65	7.46	7.95	2.65	7.02	6.27
FRUITS & NUTS	8.93	5.28	4.6	3.68	6.6	4.66	3.64	3.72
SUGAR	0.78	38.45	7.63	6.91	0.26	0.2	0.19	0.2
OIL SEEDS	0.53	0.09	0.06	0.1	0.06	0.01	0.07	0.06
VEGETABLE OILS FIXED	26.72	10.51	52.1	50.08	49.45	39.77	49.86	53.32
VEGETABLE & ANIMAL FATS	0.04	0.03	0.05	0.06	0.09	0.06	0.07	0.06
COTTON (Raw & Waste)		8.54	2.62	7.8	9.8	12.63	7.03	7.17
WOOD & WOOD PRODTS.		11.85	10.39	12.19	17.78	15.89	11.05	14.93
TOTAL AGR. (Rs. Crores)	1205.86	5937.21	14566.48	16066.73	12086.23	16256.61	17608.83	21894.37
TOTAL IMPORT (Rs. Crores)	43170.82	89970.7	178331.7	215528.5	228306.6	245199.7	297205.9	353975.6
% SHR OF AGR. IN TOTAL	2.79	6.6	8.17	7.45	5.29	6.63	5.92	6.19

Source: *Agricultural Statistics at a Glance*, GOI, 2004.

TABLE 8: DEMAND PROJECTIONS FOR 2020 FROM VARIOUS SOURCES (million tonnes)

SOURCE	RICE	WHEAT	TOTAL	PULSES	MILK & MILK	FRUITS	VEG.	MEAT &	FISH
BHALLA <i>et al</i> (1999)	—	—	246.08	—	289.591	—	—	19.918	—
KUMAR (1998)	116.7	92.7	237.6	24.2	142.7	77	149.7	7.8	11.8
ROSEGRANT <i>et al</i> (1995)	—	—	223.57	--	159.92	--	--	10.91	--

TABLE 9: ANNUAL AVERAGE GROWTH RATES OF AGRICULTURAL GCF & GFCF AT CONSTANT PRICES (%)

YEAR	AGRICULTURE, FORESTRY & FISHING					
	TOTAL		PUBLIC		PRIVATE	
	GCF	GFCF	GCF	GFCF	GCF	GFCF
1971-72 to 1980-81	6.4	5.9	9.1	12.3	5.3	2.5
1981-82 to 1990-91	1.7	1.8	-3.6	-3.9	5.6	6.3
1992-93 to 2001-02	2.2	2.1	-0.4	-0.2	3.3	3.1

Note: Private = Total - Public

Source: *National Account Statistics*, Central Statistics Organisation, various issues.

TABLE 10: PUBLIC SECTOR INVESTMENT IN AGRICULTURE AND SUBSIDIES**(Rs. Crore in current prices)**

YEAR	INVESTMENT	SUBSIDIES
1993-94	4981	14069
1994-95	6002	16125
1995-96	6762	17677
1996-97	7296	26050
1997-98	6921	26156
1998-99	7583	28424
1999-00	8662	30944
2000-01	8170	34447
2001-02	8975	36224

Source: *Agricultural Statistics at a Glance 2004***TABLE 11: AREA UNDER HYV**

YEAR	AREA UNDER HYV (as % of total area under crop)	
	RICE	WHEAT
1970-71	14.86	35.52
1980-81	45.41	72.28
1990-91	64.17	86.76
1996-97	76.78	91.41
1998-99	73.66	87.20

Source: *Fertiliser Statistics*, Fertiliser Association of India, various issues.

TABLE 12: MINIMUM SUPPORT PRICES OF MAJOR AGRICULTURAL PRODUCTS (Rs. Per quintal)

COMMODITY	90-91	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	02-03*	03-04
CMN PADDY	205	340	360	380	415	440	490	510	530	530	20	550
COARSE CRLS.	180	280	300	310	360	390	415	445	485	485	5	505
MAIZE	180	290	310	320	360	390	415	445	485	485	5	505
WHEAT	225	360	380	475**	510 \$	550	580	610	620	620	10	630
BARLEY	200	285	295	305	350	385	430	500	500	500	5	525
GRAM	450	670	700	740	815	895	1015	1100	1200	1220	5	1400
ARHAR	480	760	800	840	900	960	1105	1200	1320	1320	5	1360
MOONG	480	760	800	840	900	960	1105	1200	1320	1330	5	1370
URAD	480	760	800	840	900	960	1105	1200	1320	1330	5	1370
SUGARCANE	23	39	42.5	45.9	48.45	52.7	56.1	59.5	62.05	69.5	-	73
COTTON	620	1000	1150	1180	1330	1440	1575	1625	1675	1675	20	1725
GRNDNT (SHELL)	580	860	900	920	980	1040	1155	1220	1340	1355	20	1400
JUTE	320	470	490	510	570	550	750	785	810	850	-	860
RPSD/MSTRD	810	830	860	890	940	1000	1100	1200	1300	1330	10	1600
SUNFLWR SEED	600	900	950	960	1000	1060	1155	1170	1185	1195	15	1250
SOYABEAN												
BLACK	350	570	600	620	670	705	755	775	795	795	10	840
YELLOW	400	650	680	700	750	795	845	865	885	885	10	930
SAFFLOWER	760	780	800	830	910	990	1100	1200	1300	1300	5	1500
TORIA	780	800	825	855	905	965	1065	1165	1265	1295	10	1565
TBCO(Per kg.)												
BLACK SOIL	13.25	18.5	19	19	20.5	22.5	25	26	27	28	-	31
LIGHT SOIL	14.25	21	21.5	22	23.5	25.5	27	28	29	30	-	33
COPRA												
MILLING	1600	2350	2500	2500	2700	2900	3100	3250	3300	3300	-	3320
BALL	-	2575	2725	2725	2925	3125	3325	3500	3550	3550	-	3570
SESAMUM	-	-	850	870	950	1060	1205	1300	1400	1450	5	1485
NIGERSEED	-	-	720	720	800	850	915	1025	1100	1120	-	1155

* Special one time drought relief (SDR) price announced for kharif crops during 2002-03.** Including a Central

Bonus of Rs. 60 per quintal from 01.4.97 to 30.06.97. \$ Including a Central Bonus of Rs. 55 per quintal from 01.04.98 to 30.06.98.

Source: *Agricultural Statistics at a Glance*, GOI, 2004

TABLE 13: DISTRIBUTION OF FOOD GRAINS UNDER THE PDS

Year	NET AVAILABILITY OF FOOD GRAINS	PUBLIC DISTRIBUTION	PUBLIC DISTRIBUTION AS % OF NET AVAILABILITY OF FOOD GRAINS	FOOD SUBSIDY (Rs. crores)	FOOD SUBSIDY (% of GDP)
1980	101.4	15.0	14.8		
1981	114.3	13.0	11.4		
1982	116.9	14.8	12.7		
1983	114.7	16.2	14.1		
1984	128.6	13.3	10.3		
1985	124.3	15.8	12.7		
1986	133.8	17.3	12.9		
1987	134.8	18.7	13.9		
1988	130.8	18.6	14.2		
1989	147.2	16.4	11.1	2476	0.4
1990	144.8	16.0	11.0	2450	0.4
1991	158.6	20.8	13.1	2850	0.4
1992	148.5	18.8	12.7	2800	0.4
1993	149.8	16.4	10.9	5200	0.7
1994	154.8	14.0	9.0	5100	0.6
1995	166.7	15.3	9.2	5377	0.6
1996	163.3	18.3	11.2	6066	0.6
1997	176.2	17.8	10.1	7900	0.8
1998	159.6	18.6	11.7	9100	0.8
1999	169.4	17.7	10.4	9434	0.5
2000	168.3	13.0	7.7	12060	0.6
2001	157.0	13.2	8.5	17499	0.8
2002	188.8	18.1	9.6	24176	1.0
2003	170.8	22.5	13.2	25200	0.9

Note: Net availability = Net production + Net imports - changes in government stocks. Food Subsidy is on financial year basis.

Source: *Economic Survey*, GOI, 2002-03, Expenditure Budget, Vol. 1, various issues.

TABLE 14: INPUT SUBSIDIES IN INDIAN AGRICULTURE -ALL INDIA

	POWER		FERTILISER		IRRIGATION	AT CURRENT	AT 1981-82	AS % OF GDP	AS %
	GULATI	GOI	GULATI	GOI	GULATI <i>et al</i>	PRICES	PRICES	IN AGRICULTURE	OF GDP
	(in Rs. Billion)					(Rs. Billion)	(Rs. Billion)		
1980-81	3.68	-	-	-	4.12	7.8	8.7	1.8	0.64
1981-82	4.47	-	2.33	-	4.58	11.4	11.4	2.4	0.8
1982-83	5.83	-	0.82	-	5.42	12.1	11.5	2.4	0.76
1983-84	7.67	-	2.15	-	6.32	16.1	14.3	2.6	0.86
1984-85	9.97	-	12.12	-	7.25	29.3	24.4	4.5	1.41
1985-86	13.04	-	14.22	-	7.44	34.7	27.7	5	1.48
1986-87	17.06	-	-0.72	-	10.78	27.1	20.4	3.6	1.04
1987-88	25.35	-	5.27	-	19.72	50.3	35.1	6	1.71
1988-89	30.07	-	18.97	-	23.54	72.6	47	7	2.06
1989-90	35.94	-	28.58	45.42	23.09	87.6	52.9	7.6	2.14
1990-91	46.21	46.05	45.58	43.89	25.71	117.5	64.3	8.7	2.46
1991-92	58.84	58.89	35.07	51.85	28.68	122.6	59	7.7	2.22
1992-93	73.44	73.35	32.61	57.96	32.88	138.9	60.7	7.8	2.2
1993-94	89.57	89.66	33.52	44.00	34.41	157.5	63.6	7.1	2.02
1994-95	112	109.41	78.89	57.69	39.54	230.4	83.9	9	2.52
1995-96	138.38	136.06	96.94	67.35	44.12	279.4	94.5	10.1	2.62
1996-97	155.85	155.86	96.32	75.78	44.39	296.6	94.3	8.9	2.4
1997-98	190.21	190.21	81.59	99.18	46.56	318.4	96.5	9	2.3
1998-99	224.96	224.73	83.14	115.96	49.37	357.5	101.4	8.3	2.22
1999-00	262.71	246.50	62.07	132.44	52.18	377	104	8.8	2.13
2000-01	288.14	269.50		138.00					

Source: Gulati and Narayanan, 2003, *Expenditure Budget* Vol. 1, various issues, *Annual Report on the Working of State Electricity Boards and Electricity Departments*, Planning Commission, 2002.

TABLE 15: CONSUMPTION OF SOME AGRICULTURAL INPUT

YEAR	CONSUMPTION OF ELECTRICITY FOR AGRICULTURAL PURPOSES (Million KWH)	% SHARE OF AGRICULTURAL CONSUMPTION OF POWER TO TOTAL	CONSUMPTION OF FERTILISERS (Lakh Tonnes)
1982-83	17817	18.64	63.88
1983-84	18234	17.81	77.1
1984-85	20960	18.38	82.11
1985-86	23422	19.04	84.74
1986-87	29444	21.66	86.45
1987-88	35267	24.22	87.84
1988-89	38878	24.27	110.4
1989-90	44056	25.12	115.68
1990-91	50321	26.44	125.46
1991-92	58557	28.2	127.28
1992-93	63328	28.7	121.53
1993-94	70699	29.64	123.66
1994-95	79301	30.54	135.64
1995-96	85732	30.95	138.77
1996-97	84019	29.98	143.08
1997-98	91277	30.52	161.88
1998-99	97195	30.75	167.98
1999-2000	90934	29.07	180.69
2000-01	84729	26.76	167.02
2001-02	81673	25.33	173.60
2002-03	NA	NA	160.94

Source: *Agricultural Statistics at a Glance*, GOI, 2004.

TABLE 16: SUMMARY ANALYSIS OF INDIA'S MFN TARIFF, 1997/98 AND 2001/02

	NO. OF LINES	MFN 1997/98			MFN 2001/02		
		AVERAGE (%)	RANGE (%)	COEFFICIENT OF VARIATION	AVERAGE (%)	RANGE (%)	COEFFICIENT OF VARIATION
TOTAL	5113	35.3	0-260	0.4	32.3	0-210	0.4
AGRICULTURAL PRODUCTS	676	35.1	0-260	0.9	40.7	0-210	0.7
LIVE ANIMALS AND PRODUCTS THEREOF	81	25.4	15-45	0.6	39.8	35-100	0.4
DAIRY PRODUCTS	20	31.5	0-35	0.3	38	35-60	0.2
COFFEE AND TEA, COCOA, SUGAR, ETC.	128	37.6	15-192	0.4	39.6	35-170	0.4
CUT FLOWERS AND PLANTS	34	25.1	10-45	0.6	29.9	10-35	0.3
FRUIT AND VEGETABLES	150	32.7	0-127	0.5	36.6	25-115	0.3
GRAINS	16	0	0-0	-	49.4	0-100	0.8
OILS SEEDS, FATS, OIL AND THEIR PRODUCTS	71	38.9	15-45	0.2	56.2	15-100	0.5
BEVERAGES AND SPIRITS	31	114.8	15-260	0.8	96.9	35-210	0.8
TOBACCO	9	45	45-45	-	35	35-35	-
OTHER AGRICULTURAL PRODUCTS, N.E.S	136	27.8	0-45	0.5	28.1	0-50	0.4

Source: *Trade Policy Review - India*, WTO, 2002

TABLE 17: INDICATORS OF INCENTIVES TO AGRICULTURE AND MANUFACTURING

	NPC OUTPUT	NPC TRADABLE INPUTS	EPC
AGRICULTURE (1980/81 to 86/87)	0.88	0.97	0.86
MANUFACTURING (1986/87)	1.42	1.44	1.34
RATIO AGRICULTURE/ MANUFACTURING	0.62	0.67	0.64

Notes: NPC - Nominal protection coefficient, EPC - Effective protection coefficient

Source: Gulati and Pursell (1993).

TABLE 18: AVERAGE GROWTH IN AGRICULTURAL AND NON-AGRICULTURAL PRICES (Per cent)

	1982-83 to 1990-91	1992-93 to 2000-01	2001-02 to 2003-04
ALL COMMODITIES	6.92	6.95	4.16
FOOD ITEMS	8.02	8.29	2.11
FOOD GRAINS	6.66	8.69	0.48
NON-FOOD PRIMARY ARTICLES	7.99	5.27	8.39
MANUFACTURED PRODUCTS	6.59	5.74	3.37

Source: Ministry of Industry, GOI

TABLE 19: ANNUAL AVERAGE GROWTH IN MINIMUM SUPPORT PRICES (% per annum)

PRODUCT	1981-82 TO 1990-91	1991-92 TO 2000-01	2001-02 TO 2003-04
WHEAT	6.92	10.24	1.08
PADDY (COMMON)	6.99	9.62	2.57
COARSE CEREALS	5.62	9.56	4.37
ARHAR	10.66	9.67	4.34
MOONG	9.16	9.67	4.59
URAD	9.73	9.67	4.59
SUGARCANE	6.00	9.69	7.11
COTTON (F-414/H-777)	6.58	10.2	2.02
COTTON (H-4)	5.30	9.37	1.33
GROUNDNUT	11.16	7.79	4.76
SUNFLOWER	13.01	7.02	2.24
SOYBEAN (BLACK)	6.82	8.38	2.75
SOYBEAN (YELLOW)	7.18	8.11	2.47

Source: *Agricultural Statistics at a Glance*, GOI, 2004.

TABLE 20: ANNUAL AVERAGE GROWTH RATES OF AGRICULTURAL INVESTMENT AT CONSTANT PRICES (%)

YEAR	AGRICULTURE, FORESTRY & FISHING					
	Total		Public		Private	
	GCF	GFCF	GCF	GFCF	GCF	GFCF
1981-82 to 1990-91	1.7	1.8	-3.6	-3.9	5.6	6.3
1991-92 to 2001-02	2.2	2.1	-0.4	-0.2	3.3	3.1

Note: Private = Total - Public

Source: *National Account Statistics*, Central Statistics Organisation, various issues.

TABLE 21: AGRICULTURAL GROWTH (%)

		1981-82 to	1981-82 to	1992-93 to	1992-93 to	2001-02 to
		1990-91	1985-86	1996-97	2000-01	2003-04~
AGRICULTURAL GDP AT CONSTANT PRICES		3.5	3.3	4.7	3.0	3.5
FOOD GRAIN OUTPUT	A	0.2	0.3	0.3	-0.2	1.2
	P	3.6	3.6	3.3	1.7	4.0
	Y	2.9	2.9	2.6	1.4	2.8
NON FOOD GRAIN OUTPUT*	A	2.0	1.0	1.5	0.3	-1.9
	P	5.1	3.3	4.8	1.4	3.4
	Y	2.7	1.9	3.1	0.7	4.1

Notes: A - Area, P - Production, Y - Yield * Provisional figures for 2001-02 and 2002-03. ~ Based on Advance Estimates as on 05.08.2004.

Source: *Agricultural Statistics at a Glance*, GOI, 2004.

TABLE 22: SOURCES OF GROWTH OF NET OUTPUT ORIGINATING IN PRIMARY SECTOR (Per cent)

	ABSOLUTE CONTRIBUTION		RELATIVE CONTRIBUTION	
	1960-61 to 1985-86	1985-86 to 1994-95	1960-61 to 1985-86	1985-86 to 1994-95
LABOUR	0.84	0.64	40.98	18.23
CAPITAL	0.49	0.34	23.90	9.69
LAND	0.13	0.08	6.34	2.28
TOTAL FACTOR INPUT	1.46	1.06	71.22	30.20
TOTAL FACTOR PRODUCTIVITY	0.59	2.45	28.78	69.80
NET DOMESTIC PRODUCT	2.05	3.51	100.00	100.00

Source: Dholakia 1997.

TABLE 23: GROWTH IN AGRICULTURAL EXPORTS (%)

	1981-82 to	1981-82 to	1992-93 to	1992-93 to	2001-02 to
	1990-91	1985-86	1996-97	2000-01	2002-03
COFFEE	7.9	27.1	29.2	12.1	-11.0
TEA AND MATE	13.3	22.5	-8.6	2.0	-11.1
OIL CAKES	47.4	67.0	24.3	7.3	-6.8
TOBACCO	5.8	7.5	15.3	9.5	6.7
CASHEW KERNELS	34.9	61.5	6.8	6.6	3.3
SPICES	73.5	155.9	19.1	11.3	-1.2
SUGAR AND MOLASSES	98.5	37.0	145.8	195.0	117.1
RAW COTTON	105.1	13.9	153.5	83.2	-35.3
RICE	4.4	-4.4	49.3	27.8	42.2
FISH AND FISH PREPARATIONS	28.1	45.4	15.6	11.4	2.3
MEAT AND MEAT PREPARATIONS	4.4	2.2	19.9	18.4	-4.4
FRUITS, VEGETABLES AND PULSES	50.3	126.5	11.5	12.3	0.0
(excl. cashew kernels, processes fruits & juices)					
MISCELLANEOUS PROCESSED FOODS	30.0	45.2	42.9	25.7	13.5
(incl. processed fruits and juices)					

Source: *Economic Survey*, various issues.

TABLE 24: ANNUAL GROWTH RATE OF AGRICULTURAL EMPLOYMENT (%)

	AGRICULTURE, FORESTRY & FISHING
1972-73 to 1977-78	9.3
1977-78 to 1983	9.8
1983 to 1987-88	1.7
1987-88 to 1993-94	14.9
1993-94 to 1999-00	-2.0
2001 to 1999-00	-1.0

Source: Special group on targeting ten million employment opportunities per year, Planning Commission, 2002; *Economic Reforms for the Poor*, NCAER, 1998; Visaria, 1996; Census 2001.

TABLE 25: URAA NUMERICAL TARGETS FOR REDUCTION IN PROTECTION

	DEVELOPED COUNTRIES 6 YEARS: 1995-2000	DEVELOPING COUNTRIES 10 YEARS: 1995-2004
TARIFFS		
AVERAGE CUT FOR ALL AGRICULTURAL PRODUCTS	-36%	-24%
MINIMUM CUT PER PRODUCT	-15%	-10%
DOMESTIC SUPPORT		
CUTS IN TOTAL ("AMS") SUPPORT FOR THE SECTOR	-20%	-13%
EXPORTS		
VALUE OF SUBSIDIES (OUTLAYS)	-36%	-24%
SUBSIDISED QUANTITIES	-21%	-14%

Source: www.wto.org

TABLE 26: INDIA'S AGGREGATE MEASURE OF SUPPORT, 1995/96 (US\$ million)

SUPPORT	1995/96
PRODUCT SPECIFIC AMS	-29518.00 [-38.47%]
RICE	-7577.00
WHEAT	-9625.00
COARSE CEREALS	-4530.00
PULSES	-1706.00
GROUNDNUTS	-1809.00
RAPESEED AND MUSTARD TORIA	-1689.00
COTTON	-2106.00
SOYA BEANS	-192.00
TOBACCO	-181.00
JUTE	-388.00
SUGAR CANE	285.00
NON-PRODUCT SPECIFIC AMS	5772.00 [-7.52%]
FERTILISER SUBSIDY	1864.14
CREDIT SUBSIDY	101.95
ELECTRICITY SUBSIDY	2436.64
IRRIGATION SUBSIDY	1345.41
SEED SUBSIDY	23.92
TOTAL PRODUCT AND NON-PRODUCT SPECIFIC AMS	-23745.94

Source: *Trade Policy Review India*, WTO, 1998