

Economic Consequences of the Gujarat Earthquake

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I. Introduction

On the morning of January 26, 2001, just when India was celebrating her 51st Republic Day, an earthquake of 6.9 intensity on the Richter scale with epicentre 20 km northeast of Bhuj hit the western state of Gujarat.^{2,3} Bhuj is the headquarters of the district of Kutch. Kutch, with a population of 1.47 million⁴, extends over 45,662 sq. kms., and is larger than the States of Haryana (44,212 sq. kms.) and Kerala (38,863 sq. kms.). The quake devastated Kutch, and wreaked extensive damage in the adjoining districts of Ahmedabad (5.74 million), Rajkot (3.05 million), Jamnagar (1.69 million), Surendranagar (1.37 million), and Patan (estimated at 1.21 million).^{5,6} Practically all buildings and structures in five talukas (administrative subdivisions of the district) of Kutch, namely Bhuj (327 thousand), Bhachau (127 thousand), Rapar (164 thousand), Anjar (365 thousand) and Gandhidham (116 thousand) have been brought down by the quake. The death toll in Kutch was a staggering 11.5 per 1,000 people.

Based on body count, until midday February 15, 2001, the total casualty was 18,602.^{7,8} As of February 15, 2001, the number of deaths reported in Kutch itself was 17,030. Extensive losses have been reported from the affected areas. On the basis of preliminary estimates, the severity of the quake and its devastation can be judged by a comparison of some natural disasters in recent times (Table 1). Table 1, however, underscores a fundamental problem of inter-country comparison of natural disasters. Normalisation of disaster induced deaths, homelessness, and economic loss by the

² The exact time was 8:46 a.m. and the location of the epicentre was 23.6° north latitude and 69.8° east longitude. Tremors were felt in adjoining and other States as well, but with much less severity than in Gujarat.

³ The Richter scale, developed in 1935, measures the intensity of earthquakes by using a standard seismometer to measure the maximum amplitude of shaking. The scale is logarithmic and each point of change in the scale represents a ten-fold change in the intensity of the quake.

⁴ The population figure for 2001-02 is as projected by the Directorate of Economics and Statistics, Government of Gujarat. The census figure for 1991 was 1.26 million.

⁵ The figures within parentheses are population figures for 2001-02 as projected by the Directorate of Economics and Statistics, Government of Gujarat.

⁶ The outer shell of the earth is made up of large plates that float over a mass of molten substance. Colliding and scraping of these large plates causes earthquakes. The district of Kutch is quake-prone as it lies on the area of intersection of the Indian and the Eurasian plates. While there are reports of a major earthquake in the region in 1688 (see Times of India, February 16, 2001, p. 3), the first recorded earthquake in Kutch was on June 16, 1819. According to seismological records, the recent quake is the worst in the last 180 years. The intensity of the recent quake has been put at 7.7 by the US Geological Survey compared to 6.9 by the Indian Meteorological Department. As many as 272 aftershocks of 2.8 or higher intensity on the Richter scale have been recorded between January 26th and February 11th.

⁷ The Indian Defence Minister George Fernandes had put the death toll at 100,000 while reportedly the Chief Minister of Gujarat, Keshubhai Patel agreed to 30,000-35,000 figure. See Times of India, Ahmedabad, February 15, 2001, p.1.

⁸ The death toll went up to 18,605 by February 16, 2001. See "A Memorandum on the Earthquake Damage in Gujarat" presented to Government of India, Government of Gujarat, February, 2001.

population or GDP of a country can reduce the apparent scale of a disaster in a large country. This can be illustrated with the example of the district of Kutch – a district with a population close to that of Nicaragua – worst affected by the recent quake. While the inherent magnitude of the loss and the tragedy is a given quantum, it looks very different depending on whether the loss to life and income are expressed as a proportion of the population of the district itself, or of Gujarat (the Indian State to which it belongs) or India.

Table 1. Gujarat January 26, 2001 Earthquake: Comparison of Severity

	Date	Intensity ¹	Population (in million)	Deaths (in thousands)	Injured (in thousands)	Affected	Homeless	Per capita GDP (US\$ 1987)	Loss (US\$ million, 1987)	Loss to GDP in percent
Peru	Mar-70	7.8	13.5	50	30	950	600	1470	1600	8.1
Nicaragua	Dec-72	6.3	2	10	20	250	250	1350	2300	85.2
Guatemala	Feb-76	7.5	6.2	27	80	1700	1700	1400	1450	16.7
Maharashtra	Sep-93	6.4	79	10	16	1000	300	623	---	---
Gujarat	Jan-01	6.9	49	19	166	15857	---	658	---	---

¹Richter scale

Source: J.M.Albala-Bertrand: "Natural Disaster Situations and Growth: A Macroeconomic Model for Sudden Disaster Impacts", *World Development*, Vol. 21, No. 9, 1993, pp. 1417-1434, for Peru, Nicaragua, and Guatemala.

Estimating the loss from the earthquake is important for devising policies and drawing up requirements for assistance both from within and outside India. Various types of losses that can be distinguished are: casualties, number of homeless, impairment of functionality of essential facilities, and loss of output. Most earthquake-caused deaths and injuries as well as stoppage of production result from damaged buildings. This is why the loss from an earthquake depends on the density of buildings in the affected zone as well as their structural and nonstructural problems. Damage and casualty-producing potentialities of buildings depend on the type and quality of construction, age, condition of upkeep, local ground conditions, building code in effect at the time of construction, contents, usage, and number of occupants at various times of the day. While considerable progress has been made in earthquake hazard identification and strategies to deal with earthquake related problems in the last two decades, the lack of an inventory of building stock, even in the US, continues to be an obstacle in actual or potential loss estimation.⁹ The problem of a lack of inventory of buildings is particularly acute in the case of the affected areas in the recent quake in Gujarat.

⁹ One of the important landmarks in this area was the enactment of the National Earthquake Hazard Reduction Act by the US Congress in 1977. The US is a country with several areas vulnerable to earthquakes; the most notable being California on the San Andreas fault, the Puget Sound area in Oregon and Washington; the Wasatch fault area in Utah, the New Madrid fault area in the Central US, Charleston South Carolina, Boston-New York area, Alaska, Hawaii, and Puerto Rico.

Given all the limitations of the data, firm estimates of losses from the recent quake will take time to compile. In the interim, quantification is critical for designing relief and rehabilitation packages and implementing them before the onset of the monsoon.¹⁰ This paper is an attempt to estimate the economic impact of the earthquake. While it is recognised that the quake has had an adverse impact on the cultural environment of the affected districts, the State, and India in general, the focus is on the economic impact.¹¹

The economic impact of an earthquake, or any natural disaster can be classified as: (i) losses to immovable assets, (ii) losses to movable assets (iii) economic losses due to business interruption, (iv) public sector economic costs, and (v) household income losses due to death, injury, and job disruption. The first impact consists of the direct economic losses due to destroyed or severely damaged buildings and other structures (such as power substations). Losses to movable assets consist of economic losses due to damaged or destroyed contents of buildings and other private property. Public sector economic costs accrue because of loss of revenues and increases in expenses for the public sector. The paper is organised as follows. Section II focuses on the impact in terms of death and injuries, and the associated demographic and labour market implications. Section III discusses the possible effects on assets and GDP. Section IV describes the effect on the fiscal accounts in Gujarat, while Section V looks at the effect on financial markets. Section VI concludes.

II. Deaths and Injuries

a) Geographic distribution of deaths and injuries

More than 18 thousand people have perished in the earthquake, with nearly 1.66 lakh people injured (Table 2). Kutch has been devastated by the quake while five other districts – Ahmedabad, Jamnagar, Patan, Surat and Surendranagar – have been severely affected. These six districts account for as much as 99 1/3 per cent of the deaths. Towns and villages in the areas ravaged by the quake in these severely affected districts have turned into heaps of stone and concrete, and the livelihood of people has been destroyed. The affected people have been living in tents provided by the State Government and other donors, including NGOs and other governments, both from inside and outside India. There are a few reports of mental disorders from the trauma of destroyed homes and death of near and dear ones. The district of Kutch alone accounts for 92 per cent of the deaths and 82 per cent of injuries.

¹⁰ Even the summer, with temperatures soaring to 45° centigrade, can be grueling in the affected parts.

¹¹ Bhuj, a historic city going back 455 years, which is the headquarters of the district of Kutch, has sustained severe damage to the old city, including a 113 year old museum which housed old artifacts from the Harappan civilisation. Similarly, the historic temple at Dwarka, believed to date back to the eighth century A.D., dedicated to the Hindu Lord Krishna, has been affected by the quake. According to a February 19th report of the Times of India, Ahmedabad (p.5), the 15th century Halvad palace near Dhrangdharn, second only to Padmanabhapuram palace in the south for its wooden curving, was supposed to be turned into a heritage museum in the region. After the quake, it lies in a heap of wood and stone. The famous swinging minarets of Ahmedabad have also been damaged.

Arid Kutch is the most sparsely populated district in Gujarat. With a density of 28 per sq. km. relative to the state average of 211, Kutch accounts for only 3.06 per cent of Gujarat's population. Among the other affected districts, Ahmedabad and Surat have population shares of 11.11 per cent and 6.23 per cent, respectively.

Fifteen other districts of Gujarat have also been affected by the quake. Although, unlike the seriously affected districts, with 123 casualties they have been spared the trauma of a very large number of deaths, with 6,730 injured they account for over a good 4 per cent of the quake-induced injuries. Only four districts, namely Dahod, Dangs, Narmada, and Panch Mahals, appear to have escaped the wrath of nature.

Table 2. Gujarat January 26, 2001 Earthquake: Deaths and Injuries

Districts	No. of Affected Talukas	Population ¹ (September 2000)	Death	Injuries	Death Rate (per thousand)	Percentage share of total death	Percentage share of total injuries
Seriously affected districts:							
Ahmedabad	11	5,367,464	750	4037	0.14	4.03	2.42
Jamnagar	11	1,829,397	119	4930	0.07	0.64	2.96
Kutch	10	1,477,160	17030	136000	11.53	91.55	81.57
Patan	8	1,516,584	34	1695	0.02	0.18	1.02
Rajkot	14	2,941,577	422	11946	0.14	2.27	7.16
Surendranagar	10	1,414,406	112	2907	0.08	0.60	1.74
Other districts:							
Amreli	11	1,544,746	-	5	-	-	0.00
Anand	8	1,927,914	1	20	-	0.01	0.01
Banaskantha	8	2,318,413	32	2770	0.01	0.17	1.66
Bharuch	8	1,343,480	9	44	0.01	0.05	0.03
Bhavanagar	11	2,408,570	4	45	-	0.02	0.03
Gandhinagar	4	1,034,505	8	241	0.01	0.04	0.14
Junagadh	14	2,446,752	8	89	-	0.04	0.05
Kheda	10	2,098,010	-	28	-	-	0.02
Mehsana	9	1,827,351	-	1339	-	-	0.80
Navasari	5	1,270,283	17	52	0.01	0.09	0.03
Porbandar	3	549,269	9	90	0.02	0.05	0.05
Sabarkantha	8	2,060,509	-	56	-	-	0.03
Surat	8	3,975,616	46	184	0.01	0.25	0.11
Vadodora	6	3,554,674	1	256	-	0.01	0.15
Valsad	5	1,272,960	-	-	-	-	-
Total	182	44,179,641	18,602	166,734	0.42	100	100

¹. Projected mid-year population for the year 2000-2001.

Source: Report on Earthquake in Gujarat, Government of Gujarat (February 15, 2001), and Census of India, 1991, Gujarat State District Profile, Government of India.

Loss from an earthquake depends on the interaction of the geographical pattern of ground motion with the spatial array of the population and properties at risk and their loss vulnerabilities. Although Gujarat has a high urbanisation ratio of 34 per cent compared to the all-India average of 26 per cent, the location of the epicenter of the quake in the relatively sparsely populated northwestern part of the State averted a disaster that could have been of an even higher magnitude. Though the quake was of high intensity,

fortunately, the limited exposure because of the low density of population in Kutch somewhat contained the extent of the loss.

The enormity of the disaster in Kutch can be gauged by the quake-induced high death rate of 11.53 per thousand people relative to the death rate of the State of 7.9 per thousand according to last 1991 census. Of the 1.66 lakh people injured in the earthquake, thousands are still being treated for injury in state hospitals and other make-shift hospitals. Many among the severely injured people would be handicapped for the rest of their lives. Precise estimates of quake-induced deaths and disabilities will emerge only with the passage of time.

b) Age and sex distribution of the casualties

No information readily exists on the age and gender distribution of the deceased. Fatalities due to a natural disaster have a different pattern than natural deaths. Although victims of a natural disaster, who are old and infants, tend to succumb to their injuries more easily than the adults, yet a disproportionately large number of working adults die from a natural disaster. Imposing the 1991 age and sex structure of the population in the districts as per the last population census, the number of dead children below the age of 15 years works out to as large as 7,065 (Table 3).

Table 3. Gujarat Earthquake January 26, 2001: Likely Age and Sex Profile of the Deceased^{1,2}

Districts	Children (0-14 years)			Adults (15-59 years)			Elderly (60 years and above)			Total	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Ahmedabad	134	121	255	238	212	450	23	22	44	395	355
Banaskantha	7	6	13	9	8	17	1	1	2	17	15
Bharuch	2	1	3	3	3	6	0	0	0	5	4
Gandhinagar	1	1	2	3	2	5	0	0	0	4	4
Jamnagar	23	21	43	35	33	68	4	5	8	61	58
Junagadh	1	1	3	2	2	5	0	0	1	4	4
Kutch	3381	3135	6516	4743	4531	9274	546	694	1240	8670	8360
Navasari	3	3	6	5	5	10	1	1	2	9	8
Patan	6	6	12	10	10	20	1	1	2	17	17
Porbandar	2	2	4	3	3	6	0	0	0	5	4
Rajkot	78	72	150	126	118	243	13	15	28	217	205
Surat	8	8	16	15	13	28	1	1	2	24	22
Surendranagar	22	20	42	33	30	62	4	4	7	58	54
Total	3668	3397	7065	5223	4969	10194	595	745	1336	9486	9110

Source: Report on Earthquake, Government of Gujarat

¹Derived by using district-wise death figures from the source and age distribution of the population as per the 1991 census.

²The three districts of Anand, Bhavnagar, and Vadodara account for another six deaths that have not been decomposed for age-sex profile in the table.

As many as 11,531 adults between the working age of 15 and 59 years may have so far died from the disaster. As per the 1991 census, the dependency ratio (per 1000 persons aged 15-59) for Kutch was already higher at 837 relative to the State average of

731. The death of so many adults in their productive phase of life may have exacerbated the problem of staying alive in many bereaved families. The predominantly rural nature of the seriously affected districts – with more than seventy per cent of the population living in rural areas – compounds the problem. With literacy limited to the range of 50 to 60 per cent (and female literacy even lower, particularly in rural areas), many families depend on raising crops such as bajra, jawar, wheat, cotton, groundnut, and castor, and cottage industry including textile processing, dyeing and colouring, and shawl making.¹² While the quake has destroyed the production facilities of the traditional cottage industries, the death of an adult, particularly male, member may have wreaked havoc in such families. The distribution of the fatalities over districts, however, may have led to a higher overall incidence of death among the young and the old relative to their share of the total population of Gujarat.

The quake struck at 8:46 in the morning of a national holiday, when adult women are likely to have engaged themselves in ‘care sector’ activities such as preparing meals for the family, washing clothes, house cleaning, and care of sick, infirm or old people. Reportedly, there has been extra incidence of fatalities among women relative to men. While no data readily exists about the breakdown of the fatalities by sex, imposing the 1991 sex structure of the population in the districts as per the last population census, the number of dead women works out to as large as 9,110.

According to information available on February 17, 2001 from Director, Social Defence, Ahmedabad, the known incidence of orphaned children and widowed women from the quake was 348 and 826, respectively (Table 4).¹³ Bhachau in the district of Kutch accounted for the largest number of both orphans and widows.

Table 4. Gujarat Earthquake : Preliminary Estimates of Orphans and Widows

Area	Orphans	Widows
Bhuj	31	110
Bhachau	153	337
Anjar	93	174
Rapar	22	151
Gandhidham	43	41
Mandvi	4	12
Surendranagar	2	1
Total	348	826

Source: Director, Social Defence, Government of Gujarat, Ahmedabad

c) Social security and insurance

i. *Ex-gratia payments*

¹² Artisans of Kutch are famous for their exquisite work on textile.

¹³ There are some estimates that put the number of orphans at 6,000 or more (Outlook, February 19, 2001, p. 62)

The injured and the next of kin of the deceased from the earthquake are entitled to two social security and insurance benefits. First, the Government of Gujarat has announced the direct payment of ex-gratia amounts varying between Rs.2,000 and Rs.1,50,000 for the injured and the dead, with a ceiling of Rs.5,00,000 per family (Table 5). These compensations are in addition to the immediate relief of cash doles of Rs.15 per person per day and a one time lump sum Rs 1250 per family for household kits provided to the quake affected families. The doles are for a maximum of five persons per family for fifteen and thirty days in affected and severely affected areas, respectively

Table 5. Gujarat Earthquake January 26, 2001: Ex-gratia Payments to Victims from Government of Gujarat

<u>Relief to next of kin in the case of death</u>	
Death relief:	Rs.1 lakh for a major and Rs.60, 000 for a child
Additional death relief:	In addition to the death relief, Rs.50, 000 to government employees and school children.
<u>Relief in the case of injury</u>	
Injury above 40 per cent: (permanent disability):	Rs.50, 000
Less than 40 per cent:	Rs.25, 000
Major Surgery:	Rs.10, 000
Minor Surgery:	Rs.5, 000
Minor Injury:	Rs.2, 000

Using the likely age structure of the deceased as per Table 3, along with the percentage of school going children (obtained from the Statistical Abstract for Gujarat, 1998), the death relief is likely to be Rs.170.17 crore. Out of 1.7 lakh injured, assuming 5 percent i.e., 8336 to be permanently disabled, another 10 per cent or 16637 to be in the category of ‘less than 40 per cent injury’ and 85 per cent in the category of ‘minor injury’, the monetary benefits likely to be accrue to the injured are estimated to be Rs.128.40 crores. The injured coming under permanently disability and ‘less than 40 per cent injury’ are expected to get the benefit for major surgery and minor surgery also. The cash doles to the affected people and relief in lieu of household kits are likely to amount to Rs.168.75 crores and Rs.138.13 crores respectively.¹⁴

ii. *Insurance benefits*

There is a system of social insurance cover to various groups of people provided by the State Governments in India in association with the various insurance companies. In Gujarat, the Government Insurance Fund (GIF) of the Government of Gujarat acts as an insurer for all Government commercial and industrial schemes. The GIF undertakes the insurance of the properties belonging to the Government, semi-government or any other statutory bodies and public undertakings. The GIF is also associated with the personal group insurance schemes run by the Government in association with subsidiary insurance

¹⁴ The latest estimates provided by the Government of Gujarat in the memorandum submitted to the Government of India are higher by Rs. 43.89 crore at Rs. 649.34 crore.

companies. The insurance companies operating the group insurance schemes in Gujarat are New India Assurance Company, United India Insurance Company, Oriental Insurance Company and National Insurance Company.

Table 6. Gujarat: Group Accident Insurance Policies taken by the Gujarat Government

Insurer	Policy Type	Beneficiaries	Sum Insured (Rs. per person)	Coverage (Million)	Department
New India Assurance Company Ltd., Surat	Group PA Policy	Small & Marginal Farmers	50, 000	5.2	Director of Agriculture
New India Assurance Company Ltd., Surat	Group PA Policy	Police Personnel	Varied sums Insured	Various Groups	Director General Of Police
New India Assurance Company Ltd., Ahmedabad	Group PA Policy	Below Poverty Line	10, 000	12	Commissioner of Rural Development
Oriental Insurance Company Ltd., Ahmedabad	Group PA Policy	Landless Labourers	20, 000	7.5	Labour Commissioner
National Insurance Company Ltd., Ahmedabad	Group PA Policy	College Students	50, 000	0.3	Commissioner of Higher Education

Note: PA refers to Personal Accident

Source: Directorate of Insurance, GOG

Five group personal accident policies, covering death and permanent disabilities, are in operation in the State under the social welfare schemes of the Government (Table 6). The concerned Government department arranges the schemes and pay the premia. The insurance companies providing the cover pay the claims after verifying the relevant documents and proofs. The Group Personal Accident policy for people below poverty line (BPL) covers all the family members. But, the policies for small and marginal farmers, landless labourers and police personnel do not cover the whole family. In the current year (2000-01), the insurance premia paid by the various Government departments are: Rs. 2.07 crore for small and marginal farmers policy, Rs. 0.98 crore for police personnel policy, Rs. 0.86 crore for landless labourers' policy, and for BPL policy for five years (1998-2003) Rs. 3.27 crore. Taking one-fifth of the BPL premium for five years as the premium for 2000-01, the total premium paid by the Government towards various group personal accident policies works out to Rs.45.61 million.

In the affected districts, the small and marginal farmers, people below poverty line, landless labourers and college students are eligible for the insurance benefits in the case of death and permanent disability. To facilitate the insurance payment, the insurance companies have relaxed various rules and regulations for documentary proofs in the quake affected districts. Because of the lack of information

regarding the composition of the deceased and seriously injured, however, the likely amount of insurance payment is difficult to estimate. Although the insurance benefit will provide relief to the affected, there would be financial implications for the Government as well. During the last four to five years, the claim ratio (that is the ratio of actual settlement of claims to premia paid) has been around 70 per cent. With the claim ratio increasing further with the recent tragedy, the insurance companies may be expected to press for higher premia in the coming years.

d) Labour market implications

Medium- and small-scale industries in the quake affected area have suffered large scale damage, and this has resulted in loss of employment for thousands of people. Industries in Kandla Free Trade Zone, Gandhidham and Bhachau, salt industry in Kutch, Rajkot and Surendranagar, and ceramic industry in Morbi, Thangadh and Wankaner have been seriously affected. Small scale industries including refractories, powerlooms, cotton ginning and processing have also suffered damage to their buildings, kilns, etc. Damage to looms has also affected operations in some units of the powerloom industry.

Demand conditions in the local labour markets in the seriously affected talukas are unlikely to revive until the reconstruction gets well underway. There are three problems in the interim that need to be addressed. First, public policy needs to act as a facilitator to lend momentum to rapid reconstruction. Second, a social safety net needs to be provided to the workers in the affected areas to prevent destitution and migration into neighbouring towns and cities. Third, special attention needs to be devoted to the rural artisans in the affected areas who depend upon handicrafts, fabric processing, shawl making etc. and have lost the traditional employment.¹⁵ Their toolkits and inventories of finished, semi-finished and raw materials have been destroyed along with their houses. The whole chain of raw material procurement, marketing and distribution of products has got disrupted as well. This is an economically vulnerable group, and failure to provide speedy relief to them may result in their switching out of their traditional profession. There is not only the danger of losing a part of the cultural heritage, but also the know-how and production structure of items of value for future export growth.

As per the 1991 census, the work participation rate in the State was 40.2 per cent taking both main workers who get employment for more than six months and marginal workers. In the quake affected districts the work participation ranges between 33 to 43 per cent for the main workers. Leaving relatively developed States like Ahmedabad and Surat, in the other districts nearly one third of the main workers were engaged in cultivation. In Kutch district 26.6 per cent of the main workers were engaged in cultivation. The proportion of agricultural labourers is also quite high for Kutch (25.9 per cent) and for Surendranagar (28 per cent).

¹⁵ The districts of Kutch, Surendranagar, Rajkot, Jamnagar, Surat and Ahmedabad together account for about 87,000 of a total of 1.5 lakh artisans in the entire state of Gujarat. Kutch alone has 52,290 artisans. Outlook (February 19, 2001) provides these estimates citing a 1995-96 survey of National Council of Applied Economic Research. It also puts the number of affected artisans at 30,000 or more, citing the Development Commissioner (Handicrafts).

According to the Report on Fourth Economic Census (1998), there were 19.2 lakh enterprises engaged both in agricultural and non-agricultural activities in Gujarat employing 52.8 lakh persons. The Economic Census includes all enterprises other than those engaged in crop production and plantation. For the severely affected districts of Kutch, Rajkot, Surendranagar, Jamnagar, Patan, Ahmedabad, Surat and Banaskantha, the employment in the enterprises covered by the Census works out to be 2555.19 thousand (Table 7).

Given the differential district-wise impact of the earthquake, the impact on employment will not be uniform across districts. Assuming 80 per cent loss of employment in Kutch district, 30 per cent in adjoining Rajkot, Jamnagar, Surendranagar, and Patan, and 10 per cent for Banaskantha, Surat and Ahmedabad, 4.88 lakh persons are estimated to become unemployed. The duration of the earthquake-induced unemployment cannot be predicted with certainty as it crucially depends on the speed of revival of economic activity.

For the people engaged in crop production and plantations, no major loss of employment is expected. Using the 1991 population census numbers, this activity supports an estimated 48.81 lakh persons.

Table 7: Employment Classified by Economic Activities, 1998

	Agriculture	Mining & Quarrying	Manufacturing	Electricity, Gas & Water	Construction	Wholesale Trade	Retail Trade
Ahmedabad	57634	382	216276	3904	8153	27273	155607
Banaskantha	73171	240	24464	495	834	4994	27463
Jamnagar	12213	432	68145	544	16349	1463	44023
Kutch	9449	6631	15607	1260	1472	3133	21032
Patan	39569	34	18068	183	908	9368	20233
Rajkot	20140	1476	84324	683	2725	8006	74246
Surat	89499	3303	337254	5637	4652	24390	95447
Surendranagar	20834	420	44275	111	1626	3716	25324
	Hotel & Restaurant	Transport	Storage	Communication	Financial Service	Community Service	Total
Ahmedabad	15345	34980	4306	6829	34568	234109	799366
Banaskantha	2781	2217	94	783	1939	37779	177254
Jamnagar	2576	6649	282	786	2978	44487	200927
Kutch	4096	8122	3460	1338	3220	39402	118222
Patan	1730	3088	177	582	1799	23001	118740
Rajkot	6291	9686	1494	3175	8249	75733	296228
Surat	8323	10542	1276	4229	17758	107624	709934
Surendranagar	1063	3431	114	1560	1915	30132	134521
Total							2555192

Source: Report on Fourth Economic Census 1998, Gujarat, Vol. I & II, Directorate of Economics and Statistics, GoG

III. Disaster Loss and Effect on GDP and Growth

a) Disaster loss

Government of Gujarat has estimated the disaster loss at Rs.14,454 crore as per its “Memorandum on the Earthquake Damage in Gujarat” submitted to the Government of India on February 17, 2001 (Table 8). This loss, although less than the original loss estimate of about Rs.20,000 crore by over Rs.5,000 crore, can be taken as a good guide to the enormity of the damage caused by the quake. Given the multiple types of losses that the quake has wreaked, and the lack of a proper inventory of buildings and structures, estimates of the losses will continue to evolve and will firm up only over time.

There are five standard problems in the estimation of the disaster loss. First is the question of assessing the damage to buildings. Loss of building and structures accounts for the bulk of the material losses from an earthquake. Reasonably sound loss-estimation methods for projecting direct damage to buildings from ground motion can not be applied to the Gujarat quake because most of the buildings, particularly in rural areas, are non-engineered buildings. Furthermore, no inventory of buildings and structures – including ages of the structures, construction types (height, material used, etc.), usage pattern, number of inhabitants -- either before or after the earthquake, exists. Similarly, nonexistence of data on contents of structures, both homes as well as business establishments, complicates the estimation of direct nonstructural losses.

Second, it is important to be careful to distinguish between the value of buildings and the value of land. Although an entire structure may be destroyed, the site would continue to have value, unless wholesale relocation is planned. The depreciated value of non-engineered buildings needs to be carefully assessed. Furthermore, the value of land may actually go up during reconstruction and rehabilitation because of a better town-plan being implemented or the village access road being widened.

Third, there is a need to carefully distinguish between stocks and flows. Adding the loss of fixed capital in value terms to the value of output lost because of stoppage of production amounts to the addition of a stock and a flow. Furthermore, lost sales are not lost value added. Lost sales in a region can be sold elsewhere. It is necessary to avoid adding lost value added in business to lost personal income, which would be double counting. Damages include lost income, which in turn includes lost expenditure, which in turn includes lost sales tax revenues.

Table 8: Gujarat Earthquake: Government’s Sector-wise Damage Estimates

	As per Memorandum to GOI	As per report to Joint Emergency Mission World Bank/ ADB
Housing	10,000.00	9,616.7

Of which:		
Rural housing		2,283.5
Urban housing		2,333.2
Household assets		5,000.0
Education	884.00	884.4
Power	470.00	470.3
Roads and buildings	450.00	448.0
Health	242.00	175.5
Irrigation	373.00	
Water supply	289.00	289.3
Administrative buildings	183.00	183.7
Agriculture	734.30	
Industry	180.00	2,160.9
Trade and commerce	--	3,000.0
Other sectors	649.24	2,000.0
Of which:		
Emergency relief announced by Govt.	649.24	...
Total	14,454.54	19,228.8

Fourth, reconstruction invariably involves upgrades and better quake-resistant features of structures, building and facilities. Valuing the loss at the cost of reconstruction involves an upward bias to the loss estimate by compounding the true replacement cost of the lost asset with cost of upgradation. Fifth, one of the problems of cost estimation is that the notion of who is likely to bear the costs of damage is interwoven with the cost figures themselves. It is critical to distinguish between public sector losses that would have to be borne by the Government itself from private sector losses that accrue to the non-government sector.

Table 8 lays out the official damage estimates. But these estimates do suffer from the above mentioned problems and are subject to frequent revisions. Distinguishing between direct asset losses and costs of reconstruction, and with a three-way classification of losses among social sector, infrastructure and productive sectors, the Governments estimates have been reworked in the light of assessment by sectoral experts to yield results reported in Table 9. The total loss works out to about Rs.9,900 crore, with reconstruction estimated to cost Rs.10,675 crore.

Table 9. Gujarat Earthquake: Alternative Sector-wise Damage Estimate
(Rs crore)

	Losses	Reconstruction Costs
Housing	5,166	5,148
Health	220	287
Education	684	837
Social sector	6,070	6,271
Municipal infrastructure	141	209

Public Buildings and Historical Monuments	340	444
Rural water supply and sanitation	253	614
Irrigation	286	418
Power	137	453
Transport	321	358
Ports	98	121
Telecommunications	51	51
Infrastructure	1,527	2668
Agriculture	545	345
Industry	340	204
Trade and commerce	1,162	930
Productive sectors	2,047	1479
Environment	256	256
Total	9,900	10675

Public good related considerations provide strong reasons to suggest that cost of infrastructure, and health and education in the social sector should be borne by the Government. The other areas are less clear. While, in principle, private sector's losses can be left entirely for the private sector to bear, the likely poverty profile of the affected areas along with the serious risk of a further increase in destitution argue in favour of some burden-sharing by the public sector especially for the poorest.

b) Impact on GDP and growth

Gujarat is one of the most developed states of India. Among the major States of India, it ranks third in per capita income after Maharashtra and Punjab. Furthermore, the State along with its neighbour Maharashtra, grew at 9.57 per cent and 8.01 per cent, respectively – rates normally associated with 'miracle growth' economies – in the post-reform period of 1991-92 to 1997-98. Lack of adequate rainfall in recent years, however, affected the growth performance of the State. Agriculture, together with other primary sector activities, contributes about a fifth of Gross State Domestic Product (GSDP) in the State.

With only 31.5 per cent cropped area under irrigation, GSDP from agriculture declined by 2.2 per cent in 1998-99 and 18 per cent in 1999-2000. Rainfall during 1999-2000 was only 93.7 cm and 31.3 cm in north and south Gujarat, and Saurashtra and Kutch, respectively compared to the normal annual level of 111cm and 58cm respectively. Precipitation till September 2000 was only 74 cm and 29 cm respectively in the two regions. The 2000 southwest monsoon completely eluded the northern parts and the Saurashtra region. The second consecutive drought had left the dams and reservoirs with only about 4,000 million cubic meters of water against the design capacity of about

16,600 million cubic meters in December 2000. The second consecutive drought is likely to result in a further drop of agricultural output in 2000-01.

i) *Short-run impact*

The potential impact of the calamitous earthquake on Gujarat GSDP in the wake of two consecutive droughts is a matter of serious concern. A straightforward application of an incremental capital output ratio (ICOR) of 'c' to the disaster loss 'L' can yield a measure of the output loss ΔY as

$$\Delta Y = L/c \quad (1)$$

Thus, taking the disaster loss to be Rs.9,900 crore and ICOR to be approximately 4, yields an annual loss of GSDP of Rs.2,475 crore.¹⁶

Relationship (1), however, assumes all disaster loss to be equal to capital loss and directly and equally relevant for production. But, there are several factors that argue in favour of modifying equation (1) for deriving the output loss estimate. First, a part of the disaster loss is loss of current production. Thus, we have

$$\Delta Y = (L - L_o)/c \quad (2)$$

where L_o is loss of current production. Out of Rs.9,900 crore, assuming a third of the losses of Rs.2,047 crore in the productive sectors to be on account of loss of current value added, adjusting for loss of current value added in the productive sectors, with an ICOR of 4, we get an annual loss of GSDP of Rs.2,304.4 crore.¹⁷

Second, the productivity of all components of the capital lost, a heterogeneous lot, has been assumed to be a uniform 4. Social capital and infrastructural capital may be assumed to have a lower bearing on output in the short run than fixed capital in the productive sectors. Assuming that the short-run ICOR for social, infrastructural and 'productive' capital to be 5, 4, and 3, the annual loss of GSDP in the short-run is estimated to be Rs.2,116.9 crore.

Third, this loss of output assumes that no excess capacity exists elsewhere in the country to make up for the output loss in the affected areas. Damage to the structure where business is located, including damage to manufacturing equipment, loss of input supply or output demand due to structural damages suffered by input supplier or output buyer, lack of power or water supply or other lifeline services, disruption in transport facilities, loss of employees because of death, injury or migration can lead to business

¹⁶ The Ninth Five Year Plan estimates the ICOR for the eighth five plan period to be 3.7 and projects the ICOR for the Ninth Five Year Plan Period to be 4.3, owing to differences in sectoral composition of output. The estimates for this report use an average of these two figures. With an ICOR of 3.7, the estimated loss would be higher by Rs. 200 crore, and alternatively with ICOR of 4.3, it would be lower by Rs. 173 crore.

¹⁷ In the present case of Gujarat Earthquake, much of the asset loss is related to housing, the ICOR for which is likely to be large, implying a relatively lower loss in output.

interruption in the affected areas. But, such losses can be made up by gains in other parts of the country, where excess capacity exists.

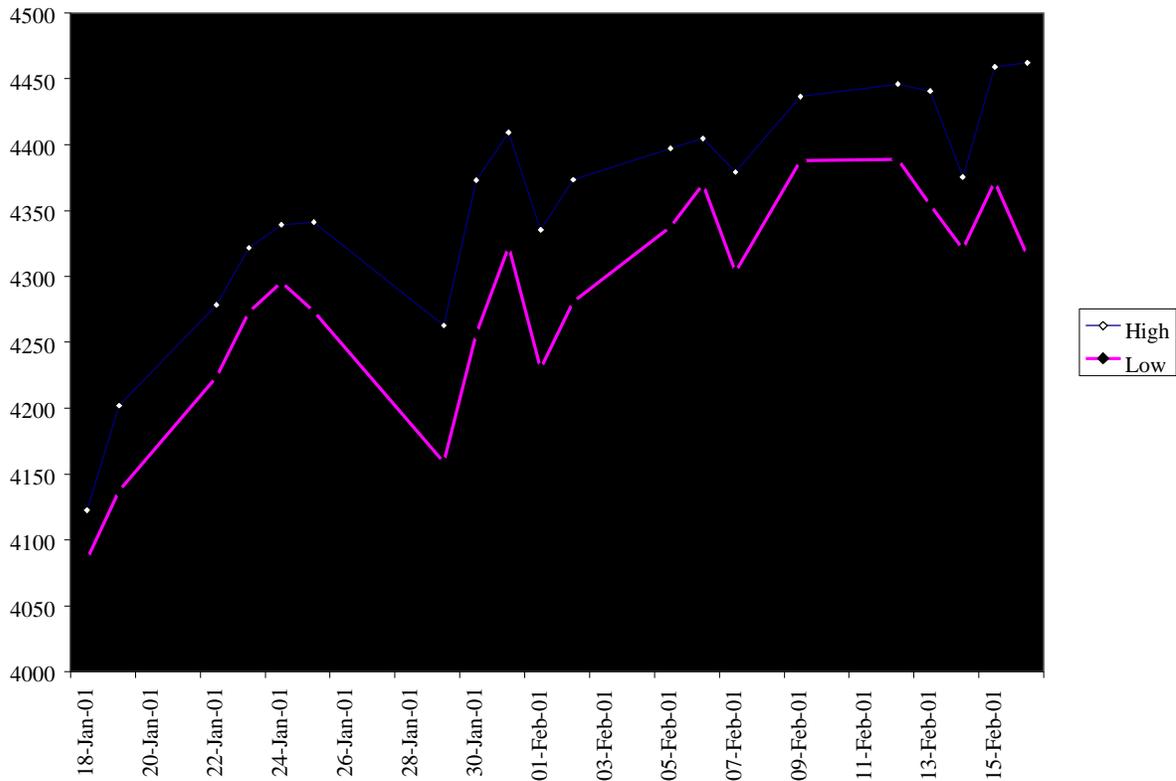
The loss of about Rs.2,000 crore is best seen as the income lost by the affected people in the first twelve months. The figure assumes added significance as it can have a durable impact on the poverty profile of the affected region. Earthquakes can create winners and losers, and it is important to devise mitigation policies to manage the redistributive effects of a large earthquake. Lower-income groups may have borne a disproportionately large share of the losses. They lived in dwellings, which were of poorest construction and most subject to damage. It is important to ensure that they receive the largest proportion of disaster relief. Without an appropriate programme of relief and rehabilitation, the growth prospects of the affected region can be retarded for a considerable period of time.

Fourth, the loss of output of Rs.2,000 crore in the first twelve months given above assumes that no reconstruction starts in the meantime. The Government has declared its resolve to start reconstruction with immediate effect.¹⁸ Reconstruction activities in the affected areas can not only lead to a restoration of much of the lost assets, but also lead to a boost to the resumption of economic activity and growth in income in the affected areas. The loss of income for the affected people is induced from the supply side through a loss in productive capacity, while investment for reconstruction will give a boost to income by building up supply capabilities as well as stimulating demand. Furthermore, upgrades of capital will result in an increase in capital productivity and reduction in ICOR. For all these reasons, the compensatory investment required to make up for the disaster loss in terms of loss of income in the short run may well be considerably less than Rs.10,675 crore.

The quake-induced impact on income of people in the affected areas of Gujarat is likely to be in the neighbourhood of about Rs.1,500 crore in the first twelve months. The quake hit Gujarat with only about two months remaining in 2000-01, the current financial year. On a monthly basis, this loss being higher in the initial months, the loss in the current year is likely to be in the region of Rs.300-400 crore. This loss, however, ignores the transfers that are going to accrue to the affected people. With relief effort in full swing, loss of income inclusive of transfers may be somewhat less. The loss of income during the first ten months of 2001-02, exclusive of transfers, will be in the region of Rs.1,100-1,200 crore. If reconstruction starts in full swing, the loss of GSDP in Gujarat

¹⁸ On February 19, 2001, Chief Minister Keshubhai Patel announced in Bhuj that 800,000 new houses would be constructed by end-June, before the onset of the monsoon. (Times of India, Ahmedabad, February 21, 2001, p.3.) While the goal will be difficult to achieve (it implies construction of more than 6500 houses per day!), it can probably be taken as an indication that reconstruction will begin immediately.

Chart 1: Movement of the SENSEX



during 2000-01 because of the earthquake will be no more than Rs. 100-200 crore, which is less than a quarter per cent of GSDP. For 2001-02, the loss of GSDP for Gujarat will be insignificant. Given that Gujarat accounts for only about 7 per cent of the GDP for India, the impact of the quake on the GDP of the country will be insignificant in both years. The stock market reaction to the quake confirms this conclusion (Chart 1).

This entire discussion assumes that the loss in production is directly related to the size of capital stock damaged and/or destroyed. To the extent the earthquake could have disrupted production in units without damages to capital, the extent of loss in GSDP due to the earthquake is underestimated.

ii) *Dynamic considerations*

A disaster only interrupts economic trends and, more often than not, is followed by a continuation of the pre-disaster economic decline or advance. Furthermore, the growth path of the local economy can even undergo substantial improvements in the wake of a major disaster. A case in point is the Great Alaska Earthquake of 1964, where the rush of aid in response to the major disaster gave the community a chance to reverse a previous pattern of long-term decline.¹⁹ The opportunity to rebuild on a massive scale,

¹⁹ Anthony M.Yezer in “The Economic Consequences of a Catastrophic Earthquake”, Proceedings of a Forum, August 1 and 2, 1990, Committee on Earthquake Engineering Division of Natural Hazard

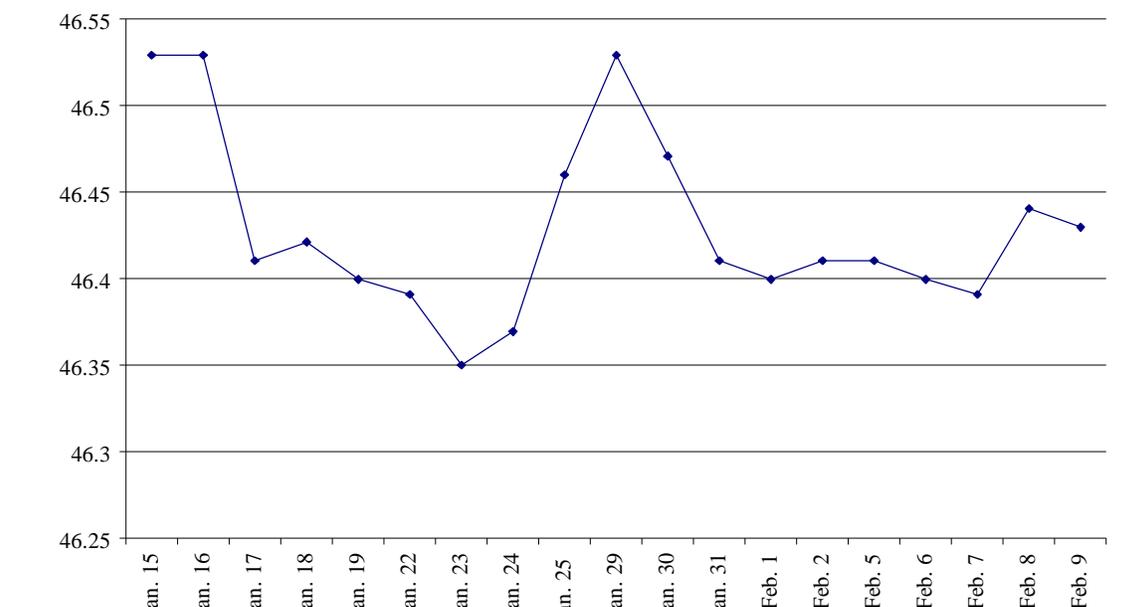
rationalising the provision of public services to introduce the latest technology, can open a local economy to production possibilities that might locate elsewhere.

Gujarat has a long coastline with 11 intermediate and 29 minor ports handling 70 per cent of the tonnage handled by all such ports in the country. Furthermore, there are a number of small jetties owned and operated by the private sector for their own captive transportation.²⁰ A large number of these ports are in the affected Saurashtra region. Not only have these ports suffered limited damage from the earthquake, but they can act as a major catalyst to the dynamic growth of the affected region. The dynamic response of growth in the affected region will critically depend on how soon the reconstruction starts, and how well it is planned in terms of improvements in social and physical infrastructure.

c) Impact on prices and balance of payments

The earthquake has not had a perceptible effect on prices or the balance of payments of the country. With buffer stocks of food grains at 45.7 million tonnes in January, 2001, far above the norm of 16.8 million tonnes, the comfortable supply position of essential commodities contributed to the maintenance of inflation stability. Furthermore, reportedly, prices even in the affected areas did not spiral up in the aftermath of the quake. While the people in the affected areas were left with little purchasing power, rapid delivery of relief materials and restoration of transportation and communication channels helped to maintain price stability.

Chart 2: Exchange Rate, Rs per \$



Mitigation Commission on Engineering and Technical Systems, National Academy Press, Washington, D.C., 1992, p. 114.

²⁰ For example, Gujarat Ambuja Cements and Essar Steel.

The stable exchange rate since January 26, 2001 indicates that the quake is not expected to have a significant impact on the balance of payments. The affected areas do not account for a large proportion of the exports of the country and the relief and reconstruction is unlikely to be import-intensive.²¹ The limited damage of the quake on the ports and jetties has helped to insulate the balance of payments from the disaster.

IV. Effect on Gujarat's Fiscal Accounts

The impact of the recent earthquake on the efforts of the Government of Gujarat at fiscal consolidation is a source of concern. Like most other States in India, following the implementation of higher salaries for public servants in 1998, Gujarat's fiscal deficit reached over 5 ½ per cent of GSDP in 1998-99 and 1999-2000.²² The stock of debt, as a proportion of GSDP, increased from 15.9 per cent to 20.6 per cent between 1997-98 and 1999-2000. According to the budget for 2000-01, the efforts at consolidation were projected to bring the deficit down by over ½ per cent of GSDP to 4.9 per cent of GSDP. But, the earthquake will have an impact on both the Government's revenues as well as its expenditure, more so on the latter. Without additional amounts of grants, not only will the deficit go up during the current year and the next, but there will be pressure on the deficit to go up in subsequent years through the extra cost of debt servicing. The 'permanent' effect of the earthquake on the deficit will depend on the rate of interest at which additional assistance is contracted, as also on the longevity of the earthquake related schemes. However, the shock administered to the fiscal system consequent to the earthquake also provides an opportunity to rationalise expenditure priorities.

A large part of the disaster loss has fallen on the public sector. The exchequer is paying, and will have to continue to pay for some time, for relief to the affected people, and restoring buildings and structures under public sector jurisdiction. The extent of additional expenditure can be considerable because of debris removal and disposal, search and rescue efforts, provision of emergency medical services, and provision of temporary shelter. According to the Government of Gujarat, 400,000 pucca/kutchcha houses and 50,000 hutments will have to be reconstructed, while 600,000 houses will have to undergo damage repair. After a natural disaster, the Government's financial outgo for reconstruction and damage repair of private houses depends on the extent of the financial support it provides to the affected homeowners. With considerable poverty all around, the provision of public funds for private housing to the victims of a natural disaster raises questions about the redistributive impact of such a policy, and the role that the government should play in risk mitigation, and development of insurance markets. Shelter being a necessity for survival, it is easy to argue for the provision of bare essential requirements to the victims of a natural disaster at public cost, but any scheme of

²¹ It is important though to make sure that markets are not lost because of disruption in supplies. The case of cosmetics, with a large concentration of production in the area, is a case in point.

²² Refer Sarma, A. (2000), "Gujarat Finances", *Economic and Political Weekly*, Aug 26-Sept 2, 2000, p. 3130.

compensation in proportion to the value of property lost is regressive in character.²³ Details of policies regarding compensation for damaged private houses are important in determining the implications for the government's finances. Expenditures can shoot up if the government adopts a generous stance regarding rebuilding houses, shops and business establishments with public resources, irrespective of size.

a) Receipts

A natural disaster like an earthquake has an impact on the Government's revenues. Income loss in the affected region can lead to a slump in sales and hence, loss of revenue from sales tax, the major source of own-tax revenue of the Government. But, apart from this direct effect, the total impact on revenues depends on how soon the recovery starts as well as the policy stance of the government. A natural disaster is followed by recovery and reconstruction. While income loss in the region because of the direct impact of the quake can lead to a loss of revenues in the short run, the construction boom following the disaster can be a source of additional inflows. Whether the Government gets its due share in the recovery phase depends on the policy stance of the Government in terms of exemptions and deferrals granted.

Receipts of the state government are broadly divided into two parts as per Indian budgetary convention – the revenue or current receipts and the capital receipts, most of which are liabilities and essentially financing items for the fiscal deficit. The revenue receipts are further divided into tax and non-tax receipts, each of which have two parts, those raised by the state itself and those transferred from the central government (*viz.* shared taxes and grants).

i) *Tax revenue*

The major taxes in most Indian states are: sales tax, state excise, stamp duty and registration fees, motor vehicle taxes and electricity duty. There are often other taxes levied that are of smaller revenue significance, including entertainment tax. In Gujarat, due to a policy of prohibition, state excise revenues are not significantly large, but in other respects, its tax structure is similar to most other larger states of India, with sales tax alone accounting for the lion's share of own tax revenue. District-wise monthly collection figures for the individual taxes available until January 2001 have been utilised to project revenues for the current and the next year.

Sales Tax: Revenue losses of Rs.115 crore and Rs.260 crore may be expected during the fiscal years 2000-01 and 2001-02, respectively. Underlying the projections, there is an assumption of 10 per cent and 25 per cent revenue loss for the month of February and March (the first two months after the quake), respectively. The biggest impact on revenues is expected only in April, which is in the next financial year, when taxes accruing in February fall due for payments. For the entire state except the Bhuj circle, revenue loss in April is taken to be 40 per cent of the expected revenue. For Bhuj, the revenue loss is taken to be 80 per cent for the whole of 2001-2002. For the other circles, the projected revenue loss during May 2001-March 2002 is based on (i) no revenue loss in Ahmedabad, Mehsana, Surat, Bharuch, Valsad, Junagadh, and Porbandar

²³ Even the provision of the bare minimum shelter facilities to the victims of a natural disaster raises the question of what to do with the poor who do not have such shelter without being victims of the disaster. Should there be an earthquake premium for shelter?

circles, (ii) 15 percent revenue loss in Sabarkantha, Navsari, Bhavnagar, Amreli, Rajkot and Jamnagar circles, and (iii) 40 percent revenue loss in Surendranagar circle.

Stamp Duty and Registration Fees: Revenue for 2000-01 has been adjusted down to reflect that only 10 percent of the collections expected for February and March are likely to materialise. In the next fiscal year, collections from stamp duty and registration fees have been projected to decline by 50 per cent for two reasons. First, after the January 26 collapse of some high-rise apartment blocks in Ahmedabad, prospective buyers will be wary of buying apartments in multi-storied buildings. There will be a slump in the market for such apartments at least for some time. Second, there is likely to be a switch in homeowners' preference away from apartments in favour of single-family homes, or tenements, as they are locally known. The owner herself constructs most single-family homes in India. For such new houses, with only the value of the land that is bought subject to stamp duty and registration fees, the tax base is much smaller than apartments where the entire cost comes under the levy.

Motor Vehicle Tax: Actual collections for 1999-2000 vis-à-vis the revised estimates for that year, as well as the trends up to January 2001 relative to budget estimates for 2000-01 show that revenue realisations have been falling short of expectations under the motor vehicles tax. For 1999-2000, the actual collections were only around Rs.590 crore as against the revised estimate of Rs.815 crore. In 2000-01, the budget estimate (inclusive of passenger tax) was pegged at Rs.1,220 crore, but collections till the end of January, 2001 were only Rs.539 crore. The earthquake, together with the already observed trends, can result in revenues under this head falling short of budget estimates for 2000-01 by Rs.588 crore. In the calculations, Kutch has been assumed to contribute no revenues during February and March. It must be noted, however, that of the average normal monthly collection of about Rs.50 crore until January, Kutch accounted for only about Rs.4 crore per month. Thus, much of the loss is on account of the continuation of the pre-earthquake trends.

Electricity Duty: Rs.4 crore of revenue loss per month vis-à-vis normal collection is assumed in the affected areas.

Entertainment tax: Rs.4 crore of revenue loss per month vis-à-vis normal collection is assumed in the affected areas.

Profession tax: A loss of Rs.5 crore is assumed for the current year. In the next fiscal, the loss is assumed to be ten per cent, mainly on account of loss of wage employment in the affected areas only.

State excise and other taxes: No revenue loss is expected, and no change has been made to the budget estimate.

Table 10. Gujarat: State Tax Revenues

Tax\Year	(Rs crore)							
	1996-97 Actuals	1997-98 Actuals	1998-99 Actuals	1999-2000 Revised estimates	2000-01 Budgete estimates	Projections		
						2000-01 L.E.	2001-02 Projected	2002-03 Projected
Sales Tax	4026	4402	4796	5400	6300	6185	6173	6738
Stamp and Regn.	399	411	506	520	600	458	332	376
Motor Vehicle Taxes*	430	434	522	815	1220	632	792	876
State Excise	24	24	27	26	30	30	29	31
Electricity Taxes	901	1024	1447	1450	1700	1692	2310	2946
Profession tax	48	62	75	100	125	120	141	176
Entt. Tax	59	60	63	68	75	67	24	25
Other Taxes	179	174	180	273	407	407	407	407
Total Own Taxes	6066	6591	7616	8652	10457	9591	10208	11574
Total Tax Revenue	7240	8166	9257	10383	12189	11323	11986	13647

GSDP	86638	92573	102206	109041	122126	122126	136781	153195
As percentage of GSDP								
Total Own Taxes	7.00	7.12	7.45	7.93	8.56	7.85	7.46	7.56
Total Tax Revenue	8.36	8.82	9.06	9.52	9.98	9.27	8.76	8.91

R.E. – Revised Estimates; B.E. Budget Estimates; L.E. Latest estimates prepared by authors.

L.E. incorporates a substantial shortfall of Rs.580 crore that is not related to the earthquake.

Incorporating these assumptions of revenue loss yields a total own tax revenue of Rs.9,591 crore during 2000-01 relative to the budget estimate of Rs.10,457 crore (Table 10). It may be noted that the shortfall of Rs.866 crore for the current year is not entirely due to the earthquake. It is estimated that as much as Rs.580 crore of this shortfall is related to reasons other than the earthquake, the case of motor vehicles tax being the prime example.

Projections for 2001-02 have been obtained by applying the average annual growth rates for the period 1996-99 to the revised estimates for 1999-2000 for all taxes except motor vehicle taxes (for which the actual collection figures are used), and adjusting them for revenue losses as detailed. This procedure yields a figure of Rs.10,208 crore as total own tax revenue. The application of the average annual growth rate for the period 1996-99 to the 2001-02 figures yield a total own tax revenue figure of Rs.11,574 crore for 2002-03.

As can be seen from the table, the impact of the earthquake *per se*, on the state's tax revenues are to the tune of Rs 286, Rs.345 and Rs.436 crore in the years 2000-01, 2001-02, 2002-03, respectively. These are not very large numbers in relation to the size of the state's budget. The reason to a large extent is that the most severely affected region of Kutch contributed only a small part of the tax revenues of the state. In the other regions, the tax impact is both small and transitory.

ii) *Nontax revenue*

In Gujarat, there are three major items of non-tax revenues – interest receipts, irrigation rates and royalties. Most other sources yield very small amounts individually. Discussions with the Government indicate that as things stand now, there may be a marginal drop in royalties only, and the non-tax revenues as a whole may not suffer any significant loss due to the earthquake.

Own non-tax revenue in Gujarat has remained fairly stable as a proportion of GSDP at about 2.53 per cent. This level is assumed to remain constant, and with GSDP growing nominally at the rate of 12 per cent per annum, the rate of growth of own non-tax revenue too would remain the same. However, the reform measures with respect to user charges that were to be introduced in the short run, may be a victim of the quake. Revision of user charges, long overdue, may be postponed due to the January 26 earthquake.

iii) *Earthquake related other flows*

There is some uncertainty regarding the prospective inflow of earthquake related assistance. As of February 19, the Government of Gujarat has received Rs.650 crore, of which Rs.500 crore are from the National Calamity Compensation Fund, Rs.110 crore from the Prime Minister's Relief Fund, and Rs.40 crore from the Chief Minister's Relief Fund. Large amounts of additional support are expected, but the exact amounts or the terms are not yet known with certainty. Even whether the whole of the estimated proceeds of Rs.1,300 crore from the 2 per cent surcharge on income tax imposed by the Government of India citing the Gujarat earthquake will be passed on to Gujarat and when remains to be seen.²⁴ The above amounts are by way of transfers. In addition, the Government of Gujarat has been permitted ways and means advances (WMA) from the Reserve Bank of India (RBI) beyond normal limits for emergency relief

²⁴ Doubts arise because the Government of India appears to be following the Eleventh Finance Commission recommendation of recouping amounts given out from the NCCF with a tax surcharge. If it is indeed so, then Government of Gujarat may get only the proceeds net of the Rs. 500 crore that it has already received from the NCCF.

and rehabilitation.²⁵ There is speculation about how the excess over the normal WMA may be converted into a longer-term loan or even a grant, but no definite information is available as yet.

b) Expenditure

On the expenditure side, the earthquake required intervention by the government in two major ways: for providing immediate relief and thereafter to ensure that rehabilitation starts to put the affected people on the road to recovery.

i) *On relief*

The relief measures, which follow the path prescribed in the relief manuals of state administration, include food supplies, medical facilities, debris removal, cash doles as well as cash compensation for death, injury and loss of cattle. Our estimates of expenditures on these counts is about Rs.838 crore (Table 11, derived from information provided by Government of Gujarat at various points). The figures for medical services assume that the total expenditure during January 26, 2001 to March 31, 2001, would be close to double that incurred by February 12, 2001. Similarly, given the reports of the large amount of debris that needs to be cleared, before the rehabilitation activities can begin, the expenditures are postulated to be three times that incurred till February 12, 2001. However, the Government of Gujarat's memorandum submitted to the Government of India estimates the anticipated increase in government expenditures on account of relief at Rs 649.34 crore. This suggests that a part of the relief expenditure, including food supplies, medical relief and notably debris removal, is expected to be met by some reallocation of currently available resources of the State Government.

Table 11. Gujarat Earthquake: Anticipated Expenditure on Relief Measures

Measure	Up to end-March 2001
Food Supplies	
Direct	19.03
Indirect	0.52
Medical relief	
Medicines and supply	2.50
Staff	13.90
Debris Removal	143.50
Cash Compensation	
Doles	168.75
Household kits	138.13
Death	200.00
Injury	142.36
Cattle	9.30

²⁵ The limit for normal WMA is Rs. 243 crore for Gujarat.

Total Expenditure	837.99
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Source: Compiled from Memorandum submitted to Government of India, and other information supplied by Government of Gujarat

ii) *On rehabilitation*

In the memorandum submitted to the Government of India, as well as the documents submitted to the Joint Earthquake Emergency Mission of the World Bank and the Asian Development Bank, the Government of Gujarat has indicated the urgent need for rehabilitation expenditures on education, health, roads and bridges, administrative buildings, drinking water, irrigation and power. On the housing rehabilitation front, the Government has also announced a plan for reconstruction and repairs of houses with four packages.²⁶ The first package consists of complete relocation of 229 villages where 70 per cent of the houses have collapsed.²⁷ These villages are in seismic zones 4 and 5. According to Government of Gujarat's estimates, a sum of Rs.3 crore will be needed to relocate and rebuild a village for 200 families.²⁸ The first package will be implemented in partnership with NGOs, corporate houses or other State Governments.²⁹ The second package consists of talukas and towns, which are severely affected, but where less than 70 per cent of the houses are destroyed. For in situ reconstruction of houses totally destroyed, families below the poverty line (BPL) and hutment dwellers under the Sardar Aavas Yojana will be given financial aid of Rs.40,000. Others with destroyed houses will be entitled to financial aid of Rs.50,000, Rs. 70,000, and Rs.90,000 for construction up to 25 sq. mtrs., 35 sq. mtrs., and 45 sq. mtrs., respectively. Owners of partially destroyed houses will be entitled to Rs.3,000 for repairing of ½ inch crack, Rs.7,000 for 10 per cent damage, Rs.15,000 for 25 per cent damage, and Rs.30,000 for 50 per cent damage.³⁰ The third package consists of areas away from the epicenter of the quake. Under this package, owners of each fully destroyed and partially damaged hutment will be given financial aid of Rs.7,000 and Rs.2,000, respectively. Owners of fully destroyed semi-pucca houses will be given aid of Rs.40,000. Owners of partially destroyed houses will be entitled to Rs.2,000 for repairing of ½ inch crack, Rs.5,000 for 10 per cent damage, Rs.10,000 for 25 per cent damage, and Rs.20,000 for 50 per cent damage. The fourth package is for jurisdictions of municipal corporations, urban development authorities, and municipalities (other than Bhuj, Anjar, Bhachau and Rapar). Under this package, owners of destroyed or damaged houses and apartments will be entitled to aid at the rate of Rs.3,500 and Rs.2,800 per sq. mtr. for frame structures and load-bearing structures, respectively. With a ceiling of 50 sq. mtrs., maxima of Rs.1.75 lakh and Rs.1.40 lakh apply to the two cases. The Centre had already released Rs.950 crore in the first fortnight of the earthquake. The Government of Gujarat has asked for the release of Rs.2,775 crore in the current financial year (up to March 31, 2001).

While repair of the damages to social and economic infrastructure is essential for putting the affected areas on the road to recovery, and is a legitimate public expenditure, rehabilitation of private housing beyond a certain minimum limit raises questions about the optimality of such a decision. In the event, the expenditure for rehabilitation of social and physical infrastructure along with the likely expenditures on the schemes announced for the housing sector is estimated at Rs 8,665 crore, or \$ 1864 million (Table 12). These measures do not include any compensation for the loss of asset base in the productive sectors, agriculture, industry and services. Any decisions on these lines would contribute towards increasing the expenditure of the Government even further.

Table 12. Gujarat Earthquake: Anticipated Expenditure on Rehabilitation Measures

²⁶ See advertisement in Times of India, Ahmedabad, February 18, 2001, p. 15

²⁷ Of these 229 villages scattered over four districts, 172 are in Kutch, 25 in Rajkot, 19 in Jamnagar, and 13 in Surendranagar.

²⁸ The cost breakdown is as follows: Rs.30 lakh for land, Rs.70 lakh for infrastructural facilities, Rs.180 lakh for housing, and Rs.20 lakh for meeting other expenses.

²⁹ The Government of Gujarat will bear up to 50 per cent of the cost under such partnership. The Government will develop these villages on its own only if no partner is forthcoming.

³⁰ Damage assessment will be done in the presence of Technical Officers, NGOs, and leading persons of the village.

	US\$ Million	Rs. crore
Education*	180	837
Health	62	287
Drinking water	132	614
Power	97	453
Municipal Infrastructure	45	209
Public Buildings	95	444
Roads and bridges	55	255
Housing*	1,107	5148
Irrigation	90	418
Total	1864	8665

Note: *: Sectors where private sector participation is possible.

Source: WB/ADB Staff estimates, preliminary.

c) Overall scenario

i) *Methodology*

The projections of own tax revenues, and relief and rehabilitation expenditures given above need to be augmented with some further projections about shared taxes, grants, revenue and capital expenditure to derive the overall fiscal scenario for the State.

The Eleventh Finance Commission's (EFC) recommendations determine the state's share in shared taxes. Figures for grants are obtained as follows:

- Statutory grants: on the basis of EFC's recommendations on upgradation and special problem grants, grants for rural and urban local bodies and Centre's contribution to the calamity relief fund;
- Other non-plan grants: on the basis of EFC's projections
- Plan grants: for 2000-01 and 2001-02, the estimates are Central assistance expected by the Government of Gujarat, split into grant and loan components according to standard 30:70 formula. With the Tenth Five Year Plan yet to be formulated, the figure for 2002-03 is an ad-hoc assumption.
- Non-debt capital receipts: given its erratic nature over time as well as small magnitude, such receipts except those from disinvestment, are assumed to remain constant at the budgeted level for 2000-01. Disinvestment proceeds for 2000-01 remain as budgeted, while no such proceeds are assumed for the subsequent years.

On the expenditure side, revenue expenditure net of interest payments is projected to increase by 8 per cent per year. Given the agreement with Asian Development Bank (ADB) for fiscal reform, the revenue expenditures were likely to decline as a proportion of GSDP. It is reasonable to assume that the rate of growth of expenditures would be somewhat higher than the rate of inflation, but lower than the nominal rate of growth of GSDP. Interest payments are determined endogenously. All fiscal deficit is assumed to be financed out of borrowing and the average effective interest rate is assumed to be 12 per cent, close to the actual observed levels. Capital expenditure as a proportion of GSDP demonstrates an increasing trend, with the ratio increasing by 12 per cent per annum, on average. This trend is assumed to persist. Stability of loans and advances extended by the State Government at around 0.5 per cent of GSDP is assumed to persist. Additional debt finances the fiscal deficit and the debt stock is revised upwards to the full extent of the fiscal deficit. An increase in deficit not only has an impact in the year when it happens, but affects the overall fiscal scenario in future years also through the additional cost of servicing a higher level of debt.

Three scenarios have been worked out to calibrate the impact of the earthquake on Gujarat's finances. The baseline is a counterfactual of what is likely to have happened without the earthquake. The

effect of the earthquake has been worked out under two alternative scenarios: an essential and an additional policy interventionist approach. The outcomes of the three scenarios are given in Table 13.

ii) *Baseline scenario – pre-earthquake*

This scenario shows an increase in fiscal deficit from Rs 6,174 crore in 2000-01 to Rs 7,429 crore in 2001-02 and finally to Rs 8,355 crore in 2002-03.

Table 13. Gujarat January 26 Earthquake: Overall Fiscal Scenario

(Rs crore)

	Pre-earthquake			Essential Policy			Additional Policy		
	2000-01	2001-02	2002-03	2000-01	2001-02	2002-03	2000-01	2001-02	2002-03
Own Tax Revenue	9,877	10,553	12,011	9,591	10,208	11,575	9,591	10,208	11,575
Own Non Tax Revenue	3,462	3,877	4,342	3,462	3,877	4,342	3,462	3,877	4,342
Shared Taxes	1,525	1,778	2,073	1,525	1,778	2,073	1,525	1,778	2,073
Grants	847	620	689	847	620	689	847	620	689
Total Revenue Receipts	15,710	16,828	19,115	15,425	16,483	18,679	15,425	16,483	18,679
Additional Receipts				660	1,500	0	660	1,500	0
Revenue Expenditure	18,959	20,171	22,398	18,959	20,249	22,601	19,556	20,530	23,286
of which									
Interest	3,503	3,478	4,369	3,503	3,556	4,572	3,503	3,838	5,258
Capital Expenditure	2,815	3,554	4,458	2,815	3,554	4,458	2,815	3,554	4,458
Loans and Advances (net)	110	532	614	110	532	614	110	532	614
Relief Expenditure				649	0	0	649	0	0
Rehabilitation Expenditure				375	2,119	1,037	2,125	5,199	1,341
Fiscal deficit	6,174	7,429	8,355	6,824	8,470	10,031	9,171	11,833	11,020
GSDP at current prices	122,126	136,781	153,195	122,126	136,781	153,195	122,126	136,781	153,195
Fiscal Deficit as percentage of GSDP	5.06	5.43	5.45	5.59	6.19	6.55	7.51	8.65	7.19

iii) *Earthquake: an essential policy interventionist approach*

The existing policy of relief and rehabilitation ensures that the government takes responsibility for certain kinds of expenditures. These include immediate relief measures like provision of cash doles, food and medicines, on the one hand and expenditure for restoring basic social and infrastructural services. The commitment on these heads amounts to Rs 4,197.07 crore.³¹ It is assumed that the whole of the relief expenditure and 11 per cent of the rehabilitation outlay (as proposed in the memorandum of the Government of Gujarat to the Government of India) are spent in the current financial year. Sixty per cent of the rehabilitation outlay is projected to be incurred in 2001-02, with the balance being disbursed in the following year. The impact of these measures, presuming that the necessary finances are obtainable as loans, is to raise the fiscal deficit to Rs 10,031 crore by 2002-03. If a part of the finances is available as international assistance, which the state would get in the standard 70:30 package, the fiscal deficit and the interest cost would be significantly lower. For instance, the assistance announced by the Asian Development Bank to the tune of \$500 million would figure in this category. However, with uncertainty about terms and phasing with which this assistance would become available to the Government of Gujarat, this impact has not been incorporated into the projection exercise.

³¹ The figure of Rs. 4,197.07 crore can be derived from Table 11 by subtracting the housing rehabilitation figure of Rs. 5,148 crore from the total rehabilitation expenditure of Rs.8,665 crore and adding Rs.649.34 of relief expenditure.

iv) *Earthquake: an additional policy scenario*

In addition to the essential rehabilitation measures, the Government is formulating a number of schemes to facilitate the private sector's return to normalcy. On the housing front, the government has announced a major initiative, which covers all the affected population, except for the towns of Anjar, Bhuj, Bhachau and Rapar. A separate rehabilitation package is being devised for these four towns. The schemes announced so far are estimated to cost approximately Rs. 4,000 crore. The rehabilitation of the four severely damaged municipalities listed above is anticipated to cost another Rs 1,000 crore. If these expenditure commitments too are to be honoured through borrowing, this would raise the fiscal deficit further to Rs 11,833 crore by 2001-02 and then a drop to Rs.11,020 crore by 2002-03. One of these schemes for complete relocation of largely damaged villages invites private participation. The extent of private initiative would determine the resultant impact of this scheme on fiscal deficit and debt. Current intelligence suggests that private participation would be forthcoming for the relocation of 150 villages, saving the Government Rs.225 crore.

In addition to the above measures, if the Government comes forth with policies to compensate earthquake-induced damage to private industry, trade and commerce, there would be additional impact of such policies on the State's finances. However, the government has to decide for itself the losses it must cover, the various social groups that it must support, and the extent of such support. A welfare state cannot obviously shirk its social responsibilities, but at the time of a natural disaster as the present one there are other institutions that should and do come into play, sharing these responsibilities. To a limited extent, the government's policies should also leave some room for private initiatives on the part of the surviving victims themselves as well as others wishing to share their burden.

There are demands from several quarters regarding the need to provide tax exemptions for relief related purchases and for the quake affected regions in general, not necessarily by the quake affected population only. While the noble intentions behind such demands cannot be faulted, administrative considerations would suggest a very cautious approach. It would probably be better to refund taxes paid by eligible parties than to provide exemptions, the misuse of which cannot be ruled out altogether.

d) Financing available

Putting together the various schemes announced by the Government of Gujarat, the expenditure impact of the earthquake on the expenditures of the State Government, including that on relief and rehabilitation, would amount to Rs. 9,345 crore. A part of the relief expenditure is offset by receipts to the tune of Rs 660 crore from NCCF, PM's relief fund and CM's relief fund. The rehabilitation expenditure as committed up to February 20, 2001, amounts to Rs 8,665 crore. Against this, the anticipated receipts from various sources reduce the unfinanced expenditures to Rs 6,645 crore.(Table 14)

Table 14. Financing of the Earthquake Induced Expenditures

	Rs Crore
Total Expenditure	9,345
Finances Already Available	
Immediate relief from NCCF	500
PM's relief fund	110
Accumulations in CM Relief Fund	50
Proposed schemes already offered by GOI	
Accelerated power development programme	192
Accelerated irrigation development programme	
Education	150
Water supply	100
Income tax surcharge	800

ADB Power Sector Loan	698
Completely Unfinanced	6,645

e) Municipal finances

Local governments have always played an important role in the provision of urban infrastructure. Their significance has been further enhanced by the 73rd and 74th amendments to the Constitution conferring them with secure constitutional status. The earthquake has not only affected the area under their jurisdiction, but also their finances, including revenues.

As for the municipalities, the main tax revenue sources are octroi and property tax. One or more of revenue sources like water charges, drainage tax and vehicle tax also fetch non-negligible revenues in some municipalities. On the basis of municipality-wise data for 1996-97, it can be determined that the income of 16 earthquake-affected municipalities excluding Ahmedabad formed about 12.6 per cent of the total municipal income in the state. If 10 percent of the income of Ahmedabad municipality is taken to be affected, that would constitute about 3.5 percent of the total municipal income. However, even in the case of the 16 municipalities taken as affected, the impact of the earthquake varies considerably among them, and it can be reasonably assumed that on the whole about 50 percent of their revenue generation is likely to be affected. Thus, including Ahmedabad, about 9.8 percent of the municipal revenues in Gujarat are likely to be lost in a whole year due to the earthquake. This translates to an amount of about 110 crore in terms of 1996-97 revenues of municipalities. Applying an assumed growth of 19 percent³² per annum to the municipal revenues, the loss works out to Rs.263 crore in the full fiscal year of 2001-2002 and a pro-rata adjusted figure of Rs. 37 crore for the two post-earthquake months of 2000-2001 fiscal year.

V. Deposits and Financial Markets

a) Background

As of end-December 1999, Gujarat had 3,630 scheduled commercial bank branches with more than Rs.44,842 crore in deposits. The number of accounts and the amount of credit outstanding in the scheduled commercial banks was more than 2 crore and Rs.20,000 crore, respectively in end-March 1999.³³ Banking habit in Gujarat is more developed, and the average income higher than in many other parts of India, and per capita bank deposit at about Rs.8,709 at end-March 1999 was considerably larger than the corresponding all-India average of Rs. 807.

The number of scheduled commercial bank branches in the six districts of Ahmedabad, Jamnagar, Kutch, Patan, Rajkot, and Surendranagar, seriously affected by the quake was 1,306 at end-December 1999 (Table 14). On average, in March 1999, the 7.4 million deposit accounts in these branches had Rs.23,245 per account, which was about 13 ½ per cent more than the average amount of Rs.20,481 per account in about 20 million accounts all over the State.

Apart from scheduled commercial banks, Gujarat has a healthy tradition of cooperative banking. At end-March 2000, there were 1,087 branches of the Gujarat State

³² This growth rate is the average annual growth in ordinary income of municipal bodies in Gujarat during 1994-97. Once the actual collection figures for more recent years are available, the estimates given here may undergo some change.

³³ The number of accounts and credit outstanding in December 1999 are not readily available.

Cooperative Bank (GSCB) all over the State with Rs.5,997 crore in deposits and Rs.3,238 crore in advances. GSCB is the apex institution of all the district cooperative banks (DCB), urban cooperative banks and other cooperative banks. The DCBs are the middle level agencies providing financial support to the cooperatives within their jurisdiction.³⁴ At the village level, 7,321 primary agricultural cooperative societies covering single village or a group of villages are working and providing crop production loans to their farmer members. Of the 3.4 million agriculturist khatedars (or people with names on the revenue ledger), about 64 per cent are covered by cooperatives.

Table 14. Gujarat January 26 Earthquake Affected Districts: Scheduled Commercial Bank Deposits, 1999

(As of last Friday of the month)

		March			December	
		Offices	Deposits		Offices	Amount of deposits (In rupees lakh)
			No. of a/c	Amount (In rupees lakh)		
1 Ahmedabad	608	3,760,912	892,405	579	963,008	
Rural	56	126,056	14,715			
Semi-urban	43	257,184	28,271			
Urban	509	3,377,672	849,419			
2 Jamnagar	152	864,655	163,959	151	180,399	
Rural	72	177,648	22,926			
Semi-urban	27	252,038	35,706			
Urban	53	434,969	105,327			
3 Kutch	169	873,139	321,653	166	338,448	
Rural	87	333,417	101,055			
Semi-urban	41	236,968	90,794			
Urban	41	302,754	129,804			
4 Patan	74	305,035	31,008	74	36,302	
Rural	37	91,916	6,343			
Semi-urban	37	213,119	24,665			
Urban	-	-	-			

³⁴ Every district does not have a DCB. There are 18 DCBs, while the number of districts is 25. The DCBs in some of the former undivided districts continue to have jurisdiction over parts of the newly formed districts. For example, the DCBs of Banaskantha and Mehsana have jurisdiction over separate parts of the newly formed district of Patan.

5	Rajkot	251	1,281,572	281,991	244	298,541
	Rural	88	200,602	22,627		
	Semi-urban	60	440,063	65,488		
	Urban	103	640,907	193,876		
6	Surendranagar	93	355,492	38,564	92	41,488
	Rural	49	73,892	7,157		
	Semi-urban	30	170,964	17,187		
	Urban	14	110,636	14,220		
	All affected districts	1,347	7,440,805	1,729,580	1,306	1,858,186
	Rural	389	1,003,531	174,823		
	Semi-urban	238	1,570,336	262,111		
	Urban	720	4,866,938	1,292,646		

Source: "Banking Statistics: Basic Statistical Returns", Vol. 28, March 1999, RBI, pp. 55-56 for March 1999 and "Banking Statistics: Quarterly Handout - December 1999", Banking Statistics Division, Department of Statistical Analysis and Computer Services, RBI, p. 32.

Table 15. Gujarat January 26 Earthquake Affected Districts: Cooperative Banks, end-March 2000

	Branches	Deposits	Advances
		(In rupees lakh)	
Ahmedabad	122	133,053.55	46,421.21
Jamnagar	38	10,799.36	15,920.58
Kutch	13	2,017.13	2,161.00
Banaskantha ¹	120	22,325.12	20,955.42
Mahesana ¹	94	51,701.98	13,396.64
Rajkot	115	51,522.10	24,480.82
Surendranagar	15	6,070.03	14,064.62
Total	517	277,489.27	137,400.29

Source: Office of the Registrar Cooperative Societies, Gujarat.

¹ The DCBs of Banaskantha and Mehsana have jurisdictions over the cooperatives in the newly formed district of Patan.

b) Impact of the earthquake and measures taken

As many as 68 branches of commercial banks were fully damaged by the earthquake. The number of branches sustaining partial damage was 80. The disruption of banking services in the aftermath of the quake added to the misery of the traumatised people in the affected districts.³⁵

The Reserve Bank of India (RBI) delegated special powers to its Regional Director for the State of Gujarat to permit banks setting up of satellite offices, extension

³⁵ Banks being closed on Friday, January 26th, a national holiday, followed by a weekend, mitigated the misery to an extent.

counters, mobile banking facilities, or shifting branches to nearby suitable places for immediate resumption of banking services at affected branches.³⁶ As of February 14, 2001, operations in all but 7 of these 148 branches had been fully restored. Furthermore, RBI instructed the banks to settle claims made by nominees of depositors who have lost their lives in the earthquake within 48 hours and in other cases, on the bank being satisfied about the legality of the claim.³⁷ The successor has to be notified by the State agencies. According to RBI instructions, payment up to Rs.50,000 in deceased claims may be released against indemnity and affidavit.

A control room for directing and monitoring relief measures was set up in Dena Bank, Ahmedabad supported at all times by officers specially designated for the purpose from SIDBI, National Housing Bank (NHB), NABARD, Dena Bank and Bank of Baroda.³⁸ Nodal offices were set up by banks in affected areas to monitor and report on the implementation of relief measures to the control room on an ongoing basis.

A meeting of the State Level Bankers' Committee (SLBC) was held in Ahmedabad on February 9, 2001 to consider providing relief and concessions to the earthquake victims. Eligibility for relief is restricted to the affected persons in the districts and blocks notified as 'affected by the earthquake' by the State Government. The recommendations as accepted by the Reserve Bank of India include freezing loan classification on an 'as is where is' basis, no demand for recovery for standard assets, and charging of simple 10 per cent interest until March 31, 2003.³⁹ For restoration and rehabilitation, they also contain liberal sanction limits – Rs.1 lakh for small traders, small business, self-employed and small road transporters, etc., Rs.2 lakh for house and shop owners, Rs.2,000 for consumption loans. The loans would carry interest rates not exceeding the prime lending rate of the State Bank of India, and no processing fee would be charged on the affected beneficiaries. For monitoring the relief measures by banks, the SLBC meetings will be convened on a monthly basis. Further, the monitoring committee of SLBC consisting of Dena Bank, RBI, SBI, Bank of Baroda, Bank of India, Central Bank of India, NHB, NABARD, SIDBI, and Relief Commissioner, Secretary of Agriculture or his representative would meet on a fortnightly basis to review the progress. The SLBC would further consult the State Government for waiver of stamp duty for registration of houses and mortgage of property and for certification of ownership of land for construction of houses and shops. It should be noted that the banks are free to evolve their own guidelines on the stipulations on margin, security and repayment schedule in the matter of direct lending for housing to borrowers with the approval of their Boards.⁴⁰

c) Likely impact

i) *Of the earthquake, without the rehabilitation package*

³⁶ The RBI is the central bank and banking regulator in the country.

³⁷ See letter RPCD.PLFS.NO./222/05.04.02(Guj)/2000-01 dated February 12, 2001 from General Manager, Rural Planning and Credit Department, RBI to SLBC Convenor Bank for Gujarat State.

³⁸ The Dena Bank is the convenor bank of the State Level Bankers' Committee (SLBC).

³⁹ See letter RPCD.PLFS.NO./222/05.04.02(Guj)/2000-01 dated February 12, 2001 from General Manager, Rural Planning and Credit Department, RBI to SLBC Convenor Bank for Gujarat State.

⁴⁰ See IECD circular letter No.(HF) 40/03.27.26/97-98 dated April 16, 1998.

The dominant impact of the earthquake will be on the financial and asset market behaviour of the affected people. The wealth loss sustained as a result of the quake would lead to a major reshuffling of their portfolios. The loss being primarily of physical assets, the people in the affected regions would draw down their financial assets to restore some of the physical assets lost. While the asset loss will impose substantial hardships on the people affected, in financial markets in aggregate terms the effect will be of second order of magnitude. The total deposits in the affected districts of about Rs. 173 billion constituted only 2.2 per cent of the aggregate deposits in the country of Rs.799 trillion.

The large deposit base of the affected regions indicates that the banks had ongoing relations with many of the affected people. This would help the banks to do the credit appraisal for restoration and rehabilitation, and together with the low credit-deposit ratio, would enable credit to flow to the affected regions. The chain of cooperatives would also contribute to the recovery and restoration.

ii) *Of the rehabilitation and recovery package*

The announced rehabilitation and recovery package will help the banks to pump in credit to the affected regions. The victims of the earthquake will require time to start their lives afresh. Any mechanical downgrading of existing loans because of nonpayment of interest or principal, requiring the banks to provision for such loans, would have been counterproductive. It would have impeded the flow of credit to the victims, and in the process, actually impaired the banks' assets at stake. Overall, while the rehabilitation package is welcome, it is not quite clear whether the stipulation of liberal amounts of loans at concessional rates to the affected people would help or hinder the flow of credit.

VI. Conclusion

The recent earthquake devastated large parts of Gujarat and the toll in terms of human lives and residential property has been enormous. The loss of a large number of housing units of low value may constitute a relatively small economic loss for the State in rupee terms, but is a very large loss in terms of the people's low-cost housing needs. The total impact of the earthquake on Gujarat's GSDP may not exceed a quarter per cent, but the challenge of reconstruction and rehabilitation in the affected areas remains. Putting in place a proper policy framework may not only restore normalcy in the region, but can start a recovery boom.

Gujarat, like most other states in India, is going through a period of fiscal distress. The quake is likely to have an adverse impact on the State's finances through lost revenues and additional expenditure. What is important, however, is to limit the damage by avoiding unnecessary tax exemptions and overgenerous compensations. Even if financing is available, it is important to remember that loan financed quake-related expenditure will have an enduring impact on the State's finances through the dynamics of public debt. Furthermore, the quake should not be allowed to postpone the long overdue adjustment of user fees for public services.

Devising a reconstruction and recovery package provides an opportunity for upgrading the infrastructure, including buildings and structures, and making them appropriate for the seismic characteristics of the region. What is important, however, is to distinguish between public sector and private sector losses. More work needs to be done on estimation of likely loss from future earthquakes to assist the politics of

earthquake hazard mitigation, consciousness raising, and understanding the commercial aspects of earthquake insurance and construction of earthquake resistant buildings.