



ADB

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Economic Bulletin  
March 2004

Volume II, Number 1

ASIAN DEVELOPMENT BANK

India Resident Mission

**ADB INDIA**  
**Economic Bulletin**

**Volume II, Number 1**

**March 2004**

## India: Key Economic Indicators

| Variables  | Unit        | Reporting Date         | Current | Percentage Change <sup>1</sup> |
|--|-------------|------------------------|---------|--------------------------------|
| GDP at Factor Cost (1993–94 prices)                    | Rs. Billion | April-December 2003    | 3,234   | 8.2                            |
| • GDP in Agriculture                                   | Rs. Billion | April-December 2003    | 570     | 9.4                            |
| • GDP in Industry                                      | Rs. Billion | April-December 2003    | 923     | 6.2                            |
| • GDP in Services                                      | Rs. Billion | April-December 2003    | 1,740   | 8.8                            |
| Industrial Production – General<br>(1993–94=100)       | Index       | FY2003                 | 188.7   | 6.9                            |
| Industrial Production – Manufacturing<br>(1993–94=100) | Index       | FY2003                 | 196.3   | 7.2                            |
| Wholesale Price – All Commodities<br>(1993–94=100)     | Index       | FY2003                 | 175.9   | 5.5                            |
| • Primary Articles                                     | Index       | FY2003                 | 181.5   | 4.3                            |
| • Manufactured Articles                                | Index       | FY2003                 | 156.4   | 5.6                            |
| Consumer Price (Industrial Worker)<br>(1982–83=100)    | Index       | FY2003                 | 500.3   | 3.8                            |
| Broad Money (M3)                                       | Rs. Billion | FY2003                 | 20,003  | 16.4                           |
| RBI's Credit to Commercial Sector                      | Rs. Billion | FY2003                 | 20.6    | –32.4                          |
| RBI's Credit to General Government                     | Rs. Billion | FY2003                 | 475.6   | –60.6                          |
| Consolidated Fiscal Deficit / GDP                      | Per cent    | FY2002                 | 10.1    | –                              |
| Domestic Public Debt                                   | Rs. Billion | FY2002                 | 18,666  | 14.4                           |
| Exports  | \$ Billion  | April-December 2003    | 14.6    | 8.9                            |
| Imports  | \$ Billion  | April-December 2003    | 20.8    | 29.7                           |
| Trade Balance / GDP                                    | Per cent    | April-December 2003    | –4.6    | –                              |
| Current Account Balance / GDP                          | Per cent    | April-December 2003    | 0.7     | –                              |
| International Reserves                                 | \$ Billion  | end-March 2004         | 107.5   | 49.5                           |
| External Debt  | \$ Billion  | end-December 2003      | 112.5   | 9.8                            |
| External Debt to GDP Ratio                             | Per cent    | end-March 2003         | 20.2    | –                              |
| Debt Service Ratio                                     | Per cent    | end-March 2003         | 15.8    | –                              |
| Foreign Exchange Rate, Spot                            | (Rs./\$)    | 31 March 2004          | 45.6    | –5.0                           |
| Nominal Effective Exchange Rate<br>(1985 =100)         | Index       | April-February 2003–04 | 36.3    | –2.2                           |
| Real Effective Exchange Rate<br>(1985=100)             | Index       | April-February 2003–04 | 74.1    | 1.9                            |

<sup>1</sup>Percentage change over the corresponding reporting date a year ago.

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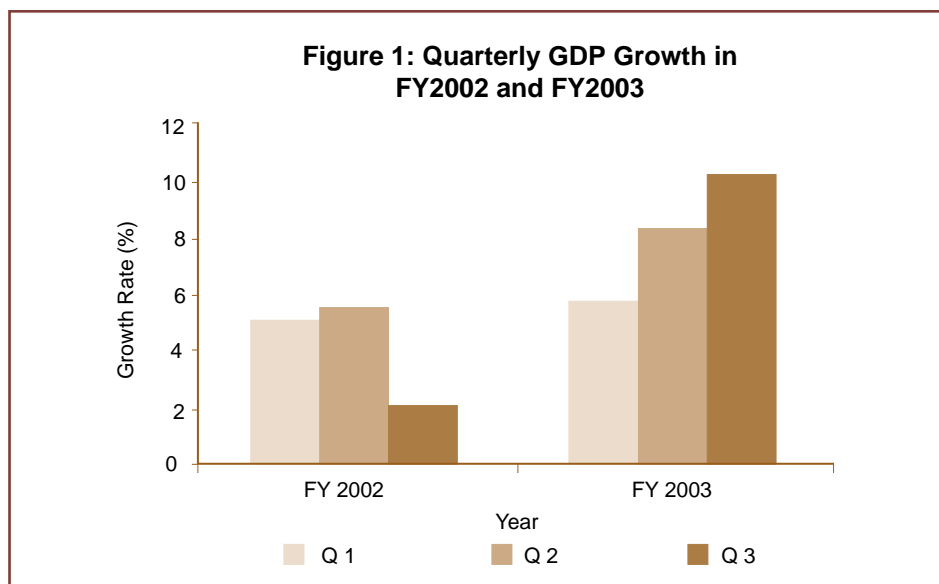
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## *Special Feature*

- **Energy Policy for Higher Economic Growth in India** 17  
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Director General, The Energy and Resources Institute (TERI), New Delhi.

## I. Macroeconomic Growth

1. GDP growth increased through the first three quarters of FY2003<sup>1</sup> to a peak rate of 10.4% in the third quarter (October-December), marking a significant improvement over 2.0% growth recorded during the same period in FY2002 (Figure 1). The government has projected 8.1% growth for the year as a whole. ADB's growth projection is 7.3%, which is close to the consensus forecast of 7.2% to 7.3%. The key question is whether such high growth will be sustained. The previous issue of this Bulletin<sup>2</sup> reported that high growth in FY2003 reflects the beginning of a new business cycle, riding on top of an underlying long-term trend of accelerating growth. Thus, high growth is likely to be sustained over the medium term. Improvements in macro indicators during FY2003 reinforce this expectation of sustained high growth. Leading indicators of performance at the sectoral level also support this assessment.



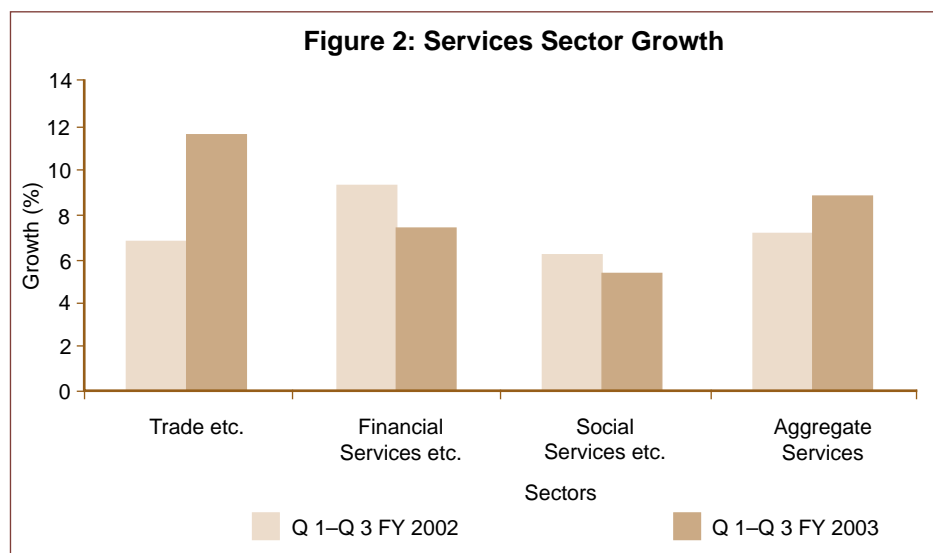
Source: Compiled from [http://www.mospi.nic.in/stat\\_pr.htm](http://www.mospi.nic.in/stat_pr.htm)

<sup>1</sup> Year ended 31 March 2003.

<sup>2</sup> ADB (2003).

## II. Sectoral Performance

2. The services sector, which accounts for over half of GDP, maintained an average growth rate of 8.8% during the first three quarters of FY2003. Buoyant services sector growth is largely on account of significantly higher growth of the group consisting of trade, hotels/restaurants, and transport and communications (Figure 2). Growth of financial and business services and real estate; social services and public administration declined during this period compared to the same period in FY2002. For the year as a whole, growth of the sector is likely to exceed 8.4%.



Source: Compiled from [http://www.mospi.nic.in/stat\\_pr.htm](http://www.mospi.nic.in/stat_pr.htm)

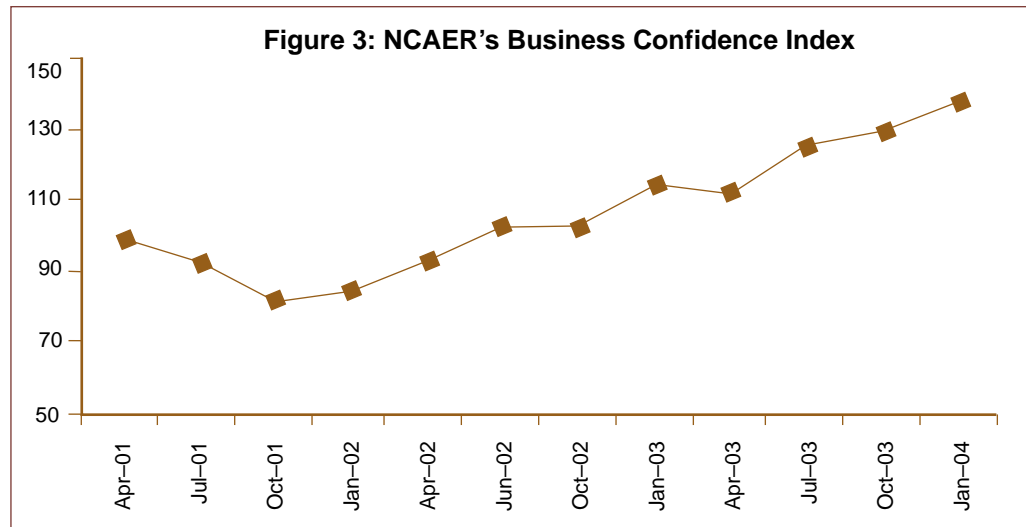
3. Industrial growth continued to remain buoyant during FY2003. Manufacturing production grew at 7.2%, mainly on account of the high growth of capital goods production (12.7%), and a significant step up in the production of consumer durables (11.6%) and intermediates (6.2%), reflecting an upswing of the industrial business cycle led by both investment and consumption demand. Most manufacturing subsectors registered positive growth (Table 1). Significant among these are basic metals, machinery and transport equipment, chemicals and allied products, beverages and tobacco, and paper and paper products. However, production of food products, cotton textiles, textile manufactures,

**Table 1: Sectoral Performance: Manufacturing (% growth)**

| Increasing Output                       |            |            |            | Declining Output     |         |         |         |
|---|------------|------------|------------|----------------------|---------|---------|---------|
| Sector                                  | 2001-02    | 2002-03    | 2003-04    | Sector               | 2001-02 | 2002-03 | 2003-04 |
| Metal Products                          | -10.0      | 6.4        | 3.4        | Food Products        | -1.6    | 10.7    | -0.2    |
| Non-metallic                            |            |            |            | Cotton Textiles      | -2.2    | -2.4    | -3.3    |
| Mineral Products                        | 1.1        | 5.0        | 3.7        | Textile Products     | 2.4     | 15.6    | -3.8    |
| Rubber, Plastic etc.                    | 11.1       | 4.9        | 4.5        | Jute and Mesta       | -5.9    | 8.4     | -4.2    |
| Man-made Fibers etc.                    | 4.4        | 3.8        | 6.2        | Leather Manufactures | 5.3     | -2.9    | -4.3    |
| Other Industries                        | 8.9        | -0.5       | 6.5        |                      |         |         |         |
| Wood & Wood Products                    | -11.0      | -17.8      | 6.8        |                      |         |         |         |
| Chemicals & Allied Products             | 4.8        | 4.0        | 8.2        |                      |         |         |         |
| Basic Metal                             | 4.3        | 9.2        | 9.1        |                      |         |         |         |
| Beverages, Tobacco etc.                 | 12.2       | 27.3       | 9.4        |                      |         |         |         |
| Machinery (except Transport Equipments) | 1.3        | 1.8        | 15.2       |                      |         |         |         |
| Paper & Paper Products                  | 3.0        | 5.6        | 15.9       |                      |         |         |         |
| Transport Equipment                     | 6.8        | 14.9       | 17.0       |                      |         |         |         |
| <b>Overall Manufacturing</b>            | <b>2.9</b> | <b>6.0</b> | <b>7.2</b> |                      |         |         |         |

Source: Compiled from [http://www.mospi.nic.in/stat\\_pr.htm](http://www.mospi.nic.in/stat_pr.htm)

leather and leather manufactures has declined. Negative growth in the textile sector in particular is a cause for concern at a time when the textile sector needs to improve its productivity to remain competitive in a post-MFA regime of world textiles trade. Weak growth in a few sectors notwithstanding, the NCAER Business Confidence Index continued its upward trend in January 2004 (Figure 3). Buoyancy in investment and consumption demand and rising business confidence reinforced one another in the upswing of the



Source: NCAER. 2004. *Business Expectations Survey*. January. New Delhi: National Council of Applied Economic Research.

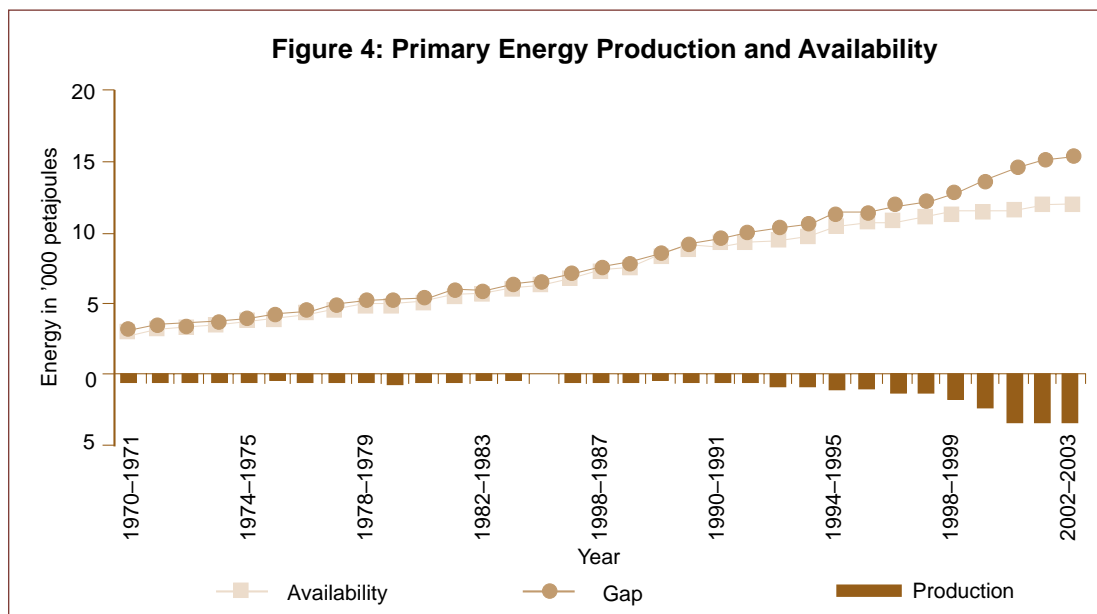
business cycle. Other leading indicators like growth in non-food credit, especially housing credit, also reflect this upswing.

4. Broad-based manufacturing growth during FY2003 was also supported by the pick up in growth of key infrastructure industries such as energy, cement and steel. Growth of the energy sub-sector in particular, comprising of coal, petroleum, natural gas, and electricity, is of critical importance. With domestic production growing at an average annual rate of 4.5% since 1970–71, the gap between domestic production and availability has been increasing over time (Figure 4). This gap is largely on account of crude petroleum. Bridging the gap will require increasing capacity of other existing sources such as hydel power<sup>3</sup>, and finding alternate sources of energy. This is an important priority for sustaining a high rate of growth.<sup>4</sup>

5. The step up in services sector growth and buoyant industrial growth in FY2003 come together with remarkably high growth in agriculture. The sector grew by a staggering 16.9%

<sup>3</sup> Mr. R. V. Shahi, Secretary, Ministry of Power, Government of India made this remark in a recent speech. See *Power Line*. February 2004. pp 36–37.

<sup>4</sup> Refer to the Special Feature on “Energy Policy for Higher Economic Growth in India” by R. K. Pachauri in this issue of the Bulletin.



Source: Compiled from [http://www.mospi.nic.in/stat\\_pr.htm](http://www.mospi.nic.in/stat_pr.htm)

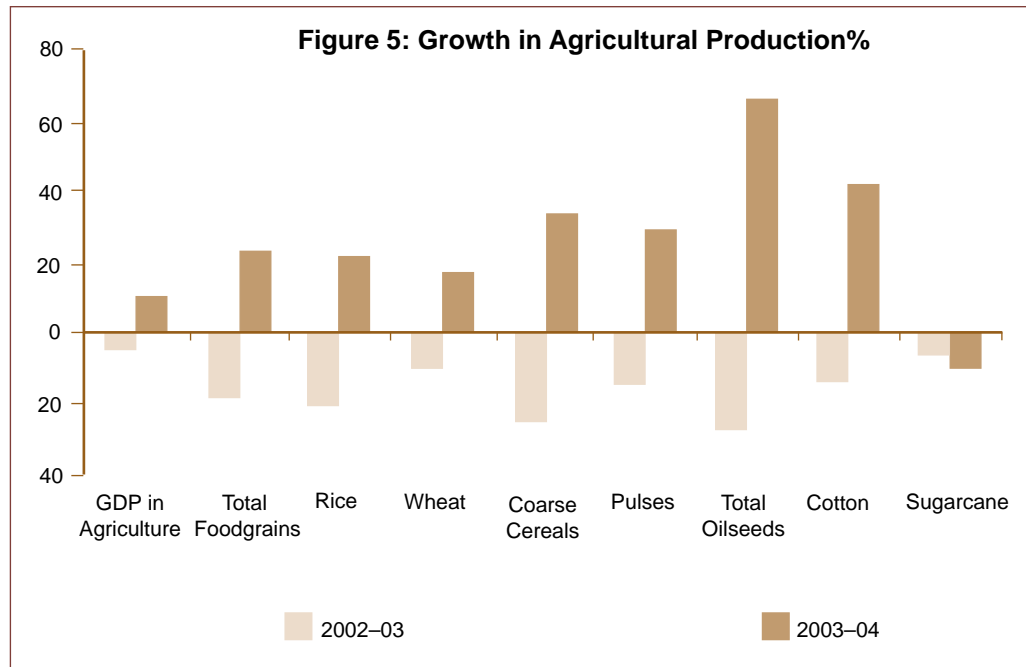
during October-December 2003 because of the recovery from a sharp drop in production during the same period the previous year. Growth in the sector is estimated at 9.1% for the year as a whole. Such high rates of agricultural growth are not unusual in a year following a drought and drop in agricultural production the previous year<sup>5</sup> (Figure 5). Moreover, these early estimates of agricultural growth in FY2003 may also be revised.<sup>6</sup> Such high growth in agriculture is unlikely to be sustained in the current year, even under normal monsoon conditions.

### III. Interregional Disparity

5. Though India's growth performance has been improving, there are serious concerns about large inter-regional disparities in growth and persisting inter-state variations in per capita income. During the period 1994-2001, Gujarat, Karnataka, Rajasthan and West Bengal

<sup>5</sup> The agricultural year in India runs from July to June, and is thus different from the financial year.

<sup>6</sup> Some indications point to lower growth of foodgrain production in 2003-04 than currently estimated because of a sharp rise in temperatures during March 2004, which adversely affected the realization of the *rabi* (winter) wheat crop.



Source: Compiled from <http://agricoop.nic.in/stat.htm>

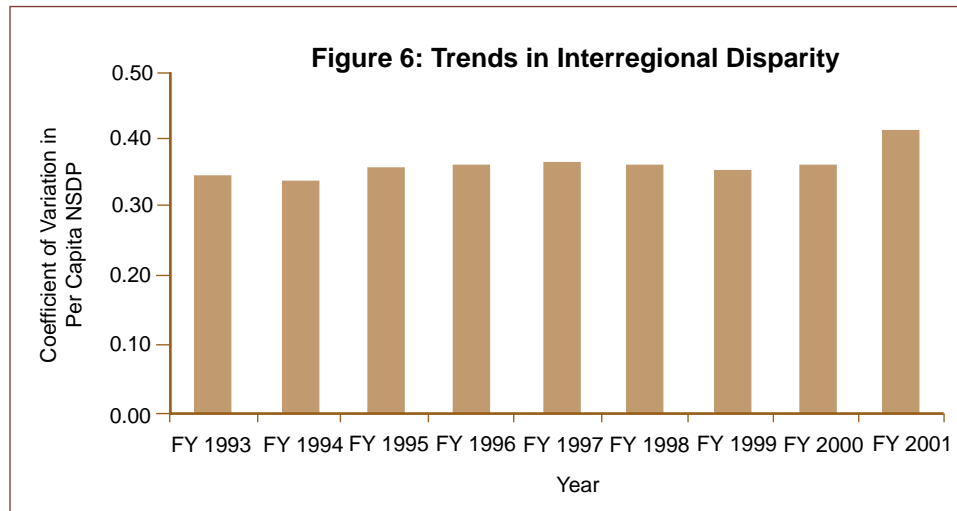
grew at over 7.0%, while other states like Assam, Bihar, Madhya Pradesh, Orissa, Punjab, and Uttar Pradesh grew at much lower rates, with Assam recording the lowest average growth at 2.3%.<sup>7</sup> With significant disparities in growth across states, large variations in per capita income across states have persisted during the 1990s. The coefficient of variation of per capita net state domestic product (NSDP) remains almost unchanged at 0.35 during FY1993-FY2000, with a slight increase in FY2001 (Figure 6).<sup>8</sup>

#### IV. Fiscal Developments

6. There has been some improvement in the federal government's fiscal indicators

<sup>7</sup> Ahluwalia (2000) shows that growth performance of a number of states improved during the 1990s as compared to growth during the 1980s, but large variations in growth across states remained.

<sup>8</sup> For earlier periods, several authors have assessed trends in inter-state disparity using different convergence measures (Barro and Sala-i- Martin, 1995). Marjit and Mitra (1996), Rao et al. (1999), Nagaraj et al. (2000), Ahluwalia (2000) and Dasgupta et al. (2001) found evidence of increasing disparity across states. Shetty (2003) and Bhattacharya and Sakthivel (2004), also find that inter-state inequality has increased. Singh et al. (2003) conclude that, depending on the choice of indicator, inter-state disparity can be either increasing, decreasing or stable.



Source: Compiled from [http://www.mospi.nic.in/11\\_percapitansdp\\_const\\_9394ser.htm](http://www.mospi.nic.in/11_percapitansdp_const_9394ser.htm)

during FY2003. The revised estimate of revenue deficit is 3.6% of GDP compared to 4.4% in FY2002. Similarly, the fiscal deficit declined from 5.4% in FY2002 to 4.8% in FY2003. Not just the ratios but even the absolute levels of these deficits are observed to be lower than the budget estimate (Table 2). The decline in the revenue deficit is mainly on account of a more than anticipated increase in receipts, especially the 358.6% increase in recoveries of loans. This includes prepayment of high cost debt by several states under the Debt Swap Schemes and receipts from disinvestments proceeds. These non-debt capital receipts are one-time measures, not measures for a sustained reduction of the deficit. Thus, the fiscal situation of the federal government remains a cause for concern. If the new union government that comes to power in May 2004 fails to come to grips with the fiscal challenge, macroeconomic stability and growth buoyancy will be jeopardized.

## V. Inflation, Money and Financial Market Developments

7. The inflation rate<sup>9</sup> has started creeping up, though it is still moderate. The inflation rate for the year as a whole averaged 5.5%, up from 3.4% during FY2002 (Figure 7). Rising

<sup>9</sup> This is inflation measured by the Wholesale Price Index (WPI).

**Table 2: Fiscal Indicators for the Indian Economy, FY2003**

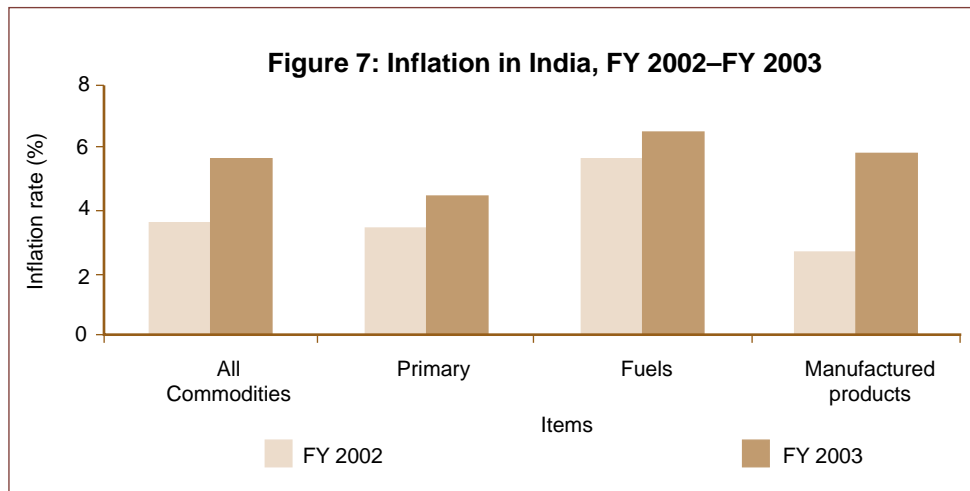
(Rs. billion)

| Indicators<br>(1)                       | Budget Estimate<br>(2) | Revised Estimate<br>(3) | (3) / (2) (%) |
|---|------------------------|-------------------------|---------------|
| Revenue Receipts                        | 2539                   | 2630                    | 103.6         |
| <i>of which</i>                         |                        |                         |               |
| Tax Revenue                             | 1849                   | 2112                    | 114.3         |
| <i>of which</i>                         |                        |                         |               |
| Direct Tax                              | 956                    | 1033                    | 108.0         |
| Customs, Excise, Service Tax            | 1541                   | 1500                    | 97.3          |
| Non-tax Revenue                         | 698                    | 755                     | 108.2         |
| Capital Receipts                        | 1849                   | 2112                    | 114.3         |
| <i>of which</i>                         |                        |                         |               |
| Recoveries of loans                     | 180                    | 646                     | 358.6         |
| Other Receipts including Disinvestments | 132                    | 145                     | 109.8         |
| Total Expenditure                       | 4388                   | 4743                    | 108.1         |
| <i>of which</i>                         |                        |                         |               |
| Current Expenditure                     | 3662                   | 3629                    | 99.1          |
| Capital Outlay                          | 726                    | 1114                    | 153.5         |
| Revenue Deficit                         | 1123                   | 999                     | 88.9          |
| Fiscal Deficit                          | 1536                   | 1321                    | 86.0          |

Source: Compiled from <http://indiabudget.nic.in/ub2004-05/bag/bag1.htm>

inflation is evident for primary articles as well as fuels, and manufactured products. However, inflation as measured by the consumer price index (CPI) for industrial workers was lower at 3.8% during FY2003.

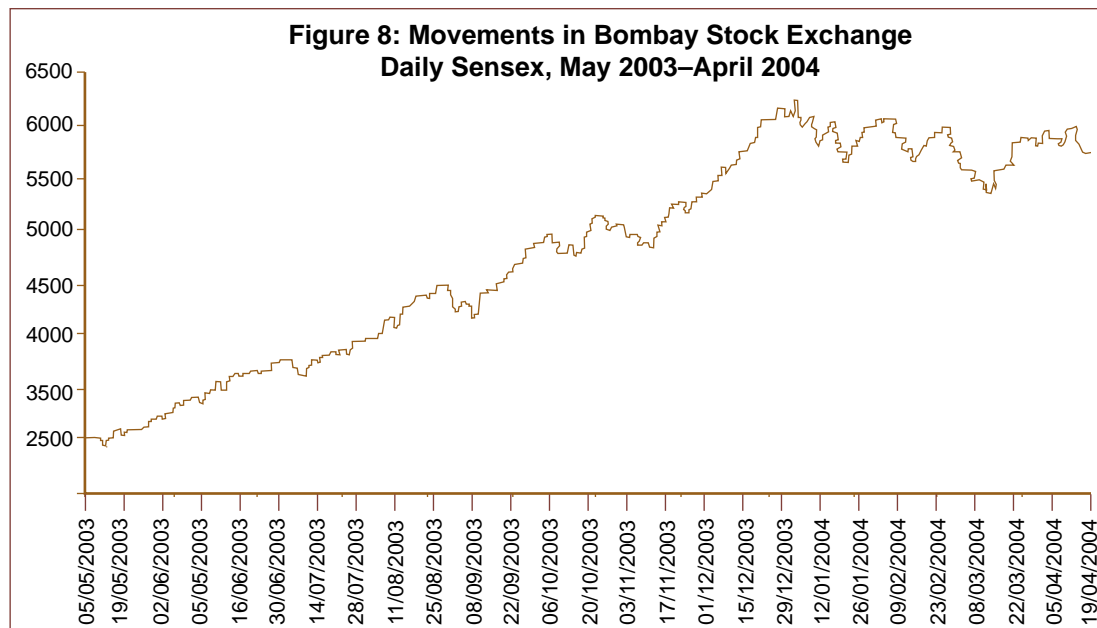
**8.** Money supply (M3) growth has risen in recent months. After growing at around 11.0% for a large part of the year, M3 growth rose to 15.8% by 19 March 2004. Rising M3 growth during FY2003 is largely on account of a surge in inflow of foreign exchange, central bank interventions in the foreign exchange market, and resulting expansion of the monetary base. Normally, the central bank can sterilize the effect of an increasing monetary base through open market operations. However, the scope for such open market operations



Source: Compiled from <http://www.eaindustry.nic.in>

was increasingly constrained by the declining stock of government securities in the Reserve Bank of India's (RBI) portfolio. Consequently, RBI has proposed a new Market Stabilisation Scheme (MSS). Under this scheme the government will issue treasury bills and dated securities in addition to its normal borrowing requirements, which will be issued and serviced like any other marketable government security. However, the amounts raised under the MSS will be held by the RBI on behalf of the government, and solely for the purpose of redemption or buy back of treasury bills and dated securities. Though this instrument can stabilize the money market, there will be an adverse impact on revenue and fiscal balances of the government on account of interest payment on treasury bills and dated securities under the MSS.

**9.** In recent months the capital market has witnessed significant fluctuations. The Bombay Stock Exchange Sensitive Index (BSE Sensex) went up from about 5000 in late November 2003 to 6000 in early January 2004 (Figure 8). The rally in the stock market during this period was across the board, and mainly attributed to foreign institutional investment (FII) inflows. The market has been very volatile since then although the overall sentiment remains bullish. Stock prices showed a downward trend starting in early January 2004, then recovered by mid-February. Daily mood swings have been seen in the market over the past few months. The interim budget announced on 9 January 2004 explains the volatile market behavior to some

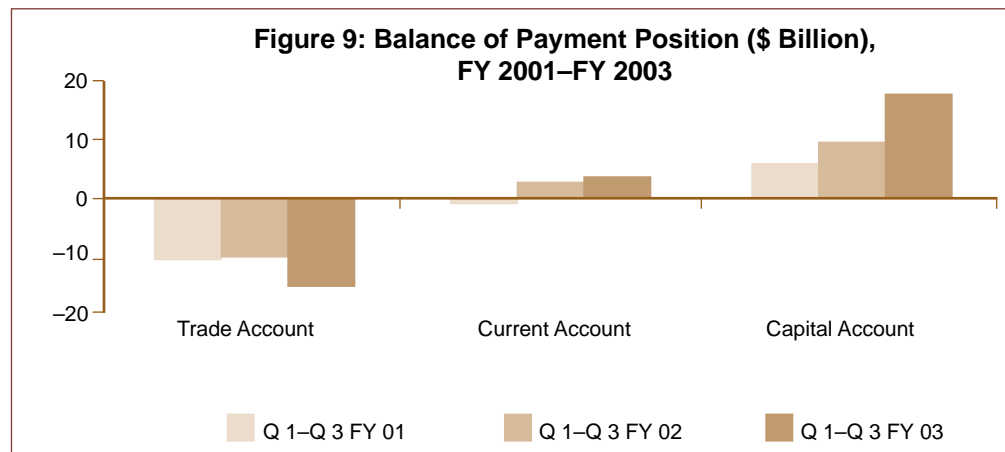


Source: Compiled from <http://www.bseindia.com>

extent. Intra-day volatility since then has been attributed by some analysts to fears of a possible ban on the use of participatory notes. These notes are issued to overseas investors who want exposure to Indian stocks, but would like to avoid the required cumbersome procedures. The decline through January and early February may have been accentuated by the incidence of short selling as well as panic selling on some days. The turnaround in the Sensex since mid-February was triggered by the upgrading of India's foreign debt by international credit rating agencies. FII investment has also been higher during the last few months, encouraged by the quarterly results of the corporate sector. Further, the divestment process under which the government offloaded as much as 10% stake in ONGC and GAIL through a public offering has boosted market sentiments. However, recent uncertainties about national elections and government formation have again made the BSE sensitive index of stocks vulnerable to large-scale institutional selling.

## **VI. Balance of Payments and Foreign Exchange Reserves**

**10.** The external sector was buoyant in FY2003, with high growth in trade. Merchandise



Source: Compiled from <http://www.rbi.org.in>

exports grew at 12.5% during April-December 2003. Merchandise imports registered even higher growth at 20.8%. High import growth is indicative of strong domestic growth and larger domestic absorption during the period. High merchandise export growth during FY2003, despite an appreciation in the real exchange rate of the rupee, reflects buoyancy in world demand. With merchandise imports growing faster than exports, the trade deficit increased during April-December 2003 as compared to the same period in FY2002 (Figure 9). However, despite an increasing trade deficit, the current account remained in surplus at 0.7% of GDP. The favourable current account position is an outcome of around 45.0% growth in the invisibles balance during April-December 2003 as compared to the same period in FY2002. The sharp rise in invisibles export earnings is largely on account of software services and earnings from business process outsourcing to Indian enterprises. Invisibles export earnings would have been higher but for lower margins on account of rupee appreciation against the dollar, and outsourcing restrictions in some countries. Exports of services, especially IT enabled services, now account for over 30% of total exports and are growing at 15.2% a year. Merchandise trade statistics, which exclude data on services exports, are therefore increasingly inadequate for analyzing foreign trade trends.

**11.** The current account surplus, along with a positive capital account balance, raised foreign

exchange reserves to \$107.5 billion in FY2003, with an estimated net inflow of \$35.6 billion during the year. The capital account surplus nearly doubled during the first three quarters of FY2003 (April-December) as against the comparable period of FY2002 (Figure 9). The net capital inflows during this period were largely on account of \$7.6 billion net portfolio investments, \$5.6 billion banking capital inflows, \$5.0 billion net other capital flows, and \$2.4 billion short-term loans. Foreign direct investment was only \$2.5 billion. This is indicative of some deterioration in the quality of foreign exchange reserves build up in FY2003 as compared to the previous year (Table 3). There are downside risks in the rising share of reversible portfolio investments and short-term loans, and relatively large banking capital inflows. Doubts are also being raised about the rationale of maintaining such large reserves

**Table 3: Sources of Accretion to Foreign Exchange Reserves (\$ billion)**

|  | FY2002      | April-December FY2003 |
|--|-------------|-----------------------|
| Current Account Balance                | 4.1         | 3.2                   |
| Net Capital Account<br><i>of which</i> | 12.1        | 17.3                  |
| Foreign Investment<br><i>of which</i>  | 4.6         | 10.1                  |
| Foreign Direct Investment              | 3.6         | 2.5                   |
| Foreign Portfolio Investment           | 0.9         | 7.6                   |
| Banking Capital                        | 8.4         | 5.6                   |
| Loans<br><i>of which</i>               | -3.8        | -3.2                  |
| Short-term Loans                       | 1.0         | 2.4                   |
| External Commercial Borrowings         | -2.3        | -3.7                  |
| External Aid                           | -2.5        | -1.8                  |
| Other Capital                          | 3.4         | 5.0                   |
| Errors & Omissions                     | 0.7         | 0.3                   |
| Valuation Change                       | 3.9         | 4.9                   |
| <b>Additions to Reserves</b>           | <b>20.8</b> | <b>25.7</b>           |

Source: RBI, 2004. *Reserve Bank of India Bulletin*. May. (<http://www.rbi.org.in>).

when the opportunity cost is high, the rupee appreciation is adversely impacting the competitiveness of exports, and the monetary base expansion is building up inflationary pressures.<sup>10</sup>

## VII. Near-Term Outlook

12. The near-term economic outlook is promising. The economy is on the upswing of a business cycle, and the underlying long-term growth rate is accelerating. Hence the high growth momentum is likely to be sustained through FY2004-FY2005 (Table 4).<sup>11</sup> This forecast is based on the assumption that sound macroeconomic fundamentals will be maintained, including the expected initiation of a serious fiscal consolidation effort following elections in May 2004; that business sentiments will continue to strengthen within and outside India; and that there will be no unforeseen shocks such as drought, war, oil price hike, etc.. Based on these positive assumptions, GDP is forecast to grow at

**Table 4: Near-Term Projections for Major Economic Indicators: India (%)**

| Indicators                                     | FY2004 | FY2005 |
|--|--------|--------|
| Real GDP Growth                                | 7.4    | 7.6    |
| Inflation                                      | 5.0    | 4.7    |
| Gross Domestic Investment/GDP                  | 24.5   | 25.0   |
| Gross Domestic Saving/GDP                      | 24.8   | 25.3   |
| Money Supply (M3) Growth                       | 13.6   | 13.5   |
| Consolidated Fiscal Balance <sup>a</sup> / GDP | -10.0  | -9.5   |
| Export Growth                                  | 16.1   | 17.6   |
| Import Growth                                  | 18.7   | 19.5   |
| Current Account/ GDP                           | 0.3    | 0.3    |
| External Debt/GDP                              | 16.0   | 15.0   |

Note: <sup>a</sup> This includes the combined fiscal deficit of the federal government and all state governments.

<sup>10</sup> See Lal, Bery and Pant (2003).

<sup>11</sup> See ADB (2004).

7.4% in 2004 with a trend growth of 3.0% and 8.5% growth in agriculture and services respectively, and 9.3% growth in industry. This reflects a peaking of the industrial business cycle which started in FY2002, prior to the upturn of the GDP business cycle. Despite the downturn of the industrial cycle in FY2005, higher services growth of 9.0% is expected to yield aggregate growth of 7.6%.

**13.** The positive assumptions underlying the above projections have associated risks. If the new government that takes over in May 2004 fails to come to grips with the fiscal deficit and other urgent reform issues, this will erode business confidence and undermine investment, resulting in reduced growth. A shift in international investor preferences could curb or even reverse the inflow of foreign capital, which is largely in the form of reversible portfolio investments, short-term loans and banking capital. This calls for a cautious policy with regard to capital account liberalization. In addition, hardening of oil prices could trigger inflation, and also widen the trade gap. Finally, a setback in agriculture due to poor monsoons could be damaging for growth, and especially for employment and poverty reduction, since the sector accounts for as much as 56.5% of employment. Moreover, the large bulk of poor people in India are dependent on agriculture.

**14.** Of all these risks, the link between fiscal consolidation, investment and growth is particularly important for policy makers. The private sector savings rate is about 26% of GDP, while the private sector investment rate is only around 16%. Thus, over 10% of GDP or 38.5% of private savings is appropriated for the public sector. However, since there is a dissaving of about 2.0% of GDP in the public sector, and a small current account surplus, the investment rate has remained at around 23%–24%. The 10th Plan growth target of 8.0% assumes an increase of the investment rate to 28.4% and a public investment rate of 8.44%, including financing by public savings of about 0.44% of GDP. These targets and assumptions are unrealistic, since even this modest public sector surplus implies a sharp fiscal turnaround from the 2.0% dissaving prevailing at present. However, assuming that the new government will launch a serious fiscal consolidation effort and achieve some reduction in public dissaving, the overall savings rate is expected to rise to 24.8% and 25.3% during FY2004 and FY2005 respectively. The investment rate is projected at 24.5% and 25% during these

two years, allowing for a small current account surplus of 0.3%.

**15.** Taking advantage of declining interest rates abroad and the large inflow of foreign capital, India has been pre-paying some of its high cost external debt. This process is likely to continue over the medium term, reducing the external debt ratio from 18.0% at present to around 16.0% in FY2004 and further to 15.0% in FY2005. Debt pre-payment has also moderated the appreciation of the exchange rate and the impact of capital inflows on the monetary base. This has helped reduce the required volume of sterilization. The central bank is expected to continue the policy of sterilization through the MSS instrument. Accordingly, money supply growth is likely to remain in the range of 13%–14% over the next two years. Inflation will remain moderate at around 5.0% under the positive scenario discussed above.

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# Special Feature

## Energy Policy for Higher Economic Growth in India

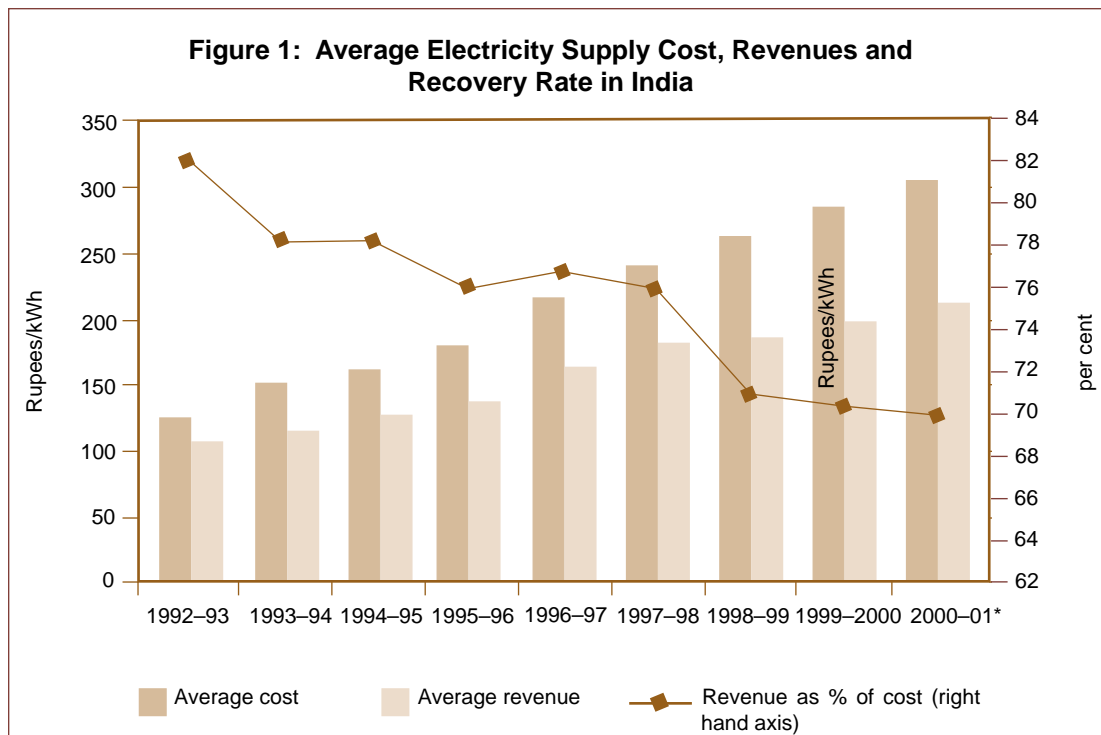
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Dr. Rajendra K Pachauri, a leading expert in the area of climate change and its policy dimensions, has headed TERI since 1981. He is also Chairman, Intergovernmental Panel on Climate Change (IPCC). In July 2001, Dr Pachauri was appointed Member, Economic Advisory Council to the Prime Minister of India. He is the author of 21 books and several papers and articles in professional journals. He has also served on academic and research bodies of various institutes in India and abroad. Dr Pachauri has served as Member, Panel of Eminent Persons on Power, Ministry of Power; Government of India; Member, Advisory Board on Energy (ABE), Government of India, 1983 – 1988; Member, National Environmental Council, Government of India; Member, Oil Industry Restructuring Group, Ministry of Petroleum and Natural Gas, Government of India, 1994. He was also Member, Board of the International Solar Energy Society (ISES), 1991–1997; Member, World Resources Institute (WRI) Council, 1992; Chairman, Work Group A – World Energy Council (WEC) Committee on Developing Countries, 1993–1995; President (1988), Chairman (1989–90), International Association for Energy Economics (IAEE), Washington, D C.; and President, Asian Energy Institute since 1992. He has also served on the Board of Directors of various national and international organizations/bodies. He was awarded the “Padma Bhushan” by the President of India in January 2001.

1. Considerable attention has been focused, for very good reason, on the recent upturn in economic growth in India and on the question whether the Indian economy can grow at over 8% a year in the coming years and decades. What we see today is no doubt a consolidation of the upswing in economic activity that began as far back as the mid 1980s, but a forward looking analysis would require that the forces propelling economic growth and those that are likely to constrain it be carefully identified and assessed. As a typical and significant example of such forces, in recent years we have seen major problems in the reliability and adequacy of power supply, which have generally constrained economic activity in several sectors. But, more importantly, these problems have increased the cost of power as a component of the total cost of production of goods and services, wherever power consumers have had to set up captive generation units, which are necessarily more expensive per kWh of electricity delivered. Another serious factor in increasing the price of electricity for different sectors of the Indian economy is the universal provision of voltage stabilizers and other protective systems that become essential against the major fluctuations of voltage and frequency that characterize the Indian power supply system. If India has to compete in the global market then it has to shed the burden of higher electricity costs, inclusive of all these allied costs. The reform process in the power sector unfortunately is moving so slowly that there is clearly a mismatch between the potential for growth and dynamism that exists in several productive sectors that use power, and the inability of the power supply industry to provide adequate and reliable service at costs that can compete with the cost of this input in other countries.

2. One simple indicator of the ill health of India's power sector relates to the average revenue generated per unit of power supplied against the average cost per unit. Figure 1 shows data on these variables for recent years. It is relevant to see that since the early 1990s the ratio of revenue to cost per unit of power supplied has actually been going down. The result is that not only does this handicap the power sector in investing in new capacity for expansion of supply, but even the plant and equipment that is used remains in a state of disrepair, because of inadequate expenditure on maintenance and upkeep.



Source: IEA. 2002. *World Energy Outlook 2002*. Paris: International Energy Agency

3. The power sector, of course, is only one segment of the energy supply industry. Public attention on other sectors unfortunately is much lower, perhaps because the hydrocarbon industry has been generally quite efficient in supply of petroleum products in various parts of the country. Petroleum products have, therefore, become a swing fuel, filling up the gap wherever other forms of energy are not available. The coal sector, on the other hand, has very few areas where direct supply takes place to the public as consumers, and hence the public does not suffer directly from inefficiency or inadequacies that appear in the performance of this sector. The bulk of coal supply in India goes to the power sector, and therefore escapes direct attention from analysts, the media and the public at large. Yet coal is an extremely important part of energy supply in this country, with a potential for playing a much larger role in the future.

4. India has been served well by a number of committees that have highlighted the importance of a coherent energy policy, beginning with the Energy Survey of India Committee in the early 1960s. This was followed by the Fuel Policy Committee about a

decade later, but the recommendations of this body were rendered partly irrelevant by the sudden oil price increase of 1973–74, which radically altered the assumptions that guided its analysis and recommendations. Later in the same decade, the Government of India set up the Working Group on Energy Policy, which completed its work in 1979 and mapped out the detailed contours of the country's future energy policy. However, much of its work remained unutilized because of subsequent changes in government at the center and a fragmentation of responsibility with parcelling out of different parts of the energy sector to different ministries and departments. A further attempt to elevate energy policy to a higher level of treatment within an integrated framework was made in 1982, when the Advisory Board on Energy was established with a Chairman of cabinet rank who reported directly to the Prime Minister. This Board carried out extremely useful work in evaluating options and highlighting priorities in the energy sector, but the Board itself was disbanded in 1986, largely because its writ was ignored by various departments and ministries in the Government of India. This happened despite the fact that its recommendations were approved by the Prime Minister before they were forwarded for action to relevant wings of the government both at the center and in the states.

5. As India looks at the means for and prospects of attaining and maintaining high rates of economic growth, the energy sector remains fragmented and largely ignored as an important element of economic policy, partly because there is no single entity in the government that is capable of formulating an integrated energy policy or highlighting the importance of energy in economic decision making. As a result, adequate attention has not been paid to the kinds of challenges India would face in the energy sector in the future. Yet, unless energy policy is integrated with and elevated to the level of overall economic policy, there is the danger not only of physical constraints on supply during specific periods of time but also the possibility of high costs of production in different sectors of the economy, particularly those that have an overwhelming dependence on energy as a factor of production. Essentially energy policy would need to be focussed on the following three broad objectives:

- access to modern forms of energy for the entire population of India;
- ensuring environmental protection throughout the energy production – conversion – consumption cycle; and

- ensuring security of energy supply from indigenous as well as external sources.

6. The first of these three objectives has not received the intellectual inputs that are required for devising integrated solutions particularly in rural areas. Nor have financial resources been deployed effectively for creating sustainable supply options that could meet the demand of a large part of the population, which still resides in the villages of India. Even in the large metropolitan cities and other urban locations in India, slum dwellers rarely have the capacity to consume modern forms of energy. Nor do they have legal access to electricity supply, for instance. As in most developing countries, therefore, supplies are often arranged illegally by tapping distribution lines. The liberalization of LPG supply has had a favourable impact nationwide, and the provision of special subsidies has made it possible in several remote locations, particularly in the mountain states of Jammu and Kashmir, Himachal Pradesh, Uttaranchal and parts of the North East, for people to receive significant quantities of supply of LPG. Expanded access to LPG has led to a reduction in demand for firewood in these states. However, some of the poorest sections of the population in these locations still need to spend long hours collecting twigs and very poor quality biomass for cooking purposes. In the mountain areas of Garhwal for instance, it is not unusual for women to walk 6 or 7 kilometers a day just in order to collect a head load of very poor quality fuelwood to meet basic cooking requirements for the household.

7. There is a larger development implication which needs deep consideration when addressing the problem of inadequate and restricted access to modern forms of energy for a large part of India's rural population. Given the fact that the rural areas of India are still dependent on agriculture and the production of fruits and vegetables, the farmer has to earn a living based on the vagaries of the market. India, for instance, is the largest producer of fruits and vegetables, but only 2% of the total produce is actually processed. Not only would an expansion of the food processing industry enhance the incomes of farmers, but it would also allow choices both by urban as well as rural segments of the population for consuming specific vegetable and fruit products round the year. Ideally, some degree of food processing and preservation of produce in cold storages should take place wherever these fruits and vegetables are grown. The lack of infrastructure, particularly in respect of modern energy supply and lack of access to finance, inhibits the growth of such facilities

in rural areas. To this extent the rural electrification program, based essentially on extending supply from the electricity grid and providing power at highly subsidized rates to the farmer, has had limited success. No doubt, large parts of the country have been able to bring about the Green Revolution by tapping groundwater resources using electric pumping sets with extension of power supply. But since the provision of this power has saddled the power supply industry with a huge financial burden in the form of subsidies, the quality and reliability of supply to rural areas receives very low priority. In the absence of suitable and reliable power supply, few enterprises can be established on a viable basis in these locations.

**8.** A forward looking approach is defined by TERI's program called INSTEP (Integrating New and Sustainable Technologies for the Elimination of Poverty). Essentially, INSTEP takes a comprehensive view of the development challenge in rural areas and embraces technological innovation in a combined and integrated manner involving agriculture, information technology and decentralized production of energy. Successful measures of innovation across the board generally lead to substantial increase in incomes. However, the management of decentralized energy supply cannot take place in the absence of proper institutional arrangements. This is where a typical government driven top-down approach generally proves ineffective. The answer lies in creating or strengthening local institutional infrastructure, involving entrepreneurs, NGOs (where available), cooperatives or the local panchayats themselves to take on the task of producing and supplying energy on a decentralized basis in a commercially viable manner. Access to finance would be a critical part of such solutions, but the recovery of any investments would normally be assured if proper institutional arrangements and systems are in place so that revenues are collected for the energy supplied. Several such schemes are now flourishing in different parts of the country, but the lessons derived from them need widespread dissemination. Current government plans to energize a large number of villages may prove less than successful, given the fact that they are likely to emphasize a top-down approach favouring in many cases the installation of diesel generating sets for decentralized supply.

**9.** This leads us to consider the second objective of what should constitute India's energy policy, namely ensuring a clean environment related to the production and use of energy.

One major consequence of inadequate and unreliable power supply is the installation of different sizes of captive generating sets throughout the length and breadth of the country. In a study carried out by TERI for the Asian Development Bank focussing on the Agra – Mathura trapezium, one of the major sources of pollution documented and quantified in the area, and one that would pose a threat to the Taj Mahal, was the existence of small diesel and kerosene generators. The study recommended the establishment of a 500 MW power plant to be operated on commercial lines for supply of reliable power in the trapezium area. This would have obviated the need for tens of thousands of small generating units and eliminated the pollution they create. Unfortunately, the entire technical assistance project on this subject and the measures that were envisaged have not been implemented.

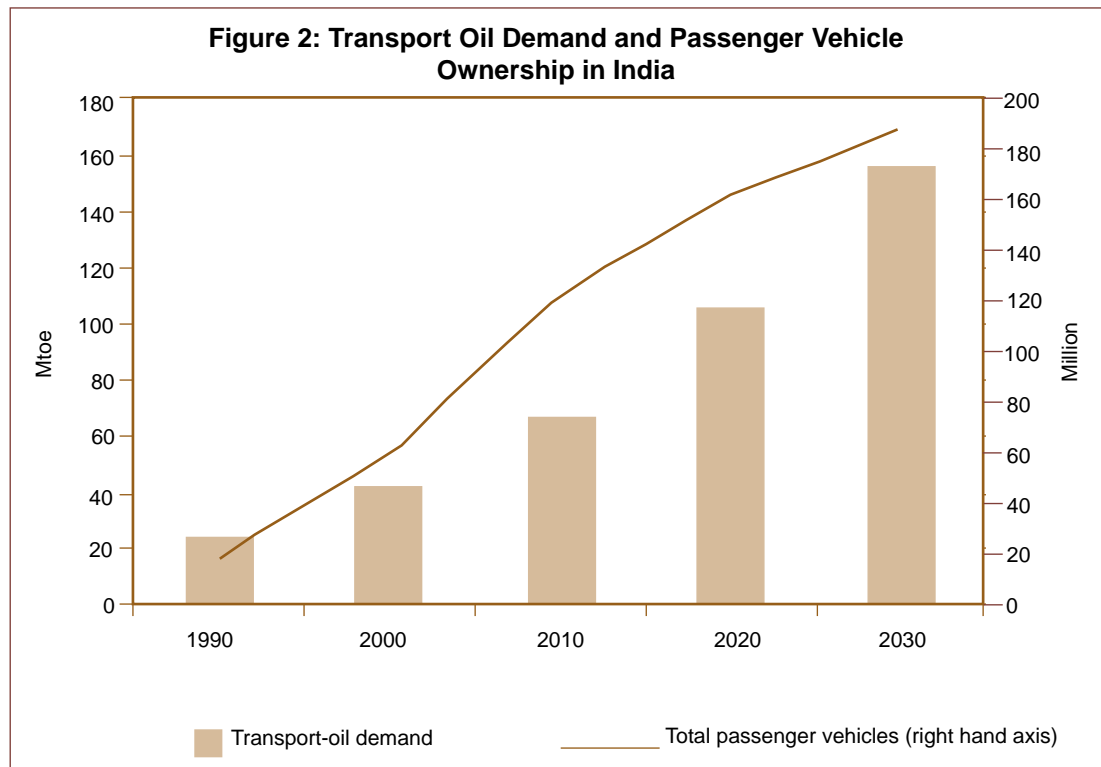
**10.** One of the major sources of air pollution particularly in the towns and cities of the country emanates from the transport sector. While the metropolitan areas have seen significant improvement in air quality, because of the introduction of Euro-II standard vehicles and in some cases cleaner fuels, the problem in most of the urban areas of India continues to remain acute. This results from very poor automobile technology in some areas, poor upkeep of road vehicles, large scale adulteration of diesel fuel and petrol with kerosene (which is heavily subsidized), and poor traffic conditions. As yet, unfortunately public transport continues to receive inadequate attention, and this is true not only of intra-city mobility but also of inter-city movements countrywide.

**11.** Indoor air pollution is a major health hazard for a large number of poor families in the country. The high dosage of pollutants inhaled as a result of cooking with poor quality fuels in small and confined homes leads to high morbidity and mortality among women and children in particular. This problem has persisted over a long period of time, and requires urgent attention for social and economic reasons. A household energy policy based on the INSTEP approach can provide effective and viable solutions.

**12.** From the viewpoint of energy security, analysis of the reasons for increased dependence on oil imports needs to define future policy. At the macro level the country has increased its dependence on road transport at the cost of the share of rail transport over the last 40 years or so. Even intra-city transport requires an urgent shift to public transport, which needs expansion in size and improvements in efficiency. The relationship between transport oil

demand and passenger vehicle ownership in India is shown in Figure 2. The situation could get completely out of hand with the growth rates projected if this business as usual scenario is actually realized. The population of almost 200 million cars projected for 2030 would consume approximately 160 million tonnes oil equivalent of energy per year at that stage, which in approximate terms represents the total consumed in the country in 2000, including all forms of energy.

**13.** Proliferation of motorized passenger vehicles and increasing freight movement on trucks is likely to create a system from which deviations would become difficult in the future. The growth of automobile manufacturing in the country and the construction of highways on a large scale would make it economically and politically difficult to create public transport options independent of automobiles, particularly those involving an expansion of the railway system. The extreme dependence of road transport on petroleum products would lead to a substantial increase in oil consumption and therefore on oil imports. The popular notion of threats to energy security centers around physical disruption



Source: IEA, 2002. *World Energy Outlook 2002*. Paris: International Energy Agency.

in supply of energy. In actual fact, security in this context needs to be viewed in terms of economic implications of specific energy developments. The International Energy Agency projects a consumption of 5.6 mbd of oil in the year 2030 in India as compared to 2.1 mbd in the year 2000. While arrangements for a strategic petroleum reserve and proper commercial linkages for importing oil from overseas may not leave much room for the risk of physical disruption of supply, the economic implications of sudden price increases with such a heavy dependence on oil imports poses serious problems of energy security for India within an economic context. The answer lies not only in creating adequate indigenous supply options, including those that harness renewable sources of energy, but also in restructuring major consuming sectors, particularly transport.

**14.** The economic impacts of sudden oil price increases can be disastrous, as indeed has been the case in recent history. If we go back to the first oil price shock we find that the increase in the wholesale price index in India was 16.55% in 1973 and 29.01% in 1974. This was, therefore, a period of unprecedented inflation which hit the Indian economy and caused severe political impacts, which do not require any elaboration. Similar economic crises hit the country in 1979–80 in the wake of the second oil price shock and in 1990–91 after the first Iraq war. It should, therefore, be clear that India pays a heavy price in terms of loss of economic welfare, social unrest and unfavourable political developments resulting from sudden oil price increases. These impacts would only become more severe with the unsustainable dependence on oil consumption and imports that would take place in the next quarter century if India followed a business as usual path.

**15.** The coming decades would require major investments in energy supply and infrastructure. An estimate by the International Energy Agency showing the total investments required in India is given below:

|                               | 2001–2010 | 2011–2020 | 2021–2030 | 2001–2030 |
|-------------------------------|-----------|-----------|-----------|-----------|
| Total Investment (\$ billion) | 172       | 247       | 347       | 766       |

To ensure this level of investment would require a substantial extent of reform in the

energy sector as a whole, but more particularly in the power sector. In realistic terms, if modern energy sources are to become accessible to vast areas in rural India, a departure will have to be made from the current subsidy driven approach used in rural electrification. If the same approach is pursued as in the past, the power sector would only get burdened further, arresting even the slow pace of reform that we see today. The answer lies largely in the creation of local institutions that allow revenues to be realized directly from the community and energy supply to be managed on a decentralized basis. Besides changes at the grass roots level to ensure access to energy for all, major improvements at the macro level are overdue to improve the overall efficiency of energy use in the economy and a reduction in oil import dependence. For this purpose, India would need to follow a radically different path in the growth and development of the transport sector and a path that emphasizes the growth of economic activities that are characterized by low intensity of energy use.

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